

REFERENCES

- [1] J. A. Quintero, J. Moncada, and C. A. Cardona, “Techno-economic analysis of bioethanol production from lignocellulosic residues in Colombia: A process simulation approach,” *Bioresour. Technol.*, vol. 139, pp. 300–307, 2013, doi: 10.1016/j.biortech.2013.04.048.
- [2] P. Nejat, F. Jomehzadeh, M. M. Taheri, M. Gohari, and M. Z. Muhd, “A global review of energy consumption, CO₂ emissions and policy in the residential sector (with an overview of the top ten CO₂ emitting countries),” *Renew. Sustain. Energy Rev.*, vol. 43, pp. 843–862, 2015, doi: 10.1016/j.rser.2014.11.066.
- [3] M. Wang, J. Han, J. B. Dunn, H. Cai, and A. Elgowainy, “Well-to-wheels energy use and greenhouse gas emissions of ethanol from corn, sugarcane and cellulosic biomass for US use,” *Environ. Res. Lett.*, pp. 249–280, 2012, doi: 10.1088/1748-9326/7/4/045905.
- [4] K. T. Tan, K. T. Lee, and A. R. Mohamed, “Role of energy policy in renewable energy accomplishment: The case of second-generation bioethanol,” *Energy Policy*, vol. 36, no. 9, pp. 3360–3365, 2008, doi: 10.1016/j.enpol.2008.05.016.
- [5] K. Hofsetz and M. A. Silva, “Brazilian sugarcane bagasse: Energy and non-energy consumption,” *Biomass and Bioenergy*, vol. 46, pp. 564–573, 2012, doi: 10.1016/j.biombioe.2012.06.038.
- [6] European Parliament, “Directive (EU) 2018/2001 of the European Parliament and of the Council on the promotion of the use of energy from renewable sources,” *Off. J. Eur. Union*, vol. 2018, no. L 328, pp. 82–209, 2018.
- [7] M. K. Hassan, R. Chowdhury, S. Ghosh, D. Manna, A. Pappinen, and S. Kuittinen, “Energy and environmental impact assessment of Indian rice straw for the production of second-generation bioethanol,” *Sustain. Energy Technol. Assessments*, vol. 47, no. August, p. 101546, 2021, doi: 10.1016/j.seta.2021.101546.
- [8] Government of India Ministry of New & Renewable Energy, “National policy on biofuels,” *Explor. Renew. Altern. Energy Use India*, no. 14, pp. 205–214, 2019.

- [9] N. Matsumoto, D. Sano, and M. Elder, “Biofuel initiatives in Japan: Strategies, policies, and future potential,” *Appl. Energy*, vol. 86, no. SUPPL. 1, pp. S69–S76, 2009, doi: 10.1016/j.apenergy.2009.04.040.
- [10] R. Sindhu, P. Binod, A. Pandey, S. Ankaram, Y. Duan, and M. K. Awasthi, “Biofuel production from biomass: Toward sustainable development,” in *Current Developments in Biotechnology and Bioengineering: Waste Treatment Processes for Energy Generation*, Elsevier B.V., 2019, pp. 79–92. doi: 10.1016/B978-0-444-64083-3.00005-1.
- [11] H. B. Aditiya, T. M. I. Mahlia, W. T. Chong, H. Nur, and A. H. Sebayang, “Second generation bioethanol production: A critical review,” *Renewable and Sustainable Energy Reviews*, vol. 66. Elsevier, pp. 631–653, 2016. doi: 10.1016/j.rser.2016.07.015.
- [12] S. S. Hassan, G. A. Williams, and A. K. Jaiswal, “Moving towards the second generation of lignocellulosic biorefineries in the EU: Drivers, challenges, and opportunities,” *Renew. Sustain. Energy Rev.*, vol. 101, no. November 2018, pp. 590–599, 2019, doi: 10.1016/j.rser.2018.11.041.
- [13] N. Sarkar, S. K. Ghosh, S. Bannerjee, and K. Aikat, “Bioethanol production from agricultural wastes: An overview,” *Renewable Energy*, vol. 37, no. 1. Elsevier Ltd, pp. 19–27, 2012. doi: 10.1016/j.renene.2011.06.045.
- [14] A. Abraham, A. K. Mathew, R. Sindhu, A. Pandey, and P. Binod, “Potential of rice straw for bio-refining: An overview,” *Bioresour. Technol.*, vol. 215, pp. 29–36, 2016, doi: 10.1016/j.biortech.2016.04.011.
- [15] C. Sarnklong, J. W. Coneja, W. Pellikaan, and W. H. Hendriks, “Utilization of rice straw and different treatments to improve its feed value for ruminants: A review,” *Asian-Australasian J. Anim. Sci.*, vol. 23, no. 5, pp. 680–692, 2010, doi: 10.5713/ajas.2010.80619.
- [16] Agriculture and Environmental Statistics Division and Department of Census and Statistics, “Department of Census and Statistics,” *Statistical Website of Sri Lanka*, 2020.
- [17] T. Silalertruksa and S. H. Gheewala, “A comparative LCA of rice straw utilization for fuels and fertilizer in Thailand,” *Bioresour. Technol.*, vol. 150, pp. 412–419, 2013, doi:

10.1016/j.biortech.2013.09.015.

- [18] K. Saga, K. Imou, S. Yokoyama, and T. Minowa, “Net energy analysis of bioethanol production system from high-yield rice plant in Japan,” *Appl. Energy*, vol. 87, no. 7, pp. 2164–2168, 2010, doi: 10.1016/j.apenergy.2009.12.014.
- [19] B. M. and P. S. Delivand Mitra Kami, “Comparing the Green House Gas Emissions of Projected Rice Straw-Based Power Plants and Rice Straw-Based Ethanol Plants in Thailand,” in *4th International Conference on Sustainable Energy and Environment (SEE 2011)*, 2012, no. February, pp. 705–711.
- [20] S. Soam, M. Kapoor, R. Kumar, R. P. Gupta, S. K. Puri, and S. S. V. Ramakumar, “Life cycle assessment and life cycle costing of conventional and modified dilute acid pretreatment for fuel ethanol production from rice straw in India,” *J. Clean. Prod.*, vol. 197, pp. 732–741, 2018, doi: 10.1016/j.jclepro.2018.06.204.
- [21] H. H. M. P. Rathnayake and S. K. D. H. S. Dilshan, “Process Simulation for Bio-Ethanol Dehydration by Azeotropic Distillation and Extractive Distillation Abstract,” *Annu. Sess. IESL*, p. [203-210], 2016.
- [22] S. Soam, M. Kapoor, R. Kumar, P. Borjesson, R. P. Gupta, and D. K. Tuli, “Global warming potential and energy analysis of second generation ethanol production from rice straw in India,” *Appl. Energy*, vol. 184, pp. 353–364, 2016, doi: 10.1016/j.apenergy.2016.10.034.
- [23] M. Rathnayake, T. Chaireongsirikul, A. Svangariyaskul, L. Lawtrakul, and P. Toochinda, “Process simulation based life cycle assessment for bioethanol production from cassava, cane molasses, and rice straw,” *J. Clean. Prod.*, vol. 190, pp. 24–35, 2018, doi: 10.1016/j.jclepro.2018.04.152.
- [24] R. Singh, M. Srivastava, and A. Shukla, “Environmental sustainability of bioethanol production from rice straw in India: A review,” *Renew. Sustain. Energy Rev.*, vol. 54, pp. 202–216, 2016, doi: 10.1016/j.rser.2015.10.005.
- [25] C. Conde-Mejía, A. Jiménez-Gutiérrez, and M. El-Halwagi, “A comparison of pretreatment methods for bioethanol production from lignocellulosic materials,” *Process Saf. Environ. Prot.*, vol. 90, no. 3, pp. 189–202, 2012, doi: 10.1016/j.psep.2011.08.004.

- [26] M. Balat, H. Balat, and C. Öz, “Progress in bioethanol processing,” *Progress in Energy and Combustion Science*, vol. 34, no. 5, pp. 551–573, 2008. doi: 10.1016/j.pecs.2007.11.001.
- [27] J. L. Shie *et al.*, “Energy life cycle assessment of rice straw bio-energy derived from potential gasification technologies,” *Bioresour. Technol.*, vol. 102, no. 12, pp. 6735–6741, 2011, doi: 10.1016/j.biortech.2011.02.116.
- [28] Ministry of Environment, *National Implementation Plan under the Stockholm Convention on POPs for Sri Lanka*. Persistent Organic Pollutants (POPs) Project, Ministry of Environment :, 2015.
- [29] A. Singh, D. Pant, N. E. Korres, A. S. Nizami, S. Prasad, and J. D. Murphy, “Key issues in life cycle assessment of ethanol production from lignocellulosic biomass: Challenges and perspectives,” *Bioresour. Technol.*, vol. 101, no. 13, pp. 5003–5012, 2010, doi: 10.1016/j.biortech.2009.11.062.
- [30] S. Jin and H. Chen, “Near-infrared analysis of the chemical composition of rice straw,” *Ind. Crops Prod.*, vol. 26, no. 2, pp. 207–211, 2007, doi: 10.1016/j.indcrop.2007.03.004.
- [31] F. C. Chang *et al.*, “Life cycle assessment of bioethanol production from three feedstocks and two fermentation waste reutilization schemes,” *J. Clean. Prod.*, vol. 143, pp. 973–979, 2017, doi: 10.1016/j.jclepro.2016.12.024.
- [32] T. Raj *et al.*, “Physical and chemical characterization of various Indian agriculture residues for biofuels production,” *Energy and Fuels*, vol. 29, no. 5, pp. 3111–3118, 2015, doi: 10.1021/ef5027373.
- [33] J. S. Lim, Z. Abdul Manan, S. R. Wan Alwi, and H. Hashim, “A review on utilisation of biomass from rice industry as a source of renewable energy,” *Renew. Sustain. Energy Rev.*, vol. 16, no. 5, pp. 3084–3094, 2012, doi: 10.1016/j.rser.2012.02.051.
- [34] K. Karimi, S. Kheradmandinia, and M. J. Taherzadeh, “Conversion of rice straw to sugars by dilute-acid hydrolysis,” *Biomass and Bioenergy*, vol. 30, no. 3, pp. 247–253, 2006, doi: 10.1016/j.biombioe.2005.11.015.
- [35] J. Lee, “Biological conversion of lignocellulosic biomass to ethanol,” *J. Biotechnol.*, vol.

56, no. 1, pp. 1–24, 1997, doi: 10.1016/S0168-1656(97)00073-4.

- [36] M. N. E. Nutawan Yoswathana, Phattayawadee Phuriphipat, Pattranit Treyawutthiwat, “Bioethanol Production from Rice Straw Nutawan,” *Energy*, vol. 1, no. 1. pp. 26–31, 2010.
- [37] M. P. A. Nanayakkara, W. G. A. Pabasara, A. M. P. B. Samarasekara, D. A. S. Amarasinghe, and L. Karunananayake, “Extraction and Characterisation of Cellulose Materials from Sri Lankan Agricultural Waste,” *Proc. Int. For. Environ. Symp.*, vol. 4, no. 172, pp. 9–15, 2018, doi: <https://doi.org/10.31357/fesympo.v22i0.3459>.
- [38] W. H. Chen, B. L. Pen, C. T. Yu, and W. S. Hwang, “Pretreatment efficiency and structural characterization of rice straw by an integrated process of dilute-acid and steam explosion for bioethanol production,” *Bioresour. Technol.*, vol. 102, no. 3, pp. 2916–2924, 2011, doi: 10.1016/j.biortech.2010.11.052.
- [39] T. C. Hsu, G. L. Guo, W. H. Chen, and W. S. Hwang, “Effect of dilute acid pretreatment of rice straw on structural properties and enzymatic hydrolysis,” *Bioresour. Technol.*, vol. 101, no. 13, pp. 4907–4913, 2010, doi: 10.1016/j.biortech.2009.10.009.
- [40] M. Molaverdi, K. Karimi, and S. Mirmohamadsadeghi, “Improvement of dry simultaneous saccharification and fermentation of rice straw to high concentration ethanol by sodium carbonate pretreatment,” *Energy*, vol. 167, pp. 654–660, 2019, doi: 10.1016/j.energy.2018.11.017.
- [41] P. Binod *et al.*, “Bioethanol production from rice straw: An overview,” *Bioresour. Technol.*, vol. 101, no. 13, pp. 4767–4774, 2010, doi: 10.1016/j.biortech.2009.10.079.
- [42] B. Gadde, C. Menke, and R. Wassmann, “Rice straw as a renewable energy source in India, Thailand, and the Philippines: Overall potential and limitations for energy contribution and greenhouse gas mitigation,” *Biomass and Bioenergy*, vol. 33, no. 11, pp. 1532–1546, 2009, doi: 10.1016/j.biombioe.2009.07.018.
- [43] J. Xiao, L. Shen, Y. Zhang, and J. Gu, “Integrated analysis of energy, economic, and environmental performance of biomethanol from rice straw in China,” *Ind. Eng. Chem. Res.*, vol. 48, no. 22, pp. 9999–10007, 2009, doi: 10.1021/ie900680d.

- [44] P. Roy, T. Orikasa, K. Tokuyasu, N. Nakamura, and T. Shiina, “Evaluation of the life cycle of bioethanol produced from rice straws,” *Bioresour. Technol.*, vol. 110, pp. 239–244, 2012, doi: 10.1016/j.biortech.2012.01.094.
- [45] S. Ashoor and R. K. Sukumaran, “Mild alkaline pretreatment can achieve high hydrolytic and fermentation efficiencies for rice straw conversion to bioethanol,” *Prep. Biochem. Biotechnol.*, vol. 50, no. 8, pp. 814–819, 2020, doi: 10.1080/10826068.2020.1744007.
- [46] S. Sharma, P. Nandal, and A. Arora, “Ethanol Production from NaOH Pretreated Rice Straw: a Cost Effective Option to Manage Rice Crop Residue,” *Waste and Biomass Valorization*, vol. 10, no. 11, pp. 3427–3434, 2019, doi: 10.1007/s12649-018-0360-4.
- [47] A. E. P. Popescu, J. L. Pellin, J. Bonet-Ruiz, and J. Llorens, “Cleaner process and entrainer screening for bioethanol dehydration by heterogeneous azeotropic distillation,” *Chem. Eng. Trans.*, vol. 81, no. 2016, pp. 829–834, 2020, doi: 10.3303/CET2081139.
- [48] S. Kumar, N. Singh, and R. Prasad, “Anhydrous ethanol: A renewable source of energy,” *Renew. Sustain. Energy Rev.*, vol. 14, no. 7, pp. 1830–1844, 2010, doi: 10.1016/j.rser.2010.03.015.
- [49] S. Karimi, R. R. Karri, M. Tavakkoli Yaraki, and J. R. Koduru, “Processes and separation technologies for the production of fuel-grade bioethanol: a review,” *Environ. Chem. Lett.*, vol. 19, no. 4, pp. 2873–2890, 2021, doi: 10.1007/s10311-021-01208-9.
- [50] S. Papong and P. Malakul, “Life-cycle energy and environmental analysis of bioethanol production from cassava in Thailand,” *Bioresour. Technol.*, vol. 101, no. 1 SUPPL., pp. S112–S118, 2010, doi: 10.1016/j.biortech.2009.09.006.
- [51] T. Silalertruksa and S. H. Gheewala, “Environmental sustainability assessment of bioethanol production in Thailand,” *Energy*, vol. 34, no. 11, pp. 1933–1946, 2009, doi: 10.1016/j.energy.2009.08.002.
- [52] C. A. García, A. Fuentes, A. Hennecke, E. Riegelhaupt, F. Manzini, and O. Masera, “Life-cycle greenhouse gas emissions and energy balances of sugarcane ethanol production in Mexico,” *Appl. Energy*, vol. 88, no. 6, pp. 2088–2097, 2011, doi: 10.1016/j.apenergy.2010.12.072.

- [53] L. Luo, E. van der Voet, and G. Huppes, “An energy analysis of ethanol from cellulosic feedstock-Corn stover,” *Renew. Sustain. Energy Rev.*, vol. 13, no. 8, pp. 2003–2011, 2009, doi: 10.1016/j.rser.2009.01.016.
- [54] A. L. Borrion, M. C. McManus, and G. P. Hammond, “Environmental life cycle assessment of bioethanol production from wheat straw,” *Biomass and Bioenergy*, vol. 47, pp. 9–19, 2012, doi: 10.1016/j.biombioe.2012.10.017.
- [55] F. Demichelis, M. Laghezza, M. Chiappero, and S. Fiore, “Technical, economic and environmental assessment of bioethanol biorefinery from waste biomass,” *J. Clean. Prod.*, vol. 277, p. 124111, 2020, doi: 10.1016/j.jclepro.2020.124111.
- [56] R. M. Jayasundara P.M., Jayasinghe T.K., “Process Simulation-based Net Energy Analysis for Future Bioethanol Production as Commercial Biofuel from Waste Rice Straw in Sri Lanka,” in *Proceedings of International Forestry and Environment Symposium*, 2019, no. 29.
- [57] Y. Moriizumi, P. Suksri, H. Hondo, and Y. Wake, “Effect of biogas utilization and plant co-location on life-cycle greenhouse gas emissions of cassava ethanol production,” *J. Clean. Prod.*, vol. 37, pp. 326–334, 2012, doi: 10.1016/j.jclepro.2012.07.035.
- [58] M. Doorn *et al.*, “WASTEWATER TREATMENT AND DISCHARGE,” in *2006 IPCC Guidelines for National Greenhouse Gas Inventories*, vol. 5, 2006, pp. 1–56.
- [59] T. Silalertruksa and S. H. Gheewala, “The environmental and socio-economic impacts of bio-ethanol production in Thailand,” *Energy Procedia*, vol. 9, pp. 35–43, 2011, doi: 10.1016/j.egypro.2011.09.005.
- [60] P. M. Jayasundara, T. K. Jayasinghe, and M. Rathnayake, “Process Simulation Integrated Life Cycle Net Energy Analysis and GHG Assessment of Fuel-Grade Bioethanol Production from Unutilized Rice Straw,” *Waste and Biomass Valorization*, vol. 13, no. 8, pp. 3689–3705, 2022, doi: 10.1007/s12649-022-01763-4.
- [61] P. Unrean, B. C. Lai Fui, E. Rianawati, and M. Acda, “Comparative techno-economic assessment and environmental impacts of rice husk-to-fuel conversion technologies,” *Energy*, vol. 151, pp. 581–593, 2018, doi: 10.1016/j.energy.2018.03.112.

- [62] S. Semwal *et al.*, “Process optimization and mass balance studies of pilot scale steam explosion pretreatment of rice straw for higher sugar release,” *Biomass and Bioenergy*, vol. 130, no. May, p. 105390, 2019, doi: 10.1016/j.biombioe.2019.105390.
- [63] G. Wernet, C. Bauer, B. Steubing, J. Reinhard, E. Moreno-Ruiz, and B. Weidema, “The ecoinvent database version 3 (part I): overview and methodology,” *Int. J. Life Cycle Assess.*, vol. 21, no. 9, pp. 1218–1230, 2016, doi: 10.1007/s11367-016-1087-8.
- [64] J. B. Dunn, S. Mueller, M. Wang, and J. Han, “Energy consumption and greenhouse gas emissions from enzyme and yeast manufacture for corn and cellulosic ethanol production,” *Biotechnol. Lett.*, vol. 34, no. 12, pp. 2259–2263, 2012, doi: 10.1007/s10529-012-1057-6.
- [65] A. Sagastume Gutiérrez, J. Van Caneghem, J. B. Cogollos Martínez, and C. Vandecasteele, “Evaluation of the environmental performance of lime production in Cuba,” *J. Clean. Prod.*, vol. 31, pp. 126–136, 2012, doi: 10.1016/j.jclepro.2012.02.035.
- [66] D. Kralisch, A. Stark, S. Körsten, G. Kreisel, and B. Ondruschka, “Energetic, environmental and economic balances: Spice up your ionic liquid research efficiency,” *Green Chem.*, vol. 7, no. 5, pp. 301–309, 2005, doi: 10.1039/b417167e.
- [67] Ceylon Electricity Board, “Ceylon Electricity Board Annual Report,” no. October, 2019.
- [68] D. Myhre, G. *et al.*, “Global Warming Potential Values,” *Green. Gas Protoc.*, vol. 2014, no. 1995, pp. 2–5, 2015.
- [69] J. Sadhukhan, E. Martinez-Hernandez, M. A. Amezcuá-Allieri, J. Aburto, and J. A. Honorato S, “Economic and environmental impact evaluation of various biomass feedstock for bioethanol production and correlations to lignocellulosic composition,” *Bioresour. Technol. Reports*, vol. 7, no. March, p. 100230, 2019, doi: 10.1016/j.biteb.2019.100230.
- [70] CEIC, “Sri Lanka Petroleum Products Supply and Demand,” *CEIC Data*, 2018.