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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

Ahdiat, A. (2023, June 14). *Pembangkitan Listrik Tenaga Surya Masih Lebih Mahal Dibanding PLTU pada 2022*. Databoks. Retrieved March 13, 2026, from https://databoks.katadata.co.id/utilitas/statistik/4f9356bfcc9e21b/pembangkitan-listrik-tenaga-surya-masih-lebih-mahal-dibanding-pltu-pada-2022

Alfathi, B. R. (2025, April 30). *85% Listrik Indonesia Berasal dari Energi Fosil*. GoodStats Data. Retrieved June 4, 2025, from https://data.goodstats.id/statistic/85-listrik-indonesia-berasal-dari-energi-fosil-g1Bb8

Alwaaritsy, N., & Romadani, A. (2025). The Role of Carbon Pricing in Accelerating Energy Transition: A Case Study of Indonesia's Industrial Processes and Product Use (IPPU) Sector. *Indonesian Journal of Energy*, *8*(2), 190–207. http://doi.org/10.33116/ije.v8i2.297

Amelinda, A. T., & Soekarno, S. (2023, June). Financial Feasibility Study of Carbon Capture, Utilization, and Storage Project in West Java, Indonesia. *European Journal of Business and Management Research*, *8*(3), 215-220. http://dx.doi.org/10.24018/ejbmr.2023.8.3.1969

Barlas, Y. (2019). *System Dynamics*.

Bazhenov, S., Chuboksarov, V., Maximov, A., & Zhdaneev, O. (2022). Technical and Economic Prospects of CCUS Projects in Russia. *Sustainable Materials and Technologies*, *33*. https://doi.org/10.1016/j.susmat.2022.e00452

Beiron, J., & Johnsson, F. (2024, August). Progressing from first-of-a-kind to Nth-of-a-kind: Applying learning rates to carbon capture deployment in Sweden. *International Journal of Greenhouse Gas Control*, *137*(104226). https://doi.org/10.1016/j.ijggc.2024.104226

Boot-Handford, M. E., Abanades, J. C., Anthony, E. J., Blunt, M. J., Brandani, S., Mac Dowell, N., & et al. (2014). Carbon capture and storage update. *Energy & Environmental Science*, *7*(1), 130-189. https://doi.org/10.1039/C3EE42350F

UNIVERSITAS GADJAH MADA
Dinamika Transisi Energi dengan Implementasi Carbon Capture, Utilization, and Storage (CCUS) pada PLTU di Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Buure, K. (2025). The eternal promise of carbon capture, utilisation and storage: Is there a business case? *Energy Research & Social Science, 127*. https://doi.org/10.1016/j.erss.2025.104308

Chang, Y., Mu, H., Li, N., & Xu, N. (2024). Economic Feasibility Analysis of Oil Industry Chain with CCUS Technology. *Population, Resources & Environmental Economics*, *5*(1). 0.23977/pree.2024.050101

Dewi, I. R. (2026, February 1). *Konsumsi Listrik RI di 2025 Tumbuh 3,75%*. CNBC Indonesia. Retrieved March 17, 2026, from https://www.cnbcindonesia.com/news/20260201105811-4-707073/konsumsi-listrik-ri-di-2025-tumbuh-375

Global CCS Institute. (2025). *Global Status of CCS 2025*. Global CCS Institute. Retrieved January 20, 2026, from https://www.globalccsinstitute.com/global-status-of-ccs/

Guo, J., Jing, Z., Song, S., & Song, S. (2022). Incentive policies for coal-fired power plants' investment in CCUS retrofit: A tripartite evolutionary game with system dynamics analysis. *SSRN*.

Han, J., Tan, Q., Ji, Q., Li, Y., Liu, Y., & Wang, Y. (2023). Simulating the CCUS technology diffusion in thermal power plants: An agent-based evolutionary game model in complex networks. *Journal of Cleaner Production, 421*, 1-11. https://doi.org/10.1016/j.jclepro.2023.138515

Hanson, E., Nwakile, C., & Hammed, V. O. (2025). Carbon capture, utilization, and storage (CCUS) technologies: Evaluating the effectiveness of advanced CCUS solutions for reducing CO2 emissions. *Results in Surfaces and Interfaces, 18*, 1-27. https://doi.org/10.1016/j.rsurfi.2024.100381

IEA. (2020, September 24). *CCUS in Clean Energy Transitions – Analysis*. IEA. Retrieved February 22, 2026, from https://www.iea.org/reports/ccus-in-clean-energy-transitions

Ighomuaye, E., Annankra, J. A., & Yakin, Z. (2025). A Critical Review of the Regulatory and Policy Landscape Governing Carbon Capture, Utilization, and Storage (CCUS) Technologies in the United States. *World Journal of Advanced Research and Reviews, 27*(1), 878-883.

UNIVERSITAS GADJAH MADA
Dinamika Transisi Energi dengan Implementasi Carbon Capture, Utilization, and Storage (CCUS) pada PLTU di Indonesia
Eufrasia Andranetta Gracelynne Eka Pramudita, Prof. Ir. Bertha Maya Shopa, S.T., M.Sc., Ph.D., IPU., ASEAN Eng.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

International Energy Agency. (2022, September 2). *An Energy Sector Roadmap to Net Zero Emissionss in Indonesia – Analysis*. IEA. Retrieved June 2, 2025, from https://www.iea.org/reports/an-energy-sector-roadmap-to-net-zero-emissions-in-indonesia

International Energy Agency & Organisation for Economic Co-operation and Development/Nuclear Energy Agency. (2020). *Projected Costs of Generating Electricity* (2020th ed.). International Energy Agency.

Islam, M. (2025, May 2). *Pengertian Dasar Carbon Pricing dan Tujuan Utamanya*. BATS News. Retrieved April 12, 2026, from https://bats-consulting.com/news/Pengertian-Dasar-Carbon-Pricing-dan-Tujuan-Utamanya

Jiao, Y. (2023, October). Analysis of the Impacts of Carbon Dioxide Emission on Climate Change. *Theoretical and Natural Science*, *7*(1), 120-127. 10.54254/2753-8818/7/20230123

Jones, M. W., Peters, G. P., Gasser, T., Andrew, R. M., Schwingshackl, C., Gütschow, J., Houghton, R. A., Friedlingstein, P., Pongratz, J., & Quéré, C. L. (2023). National Contributions to Climate Change Due to Historical Emissions of Carbon Dioxide, Methane, and Nitrous Oxide Since 1850. *Scientific Data*, *10*(155). https://doi.org/10.1038/s41597-023-02041-1

Kementerian Lingkungan Hidup dan Kehutanan. (2024). *Laporan Inventarisasi Gas Rumah Kaca (GRK) dan Monitoring, Pelaporan, Verifikasi (MPV) 2023* (Vol. 9). Jakarta.

Kotagodahetti, R., Hewage, K., Karunathilake, H., & Sadiq, R. (2022). Long-term feasibility of carbon capturing in community energy systems: A system dynamics-based evaluation. *Journal of Cleaner Production*, *377*, 1-14. https://doi.org/10.1016/j.jclepro.2022.134460

Law, A. (2015). *Simulation Modeling and Analysis* (Fifth Edition ed.).

Marbun, B. T. H., Santoso, D., Kadir, W. G. A., Wibowo, A., Prabowo, H., Susilo, D., Sasongko, D., Sinaga, S. Z., Purbantanu, B. A., Palilu, J. M., & Sule, R. (2021). Improvement of borehole and casing assessment of CO2-EOR/CCUS injection and production well candidates in Sukowati Field, Indonesia in a well-

UNIVERSITAS GADJAH MADA
Dinamika Transisi Energi dengan Implementasi Carbon Capture, Utilization, and Storage (CCUS) pada PLTU di Indonesia
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

based scale. *Energy Reports, 7,* 1598-1615. https://doi.org/10.1016/j.egyr.2021.03.019

Mirzaei-Paiaman, A., Lake, L. W., & Moscardelli, L. G. (2025). A novel efficiency-based, tiered carbon storage incentive approach for CCUS through CO2 enhanced oil recovery and storage. *International Journal of Greenhouse Gas Control*, *143*, 1-20. https://doi.org/10.1016/j.ijggc.2025.104362

Muliawati, F. D. (2025, February 27). *Dirut PLN Indonesia Power Buka-bukaan Jurus Tekan Emisi di Pembangkit*. CNBC Indonesia. Retrieved June 19, 2025, from https://www.cnbcindonesia.com/news/20250227192537-4-614298/dirut-pln-indonesia-power-buka-bukaan-jurus-tekan-emisi-di-pembangkit

Muzakki, M.S. W. (2025, January 8). *Pajak Karbon, Solusi Pendanaan APBN yang Berkelanjutan?* Direktorat Jenderal Pajak. Retrieved October 3, 2025, from https://pajak.go.id/id/artikel/pajak-karbon-solusi-pendanaan-apbn-yang-berkelanjutan

Nath, F., Mahmood, M. N., & Yousuf, N. (2024). Recent advances in CCUS: A critical review on technologies, regulatory aspects and economics. *Geoenergy Science and Engineering*, *238*, 1-19. https://doi.org/10.1016/j.geoen.2024.212726

Pemerintah Indonesia. (2021). *Perpres No. 98 Tahun 2021*.

PERPRES No. 98 Tahun 2021. (n.d.). Peraturan BPK. Retrieved October 3, 2025, from https://peraturan.bpk.go.id/Details/187122/perpres-no-98-tahun-2021

Pingkuo, L., & Jiahao, W. (2024). Study on the diffusion of CCUS technology under carbon trading mechanism: Based on the perspective of tripartite evolutionary game among thermal power enterprises, government and public. *Journal of Cleaner Production*, *438*, 1-15. https://doi.org/10.1016/j.jclepro.2024.140730

PLN. (2024). *Laporan Keberlanjutan PLN 2023*. https://web.pln.co.id/statics/uploads/2024/06/SR-PLN-2023.pdf

Purnama, A. Y. R. (2025, November 13). *Kapasitas Terpasang Pembangkit RI 107 GW per Oktober, 14,4% EBT*. Bloomberg Technoz. Retrieved March 11, 2026,

UNIVERSITAS GADJAH MADA
Dinamika Transisi Energi dengan Implementasi Carbon Capture, Utilization, and Storage (CCUS) pada PLTU di Indonesia
Eufrasia Andranetta Gracelynne Eka Pramudita, Prof. Ir. Bertha Maya Shopa, S.T., M.Sc., Ph.D., IPU., ASEAN Eng.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

from https://www.bloombergtechnoz.com/detail-news/90322/kapasitas-terpasang-pembangkit-ri-107-gw-per-oktober-14-4-ebt

Purwoko, S. W. (2025, March 25). *Pekerjaan Rumah Pengendalian Emisi Gas Rumah Kaca*. Hukumonline. Retrieved October 3, 2025, from http://hukumonline.com/berita/a/pekerjaan-rumah-pengendalian-emisi-gas-rumah-kaca-lt67e2c1d94b642/

Putri, A. D., Sasongko, N. A., & Yoesgiantoro, D. (n.d.). Carbon Capture Storage dan Carbon Capture Utilization Storage (CCS/CCUS) sebagai Solusi Transisi Energi Fosil di Indonesia. *PENDIPA Journal of Science Education*, *8*(2), 191-203. https://doi.org/10.33369/pendipa.8.2.191-203

Rakhiemah, A. N., & Xu, Y. (2022). Economic viability of full-chain CCUS-EOR in Indonesia. *Resources, Conservation & Recycling*, *179*, 1-10. https://doi.org/10.1016/j.resconrec.2021.106069

Ramadhan, R., Mon, M. T., Tangparitkul, S., Tansuchat, R., & Agustin, D. A. (2024). Carbon capture, utilization, and storage in Indonesia: An update on storage capacity, current status, economic viability, and policy. *Energy Geoscience*, *5*, 1-16. https://doi.org/10.1016/j.engeos.2024.100335

Rimbono, R., Supriatna, J., Hendrotoro, R., Koestoer, S., & Hamzah, U. S. (2025). Bridging the Gap: Multi-Stakeholder Perspectives on the Role of Carbon Capture and Storage (CCS)/Carbon Capture Utilization and Storage (CCUS) in Achieving Indonesia's Net Zero Emissionss. *Sustainability*, *17*(13), 1-22.

Ritchie, H., & Roser, M. (n.d.). *Indonesia: CO2 Country Profile*. Our World in Data. Retrieved October 4, 2025, from https://ourworldindata.org/co2/country/indonesia

Roy, P., Mohanty, A. K., & Misra, M. (2023). Prospects of carbon capture, utilization and storage for mitigating climate change. *Environmental Science: Advances*, *2*(5), 409-423. https://doi.org/10.1039/D2VA00236A

Salem, N., Brar, K. K., Asgarian, A., Kaur, K., Magdouli, S., & Perreault, N. N. (2025). Advancements in Carbon Capture, Utilization, and Storage (CCUS): A Comprehensive Review of Technologies and Prospects. *Clean Technologies*, *7*(4), 109. 10.3390/cleantechnol7040109

UNIVERSITAS GADJAH MADA
Dinamika Transisi Energi dengan Implementasi Carbon Capture, Utilization, and Storage (CCUS) pada PLTU di Indonesia
Eufrasia Andranetta Gracelynne Eka Pramudita, Prof. Ir. Bertha Maya Shopa, S.T., M.Sc., Ph.D., IPU., ASEAN Eng.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Samosir, Y. O., Widayatno, R. L., & Yanto, S. (2025, March). Implementation of CCUS Technology in the Development of Steam Power Plants: Challenges and Opportunities in the Era of Energy Transition. *Formosa Journal of Science and Technology*, *4*(3), 925-934. https://doi.org/10.55927/fjst.v4i3.41

Setiawan, D. (2025). *Rencana ekspansi PLTU captive dapat menghambat target iklim Indonesia*. EMBER.

Shahibah A. (2025, May 24). *Emisi Karbon di Indonesia Terus Meningkat*. GoodStats Data. Retrieved October 3, 2025, from https://data.goodstats.id/statistic/emisi-karbon-di-indonesia-terus-meningkat-7hqfg

Song, C., Zhao, Z., & Liu, Z. (2025). Evaluation of regional and temporal dynamics in CCUS-hydrogen development policy pathways: A data-driven framework. *Renewable Energy*, *239*, 1-19. https://doi.org/10.1016/j.renene.2024.122083

Song, D., Jiang, T., & Rao, C. (n.d.). Review of Policy Framework for the Development of Carbon Capture, Utilization and Storage in China. *International Journal of Environmental Research and Public Health*, *19*(24), 16853. https://doi.org/10.3390/ ijerph192416853

Song, X., Ge, Z., Zhang, W., & Wang, Z. (2023). Study on multi-subject behavior game of CCUS cooperative alliance. *Energy*, *262*. http://dx.doi.org/10.1016/j.energy.2022.125229

Sopha, B. M., Ma'mun, S., Wibisono, M. A., & Kim, I. (2026, February 11). Exploring carbon scheme scenarios for retrofitted coal-fired power plants with carbon capture system in Indonesia. *Cleaner Energy Systems*, *13*. https://doi.org/10.1016/j.cles.2026.100240

Sopha, B. M., & Sakti, S. (2021). Pemodelan dan Simulasi Berbasis Agen untuk Sistem Kompleks Sosio-Teknikal.

Spafford, L., & MacDougall, A. H. (2020). Quantifying the Probability Distribution Function of the Transient Climate Response to Cumulative CO_2 Emissions. *Environmental Research Letters*, *15*(3). 10.1088/1748-9326/ab6d7b

Sterman, J. D. (2000). *Business Dynamics: Systems Thinking and Modeling for a Complex World*. McGraw-Hill: New York.

UNIVERSITAS GADJAH MADA
Dinamika Transisi Energi dengan Implementasi Carbon Capture, Utilization, and Storage (CCUS) pada PLTU di Indonesia
Eufrasia Andranetta Gracelynne Eka Pramudita, Prof. Ir. Bertha Maya Shopa, S.T., M.Sc., Ph.D., IPU., ASEAN Eng.
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Sumardi, E. (2023, September 11). *PLN dan Karbon Korea Co Ltd Siapkan Implementasi Teknologi CCUS di PLTU - Tribun-timur.com*. Tribun-Timur.com. Retrieved June 19, 2025, from https://makassar.tribunnews.com/2023/09/11/pln-dan-karbon-korea-co-ltd-siapkan-implementasi-teknologi-ccus-di-pltu?page=2

Sunanda, W., Setyonegoro, M. I. B., Hadi, S. P., & Sarjiya. (2025, September 15). Advancing the carbon pricing framework in Indonesia: A systematic review of policies, challenges, and global lessons. *Results in Engineering*, *28*, 1-19. https://doi.org/10.1016/j.rineng.2025.107155

Tardin-Coelho, R., Bharadwaj, B., & Ashworth, P. (2025). Carbon capture utilisation and storage (CCUS) and public perceptions: A systematic literature review. *International Journal of Greenhouse Gas Control*, *145*. https://doi.org/10.1016/j.ijggc.2025.104393

Timorria, I. F. (2025, April 21). Ada Potensi Investasi Carbon Capture (CCS) di Indonesia Senilai Rp640 Triliun. *Ekonomi Hijau*. https://hijau.bisnis.com/read/20250421/653/1870724/ada-potensi-investasi-carbon-capture-ccs-di-indonesia-senilai-rp640-triliun#goog_rewarded

United Nations Environment Programme. (2019). *Emission Gap Report 2019*. https://www.unenvironment.org/resources/emissions-gap-report-2019

Wahyu, T. (2023). Potensi CCS/CCUS Tingkatkan Produksi Migas dan Terwujudnya NZE. *Jurnal Migas*, *1*(11).

Wahyu, T., & Apriani, D. (2022). Urgensi Transisi Energi Berkelanjutan. *Jurnal Migas*, *1*(9).

Wang, P., Robinson, A. J., & Papadokonstantakis, S. (2024). Prospective techno-economic and life cycle assessment: a review across established and emerging carbon capture, storage and utilization (CCS/CCU) technologies. *Front Energy Res*, *12*, 1412770. doi: 10.3389/fenrg.2024.1412770

Ye, J., Yan, L., Liu, X., & Wei, F. (2023). Economic feasibility and policy incentive analysis of Carbon Capture, Utilization, and Storage (CCUS) in coal-fired power plants based on system dynamics. *Environmental Science and Pollution Research*, *30*, 37487-37515. https://doi.org/10.1007/s11356-022-24888-4

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GADJAH MADA
**Dinamika Transisi Energi dengan Implementasi Carbon Capture, Utilization, and Storage (CCUS) pada
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Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Zhang, K., Tao, M., & Hao, J. (2023). Analysis and Prediction of Factors Influencing Carbon Emissions of Energy Consumption Under Climate Change. *Strategic Planning for Energy and the Environment, 43*(1), 81-112. 10.13052/spee1048-5236.4314