

DAFTAR PUSTAKA

- Aalborg Energie Teknik. (2022). *Staged combustion*. <https://knowledge.aet-biomass.com/primary-techniques-for-nox-reduction>
- Academic Accelerator. (n.d.). *Staged Combustion*. <https://academic-accelerator.com/encyclopedia/staged-combustion>
- Albrecht, B. A., Zahirovic, S., Bastiaans, R. J. M., van Oijen, J. A., & de Goey, L. P. H. (2008). A premixed flamelet-PDF model for biomass combustion in a grate furnace. *Energy and Fuels*, 22(3), 1570–1580. <https://doi.org/10.1021/ef7007562>
- Amaral, S. S., de Carvalho, J. A., Costa, M. A. M., & Pinheiro, C. (2016). Particulate Matter Emission Factors for Biomass Combustion. *Atmosphere*, 7(11), 1–25. <https://doi.org/10.3390/atmos7110141>
- Astuti, A. D. (2019). Analisis Potensi Dampak Lingkungan Dari Budidaya Tebu Menggunakan Pendekatan Life Cycle Assessment (Lca). *Jurnal Litbang: Media Informasi Penelitian, Pengembangan Dan IPTEK*, 15(1), 51–64. <https://doi.org/10.33658/jl.v15i1.127>
- BNTET Burner. (2021). *The functions and differences of the primary, secondary and tertiary air of the boiler burner*. <https://bntet-burner.com/news/The-functions-and-differences-of-the-primary--secondary-and-tertiary-air-of-the-boiler-burner.html>
- Bowman, J., Davidson, M., Penterson, J., & Kevin Toupin. (2009). *Biomass Combustion Technologies*. 33306(December).
- Campbell, C. (1963). Combustion Efficiency. *The Sports Car Engine*, 170–191. https://doi.org/10.1007/978-1-4899-7204-0_9
- Cao, G., Zhang, X., Gong, S., & Zheng, F. (2008). Investigation on emission factors of particulate matter and gaseous pollutants from crop residue burning. *Journal of Environmental Sciences*, 20(1), 50–55. [https://doi.org/10.1016/S1001-0742\(08\)60007-8](https://doi.org/10.1016/S1001-0742(08)60007-8)
- Carroll, J. P., Finnan, J. M., Biedermann, F., Brunner, T., & Obernberger, I. (2015). Air staging to reduce emissions from energy crop combustion in small scale applications. *Fuel*, 155(x), 37–43. <https://doi.org/10.1016/j.fuel.2015.04.008>
- Centers For Disease Control And Prevention. (2023). *Particle Pollution* No Title. https://www.cdc.gov/air/particulate_matter.html
- Davis, S. H. (2017). *What Is the Difference in Open & Closed Burning?* <https://homesteady.com/info-8624070-difference-open-closed-burning.html>
- Department Of Energy & Environmental Protection. (2020). *Particulate Matter Introduction*. [https://portal.ct.gov/DEEP/Air/Planning/Particulate-Matter/Particulate-Matter-Fact-Sheet#:~:text=They come from a variety,of gases \(secondary particles\).](https://portal.ct.gov/DEEP/Air/Planning/Particulate-Matter/Particulate-Matter-Fact-Sheet#:~:text=They come from a variety,of gases (secondary particles).)
- Emil, E. (2019). Pengaruh Excess Air terhadap Kinerja PLTU Berkapasitas 12,5 MW dengan Beban Bervariasi:Sebuah Simulasi TermodinamikaMenggunakan SoftwareCYCLETEMPO V.5.0. *Rekayasa Mesin, October 2019*, 287–298.
- Ghufron, H. C., Prasetyo, T., Harijono, T., Program, M., Teknik, S., Energi, K., Teknik, J., Politeknik, M., Semarang, N., & Sudarto, J. H. (2014). Analisa Pengaruh Excess Air Terhadap Flue Gas Di Pltu Tanjung Jati B Unit 2. *EKSERGI Jurnal Teknik Energi*, 10(3), 84–89.
- Habibi, M. Y., & Saptoadi, H. (2020). *Studi Eksperimental Emisi Gas Buang dan Temperatur Dapur Pembakaran Tempurung Kelapa pada Fixed Grate Furnace dengan Variasi Temperatur Udara Primer*. <https://etd.repository.ugm.ac.id/penelitian/detail/190474>

- Hanafi, N. H., Hassim, M. H., & Setapar, S. H. M. (2015). *Comparison Of Emission Factors From Biomass Burning Facilities*. 6(August 2015), 79–86.
- Holubčík, M., Čajová Kantová, N., Jandačka, J., & Čaja, A. (2022). The Performance and Emission Parameters Based on the Redistribution of the Amount of Combustion Air of the Wood Stove. *Processes*, 10(8). <https://doi.org/10.3390/pr10081570>
- Houshfar, E., Løvås, T., & Skreiberg, Ø. (2010). *Detailed Chemical Kinetics Modeling of NOx Reduction in Combined Staged Fuel and Staged Air Combustion of Biomass*. June 2014. <https://doi.org/10.5071/18thEUBCE2010-VP2.4.4>
- Indrawanto, C., Purwono, Syakir, M., Siswanto, Soetopo, D., Munarso, S. J., Pitono, J., & Rumini, W. (2016). *Budidaya dan Pascapanen Tebu* (Vol. 01).
- Jamilatun, S., Pitoyo, J., Arifah, Z., Amelia, S., & Maarif, A. (2022). Pirolisis Ampas Tebu (*Saccharum officinarum* Linn): Pengaruh Suhu terhadap Yield dan Karakteristik Produk. *Prosiding Semnaslit Lppm Umj 2022*.
- Jangsawang, W., & Kerdsuwan, S. (2002). Correlation between Excess Oxygen Level and Secondary Combustion Chamber Temperature on the Combustion Efficiency from the Incineration of Real Infectious Waste in A Controlled-Air Incinerator. *The Journal of KMITNB*, 12(2), 21–30.
- John Clarke. (2021). *Excess Air: Its Role in Combustion and Heat Transfer*. <https://www.heattreattoday.com/media-category/commentary/op-ed/excess-air-its-role-in-combustion-and-heat-transfer/>
- Junejo, A., Al-Abdeli, Y. M., & Porteiro, J. (2023). Role of Air Staging in a Batch-Type Fixed Bed Biomass Combustor under Constant Primary Air. *Journal of Thermal Science*, 32. <https://doi.org/10.1007/s11630-023-1869-9>
- Kanokkanjana, K., & Garivait, S. (2012). Estimation of Emission from Open Burning of Sugarcane Residues before Harvesting. *GMSARN International Journal*, 6, 157–161.
- Kozioł, M., & Kozioł, J. (2023). Impact of Primary Air Separation in a Grate Furnace on the Resulting Combustion Products. *Energies*, 16(4). <https://doi.org/10.3390/en16041647>
- Kurnia, U., & Sutrisno, N. (2008). Strategi Pengelolaan Lingkungan Pertanian Agricultural Environmental Management Strategy. *Jurnal Sumberdaya Lahan*, 2(1), 59–74.
- Lamberg, H., Sippula, O., Tissari, J., & Jokiniemi, J. (2011). Effects of air staging and load on fine-particle and gaseous emissions from a small-scale pellet boiler. *Energy and Fuels*, 25(11), 4952–4960. <https://doi.org/10.1021/ef2010578>
- Maciejewska, A., Veringa, H., Sanders, J., & Peteves, S. D. (2006). Co-Firing of Biomass With Coal: Constraints and Role of Biomass Pre-Treatment. In *Institute for Energy*.
- Mashoko, L., Mbohwa, C., & Thomas, V. M. (2010). LCA of the South African sugar industry. *Journal of Environmental Planning and Management*, 53(6), 793–807. <https://doi.org/10.1080/09640568.2010.488120>
- Mujiarto, S., Suliono, S., Maolana, I., & Murdjani, M. (2017). Karakteristik Gas Buang Dual Fuel Gasifier Downdraft Serbuk Kayu Dan Diesel Engine Generator Set 3 Kw. *Jurnal INTEKNA: Informasi Teknik Dan Niaga*, 17(2), 132–140. <https://doi.org/10.31961/intekna.v17i2.477>
- Mukhtar, R., Hamonangan Panjaitan, E., Wahyudi, H., Santoso, M., & Dwiana Lestiani, D. (2012). Kandungan Black Carbon Pada Partikulat Udara Halus Dan Kasar Dalam Udara Ambien Di Daerah Serpong - Tangerang. *Jurnal Ecolab*, 6(1), 1–11. <https://doi.org/10.20886/jklh.2012.6.2.1-11>
- Nevada Department of Environmental Protection. (n.d.). *Particulate Matter Pollution*

- Fact Sheet. 1–4. https://ndep.nv.gov/baqp/monitoring/docs/particulate_matter.pdf
- Pakpahan, B., Silalahi, C., Gultom, D., Sihombing, E., Simanjuntak, J., Munthe, L., Panjaitan, P., & Lubis, R. (2021). Analysis Combustion A Boiler With Capacity Of 260 Ton/Hour Using Gas Fuel. *SINERGI: Jurnal Ilmiah Teknik Mesin Polmed*, 2(2), 2021.
- Parinduri, L., & Parinduri, T. (2020). Konversi Biomassa Sebagai Sumber Energi Terbarukan. *Journal of Electrical Technology*, 5(2), 88–92. <https://www.dosenpendidikan.>
- Petir Papilo, Kunaifi, Erliza Hambali, Nurmiati, R. F. P. (2015). Penilaian Potensi Biomassa Sebagai Alternatif Energi Kelistrikan. *Jurnal PASTI*, IX(2), 164–176.
- Prasetyo Nuryadi, A., Penta Helios, M., Muhammad Fathoni, A., Pujowidodo, H., Prabandaru Sumarah, K., Jaka Komara, R., Milky Kuswa, F., & Teguh Soewono, R. (2023). Simulasi CFD Pengurangan CO₂ pada Co-firing Batubara dan Tandan Kosong Kelapa Sawit Menggunakan Model Pembakaran Non-Premixed CFD Simulation of CO₂ Reduction in Co-firing of Coal and Palm Oil Empty Fruit Bunches using a Non-Premixed Combustion Model. *Jurnal Teknologi Lingkungan*, 24(2), 283–291.
- Prastya, R., Susilo, B., & Lutfi, M. (2013). (In Press) Pengaruh Penggunaan Bahan Bakar Biogas terhadap Emisi Gas Buang Mesin Generator Set Influence Of Biogas Fuel Usage On Generator Set Exhaust Emission. *Jurnal Keteknikan Pertanian Tropis Dan Biosistem*, 1(2), 77–84.
- Pritchard, J., & Cheng, W. K. (2015). Effects of Secondary Air on the Exhaust Oxidation of Particulate Matters. *SAE International Journal of Engines*, 8(3), 1088–1097. <https://doi.org/10.4271/2015-01-0886>
- Rao, K. V. N. S., & Reddy, G. V. (2008). Effect of secondary air injection on the combustion efficiency of sawdust in a fluidized bed combustor. *Brazilian Journal of Chemical Engineering*, 25(1), 129–141. <https://doi.org/10.1590/s0104-66322008000100014>
- Regueiro, A., Patiño, D., Porteiro, J., Granada, E., & Míguez, J. L. (2016). Effect of air staging ratios on the burning rate and emissions in an underfeed fixed-bed biomass combustor. *Energies*, 9(11). <https://doi.org/10.3390/en9110940>
- S.C. Department of Health, & Control, E. (2019). *What is Particulate Matter?* <https://scdhec.gov/environment/your-air/most-common-air-pollutants/particulate-matter/what-particulate-matter>
- Sadaka, S., & Johnson, D. M. (2017). *Biomass Combustion What Is Combustion ?* 6. <https://www.uaex.edu/publications/PDF/FSA-1056.pdf>
- Sahu, S. K., Ohara, T., Beig, G., Kurokawa, J., & Nagashima, T. (2015). Rising critical emission of air pollutants from renewable biomass based cogeneration from the sugar industry in India. *Environmental Research Letters*, 10(9). <https://doi.org/10.1088/1748-9326/10/9/095002>
- Sepfitrah. (2016). Analisis Proximate Hasil Tambang di Riau (Studi Kasus Logas , Selensen dan Pangkalan Lesung). *Jurnal Sainstek STT Pekanbaru*, 4(1), 18–26.
- Sirisomboon, K., & Charernporn, P. (2017). Effects of air staging on emission characteristics in a conical fluidized-bed combustor firing with sunflower shells. *Journal of the Energy Institute*, 90(2), 316–323. <https://doi.org/10.1016/j.joei.2015.12.001>
- Steven, S., Hernowo, P., Restiawaty, E., Irawan, A., Rasrendra, C. B., Riza, A., & Bindar, Y. (2022). Thermodynamics Simulation Performance of Rice Husk Combustion with a Realistic Decomposition Approach on the Devolatilization Stage. *Waste and*

- Subiyakto, Sujak, & Sunarto, D. A. (2020). Burning Effect of Sugarcane Residue After Cutting on the Diversity of Arthropods in Ratoon Sugarcane. *Advances in Biological Sciences Research*, 8(December 2016), 117–122. <https://doi.org/10.2991/absr.k.200513.020>
- Sun, J., Shen, Z., Zhang, L., Zhang, Q., Lei, Y., Cao, J., Huang, Y., Liu, S., Zheng, C., Xu, H., Liu, H., Pan, H., Liu, P., & Zhang, R. (2018). Impact of primary and secondary air supply intensity in stove on emissions of size-segregated particulate matter and carbonaceous aerosols from apple tree wood burning. *Atmospheric Research*, 202(November 2017), 33–39. <https://doi.org/10.1016/j.atmosres.2017.11.010>
- Suranani, S., & Goli, V. R. (2012a). Fuel Particle Size Effect on Performance of Fluidized Bed Combustor Firing Ground Nutshells. *International Journal of Chemical Engineering and Applications*, January, 147–151. <https://doi.org/10.7763/ijcea.2012.v3.176>
- Suranani, S., & Goli, V. R. (2012b). Fuel Particle Size Effect on Performance of Fluidized Bed Combustor Firing Ground Nutshells. *International Journal of Chemical Engineering and Applications*, January 2012, 147–151. <https://doi.org/10.7763/ijcea.2012.v3.176>
- Surjosatyo, A. (2010). Pembakaran Gas Hasil Gasifikasi Biomassa di Premixed Gas Burner dengan Metoda 3D Computational Fluid Dynamic. *Jurnal Teknik Mesin*, 12(1), 7–12. <https://doi.org/10.9744/jtm.12.1.7-12>
- TSI. (2004). An Overview of Measurements, Methods and Calculations Used in Combustion Analysis. *Combustion Analysis Basics*, 19. http://www.tsi.com/uploadedFiles/_Site_Root/Products/Literature/Handbooks/CA-basic-2980175.pdf
- Utah Office Of Energy Development. (n.d.). *Combustion Process*. <https://energy.utah.gov/wp-content/uploads/Chemistry-of-Combustion-Full-Lesson.pdf>
- Van Kuijk, H. A. J. A., Bastiaans, R. J. M., Van Oijen, J. A., & De Goey, L. P. H. (2008). Grate furnace combustion: A submodel for the solid fuel layer. In *International Journal for Multiscale Computational Engineering* (Vol. 6, Issue 1). <https://doi.org/10.1615/IntJMultCompEng.v6.i1.90>
- Vinet, L., & Zhedanov, A. (2011). Study of combustion of bagasse/straw sugarcane and its atmospheric emissions using a pilot-burner. *Journal of Physics A: Mathematical and Theoretical*, 44(8), 9–25. <https://doi.org/10.1088/1751-8113/44/8/085201>
- Vos, J. (2005). *Biomass energy for heating and hot water supply in Belarus-Best Practice Guidelines. Part A: Biomass Combustion*. . June, 125.
- Wahyudi, R., Ivanto, M., & Juliandari, M. (2021). Potensi Nilai Kalor Biomassa Dari Ampas Tebu (Bagasse) Yang Bersumber Dari Penjual Minuman Sari Tebu Di Kota Pontianak. *Jurnal Serambi Engineering*, 6(1), 1639–1646. <https://doi.org/10.32672/jse.v6i1.2654>
- Wang, Chen, Cicilia Kemunto Mesa, Samuel Bimenyimana, Nathan Bogonko, George Adwek, Yiyi Mo, Godwin Norensé Osarumwense Asemota, Changfu Yuan, Yaowen Chen, Changtai Li, E. N. and A. N. (2022). Effect of Varying Temperature and Oxygen on Particulate Matter Formation in Oxy-Biomass Combustion. *Energy Engineering*. <https://www.techscience.com/energy/v119n3/47290/html>
- Wijaya, M., & Wiharto, M. (2021). PKM Kelompok Petani Tebu Berbasis Limbah Tebu

Zhao, H., & Wang, J. (2021). The Combustion Numerical Simulation of a Liquid Slag Pulverized Coal Burner in the High Temperature Secondary Air. *IOP Conference Series: Earth and Environmental Science*, 898(1). <https://doi.org/10.1088/1755-1315/898/1/012005>

Zhou, A., Tu, Y., Xu, H., Wenming, Y., Zhao, F., Boon, S. K., & Subbaiah, P. (2019). Numerical investigation the effect of air supply on the biomass combustion in the grate boiler. *Energy Procedia*, 158, 272–277. <https://doi.org/10.1016/j.egypro.2019.01.088>