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2nd INTERNATIONAL CONFERENCE

FIRST

FORUM IN RESEARCH, SCIENCE, AND TECHNOLOGY (FIRST)

CONFERENCE PROGRAMS AND ABSTRACT

INTERNATIONAL CONFERENCE FORUM IN RESEARCH, SCIENCE, AND TECHNOLOGY 2018

OCTOBER 30-31, 2018

Palembang, Province of South Sumatera

Indonesia

Organized By :

Collaborate With :

FOREWORD FROM GENERAL CHAIR
2nd FIRST 2018 INTERNATIONAL CONFERENCE

Welcome to 2 nd FIRST 2018, It is with a great pleasure that we extend our warm welcome to all the participants of the 2nd FIRST 2018 International Conference, Forum in Research, Science, and Technology. This conference is held for second times and organized by State Polytechnic of Sriwijaya. The first conference in the series was held in State Polytechnic of Sriwijaya, Palembang, South Sumatera, Indonesia on October 18-19, 2016. It is a good collaboration of State Polytechnic of Sriwijaya, University of Cologne, University of Sunderland, International Islamic University Malaysia, and Politeknik Seberang Perai Malaysia. The 2nd FIRST 2018 International Conference has attracted 109 participants from 6 countries.

The 2nd FIRST 2018 particularly encouraged research students and developing academics to present and to discuss new and current work in the field of 3 Tracks, including Engineering and Science (Track 1), Computer Science and ICT (Track 2), and Social Science (Track 3). 109 selected papers were presented from 137 peer reviewed paper by reviewers drawn from the scientific committee, external reviewers and editorial board.

Finally, as the General Chair of the Conference, I would like to express my deep appreciation to all members of the Steering Committee, Technical Program Committee, Organizing Committee and Reviewers who have devoted their time and energy for the success of the event.

In the end, I hope you enjoy the conference and the beauty of Palembang.

Dr.Ir. Rusdianasari, M.Si.
General Chair of 2nd FIRST 2018

FOREWORD FROM DIRECTOR OF STATE POLYTECHNIC OF SRIWIJAYA

Dear all participants, welcome to Palembang, Indonesia. It is my great pleasure to have all of you who have come from many parts of the world, to join the 2nd FIRST 2018 International Conference, Forum in Research, Science, and Technology. This conference is initiated and organized by State Polytechnic of Sriwijaya in collaboration with State University of Cologne, University of Sunderland, International Islamic University Malaysia, and Politeknik Seberang Perai Malaysia.

It is also my great pleasure to see that this conference is an effective media to link the researchers from many parts of the world. The theme for the 2nd FIRST 2018 is "Applied Technology for Sustainable Development in Supporting Prosperous Human Existence". It is expected it will be worthwhile platform for researchers to present their finding in the areas on multidisciplinary of Engineering and Science (Track 1), Computer Science and ICT (Track 2), and Social Science (Track 3). It has also provided an opportunity for the professionals and researchers to learn and share about the latest development and research in those 3 tracks.

Finally, on behalf of the conference committee, I would like to express my gratitude and great appreciation towards all of the authors, reviewers, and participants for the great contribution to ensure the success of this event.

Dr. Ing. Ahmad Taqwa, M.T.
Director of State Polytechnic of Sriwijaya

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RUNDOWN
2nd FIRST 2018 INTERNATIONAL CONFERENCE
(FORUM IN RESEARCH SCIENCE AND TECHNOLOGY)
Horison Ultima Hotel, Palembang, South Sumatera, Indonesia
Tuesday – Wednesday, October 30-31, 2018

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<tr><td>1.</td><td>Registration</td><td>Event Section Committee</td><td>07.00 – 07.30</td><td colspan="2" rowspan="9">M.Miftakhul Amin, S.Kom., M.Eng</td></tr>
<tr><td>2.</td><td>The Opening Ceremony</td><td rowspan="7">Event Section Committee</td><td rowspan="7">07.30 – 08.30</td></tr>
<tr><td></td><td>Tari Tanggai</td></tr>
<tr><td></td><td>Indonesian National Anthem</td></tr>
<tr><td></td><td>Do’a</td></tr>
<tr><td></td><td>Chair Report Speech</td></tr>
<tr><td></td><td>Speech and Opening Remarks by Director of State Polytechnic of Sriwijaya</td></tr>
<tr><td></td><td>Souvenirs Gift, Group Photos</td></tr>
<tr><td>3.</td><td>Coffee Break</td><td>Event Section Committee</td><td>08.35 – 08.45</td></tr>
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<tr><th>No.</th><th>Keynote Speaker</th><th>Affiliation</th><th>Time Allotment</th><th>Moderator</th><th>Liaison Officer</th></tr>
<tr><td>1.</td><td>Dr. Ing. Ahmad Taqwa, M.T.</td><td>Politenik Negeri Sriwijaya</td><td>08.45 – 09.15</td><td rowspan="4">Mr. Firdaus, S.T., M.T.</td><td rowspan="4">Dr. Eng. Herlambang, M.Kom</td></tr>
<tr><td>2.</td><td>Prof. Dr. Rahmat Budiarto</td><td>Al Baha University, Saudi Arabia</td><td>09.15 – 09.45</td></tr>
<tr><td>3.</td><td>Prof. Dr. Werner Rammensee</td><td>Cologne University, Germany</td><td>09.45 – 10.15</td></tr>
<tr><td>4.</td><td>Prof. Erry Yulia Triblas Adesta</td><td>International Islamic University, Malaysia</td><td>10.15 – 10.45</td></tr>
<tr><td>5.</td><td>Assoc. Prof. Dr. Augustus E. Osseo-Asare</td><td>University of Sunderland, United Kingdom</td><td>10.45 – 11.15</td><td rowspan="2">Dr. Markoni Badri, S.E., M.B.A.</td><td rowspan="2">M.Miftakhul Amin, S.Kom., M.Eng</td></tr>
<tr><td>6.</td><td>Prof. Badri Munir Sukoco, S.E., MBA.,Ph.D</td><td>Universitas Airlangga</td><td>11.15 – 11.45</td></tr>
</table>

No.	Invited Speaker	Affiliation	Time Allotment	Moderator	Liaison Officer
1.	Assoc. Prof. Pindo Tutuko, Ph.D.	University of Merdeka Malang	11.45 – 12.30	Dr. Nurul Aryanti	Dr. Eng. Herlambang, M.Kom
2.	Ir. Indra Chandra Setiawan, M.T.	Senior Manager PT. Toyota Motor Manufacturing Indonesia			
3.	Dr. Mohammed Yahya Azahrani	Al Baha University, Saudi Arabia			
Break, Sholat Dzuhur, Lunch			12.30 – 13.15		
PARALEL SESSION					
No.	**Theme**	**Room**	**Time**	**Moderator**	**Articles**
1.	TRACK 1 (Electrical Engineering, Mechanical Engineering, Civil Engineering)	ROOM 1 (Leuser)	13.30 – 17.20	Agus Subriyanto, S.T., M.T. / Deris Stiawan, M.T., Ph.D./ Nyayu Latifah Husni, S.T., M.T.	22
2.	TRACK 1 (Industrial Engineering, Energy, Biology, Cehmical Engineering)	ROOM 2 (Dempo I)	13.30 – 17.30	Ir. Jaksen M. Amin, M.Si. / Doeslohal Djumrianti, S.E.MIS., Ph.D / Koryati, M.Pd	23
3.	TRACK 1 (Chemical Engineering)	ROOM 3 (Dempo II)	13.30 – 17.20	Anerasari, M.B.Eng., M.Si / Dr. Welly / M.Miftakhul Amin, S.Kom., M.Eng	22
4.	TRACK 2 (Computer Science, , Computer Engineering, Information System, Informatics Management) TRACK 3 (English)	ROOM 4 (Semeru I)	13.30 – 16.40	Ummasyro, S.E. Med.M / Dr. Eng. Herlambang, M. Kom /	18
5.	TRACK 3 (Management Economics, Business Administration, Accounting)	ROOM 5 (Semeru II)	13.30 – 17.40	Dr. Jalaluddin Sayuti / Dr. Periansyah / Dr. Sari Lestari ZR	24

WEDNESDAY, October 31, 2018 Horison Hotel Ultima, GOLDEN Room, 2nd Floor				
No.	**Session**	**Person in Charge**	**Time Allotment**	**Liaison Officer**
1.	**Registration**	Event Section Committee	07.30 – 08.00	Event Section Committee
No.	**Session**	**Speakers**	**Time Allotment**	**Liaison Officer**
1.	**Materi 1:** 7 Things to Do to Publish Your Paper in Accredited & International Journal (IRJBS):	M. Eko Y. Napitupulu M. Ikom	08.00 – 09.00	M.Miftakhul Amin, S.Kom., M.Eng
2.	Cofee Break		09.00 – 09.15	Event Section Committee
3.	**Materi 2 :** How to Write Reseach Paper	Marieska Verawaty, S.Si., M.Si, Ph.D / Deris Stiawan, M.T., Ph.D	09.15 – 12.30	Nyayu Latifah Husni, S.T., M.T.
4.	Break, Sholat Dzuhur, Lunch		12.30 – 13.30	Event Section Committee
No.	**Session**	**Speakers**	**Time Allotment**	**Liaison Officer**
1.	Couching Clinic and Workshop Session 1	Couching Clinic and Workshop Team	13.30 – 15.00	Ade Silvia Handayani, S.T., M.T.
2.	Cofee Break		15.15 – 15.30	Event Section Committee
3.	Couching Clinic and Workshop Session 2	Couching Clinic and Workshop Team	15.30 – 16.30	Dr. Sari Lestari ZR
4.	Closing		16.30 – 17.00	Dr. Marieska Lupikawaty

Theme : TRACK 1 (Electrical Engineering, Mechanical Engineering, Civil Engineering)
Room : ROOM 1 (Leuser)
Moderator : Agus Subiyanto, S.T., M.T. / Deris Stiawan, M.T., Ph.D./
Nyayu Latifah Husni, S.T., M.T.
Time : 13.30 – 18.05 WIB
Articles : 22

ID	Time	Tittle	Authors with affiliation and country
864	13.30 – 13.40	Coffee grouping Control System using TCS3200 Sensor based on XBEE PRO	Sarjana, Emilia Hesti, Sholihin, Halimah Tussyadyah (Politeknik Negeri Sriwijaya)
865	13.40 – 13.50	Mimo Printed Dipole Antenna For WIMAX Network Usage Application	Suzanzefi, Ciksadan, Irawan Hadi, R.A. Halimah Thusyadiyah (Politeknik Negeri Sriwijaya)
1010	13.50 – 14.00	Motion Control Analysis of a Spherical Robot as a Surveillance Robot	Tresna Dewi, Pola Risma, Yurni Oktarina, RD Kusumanto (Politeknik Negeri Sriwijaya)
1030	14.00 – 14.10	Wajanbolic Reflection Antenna For 4G Service in Urban and Sub Urban Areas	Jon Endri, Ade Silvia Handayani, Raudatul Jannah (Politeknik Negeri Sriwijaya)
1082	14.10 – 14.20	Enhancement of Navigation Systems of Mobile Robots in Gas Leakage Searching	Nyayu Latifah Husni (Politeknik Negeri Sriwijaya), Nadya Lukita(Politeknik Negeri Sriwijaya), Masayu Annisah(Politeknik Negeri Sriwijaya), Ade Silvia Hadayani(Politeknik Negeri Sriwijaya), Adella Rialita(Politeknik Negeri Sriwijaya), Siti Nurmaini (Universitas Sriwijaya), Irsyadi Yani (Universitas Sriwijaya),
1126	14.20 – 14.30	Higher Education Role in Supporting Indonesian Government Policy in Developing Renewable Energy	Ahmad Taqwa (Politeknik Negeri Sriwijaya)
1137	14.30 – 14.40	Energy Transfer Provision Based on RF-Radio Frequency as Established Solution of Learning Process Using Laptop and Wireless Projector	Suroso, Sopian Soim, Ade Silvia Handayani, Ahmad Taqwa (Politeknik Negeri Sriwijaya)
1164	14.40 – 14.50	Transmission Performance Analysis of TDMA Radio and MAC Communication of TDMA Protocol in TDMA Radio	Ferry Nando, (Nittan Valve Kabushiki Kaisha, Japan) A. Permatasari (Telecommunication Engineering, Politeknik Negeri Sriwijaya), Lindawati (Telecommunication Engineering, Politeknik Negeri Sriwijaya) , Ade Silvia Handayani (Telecommunication Engineering, Politeknik Negeri Sriwijaya)
921	14.50 – 15.00	Milling Process Prediction Model of Sugarcane Juice Using Artificial Neural Networks (ANN)	Devie Oktarini (Department of Industrial Engineering, University of Tridinanti (UTP), Amrifan Saladin Mohruni (Universitas Sriwijaya), Safian Sharif (Dept. of Materials Manuf. and Ind. Engineering, Universiti Teknologi Malaysia), Muhammad Yanis (Associate Professor in Mechanical Engineering Sriwijaya University), Madagaskar (Indonesia)

1007	15.00 – 15.10	Experimental Study of Low-Rank Coal From South Sumatra used in Humidifier and Flash Dryer	Irwin – Bizzy (Mechanical Engineering Department Sriwijaya University), Riman Sipahutar (Mechanical Engineering Department Sriwijaya University), Eddy Ibrahim (Mining Engineering Department Sriwijaya University), Muhammad Faizal (Chemical Engineering Department Sriwijaya University)
1024	15.10 – 15.20	Investigation of Finite Element Modelling on Thin-Walled Machining of Ti6Al4V using DEFORM-3D	Amrifan Saladin Mohruni (Mechanical engineering Department Faculty of Engineering Sriwijaya University), Muhammad Zahir (Mechanical Engineering Department Sriwijaya University), Muhammad Yanis (Mechanical Engineering Department Sriwijaya University), Safian Sharif (Department of Materials Manufacture and Industrial Engineering Universiti Teknologi Malaysia), Irsyadi Yani (Mechanical Engineering Department Sriwijaya University)
1031	15.20 – 15.30	Optimization of Molding Parameters for a Micro Gear with Taguchi Method	Min-Wen Wang (Mechanical Engineering Department, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan), Fatahul Arifin (Mechanical Engineering Department, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan), Thi Truc-Ngan Huynh (Industrial Engineering and Management Department, National Kaohsiung University of Applied Sciences, Kaohsiung, Taiwan
	15.30 – 15.40		BREAK
1032	15.40 – 15.50	The effect of Air Flow Rate and Ratio between Coal and Coconut Shell on Heat Energy Produced in an Updraft Gassifier	Riman Sipahutar (Mechanical Engineering Department Sriwijaya University), Diah Kusuma Pratiwi (Mechanical Engineering Department, Engineering Faculty, Sriwijaya University), Amir Arifin ((Mechanical Engineering Department, Engineering Faculty, Sriwijaya University), Irwin Bizzy ((Mechanical Engineering Department, Engineering Faculty, Sriwijaya University)
1161	15.50 – 16.00	Toward Real Time IoT Based Paste Monitoring System for Small to Medium Enterprise (SME)	Erry YT Adesta (Department of Manufacturing and Materials Engineering, International Islamic University Malaysia (IIUM), Jalan Gombak, 53100 Kuala Lumpur, Malaysia), I Hilmy (Department of Manufacturing and Materials Engineering, International Islamic University Malaysia (IIUM), Jalan Gombak, 53100 Kuala Lumpur, Malaysia), Avicenna (Department of Manufacturing and Materials Engineering, International Islamic University Malaysia (IIUM), Jalan Gombak, 53100 Kuala Lumpur, Malaysia) and D Agusman (Jurusan TeknikMesin, FakultasTeknik, UniversitasMuhammadiyah Prof. Dr. HAMKA, Jl. Limau 2 KebayoranBaru, Jakarta Selatan, Indonesia)
1163	16.00 – 16.10	Reducing CO_2 Emissions from Land Transport Sector in Indonesia: Case Study Automobiles Sector	Indra Chandra Setiawan (Department of Mechanical & Industrial Engineering, Faculty of Engineering, GadjahMada University, Indonesia), Indarto (Department of Mechanical & Industrial Engineering, Faculty of Engineering, GadjahMada University, Indonesia), and Deendarlianto (Department of Mechanical & Industrial Engineering, Faculty of Engineering, GadjahMada University, Indonesia)
898	16.10 – 16.20	High Quality Concrete by Using Admixture Superplasticizer and Additional Lime Off	Kosim (Politeknik Negeri Sriwijaya), Raja Marpaung (Politeknik Negeri Sriwijaya)), Zainuddin (Politeknik Negeri Sriwijaya), Darma Prabudi (Politeknik Negeri Sriwijaya)
925	16.20 – 16.30	Criteria Analysis, Weight and Priority for Handling Bridges in Kudus District using	Erwin DW Prasetyo (Dinas Pekerjaan Umum dan Penataan Ruang Kabupaten Kudus, Jawa Tengah, Indonesia), Mudjiastuti Handajani (Magister Teknik Sipil Universitas Diponegoro Semarang) dan Ismiyati (Magister Teknik Sipil Universitas Diponegoro Semarang).

		AHP and Promethee II methods	
997	16.30 – 16.40	A Scouring Patterns Around Pillars of Sekanak River Bridge	Achmad Syarifudin (Civil Engineering department, Universitas Bina Darma, Palembang), Dewi Sartika (Balai Besar Wilayah Sungai Sumatera VIII, Ministry of Public Works and Housing Settlement, Indonesia)
1022	16.40 – 16.50	Irrigation Maintenance Priority Analysis (Case Study: Irrigation Areas in Salatiga City)	Hendarto Efendi (Public Works and Spatial Planning Department of Salatiga City, Central Java, Indonesia), Sri Sangkawati (Master in Civil Engineering Diponegoro University Semarang, Indonesia), Pranoto Samto Atmodjo (Master in Civil Engineering Diponegoro University Semarang, Indonesia)
1034	16.50 – 17.00	The Influence of Temperature Changes on Performance Latson (AC-WC) Plastic Waste with the Marshall Method	Mahmuda (Civil Engineering Departement, Sriwijaya State Polytechnic,Indonesia), Sumiati (Civil Engineering Departement, Sriwijaya State Polytechnic,Indonesia), Puryanto (Civil Engineering Departement, Sriwijaya State Polytechnic,Indonesia) and M. Prawira. W (Civil Engineering Departement, Sriwijaya State Polytechnic,Indonesia)
1084	17.00 – 17.10	Utilization of Local Material of South Sumatra for Porous Asphalt Type AC-WC to Improve Security Levels of Road and Environmentally Friendly	Amiruddin (State Polytechnic of Sriwijaya, Indonesia), Ibrahim (State Polytechnic of Sriwijaya, Indonesia), I Sulianti (State Polytechnic of Sriwijaya, Indonesia) and Agus Subrianto (State Polytechnic of Sriwijaya, Indonesia)
1162	17.10 – 17.20	Tracing the City Pattern of Netherlands and Indonesia using Depth Calculation and Connectivity	Pindo Tutuko (Department of Architecture, University of Merdeka Malang, Indonesia), Nurhamdoko Bonifacius (Department of Architecture, University of Merdeka Malang, Indonesia), Dani Yuniawan (Department of Industrial Engineering, University of Merdeka Malang, Indonesia Department of Industrial Engineering, University of Merdeka Malang, Indonesia), Adisti Safrilia (Department of Architecture, University of Merdeka Malang, Indonesia), Nurhamdoko Bonifacius (Department of Architecture, University of Merdeka Malang, Indonesia), Mochamad Rizqi Junianto (Master Program, Department of Architecture, University of Merdeka Malang, Malang 65146, Indonesia), Reynold Johan Aleksander Telnoni (Master Program, Department of Architecture, University of Merdeka Malang, Malang 65146, Indonesia)

Theme : TRACK 1 (Industrial Engineering, Energy, Biology)
Room : ROOM 2 (Dempo I)
Moderator : Ir. Jaksen M. Amin, M.Si. / Doeslohal Djumrianti, S.E.MIS., Ph.D / Koryati, M.Pd
Time : 13.30 – 17.35 WIB
Articles : 23

ID	Time	Tittle	Authors with affiliation and country
778	13.30 – 13.40	IoT Technology Monitoring, Controlling and Data Logging for ATS on Grid Connected Solar-Wind Hybrid System	Budiman (Applied Master of Renewable Energy Engineering, Renewable Energy Engineering Department, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara Bukit Besar, Palembang, South Sumatera Indonesia 30139), Ahmad Taqwa (Electrical Engineering, Electronics Department, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara Bukit Besar, Palembang, South Sumatera Indonesia 30139), RD.Kusumanto (Electrical Engineering, Electronics Department, Politeknik Negeri Sriwijaya, Jalan Srijaya Negara Bukit Besar, Palembang, South Sumatera Indonesia)
783	13.40 – 13.50	Design of Mini Horizontal Wind Turbine for Low Wind Speed Area	Agum Try Wardhana (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang, 30139, Indonesia*), Ahmad Taqwa (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, 30139, Indonesia), Tresna Dewi (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, 30139, Indonesia).
877	13.50 – 14.00	A Micro Hydro Pelton Turbine Prototype (Review of the effect of water debit and nozzle angle to rotation and pelton turbine power)	Septa Eka Lesmana (Applied Master of Renewable Energy Engineering, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia), Leila Kalsum (Chemical Engineering Department, Renewable Energy Engineering, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia), and Tri Widagdo (Mechnical Engineering Department, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia).
922	14.00 – 14.10	Optimalization of Antimicrobial Production from Endophytic Fungus Sporothrix sp. LBKURCC43 by Modifying Carbon and Nitrogen Sources of Fermentation Media	Abdul Rohman Wali (Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Riau), Nursyirwani (Department of Marine Sciences, Faculty of Fishery and Marine Sciences, Universitas Riau), Saryono (Department of Chemistry, Faculty of Mathematics and Natural Sciences, Universitas Riau)
929	14.10 – 14.20	Achievement Analysis of One Cylinder Diesel Engine Using Virgin Coconut Oil Biodiesel	Burhan Yuliansyah (Applied Master of Renewable Energy Engineering Politeknik Negeri Sriwijaya, Palembang 30139, Indonesia), Triwidagdo (Mechanical Engineering Department Politeknik Negeri Sriwijaya Palembang 30139,Indonesia), Abuhasan (Chemical Engineering Department Politeknik Negeri Sriwijaya, Palembang 30139, Indonesia)
980	14.20 – 14.30	Optimization of Monocrystalline Solar Panels Using Reflector Scanning Technology	Fiqri Al Faruqi (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya,Palembang 30139, Indonesia), RD. Kusumanto (Electrical Engineering Department, Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang 30139, Indonesia), and Abu Hasan (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang 30139, Indonesia).
988	14.30 – 14.40	Performance Test of Pelton Micro-Hydro Turbine With The Variations of Nozzle Output Angle, Blades	Echa Okdinata (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya,Palembang ,Indonesia), Abu Hasan (Chemical Engineering Department, Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Indonesia), and Carlos Sitompul (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Indonesia)

		Number and Water Flow Discharge to Produce The Maximum Output Power	
992	14.40 – 14.50	Minimum Power of Solar Panel Movement in Solar Tracker System Prototype	Aldony Reco Putra (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang Indonesia), RD Kusumanto (Electrical Engineering Department, Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia), and Ahmad Taqwa (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia.)
995	14.50 – 15.00	PLC Application as an Automatic Transfer Switch for On-Grid PV System; Case Study PLTS Jakabaring Palembang	Achmad Kurniawan (Politeknik Negeri Sriwijaya, Palembang, Indonesia), Ahmad Taqwa (Politeknik Negeri Sriwijaya, Palembang, Indonesia),, and Yohandri Bow (Politeknik Negeri Sriwijaya, Palembang, Indonesia)
1035	15.00 – 15.10	Automatic Cooling System For Efficiency and Output Enhancement of a Pv System Application in Palembang, Indonesia	Hadli Harahap (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Tresna Dewi (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Rusdianasari (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia)
1053	15.10 – 15.20	Sea Salt Deposition Effect On Output And Efficiency Losses Of The Photovoltaic Installation System; A Case Study In Palembang, South Sumatera	Firdaus Setiawan (Renewable Energy Department, Politeknik Negeri Sriwijaya Palembang, Indonesia), Tresna Dewi (Electro Department, Politeknik Negeri Sriwijaya Palembang, Indonesia) and Syahirman Yusi (Bussiness Administration Department, Politeknik Negeri Sriwijaya Palembang, Indonesia)
1066	15.20 – 15.30	Effects of Direct Glass Film Installation on to Photovoltaic Solar Panel	Hendra Kusuma Negara (Applied Master of Renewable Enery Engineering, PoliteknikNegeriSriwijaya Palembang), RD. Kusumanto (Electrical Engineering Department, PoliteknikNegeriSriwijaya Palembang), Abu Hasan (Chemical Engineering Department, Gajah Mada University)
	15.30 – 15.40		BREAK
1070	15.40 – 15.50	FFA Reduction in A Waste Cooking Oil as A Raw Material For Biodiesel With Activated Coal Ash Adsorbent	Endang Susilowati (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Indonesia), Abu Hasan (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara, Bukit Besar, Palembang), and Aida Syarif (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara, Bukit Besar, Palembang)
1087	15.50 – 16.00	Cooling Effect With Heat Sink Fan to Improve Solar Panel (Photovoltaic) Performance	Efsilon K.A. Fatoni (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya Palembang, Indonesia), Ahmad Taqwa (Electrical Engineering Department Politeknik Negeri Sriwijaya Palembang, Indonesia), Rd. Kusumanto (Electrical Engineering Department Politeknik Negeri Sriwijaya Palembang, Indonesia)
1103	16.00 – 16.10	Effect of Reaction Temperature for Biodiesel Quality Using Microwaves Technology	RA Nurul Moulita (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang), Rusdianasari (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang), and Leila Kalsum(Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang)
1105	16.10 – 16.20	The Potential of Microwave in the	Sandhy Yunsari (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Indonesia), Rusdianasari (Chemical

		manufacture of Biodiesel by Using Crude Palm Oil (CPO)	Engineering Department, Politeknik Negeri Sriwijaya, Indonesia), and A. Husaini (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Indonesia)
1116	16.20 – 16.30	Experimental Investigation Scenarios of Partial Shade On The PV (Photovoltaic) Module Application in Palembang, Indonesia	Herdian Wibowo (Applied Master of Renewable Energy Engineering, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Yohandri Bow (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Carlos, RS (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia)
1129	16.30 – 16.40	Community Empowerment at Sri Tiga Village, Sumber Marga Telang Sub-District, Banyuasin Regency, The Province of South Sumatera; Technology for Green Production of Nata De Coco and Swamp Water Filtration	Marieskaverawaty (Biology Department, Faculty of Math and Natural Science, Sriwijaya University, South Sumatera, Indonesia), B. Lakitan (Faculty of Agriculture, Sriwijaya University, South Sumatera, Indonesia) and S.Herlinda (Plant Pest and Disease Department, Faculty of Agriculture, Sriwijaya University, Indonesia)
1130	16.40 – 16.50	Effect of Potential Toxic Cyanobacteria Planktothrix agardhii isolated from A Retention Pond in Palembang to Cyprinus carpio L: A Preliminary Study	R. Wulandari (Biology Department, Faculty of Math and Natural Science, Sriwijaya University, South Sumatera, Indonesia), M. Amalia (Biology Department, Faculty of Math and Natural Science, Sriwijaya University, South Sumatera, Indonesia), R. Aryawati (Marine Department, Faculty of Math and Natural Science, Sriwijaya University, South Sumatera, Indonesia), SA. Hamim (Faculty of Enggineering, University of Indo Global Mandiri, South Sumatera, Indonesia) and M. Verawaty (Biology Department, Faculty of Math and Natural Science, Sriwijaya University, South Sumatera, Indonesia)
1140	16.50 – 17.00	Analysis of Biodiesel Conversion on Raw Material Variation Using Statistical Process Control Method	Winny Andalia (Department of Industrial Engineering Faculty of Engineering, Universitas Tridinanti, Palembang, 30129, Indonesia), , I Pratiwi (Department of Industrial Engineering Faculty of Engineering, Universitas Tridinanti, Palembang, 30129, Indonesia), S Arita (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya, Palembang, 30139, Indonesia)
1141	17.00 – 17.10	Nitrogen Gas Production By Pressure Swing Adsorption (Psa) Method Using Carbon Molecular Sieve (Cms) As Oxygen Adsorption	Agus Manggala (Energy Engineering, Polytechnic State of Sriwijaya), A Zikri (Energy Engineering, Polytechnic State of Sriwijaya), Erlinawati (Energy Engineering, Polytechnic State of Sriwijaya), Sutini PL (Energy Engineering, Polytechnic State of Sriwijaya), M Arifin (Energy Engineering, Polytechnic State of Sriwijaya)
1142	17.10 – 17.20	Hydrogen Storage From The Result Of Reactor Ace (Aluminium Corrosion And Electrolysis) Production By Pysisorption Method	A Zikri (Energy Engineering, Polytechnic State of Sriwijaya), Erlinawati (Energy Engineering, Polytechnic State of Sriwijaya), L Trisnaliani (Energy Engineering, Polytechnic State of Sriwijaya), A Aswan (Energy Engineering, Polytechnic State of Sriwijaya), A Firdausia (Energy Engineering, Polytechnic State of Sriwijaya)
1160	17.20 – 17.30	Effectiveness of Electrocoagulation Method in Processing Integrated Wastewater Using Aluminum and Stainless Steel Electrodes	Rusdianasari (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang), Jaksen (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang), Ahmad Taqwa (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang), Yudi Wijarnako (Electrical Engineering Department, Politeknik Negeri Sriwijaya, Palembang)

Theme : TRACK 1 (Chemical Engineering)
Room : ROOM 3 (Dempo II)
Moderator : Anerasari, M.B.Eng., M.Si / Dr. Welly / M.Miftakhul Amin, S.Kom., M.Eng
Time : 13.30 – 17.20 WIB
Articles : 22

ID	Time	Tittle	Authors with affiliation and country
899	13.30 – 13.40	Potential of Clay in Coal Mining of Tanjung Enim Area As a Filler on Rubber Compound	Abu Hasan (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), L Kalsum (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), , M Yerizam (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), Robert Junaidi (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), M Taufik (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), M Aznury (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia), and Fatria (Chemical Engineering Department, State Polytechnic of Sriwijaya Palembang Indonesia)
900	13.40 – 13.50	Influence The Addition of Lapindo Mud is Calcined to the Quality of Cement Podzoland by Using Electric Furnace	Robert Junaidi (teaching staff Bachelor Degree (D IV) Chemical Engineering State Polytechnic of Sriwijaya), Abu Hasan (teaching staff of Master of Applied Renewable Energy Technique of State Polytechnic of Sriwijaya), dan Mustain Zamhari (teaching staff Bachelor Degree (D IV) Chemical Engineering State Polytechnic of Sriwijaya)
959	13.50 – 14.00	An Analysis Of The Impact Of The Coal Mining Activities On The Condition Of Water Quality In The Coal Mining Areas In South Sumatra	Marhaini (Department of Chemical Engineering, Faculty of Engineering, Muhammadiyah University, Palembang, Indonesia), Legiso (Department of Chemical Engineering, Faculty of Engineering, Muhammadiyah University, Palembang, Indonesia), Heny Juniar (Department of Chemical Engineering, Faculty of Engineering, Muhammadiyah University, Palembang, Indonesia), Mubin (Department of Chemical Engineering, Faculty of Engineering, Muhammadiyah University, Palembang, Indonesia)
1014	14.00 – 14.10	Sodium silicate composite filled by zinc oxide as low resistance thermal grease	Wahyu Jati Kusuma ([1]Department of Chemical Engineering, State Polytechnic of Sriwijaya, Srijaya Negara Street, Palembang 30139, Indonesia), Fadarina (Department of Chemical Engineering, State Polytechnic of Sriwijaya, Srijaya Negara Street, Palembang 30139, Indonesia), and Abu Hasan ([1]Department of Chemical Engineering, State Polytechnic of Sriwijaya, Srijaya Negara Street, Palembang 30139, Indonesia)
1068	14.10 – 14.20	Adsorption Model in Removal of Direct Synthetic Dyes in Aqueous Solution onto Tea Waste	Lia Cundari (Chemical Engineering Department Faculty of Engineering Universitas Sriwijaya Indralaya Indonesia), Bazlina Dawami Afrah (Chemical Engineering Department Faculty of Engineering Universitas Sriwijaya Indralaya Indonesia), Dwi Indah Utami (Chemical Engineering Department Faculty of Engineering Universitas Sriwijaya Indralaya Indonesia), Natra Ilhani Matondang (Chemical Engineering Department Faculty of Engineering Universitas Sriwijaya Indralaya Indonesia)
1071	14.20 – 14.30	Production of Biogas from Artificial Substrates (Oil, Protein and Cellulose) by Indigenous Anaerob Bacteria	Putri Agustryani, Muhammad Said (Chemical Engineering Department, Faculty of Engineering, Universitas Sriwijaya, Palembang, 30139, Indonesia), Muhammad Faizal (Chemical Engineering Department, Faculty of Engineering, Universitas Sriwijaya, Palembang, 30139, Indonesia), Bazlina Dawami Afrah (Chemical Engineering Department, Faculty of Engineering, Universitas Sriwijaya, Palembang, 30139, Indonesia)
1076	14.30 – 14.40	Mechanical properties of bioplastics product from	Sopiah Zainal (Teknik Kimia, Politeknik Negeri Sriwijaya),Yuniar (Teknik Kimia, Politeknik Negeri Sriwijaya), Martha Aznury (Teknik

		Musa paradisica formatypica concentrate with plasticiser variables	Kimia, Politeknik Negeri Sriwijaya), and Melianti (Teknik Kimia, Politeknik Negeri Sriwijaya)
1077	14.40 – 14.50	Oxygen Adsorption Kinetics Study in PSA (Pressure Swing Adsorber) for Nitrogen Production	Indah Purnamasari (Chemical Engineering Department, State Polytechnic of Sriwijaya), M Yerizam (Chemical Engineering Department, State Polytechnic of Sriwijaya), A Hasan (Chemical Engineering Department, State Polytechnic of Sriwijaya), and R Junaidi (Chemical Engineering Department, State Polytechnic of Sriwijaya)
1078	14.50 – 15.00	Characteristics of Activated Charcoal from Coconut Midribs in Jumputan Waste Adsorption Process	Enggal Nurisman (Chemical Engineering Department Sriwijaya University, Palembang Indonesia), Syaiful (Chemical Engineering Department Sriwijaya University, Palembang Indonesia), Rahmatullah (Chemical Engineering Department Sriwijaya University, Palembang Indonesia)
1089	15.00 – 15.10	Geochemical Organic of Airbenakat Black shale in Berau Areas, Jambi	Putri Dwi Afifah (Sriwijaya University), Budhi Setiawan (Sriwijaya University)
1091	15.10 – 15.20	O-rings material deterioration due to contact with biodiesel blends in a dynamic fuel flow	Leily Nurul Komariah (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya, Palembang, Indonesia), S Arita (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya, Palembang, Indonesia), F Aprianjaya (Energy and Environmental Engineering Laboratory Universitas Sriwijaya, Indralaya Ogan Ilir Indonesia), M G Novaldi (Energy and Environmental Engineering Laboratory Universitas Sriwijaya, Indralaya Ogan Ilir, Indonesia) , M F Fathullah (Energy and Environmental Engineering Laboratory Universitas Sriwijaya, Indralaya Ogan Ilir, Indonesia)
1092	15.20 – 15.30	Mathematics Instructional Package Based on Creative Problem Solving to Improve Additive Reasoning Ability and Creative Thinking Ability	Yulianto Wasiran (Departement of Chemical Engineering. State of Polytechnic Sriwijaya. Jalan Srijaya Negara Bukit Besar. Palembang.Indonesia)
	15.30 – 15.40		BREAK
1097	15.40 – 15.50	Lipid Extraction from Mikroalgae Spirulina Platensis for Raw Materials Biodiesel	Leila Kalsum (Applied Renewable Energy Engineering Study Program, State Polytechnic of Sriwijaya,Palembang 30139, Indonesia), Erwana Dewi (Chemical Engineering Study Program, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia), Elina Margarety (Chemical Engineering Study Program, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia) and Aisyah Suci Ningsih (Chemical Engineering Study Program, State Polytechnic of Sriwijaya, Palembang 30139, Indonesia)
1099	15.50 – 16.00	The Characteristics of Particle Board from Empty Fruit Palm Oil (Elaeis guineensis Jacq) by using an Adhesive of Liquid Guava Rod Bark	Siti Chodijah (Staff Edukatif of Chemical Engineering Department , Polytechnic Negeri Sriwijaya), Erwana Dewi (Staff Edukatif of Chemical Engineering Department , Polytechnic Negeri Sriwijaya) and Jaksen (Staff Edukatif of Chemical Engineering Department , Polytechnic Negeri Sriwijaya)
1100	16.00 – 16.10	Production of Glucose From Waste Bark Acacia Mangium Using Delignification and Chemical Hydrolysis Process	Susila Arita (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya Jl. Raya Prabumulih Inderalaya-Palembang-South Sumatra), Fitri Hadiah (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya Jl. Raya Prabumulih Inderalaya-Palembang-South Sumatra) , Rizky Amalia (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya Jl. Raya Prabumulih Inderalaya-Palembang-South Sumatra), Elsi Rosmalisa (Department of Chemical Engineering Faculty of Engineering, Universitas Sriwijaya Jl. Raya Prabumulih Inderalaya-

			Palembang-South Sumatra)
1107	16.10 – 16.20	Pectin Ekstraction From Kepok Banana Peels (Musa paradisiaca fomatypica) As Biodegdradable Film Plastic	Siti Chodijah (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia), M Husaini (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia), M Zaman (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia) and Hilwatulisan (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia)
1109	16.20 – 16.30	The Effect of Reaction Time and pH on the Modification Process of Sago Starch Oxidation	Yuniar (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia), Elina Margaretty (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia), Fadarina (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia), Anerasari M (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia) and Ida Febriana (Chemical Engineering Department, State Polytechnic of Sriwijaya, South Sumatera, Indonesia)
1117	16.30 – 16.40	Treatment of Leachate from Garbage using Electrocoagulation Type MP-P (MonoPolar-Paralel) Methode	Anerasari Meidinariasty (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Rusdianasari (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Yohandri Bow (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia), Irawan Rusnadi (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia),A. Lutfi Fuadi (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Palembang, Indonesia.)
1125	16.40 – 16.50	Analysis Of Cooler Performance In Supply Air Feed For Nitrogen Production Process Using Pressure Swing Adsorption (PSA) Method	Adi Syakdani (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia), Yohandri Bow (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia), Rusdianasari (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia), and Muhammad Taufik (Chemical Engineering Department, Politeknik Negeri Sriwijaya, Jl. Srijaya Negara Palembang, 30139, Indonesia)
1131	16.50 – 17.00	Fuel Production from LDPE and HDPE Plastic Waste	Netty Herawati (Chemical Engineering Department, Faculty of Engineering, Universitas Muhammadiyah Palembang, Indonesia), Mardwita Mardwita (Chemical Engineering Department, Faculty of Engineering, Universitas Muhammadiyah Palembang, Palembang 30263, Indonesia, Eka Sri Yusmartini (Chemical Engineering Department, Faculty of Engineering, Universitas Muhammadiyah Palembang, Indonesia), Robiah Robiah (Chemical Engineering Department, Faculty of Engineering, Universitas Muhammadiyah Palembang Indonesia)
1133	17.00 – 17.10	Effect of Time and Concentration of Sulfuric Acid on Yield Bioethanol Produced In Making Bioethanol from Peat Soil	Kiagus Ahmad Roni (Chemical Engineering Study Program, Engineering Faculty, Muhammadiyah University of Palembang), Merisha Hastarina(Industrial Engineering Study Program, Engineering Faculty, Muhammadiyah University of Palembang), Netty Herawati (Chemical Engineering Study Program, Engineering Faculty, Muhammadiyah University of Palembang)
1138	17.10 – 17.20	Banana Midrib as Substitute for Pulp Production	Fadarin (Jurusan Teknik Kimia, Politeknik Negeri Sriwijaya, Palembang 30139), Mustain Zamhari (Jurusan Teknik Kimia, Politeknik Negeri Sriwijaya, Palembang), Selastia Yuliati (Jurusan Teknik Kimia, Politeknik Negeri Sriwijaya, Palembang), Ibnu Hajar (Jurusan Teknik Kimia, Politeknik Negeri Sriwijaya, Palembang), Wahyu Jati Kusuma (Jurusan Teknik Kimia, Politeknik Negeri Sriwijaya, Palembang)

Theme : Computer Science, Computer Engineering, Information System, Informatics Management, English,
Room : ROOM 4 (Semeru I)
Moderator : Ummasyro, S.E. Med.M / Dr. Eng. Herlambang, M. Kom
Time : 13.30 – 16.40 WIB
Articles : 18

ID	Time	Title	Authors with affiliation and country
785	13.30 – 13.40	Implementation of Customer Relationship Management (CRM) With User Centered Design (UCD) User Satisfaction to Measure E-Library PT. Pupuk Sriwidjaja Palembang	Ali Ibrahim(Research laboratory Entreprener Resource Planning Faculty of Computer Science), Dahlia(Department of Information Systems Faculty of Computer Science Sriwijaya University), Derdi Kurniawa(Department of Information Systems Faculty of Computer Science Sriwijaya University), Dini Ayu Lestari(Department of Information Systems Faculty of Computer Science Sriwijaya University), Enky Ratnasari(Department of Information Systems Faculty of Computer Science Sriwijaya University), M.Hengky Setiawan(Department of Information Systems Faculty of Computer Science Sriwijaya University)
1080	13.40 – 13.50	Weather Classification based on Hybrid Cloud Image Using Principal Component Analysis(PCA) and Linear Discriminant Analysis(LDA)	Yulia Hapsari(Master of Informatics Engineering, Universitas Sriwijaya, Palembang, 30139, Indonesia), Syamsuryadi(Department of Informatics, Faculty of Computer Science, Universitas Sriwijaya, Palembang, 30139, Indonesia)
1017	13.50 – 14.00	Implementation of Calibration in Gas Hazardous CO and CO2 in Closed Room Using Fuzzy Logic	Slamet Widodo(Department Polytechnic of Sriwijaya, Srijaya Negera Street, Bukit Besar, Palembang - Indonesia), M.Miftakhul Amin(Department Polytechnic of Sriwijaya, Srijaya Negera Street, Bukit Besar, Palembang - Indonesia), A.Bahri Joni M(Department of Polytechnic of Sriwijaya, Srijaya Negera Street, Bukit Besar, Palembang - Indonesia)
1025	14.00 – 14.10	A Framework of Promoting Government Services Using Social Media: Sudan E-Government Case Study	M. S. Adrees(College of Computer Science and Information Technology, Albaha University, Albaha, Saudi Arabia), O. E. Sheta(College of Computer Science and Information Technology, Albaha University, Albaha, Saudi Arabia), M. K. Omer(College of Computer Science and Information Technology, Albaha University, Albaha, Saudi Arabia), D. Stiawan(Dept. of Computer Engineering, Faculty of Computer Science, Universitas Sriwijaya, Palembang, Indonesia), R. Budiarto(College of Computer Science and Information Technology, Albaha University, Albaha, Saudi Arabia)
989	14.10 – 14.20	Geographic Information System of Health Service Place in Palembang	Arsia Rini(Informatics Management Study Program, Politeknik PalComTech, Palembang, 30129, Indonesia), Heki Aprianto(Informatics Management Study Program, Politeknik PalComTech, Palembang, 30129, Indonesia)
991	14.20 – 14.30	Database Design for Website Service Guide “Waterfall Tour South Sumatera	Meidyan Permata Putri(Information Systems Study Program, STMIK PalComTech Palembang), Hendra Effendi(Informatics Engineering Study Program,STMIK PalComTech Palembang)
1012	14.30 – 14.40	The Small and Medium Enterprise (SME) Promotion Website of Pedado Village	Rezania Agramanisti Azdy(Informatics Study Program, STMIK PalComTech, Indonesia), Febriyanti Darnis (Information System Study Program, STMIK PalComTech, Indonesia

853	14.40 – 14.50	Advancement Parking Application Using MEAN Stack: A Narrative Review	Dian Nugraha (School of Graduates Studies, Management and Science University, Shah Alam, Selangor Malaysia), Falah Y. H. Ahmed (Faculty of Information Science & Engineering, Management and Science University, Shah Alam, Selangor, Malaysia)
927	14.50 – 15.00	Review of Progress Expert System: to Detect Diseases in Humans, Plants, and Animals	Febria Anjara(Management and Science University, Malaysia), Adam Amril Jaharadak (Management and Science University, Malaysia)
928	15.00 – 15.10	Blended Learning as Instructional Media : A review of The Literature	Nora Listiana(School of Graduate Studies, Management and Science University, University Drive, Seksyen 13,40100 Shah Alam, Selangor, Malaysia), Dr. Adam AmrilJaharadak(School of Graduate Studies, Management and Science University, University Drive, Seksyen 13,40100 Shah Alam, Selangor, Malaysia)
1054	15.10 – 15.20	Quality Control System (QCS) of Tourism Industry Sector in Palembang City	Fatmariani(Informatics Management, Palcomtech Polytechnic, Palembang,Indonesia), Alan Saputro(Informatics Management, Palcomtech Polytechnic, Palembang,Indonesia)
1065	15.20 – 15.30	The Implementation of Ant Colony Algorithm in Finding The Shortest Travel Route of Palembang Tourism by Android Based	Safira Faizah(Studi Program DIV Informatics Management Informatics Management Department, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar Street, Bukit Lama, Ilir Barat I, Palembang 30139), Leni Novianti, S.Kom., M.Kom.(Studi Program DIV Informatics Management Informatics Management Department, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar Street, Bukit Lama, Ilir Barat I, Palembang 30139), Nita Novita, S.E., M.M.(Studi Program DIV Informatics Management Informatics Management Department, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar Street, Bukit Lama, Ilir Barat I, Palembang 30139)[3]
	15.30 – 15.40		BREAK
1106	15.40 – 15.50	The Application of Supply Chain Management (SCM) Methods in Practicum Material Supply in Informatics Management Major, State Polytechnic of Sriwijaya	Sony Oktapriandi S.Kom., M.Kom.(Informatics Management D4 Study Program Informatics Management Major, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar, Bukit Lama, Ilir Barat I, Palembang 30139), Indra Satriadi S.T. M.Kom.(Informatics Management D4 Study Program Informatics Management Major, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar, Bukit Lama, Ilir Barat I, Palembang 30139), Hetty Meileni S.Kom., M.T.(Informatics Management D4 Study Program Informatics Management Major, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar, Bukit Lama, Ilir Barat I, Palembang 30139), Desi Apriyanty S.E., M.Si (Informatics Management D4 Study Program Informatics Management Major, State Polytechnic of Sriwijaya Jl. Srijaya Negara Bukit Besar, Bukit Lama, Ilir Barat I, Palembang 30139),
1110	15.50 – 16.00	Application of Mapping of The Raskin Aid Using AHP Fuzzy Method based on Geographic Information System	Leni N, S.Kom., M.Kom.(Study Program of Informatics Management Diploma IV Polytechnic of Sriwijaya, Palembang), Isnaini Azro, S.Kom., M.Kom.(Study Program of Computer Engineering Department of Informatics Management, Polytechnic of Sriwijaya, Palembang), Robinson, S.Kom.,M.Kom(Study Program of Informatics Management Diploma IV Polytechnic of Sriwijaya, Palembang)
1112	16.00 – 16.10	Design of Mobile Campus Sriwijaya State Polytechnic Application for Android	Dewi Irmawati.(Informatics Management of Diploma IV Informatics Management Major, State Polytechnic of Sriwijaya, Palembang), Leni N(), Devi Sartika(Informatics Management of Diploma IV Informatics Management Major, State Polytechnic of Sriwijaya, Palembang), Ienda Meiriska(Informatics Management of Diploma IV Informatics Management Major, State Polytechnic of Sriwijaya, Palembang)

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			Sriwijaya, Indonesia)
1114	14.30 – 14.40	The Factors Affecting Students for Choosing The Business Administration Departement as A College in Higher Education	Afrizawati, SE, M.Si (Business Administration State Polytechnic Sriwijaya Palembang Indonesia), Dr. Paisal, SE, M.Si (Business Administration State Polytechnic Sriwijaya Palembang Indonesia) Hendra Sastrawinata, SE, M.M (Business Administration State Polytechnic Sriwijaya Palembang Indonesia)
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Higher Education Role in Supporting Indonesian Government Policy in Developing Renewable Energy

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Abstract. Indonesia is a country blessed with natural resources potential to be utilized as the renewable energy. Actions should be taken to improve renewable energy based power generation due to the diminishing of conventional fossil fuel and its significant effects on global warming and environmental destruction. Indonesia needs a particular strategy to be able to reach the target of renewable energy utilization by 2025 and 2050. In term of energy consumption, Indonesia is one of the fastest growing countries due to its robust economic development, increasing urbanization and steady population growth. Indonesia uses 40% of the total energy in ASEAN (Association of Southeast Asian Nations) member. Between 2000 and 2014, energy consumption in Indonesia increased by around 65% and is predicted to reach 80% in 2030. This high demand for energy can be fulfilled if all the sectors in Indonesia are hand in hand reaching the targeted goal of renewable energy share. Politeknik Negeri Sriwijaya as a higher education institution should play an active role in supporting government policy in developing renewable energy. This paper discusses POLSRI roles in supporting this policy to develop renewable energy in Palembang and South Sumatra. The literature data is collected from various sources discussing the energy policies of renewable energy. The objectives of this study are to provide the renewable energy development strategies in Indonesia, especially to achieve the target of 23% renewable energy mix in 2025 and 31% in 2050 from the final energy mix following the national energy policy (Government Regulation No.79 of 2014) primarily from the power generation sector.

Keywords: Renewable energy, Government Policy, and Regulation, Energy Sustainability

1. Introduction

Energy is an invetible necessity that is vital for the quality of human life. Industrial evolution and excessive development it caused increase the energy consumption provided by the conventional fossil fuel such as oil, coal, and LNG. Unfortunately, the excessive consumption resulted in the decrement of fossil fuels and the environmental impact in the form of CO_2 emission. The pollution occurs due to fossil fuels consumption came in the form of global warming that led to the increment of sea level, temperature instability, and other social impacts. The fossil fuel depletion due to higher rate of consuming it than nature can replenish it. The solution of fossil fuel depletion and environmental problem is by increasing the production and utility of renewable energy. Indonesia is islands located in equator has many potential renewable energies such as solar, water, biomass, geothermal and tidal wave [1].

In term of energy consumption, Indonesia is one of the fastest growing countries due to its robust economic development, increasing urbanization and steady population growth. Indonesia uses 40% of the total energy in ASEAN (Association of Southeast Asian Nations) member. Between 2000 and 2014, energy consumption in Indonesia increased by around 65% and is predicted to reach 80% in 2030 [2,3].

Energy is categorized into non-renewable and renewable energy that has the virtue that non-renewable energy does not have. This kind of energy will never stop or run out during the natural cycle. It is environmentally friendly and minimizes pollution. However, the setback is that the renewable energy efficiency is less than non-renewable energy and energy production is more. Due to the insistence of fossil fuel depletion and environmental problems make the Indonesian government strives for this new energy in order to maintain the stability and energy security in Indonesia amid the decreasing non-supply. To optimize the use of renewable energy in Indonesia, the government has Government Regulation Number 79 of 2014 concerning National Energy Policy National Article 11 paragraph 2, which explains the priorities of national energy development. In Government Regulation Number 79 of 2014 concerning National Energy Policy, precisely in Article 9 letter F, Indonesia has set the energy achievement target of around 30% by 2050 [2-7].

The implementation of this government regulation until 2015 is the overall energy sources in all sectors. Petroleum is still the primary foundation of Indonesian energy the percentage of 43%, followed by coal and natural gas, with the percentage of 28.7% and 22%. This condition indicates that the utilization of renewable energy in Indonesia is not maximal up to now and unable to cover the growth of energy 3.2% and electricity consumption 6% annually. If the rate of renewable energy utilization is only 0.36% per year, then it will be difficult to reach 23% increment by 2025.

Indonesia's electricity consumption is predicted to be more than triple by 2030. The economic growth increases energy consumption for various home appliances, and at the same time the government has to distribute electricity connection across remote areas and island, and the distribution is expected for near-100% electrification by 2026. The fastest growth is in transport and industry and becomes more than double by 2030. Motorcycles and cars are populating Indonesia streets every day. In the industry sector, cement, aluminum, paper, and ceramic are the primary growth.

The utilization of renewable energy in the business sector also is still limited due to a variety of technical, non-technical problems that hinder the development of a new renewable national energy. Besides, electricity tariffs from fossil energy (coal) are cheap because of the low world price of coal and dependence on oil-based energy sources due to subsidies provided, as well as expensive renewable energy technology components due to having to import from abroad and the limited renewable energy industry in Indonesia. Infrastructure limitations are also one of the factors that cause restrictions on public access to energy, especially renewable energy, and the global challenges faced by Indonesia. Therefore, the utilization of existing national energy resources is not efficient and is still very low when compared to the potential.

Based on the existing energy policy in Indonesia and the problem of renewable energy faced currently, a strategy is required to develop renewable energy in Indonesia in order to be able to reach the target of renewable energy utilization by 2025 and 2050. The improvement of renewable energy utilization, research and application should be supported by all the sectors including higher education institution, such as Politeknik Negeri Sriwijaya (POLSRI).

This paper analyzes the Higher Education Role in Supporting Indonesian Government Policy in Developing Renewable Energy. The literature data is collected from various sources discussing the energy policies of renewable energy tariffs and licensing, including the technological aspect analysis and factors to support the development of renewable energy to ensure the stability of energy security. The objectives of this study are to provide the renewable energy development strategies in Indonesia, especially to achieve the target of 23% renewable energy mix in 2025 and 31% in 2050 from the final energy mix following the national energy policy (Government Regulation No.79 of 2014) primarily from the power generation sector.

2. Indonesian Government Policy on Renewable

Indonesia is the country located in the equator blessed with many natural resources and minerals, and if managed and appropriately utilized will be able to meet the energy of all people in this country. Therefore, Indonesia is optimistic about setting an ambitious target to increase the use of renewable energy by up to 23% by 2025, and 31% by 2050, as shown in Figure 1. It is expected that renewable energy has the share of 17% in total final energy consumption (TFEC), upgrading from the current 6%. Figure 2 shows the TFEC in Indonesia where the most significant share is still in Java and Sumatera.

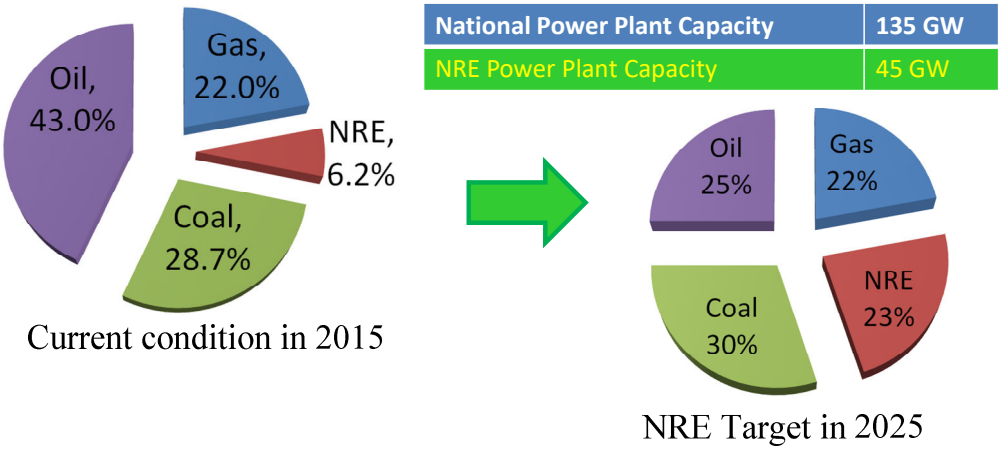

Figure 1. NRE target in 2025

The depletion of the reserved conventional energy sources and the increment of energy consumption each year encourages the government to review its energy policies to increase the use of new and renewable energy (EBT) and reduce dependence on fossil energy. In the context of the use of renewable energy, several policies to support renewable energy other than Government Policy No. 79 of 2014 has been widely issued, some of which are discussed are:

1. Regulation No. 30/2007 concerning Energy
2. Regulation No. 21/2014 concerning Geothermal
3. Regulation No. 30/2009 concerning Electricity.
4. Government Policy RI No. 70/2009 concerning Energy Conservation.
5. Presidential Regulation No. 4 of 2016 concerning
6. Acceleration of Electricity Infrastructure Development
7. MEMR Regulation No. 19 of 2016 concerning the Purchase of Electric Power from PV-PV PLTS by PT. PLN (Persero).
8. MEMR Regulation No. 19 of 2015 concerning Purchasing Electric Power from Hydro Power Plants with Capacity of up to 10 MW by PT. State Electricity Company.
9. MEMR Minister Regulation No. 44 of 2015 concerning Purchasing Electric Power by PT. State Electricity Company (Persero) from Municipal Waste-Based Power Plants.
10. MEMR Minister Regulation No. 21 of 2016 concerning Purchasing Electric Power from
11. Biomass Power Plants and Biogas Power Plants by PT. State Electricity Company.
12. MEMR Minister Regulation No. 17 of 2014 concerning Purchasing Electric Power from PLTP and Geothermal Steam for PLTP by PT. State Electricity Company (Persero).
13. MEMR Minister Regulation No. 10 of 2017 concerning Power Purchase Regulations Electricity.
14. MEMR Minister Regulation No. 12 of 2017 concerning Utilization of Renewable Energy Sources for Electricity Supply.

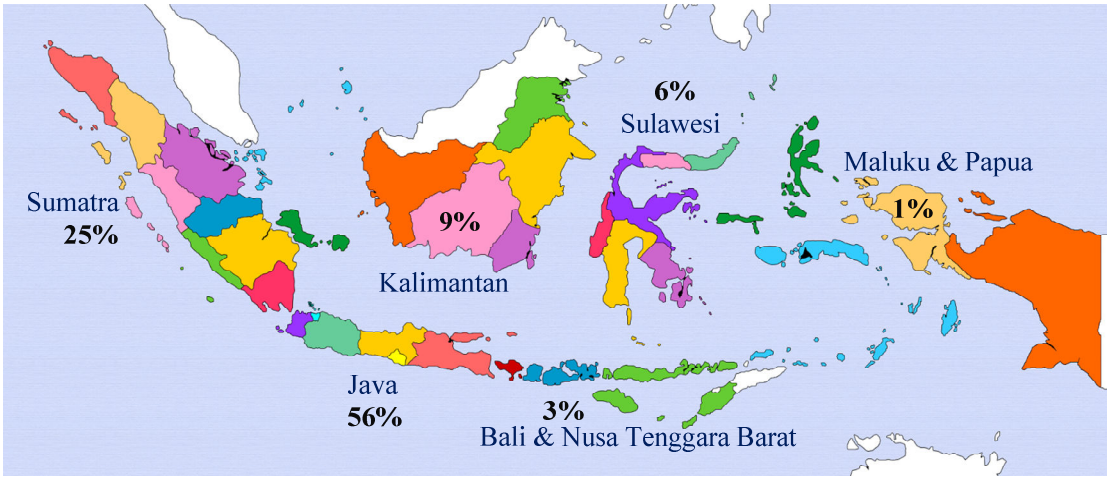

Figure 2. Total final energy consumption in Indonesia in 2013

3. Energy Consumption Mapping in Indonesia

Indonesian government set a target to realize that by 2025, 23% of primary energy supply is supplied by renewable energy. This target is set as part of a collective target set by ASEAN member states. Indonesia with 250 million population becomes the largest country in ASEAN. Therefore, it has to take the critical role to meet the targeted renewable energy application. 250 million people spread out over more than 17000 islands and this condition becomes the challenges for evenly distributed electrification across the country. Indonesia's state utility company PLN (Perusahaan Listrik Negara) aims for 98% electrification by 2022.

The share of modern renewable energy in TFEC (Total Final Energy Consumption) shows the total consumption of energy in the used-end sector of electricity including the renewable source of electricity generation and conventional one. The main sectors consuming energy are building (including residential, commercial and public sector), industry (including manufacturing and mining sectors), and transport (including the direct use of renewable energy). Indonesia has a 40% share of TFEC in ASEAN, which equals to 7.3 EJ in the year 2014. TFEC grew more than 20%, and more than half is in the Java-Bali region with 35% power generation between 2010-2014.

The largest energy providers come from petroleum product (diesel, gasoline and liquefied petroleum gas – LPG) as the largest share of TFEC (37%) in 2014, which is down 3% from year 2010 due to the increment of coal utilization (from 0.8 EJ or 14% of TFEC in 2010, to 1.4 EJ or 18% of TFEC in 2014). Electric consumption is increased by 34% between 2010 and 2014 although the TFEC share is quite the same from around 9% to 10%. 2/3 of electricity consumption is for buildings, and the rest is for industries. The electrification rate is currently 88% with a target of 97% for 2019. Figure 3 shows the electrification rate per % of the population in Indonesia in 2015.

The utilization of renewable energy in Indonesia is dominated by bioenergy for the industry, buildings, and transport. The household cooking uses 80% of those renewable energies. The modern renewable energy was 5.8% of TFEC or 426 PJ in 2014. 65% of renewable energies today is bioenergy, biodiesel is 13% for transportation, and 22% is shared between PV system, hydropower, and geothermal power. The total share of renewable energy in power generation was 12.4% in 2014. The TFEC share of renewable energy decreased from 59% in 2000 to 37% in 2013 due to the increment of coal utilization to meet society energy demand.

Buildings have a relative fix TFEC share in Indonesia although the households increase 1.5% per year with an average of 4 people per household with energy consumption around 10 MWh per household per year. This constant level of energy demand is due to the transition to a more efficient form of energy use by substituting kerosene to LPG whose efficiency is 40%-60%. Although in some places, the primary energy source is still fuelwood for cooking, mainly in West Nusa Tenggara, Sulawesi, and

Papua. The action taken to overcome this condition is by Indonesia clean stove initiative campaign, a collaboration between the Indonesian government and the World Bank initiated in 2012.

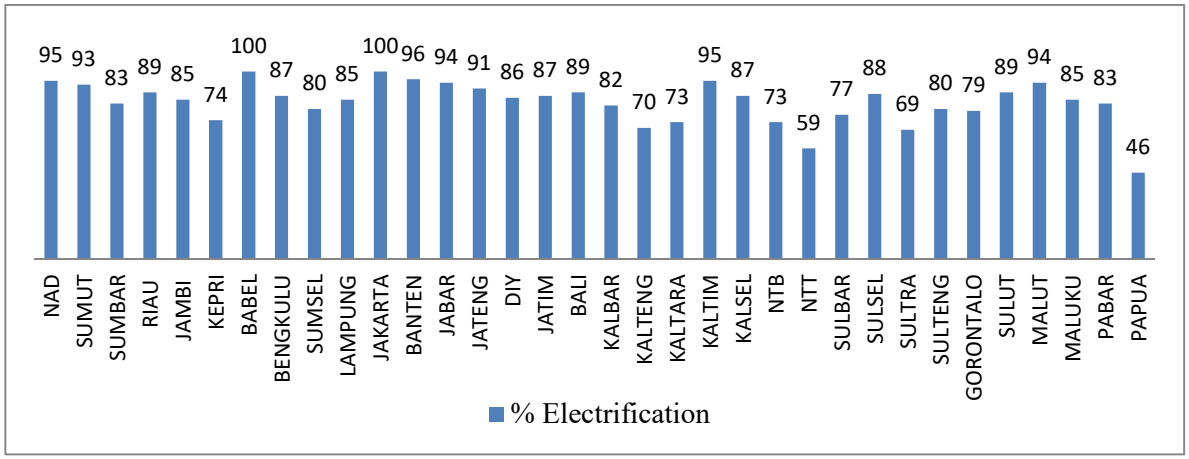

Figure 3. Electrification rate per % of population in Indonesia in 2015

The largest share of TFEC comes from industries 2.7 EJ or 36% in 2014, which increased 5% per year from 2010 and most of the energy consumption from coal utilization as the primary fuel. The largest energy users in the industry are coming from aluminum, cement, ceramics, brick, and paper producers. 22% of energy provider in the industry comes from bioenergy in 2014.

Energy consumption growth in transport is increasing very fast in recent year transport energy demand stood at 1.5 EJ, or 26% of TFEC from 2010, and by 2014 becomes 2 EJ or 29% of TFEC, this condition is mainly due to the immense growth of motorcycles and car. Domestic production of motorcycles was 5.7 million units, and 85% is for domestic sales. Half of the energy consumption in Indonesia is from gasoline by road vehicles, another 40% is diesel, and about 2% is the electric car.

4. Energy Production Mapping in Indonesia

Indonesia is a fossil fuel producer country and the largest coal exporter and producer in the world by 2014. Coal reservation is estimated to be 31.270 million tons, and more than 80% is in East Kalimantan and South Sumatra. The estimated coal reserves would last for another 70 years at current production levels. When total coal resources (hypothetic, inferred, indicated and measured) are considered, this would be 272 years. Coal exports are to China, India, Japan, and the Republic of Korea. Most of the coal deposits in Indonesia are medium and low-calorific varieties of sub-bituminous coal, with low ash and sulfur content, suitable in particular for power generation. Metallurgical coal, used in iron and steel making, is found less in Indonesia (GBG Indonesia, 2014).

The natural gas reserved in Indonesia is about 149 trillion standard cubic feet of gas (tscf) with steady production of 3 tscf per year. 1 tscf of domestic production in 2014 was used in industry and power; another 1 tscf was consumed by liquefied natural gas (LNG) plants, and 0.3 tscf was exported through gas pipes. Oil reservation is around 7.4 billion barrels in January 2014, and crude oil production decreases from 517 million in 2010 to 288 million barrels in 2014 due to the reliance on mature oil fields and lacks new oil exploration.

Almost all of the biodiesel produced in Indonesia is from palm oil, which is around 11 million hectares. In 2008, the crude palm oil for domestic production was only 1% of total crop production, and it was increased to be 10% in 2014. Land clearing for palm oil production created the problem of forest fires and other adverse environmental outcomes such as CO2 emission. Up to 2014, the production of biodiesel in Indonesia increased rapidly and became the fourth most significant producers in the world, estimated at 190 million liters in 2009 and increases up to 3.961 million liters in 2014. However, export shared of total production has declined significantly due to domestic biodiesel blending. European

Union was the primary market for Indonesian biodiesel in 2012, but this condition was stopped in 2014, and nowadays, China is the primary market up to 55% of total export.
Due to structural changes in Indonesia biodiesel in 2015, the national blending mandate was increased from B10 to B15; this condition was also added by the decrement of oil prices in 2014 where Indonesian biodiesel prince was based on the gas-oil price. Therefore, a new price had to be set up. Although Indonesia was the 11th largest producer of biodiesel globally, the lower price makes the export decreased significantly, while the national blending mandate was not fulfilled.

In 2016, biodiesel production increased again since some subsidy problems were solved. The government implemented B20 (and B30 for the power sector), and compensation was provided by the Indonesian Palm Oil Estate Fund for subsidized biodiesel (Public Service Obligation – PSO), which is blended for use in transport. The subsidized target was set 3.2 billion liters and for non-subsidized was 1.3 billion.

4.1 Power Generation Mapping in Indonesia

Total electric generated in Indonesia was 229 TWh in 2014, and 70% belongs to PLN (State Electric Company), and another 30% from privates electric companies, private power utilities (PPUs) and independent power producers (IPPs). PLN monopoly was reduced from 92% of total on-grip power in 2000. Coal was dominated the power generation by 53% in 2014 or 120 TWh, a rapid increment from 2010 (40%). Natural gas share is 25%, and petroleum products are 10% including the rental contract from the private sector (around 4 GW of the diesel generator). Renewable energy has an 11% share of total on-grid power generation in 2014, a decrement from 16% in 2010. This condition was also affected by the increment of coal utilization. Renewable power has a higher share in Sulawesi & Nusa Tenggara (39%) and Sumatra (17%), due to the utilization of hydropower resources. Oil-fired power generation was the primary source for Kalimantan and Maluku & Papua. Figure 4 shows the on-grid power generation capacity in Indonesia by 2014.

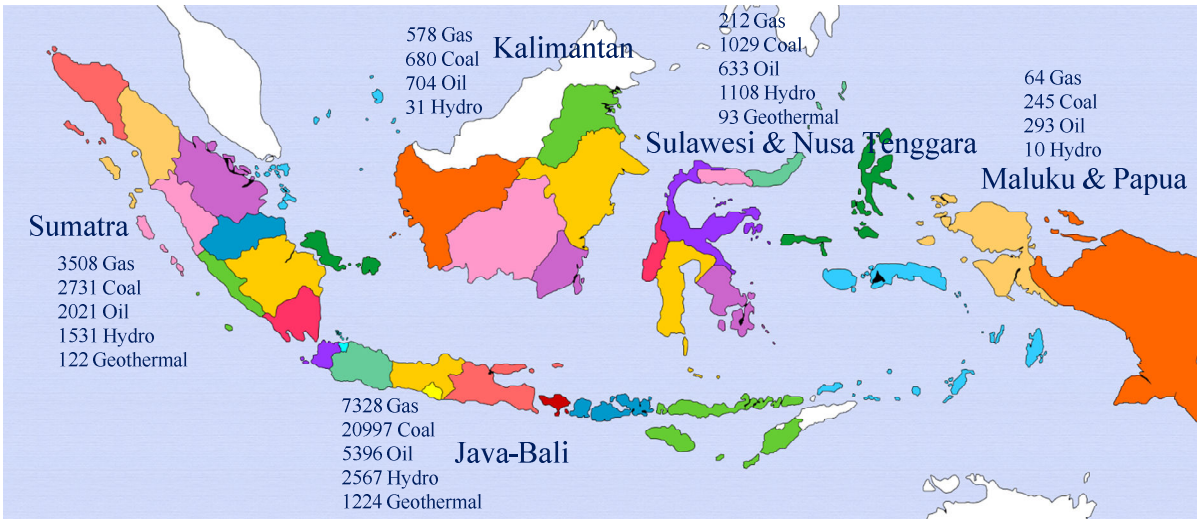

Figure 4. On-grid power generation capacity in Indonesia (in MW installed) by 2014

Hydropower capacity was 5.2 GW by the end of 2014 from 3.7 GW in 2010. All of larger than 50MW hydropower plants are located in Java-Bali, Sumatra, and Sulawesi & Nusa Tenggara. The largest hydropower plant in Indonesia is Cirata Dam Located in West Java with the capacity of 1GW. There is a significant increment for small scales hydropower plants from 14 MW in 2010 to 170 MW in 2014.

Geothermal capacity in Indonesia is limited from 1.2 GW in 2010 to 1.4 GW in 2014 despite the effort to expand the development. In 2014, 44 new plants started to operate to fulfill the target of 4000

MW, and the feed-in tariff was introduced. However, the increment is still too slow due to institutional, regulatory and tariffs constraints. It was targeted that 1.2 GW geothermal capacities installed in Java (about 1.2 GW), and currently, eight projects are ongoing for geothermal power plant starting from 2016 and 2017. Bioenergy in Indonesia is mainly from residues and waste in the palm and paper industries with 1.6 GW capacity, and 92 MW of that amount was grid-connected in 2014.

There is a relatively significant improvement of PV system installation, and utilization in Indonesia, from 42 MW in 2012 to 80 MW. 10 MW of the share is the on-grid component. The small scales of PV system are mainly off-grid system. The on-grid system started to be installed massively in 2015, located in Bali (2 MW), Kupang (5 MW) and Gorontalo (2 MW). In 2016, MoU was set up that PLN would develop utility-scale solar PV system in Indonesia. Indonesia's state-owned Pertamina and the local government actively participate in meeting the target of PV system generated power. 9.8 MW of wind power generator was installed in 2016, and 3 PPAs were signed for the development of wind farms in Indonesia: 50 MW in Samas (Java), 60 MW in Jeneponto (Sulawesi) and 70 MW in Sidrap (Sulawesi).

The off-grid system comes from on-site industrial power capacity, mini-grids and stand-alone generation in rural areas (based on diesel generators, micro-hydropower, solar PV, biogas plants and micro-wind), and solar home systems. In 2014 the on-site industrial power capacity was about 4.4 GW including bioenergy power capacity. The most off-grid power generators are scattered in rural areas of Indonesia mostly in the form of diesel gen-sets that represent up to 900 MW, declined from 2007 (987 MW). It is about 286 micro hydropower and 220 solar PV mini-grid installation with 5 kW to 400 kW capacity with varied funded, privately or government funded, and or partnership with private companies.

4.2. Drivers for Renewable Energy in Indonesia

On account of reaching the ambitious targets of renewable energy, Indonesia has to find the drivers for improving the generation and utilization of renewable energies. The first driver would be health and environmental impacts. The utilization of conventional power generation gives terrible effects to the environment that in the end cause casualties to the people around the plant area. The effect varies between premature deaths, illness due to air and water pollutions. In 2012, it was reported around 4.3 million people died prematurely due to household air pollution, and another 3.7 million due to outdoor air pollution. The coal plants cause more than 6500 premature death every year due to energy-related Sulphur dioxide (SO_2) emission.

The main contributor to outdoor pollution in an urban area is the motorized vehicles creating a poor level of air quality. In 2014, major cities like Jakarta, the average cost of air pollution due to the illness ae up to USD 535 and double PM10 concentration of WHO standard. The greenhouse gas emission was at 1 800 Mt CO_2-eq in 2005 due to forest burning for land-use including fossil fuel resource extraction about 63% and 19% due to fossil fuel combustion. The CO_2 emission from this combustion estimated at 322 Mt CO_2 in 2005, and further increased to 425 Mt CO_2 by 2013, and 40% is from the power generation and 33.3% from transport area. Due to coal mining, the water quality in South Kalimantan is at risk of toxic pollution, and the coal mining activities are increasing rapidly across Kalimantan. Despite the abundance of fresh water, the demand of water-cooling for power generation also becomes a threat to the environmental sustainability.

Renewable energy is also giving macroeconomic impacts in increasing GDP, trade, employment and welfare for Indonesia. The GDP increment due to renewable deployment is predicted at around 0.3% and 1.3% in 2030. The trade balance of Indonesia could improve by an estimated 0.9% to 1.6% in the same year. This increment can improve the number of renewable energy-related jobs in Indonesia up to 1.3 million by 2030. The improvement also comes from social and environmental factors between 3.6% and 5.8% by 2030. The increment of renewable energy utilization means technology improvement and transfer that will be an additional effect on the economy as a whole. In 2015, 100 science and technology parks across the country. In order to improve the technology transfer, skill and knowledge improvement for the support it needs vocational training center in educating the green technologies and knowledge.

Indonesia is blessed with the containment of fossil fuels, however, due to the growing demand for petroleum and diesel for transport, import of petroleum product became a necessity. The implantation of renewable energy reduces the petroleum products dependence, and become a key technology in increasing electrification particularly in rural areas of Indonesia.

5. Higher education role in supporting government program in renewable energy

Higher education training is a new strategy to promote and support the government in achieving the target to increase the use of renewable energy by up to 23% by 2025, and 31% by 2050. Currently, vocational education institutes and universities in Indonesia are taking an active role in supporting government policy. At present, throughout Indonesia, training and education for renewable energy are on the ground or planning phase that is different significantly with the stage of development, teaching and content profile, financing structure and experience. The education is purely technical, engineering programmes based at a single university to a transnational setting involving taught courses at several universities, addressing renewable energy within an interdisciplinary approach.

South Sumatra Province with the capital city Palembang is blessed with natural resources for generating renewable energy such as PV system and hydro. South Sumatra also has a wide area of oil farm that can be a good source for biodiesel. One of the public vocational educations in Palembang is Politeknik Negeri Sriwijaya (POLSRI). POLSRI as a vocational education supports training education and research in renewable energy by conducting a master degree program in renewable energy officially since February 3th 2016. Although POLSRI already has the undergraduate program in energy, on the master degree program, the training and research are focused on the development of renewable energy, not only in Palembang but also in South Sumatra, by conducting collaboration with other institution, such as Pertamina, PTBA and Palembang government.

POLSRI should produce engineers that are trained to plan, design, develop, operate and maintain renewable energy installations at all sizes and levels. The capacities of future policy-makers need to be strengthened to develop conducive policy frameworks that promote the use of renewable energy technologies.

Palembang as the city located near the equator is getting an abundance of sunrays whole year long making it a perfect place to install the PV system. Currently, PV systems are developed by Pertamina and Palembang government. Pertamina has a 3 KW PV system to power the managerial building shown in Figure 5.a, and Palembang government installed 200 MW PV system to support Jakabaring Sports City during Asian Games, to ensure no electrical shortage, shown in figure 6.a. Figure 5b shows the students and staffs of POLSRI were visiting PTLS belongs to PT Pertamina RU III Plaju Palembang.

POLSRI conducts a collaboration with PLTS (PV system power generation) Jakabaring by signing the Memorandum of Understanding of both parties. By this MoU, POLSRI can conduct research and study of PV system directly to the implementation and support the vocational program. Therefore, the training of human resources in Politeknik on the continent using available resources and skilled workforce is vital for the long-term sustainability of resource development. Figure 6b shows the staffs and students of POLSRI were visiting PLTS Jakabaring.

The few trained professionals with extra support regarding facilitation, can sustainably run and manage renewable energy training in higher education institutions. The training of students and staffs' skill improvement can be conducted using the available resources, not only form the internal of POLSRI but also from the external institutions, and at the same time, POLSRI supports the research and development of external institution, forming a fruitful collaboration to support the government policy in improving the application of renewable energy in Indonesia.

Figure 5a. PLTS PT. Pertamina RU III Plaju

Figure 5b. Students and Staffs of POLSRI visiting PLTS PT. Pertamina RU III Plaju

Figure 6a. PLTS Jakabaring

Figure 6b. Students and Staffs of POLSRI visiting PLTS Jakabaring

6. Conclusion

The implementation of renewable energy is already urgent due to the diminishing of conventional fossil fuels and their effects on the environment in the form of CO_2 that causes global warming and the earth destruction. The Indonesian government has set policies and regulation concerning the utilization of renewable energy since Indonesia is blessed with so many natural resources that enable the full application of renewable energy such as PV system, hydro, biodiesel, and wind turbines. Politeknik Negeri Sriwijaya as a higher education institution supports government program by conducting the master program in renewable energy and having the collaboration in research and training with the external institution such as Pertamina and Palembang government in promoting the generation and utilization of renewable energy in Palembang and South Sumatra.

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