UNIVERSITAS GADJAH MADA
PEMODELAN BASELINE KONSUMSI LISTRIK PELANGGAN UNTUK ESTIMASI DAMPAK ENERGI PLTS ATAP BERBASIS MACHINE LEARNING: STUDI KASUS DKI JAKARTA
Merlin Julius Hutagalung, Prof. Ir. Nazrul Effendy, ST, MT, Ph.D., IPM., ASEAN Eng. ; Dr. Eng. Ir. Dwi Joko Suroso, S
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

DAFTAR PUSTAKA

[1] D. Abdikarimova, A. Ibragimov, S. F. Sidique, M. Arifuzzaman, and M. Brindal, "Understanding the dynamics of household solar PV adoption in Uzbekistan," Energy for Sustainable Development, vol. 92, p. 101966, 2026, doi: https://doi.org/10.1016/j.esd.2026.101966

[2] L. A. S. Ayu, I. A. D. Giriantari, and I. N. Setiawan, "Analisis unjuk kerja pembangkit listrik tenaga surya (PLTS) atap on-grid 11,2 kWp di Residensial Bukit Gading Mediterania, Jakarta Utara," Jurnal SPEKTRUM, vol. 10, no. 1, pp. 32–43, 2023, doi: https://doi.org/10.24843/SPEKTRUM.2023.v10.i01.p5

[3] B. Cakir Erdener, C. Feng, K. Doubleday, A. Florita, and B.-M. Hodge, "A review of behind-the-meter solar forecasting," Renewable and Sustainable Energy Reviews, vol. 160, p. 112224, 2022, doi: https://doi.org/10.1016/j.rser.2022.112224

[4] B. Chandra, L. M. F. Purwanto, and A. S. Muljadinata, "Solar photovoltaics efficiencies on net zero energy house at Greater Jakarta," International Journal on Advanced Science, Engineering and Information Technology, vol. 14, no. 6, pp. 1914–1922, 2024

[5] M. Charytanowicz, A. Olwert, W. Radziszewska, J. Jarnicka, K. Gajowniczek, T. Ząbkowski, J. Brożyna, G. Mentel, and G. Matejko, "Machine learning for energy load prediction and its interpretation," in Proceedings of the 2022 IEEE 11th International Conference on Intelligent Systems (IS), IEEE, 2022, doi: https://doi.org/10.1109/IS57118.2022.10019658

[6] B. Devanathan, K. J. Varshitha, L. P. Kumar, P. Manellore, S. A. Lakshmanan, S. Kayalvizhi, and A. Suyampulingam, "AI-based energy consumption forecasting in smart homes using multi-algorithm analysis across temporal resolutions," Results in Engineering, vol. 29, p. 109272, 2026

[7] X. Dong, Y. Luo, S. Yuan, Z. Tian, L. Zhang, X. Wu, and B. Liu, "Building electricity load forecasting based on spatiotemporal correlation and electricity consumption behavior information," Applied Energy, vol. 377, p. 124580, 2025, doi: https://doi.org/10.1016/j.apenergy.2024.124580

[8] M. A. Eltawil and Z. Zhao, "Grid-connected photovoltaic power systems: Technical and potential problems—A review," Renewable and Sustainable Energy Reviews, vol. 14, no. 1, pp. 112–129, 2010, doi: https://doi.org/10.1016/j.rser.2009.07.015

[9] A. Falces, C. Capellan-Villacian, M. Mendoza-Villena, P. J. Zorzano-Santamaria, P. M. Lara-Santillan, E. Garcia-Garrido, L. A. Fernandez-Jimenez, and E. Zorzano-Alba, "Short-term net load forecast in distribution networks with PV penetration behind the meter," Energy Reports, vol. 9, pp. 115–122, 2023, doi: https://doi.org/10.1016/j.egyr.2022.12.103

[10] A. Fias, M. U. Hashmi, and G. Deconinck, "Uncertainty quantification in load profiles with rising EV and PV adoption: The case of residential, industrial, and office buildings," Sustainable Energy, Grids and Networks, vol. 45, p. 102078, 2026

[11] H. Gong, V. Rallabandi, M. L. McIntyre, E. Hossain, and D. M. Ionel, "Peak reduction and long-term load forecasting for large residential communities including smart homes with energy storage," IEEE Access, vol. 9, pp. 19345–19355, 2021, doi: https://doi.org/10.1109/ACCESS.2021.3052994

[12] L. Govindarajan, M. F. M. Batcha, S. M. Seri, M. K. Abdullah, and J. Taweekun, "Analysing the performance of large-scale rooftop solar PV system using Heliscope, PVsyst and PV*SOL photovoltaic simulation software: As a renewable energy strategy," Journal of Advanced Research in Applied Sciences and Engineering Technology, vol. 52, no. 1, pp. 192–208, 2025, doi: https://doi.org/10.37934/araset.52.1.192208

PEMODELAN BASELINE KONSUMSI LISTRIK PELANGGAN UNTUK ESTIMASI DAMPAK ENERGI PLTS ATAP BERBASIS
MACHINE LEARNING: STUDI KASUS DKI JAKARTA
Merlin Julius Hutagalung, Prof. Ir. Nazrul Effendy, ST, MT, Ph.D., IPM., ASEAN Eng. ; Dr. Eng. Ir. Dwi Joko Suroso, S
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

[13] Z. Guo, J. R. O'Hanley, and S. Gibson, "Predicting residential electricity consumption patterns based on smart meter and household data: A case study from the Republic of Ireland," Utilities Policy, vol. 79, p. 101446, 2022.

[14] G. R. Harikrishnan, S. Sreedharan, and N. C. Binoy, "Advanced short-term load forecasting for residential demand response: An XGboost-ANN ensemble approach," Electric Power Systems Research, vol. 242, p. 111476, 2025.

[15] S. Hayat, A. Nawaz, A. A. Almani, E. Mustafa, Z. Javid, and W. Holderbaum, "Enhancing power system flexibility using AI-based forecasting techniques: A comparative study," Battery Energy, vol. 5, p. e70079, 2026, doi: https://doi.org/10.1002/bte2.70079

[16] M. Hu, D. Ge, R. Telford, B. Stephen, and D. C. H. Wallom, "Classification and characterization of intra-day load curves of PV and non-PV households using interpretable feature extraction and feature-based clustering," Sustainable Cities and Society, vol. 75, p. 103380, 2021, doi: https://doi.org/10.1016/j.scs.2021.103380

[17] N. A. Hutagalung, I. N. Setiawan, and I. W. Sukerayasa, "Analisis unjuk kerja pembangkit listrik tenaga surya (PLTS) atap on-grid 463,25 kWp di perusahaan farmasi pada kawasan PT Jakarta Industrial Estate Pulogadung, Jakarta Timur," Jurnal SPEKTRUM, vol. 10, no. 2, 2023.

[18] N. M. Ibrahim, A. I. Megahed, and N. H. Abbasy, "Short-term individual household load forecasting framework using LSTM deep learning approach," in Proceedings of the 2021 5th International Symposium on Multidisciplinary Studies and Innovative Technologies (ISMSIT), IEEE, 2021

[19] K. T. N. Ihsan, A. D. Sakti, A. Higuchi, H. Takenaka, and K. Wikantika, "City-level solar photovoltaic potential using integrated surface models and Himawari satellite in Jakarta and Bandung Indonesia," Energy and Buildings, vol. 319, p. 114552, 2024, doi: https://doi.org/10.1016/j.enbuild.2024.114552

[20] O. Jafarli, "System-level assessment of residential rooftop solar PV for urban decarbonisation in Azerbaijan," Unconventional Resources, p. 100452, 2026

[21] M. Jené-Vinuesa, H. Kazmi, M. Aragüés-Peñalba, and A. Sumper, "Conditional diffusion modeling for probabilistic behind-the-meter PV disaggregation," Energy and AI, vol. 24, p. 100692, 2026.

[22] T. Kaewnukultorn, S. B. Sepúlveda-Mora, and S. Hegedus, "The impacts of DC/AC ratio, battery dispatch, and degradation on financial evaluation of bifacial PV+BESS systems," Renewable Energy, vol. 236, p. 121402, 2024, doi: https://doi.org/10.1016/j.renene.2024.121402

[23] B. Kamil, A. Sudradjat, Hartadhi, B. Sutrisno, D. Khairiani, Tarno, and A. Taradini, "Performance analysis of multi-oriented residential rooftop PV system in Indonesia towards net zero emission by 2060," Progress in Solar Energy and Engineering Systems, vol. 6, no. 1, pp. 16–22, 2022, doi: https://doi.org/10.18280/psees.060102

[24] W. Kanchana, J. G. Singh, and W. Ongsakul, "Data-driven hidden solar PV and energy storage capacity estimation from the net-load of active distribution systems," Sustainable Energy, Grids and Networks, vol. 44, p. 101940, 2025.

[25] Kementerian Energi dan Sumber Daya Mineral Republik Indonesia, "Peraturan Menteri Energi dan Sumber Daya Mineral Nomor 2 Tahun 2024 tentang Pembangkit Listrik Tenaga Surya Atap yang Terhubung pada Jaringan Tenaga Listrik Pemegang Izin Usaha Penyediaan Tenaga Listrik untuk Kepentingan Umum," Kementerian Energi dan Sumber Daya Mineral, 2024.

[26] Kementerian Energi dan Sumber Daya Mineral Republik Indonesia, "Rencana Umum Ketenagalistrikan Nasional," Kementerian Energi dan Sumber Daya Mineral, 2025.

PEMODELAN BASELINE KONSUMSI LISTRIK PELANGGAN UNTUK ESTIMASI DAMPAK ENERGI PLTS ATAP BERBASIS
MACHINE LEARNING: STUDI KASUS DKI JAKARTA
Merlin Julius Hutagalung, Prof. Ir. Nazrul Effendy, ST, MT, Ph.D., IPM., ASEAN Eng. ; Dr. Eng. Ir. Dwi Joko Suroso, S
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

[27] Y. Kiguchi, Y. Heo, M. Weeks, and R. Choudhary, "Predicting intra-day load profiles under time-of-use tariffs using smart meter data," Energy, vol. 173, pp. 959–970, 2019, doi: https://doi.org/10.1016/j.energy.2019.01.037

[28] S. Köhler, R. Rongstock, M. Hein, and U. Eicker, "Similarity measures and comparison methods for residential electricity load profiles," Energy and Buildings, vol. 271, p. 112327, 2022, doi: https://doi.org/10.1016/j.enbuild.2022.112327

[29] H. Li, M. Heleno, W. Zhang, K. Sun, L. Rodriguez Garcia, and T. Hong, "A cross-dimensional analysis of data-driven short-term load forecasting methods with large-scale smart meter data," Energy and Buildings, vol. 344, p. 115909, 2025, doi: https://doi.org/10.1016/j.enbuild.2025.115909

[30] C. C. Liu, H. Chen, J. Shi, and L. Chen, "Self-supervised learning method for consumer-level behind-the-meter PV estimation," Applied Energy, vol. 326, p. 119961, 2022, doi: https://doi.org/10.1016/j.apenergy.2022.119961

[31] V. Michalakopoulos, E. Sarmas, I. Papias, P. Skaloumpakas, V. Marinakis, and H. Doukas, "A machine learning-based framework for clustering residential electricity load profiles to enhance demand response programs," Applied Energy, vol. 361, p. 122943, 2024, doi: https://doi.org/10.1016/j.apenergy.2024.122943

[32] C. Ortigoza-Larroza, G. I. Rivas-Martínez, S. Grillo, and E. Benítez, "Residential electricity consumption forecasting using machine learning and SARIMA approaches: A case study of Paraguay," International Journal of Energy and Water Resources, vol. 10, p. 24, 2026, doi: https://doi.org/10.1007/s42108-025-00438-9

[33] K. Pan, Z. Chen, C. S. Lai, C. Xie, D. Wang, X. Li, Z. Zhao, N. Tong, and L. L. Lai, "An unsupervised data-driven approach for behind-the-meter photovoltaic power generation disaggregation," Applied Energy, vol. 309, p. 118450, 2022, doi: https://doi.org/10.1016/j.apenergy.2021.118450

[34] K. R. Panjaitan, I. A. D. Giriantari, and I. N. Setiawan, "Analisis unjuk kerja PLTS carport 37,8 kWp di area perkantoran Kementerian ESDM Republik Indonesia Jakarta Pusat," Jurnal SPEKTRUM, vol. 10, no. 1, pp. 25–31, 2023, doi: https://doi.org/10.24843/SPEKTRUM.2023.v10.i01.p4

[35] Pemerintah Republik Indonesia, "Peraturan Pemerintah Republik Indonesia Nomor 25 Tahun 2021 tentang Penyelenggaraan Bidang Energi dan Sumber Daya Mineral," Pemerintah Republik Indonesia, 2021.

[36] PT PLN (Persero), "Rencana Usaha Penyediaan Tenaga Listrik (RUPTL) PT PLN (Persero) Tahun 2025–2034," PT PLN (Persero), 2025.

[37] R. K. D. Putri, T. H. Nufus, and M. Ridwan, "Analisis kinerja pada sistem pembangkit listrik tenaga surya terhadap efek partial shading di PT Bluebird Group," Prosiding Seminar Nasional Teknik Mesin Politeknik Negeri Jakarta, pp. 1025–1034, 2024.

[38] Z. Qu, X. Ge, J. Lu, and F. Wang, "Unsupervised disaggregation of aggregated net load considering behind-the-meter PV based on virtual PV sample construction," Applied Energy, vol. 381, p. 125007, 2025, doi: https://doi.org/10.1016/j.apenergy.2024.125007

[39] H. Rafiq, P. Manandhar, E. Rodriguez-Ubinas, J. D. Barbosa, and O. A. Qureshi, "Analysis of residential electricity consumption patterns utilizing smart-meter data: Dubai as a case study," Energy and Buildings, vol. 291, p. 113103, 2023, doi: https://doi.org/10.1016/j.enbuild.2023.113103

[40] N. S. M. Salleh, A. Suliman, and B. N. Jørgensen, "Experiment on electricity consumption prediction using Long Short-Term Memory architecture on residential electrical consumer," in

PEMODELAN BASELINE KONSUMSI LISTRIK PELANGGAN UNTUK ESTIMASI DAMPAK ENERGI PLTS ATAP BERBASIS
MACHINE LEARNING: STUDI KASUS DKI JAKARTA
Merlin Julius Hutagalung, Prof. Ir. Nazrul Effendy, ST, MT, Ph.D., IPM., ASEAN Eng. ; Dr. Eng. Ir. Dwi Joko Suroso, S
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Proceedings of the 2021 International Congress of Advanced Technology and Engineering (ICOTEN), IEEE, 2021.

[41] W. Stainsby, D. Zimmerle, and G. P. Duggan, "A method to estimate residential PV generation from net-metered load data and system install date," Applied Energy, vol. 267, p. 114895, 2020, doi: https://doi.org/10.1016/j.apenergy.2020.114895

[42] E. Tarigan, "Comparison of energy production between fixed-mount and tracking systems of solar PV systems in Jakarta, Indonesia," Future Cities and Environment, vol. 9, no. 1, p. 3, 2023, doi: https://doi.org/10.5334/fce.167

[43] G. Tziolis, A. Livera, S. Theocharides, J. Lopez-Lorente, G. Makrides, and G. E. Georghiou, "Net load forecasting: A comprehensive literature review," Sustainable Energy Technologies and Assessments, vol. 82, p. 104450, 2025

[44] G. Tziolis, J. Lopez-Lorente, M.-I. Baka, A. Koumis, A. Livera, S. Theocharides, G. Makrides, and G. E. Georghiou, "Direct short-term net load forecasting in renewable integrated microgrids using machine learning: A comparative assessment," Sustainable Energy, Grids and Networks, vol. 37, p. 101256, 2024, doi: https://doi.org/10.1016/j.segan.2023.101256

[45] U.S. Department of Energy, "Photovoltaics: Basic design principles and components," National Renewable Energy Laboratory, 1997.

[46] P. Venkatasubbu, K. Verma, and D. E. M. Jaincy, "A hybrid deep learning and ensemble framework for smart grid load forecasting using GRU and XGboost," in Proceedings of the 2025 International Conference on Sensors and Related Networks (SENNET), IEEE, 2025, doi: https://doi.org/10.1109/SENNET64220.2025.11136089

[47] J. Wang, W. Zheng, and Z. Li, "Detection and estimation of behind-the-meter photovoltaic generation based on smart meter data analytics," The Electricity Journal, vol. 35, no. 5, p. 107132, 2022, doi: https://doi.org/10.1016/j.tej.2022.107132

[48] C. Zhang, H. Long, Z. Zhang, and J. Cao, "Practicality-enhanced behind-the-meter PV power generation disaggregation based on synchronization and transferability fused LSTM framework," Energy and AI, vol. 23, p. 100675, 2026, doi: https://doi.org/10.1016/j.egyai.2026.100675

PEMODELAN BASELINE KONSUMSI LISTRIK PELANGGAN UNTUK ESTIMASI DAMPAK ENERGI PLTS ATAP BERBASIS
MACHINE LEARNING: STUDI KASUS DKI JAKARTA
Merlin Julius Hutagalung, Prof. Ir. Nazrul Effendy, ST, MT, Ph.D., IPM., ASEAN Eng. ; Dr. Eng. Ir. Dwi Joko Suroso, S
Universitas Gadjah Mada, 2026 | Diunduh dari http://etd.repository.ugm.ac.id/

Lampiran: Histori alur persetujuan

No	Jabatan	Nama	Jenis	Tanggal Disetujui
1	Dosen Penguji	Dr. Eng. Ir. Mohammad Kholid Ridwan, S.T., M.Sc., IPU., ASEAN Eng.	Paraf	Selasa, 14 Juli 2026 10:11
2	Dosen Penguji	Ir. Nopriadi, S.T., M.Sc., Ph.D., IPM.	Paraf	Selasa, 14 Juli 2026 21:54
3	Dosen Pembimbing	Dr. Eng. Ir. Dwi Joko Suroso, S.T., M.Eng., IPP.	Paraf	Rabu, 15 Juli 2026 05:22
4	Dosen Pembimbing	Prof. Ir. Nazrul Effendy, S.T., M.T., Ph.D., IPM. ASEAN Eng.	Paraf	Rabu, 15 Juli 2026 05:43
5	Ketua Program Studi Magister Teknik Fisika	Dr. Gea Oswah Fatah Parikesit, S.T., M.Sc.	Paraf	Rabu, 15 Juli 2026 05:53
6	Ketua Departemen Teknik Nuklir dan Teknik Fisika	Prof. Dr. Ir. Faridah, S.T., M.Sc., IPU. ASEAN Eng.	Tanda Tangan	Rabu, 15 Juli 2026 12:35

Diajukan oleh Riny Wasita, A.Md. pada Selasa, 14 Juli 2026 10:04

Dokumen ini telah melalui proses approval secara daring sebelum QR Code dibubuhkan.
Scan QR Code yang ada di setiap halaman dokumen ini untuk verifikasi.