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DAFTAR PUSTAKA

Abu-Nada, A., McKay, G., & Abdala, A. (2020). Recent Advances in Applications of Hybrid Graphene Materials for Metals Removal from Wastewater. *Nanomaterials*, *10*(3), 595. https://doi.org/10.3390/nano10030595

Ali, N., Bahman, A. M., Aljuwayhel, N. F., Ebrahim, S. A., Mukherjee, S., & Alsayegh, A. (2021). Carbon-Based Nanofluids and Their Advances towards Heat Transfer Applications—A Review. *Nanomaterials*, *11*(6), 1628. https://doi.org/10.3390/nano11061628

Ali, N., Teixeira, J. A., & Addali, A. (2018). A Review on Nanofluids: Fabrication, Stability, and Thermophysical Properties. *Journal of Nanomaterials*, *2018*, 1–33. https://doi.org/10.1155/2018/6978130

Ansón-Casaos, A., Ciria, J. C., Sanahuja-Parejo, O., Víctor-Román, S., González-Domínguez, J. M., García-Bordejé, E., Benito, A. M., & Maser, W. K. (2020). The viscosity of dilute carbon nanotube (1D) and graphene oxide (2D) nanofluids. *Physical Chemistry Chemical Physics*, *22*(20), 11474–11484. https://doi.org/10.1039/d0cp00468e

Badan Geologi. (2025). *Neraca sumber daya dan cadangan mineral, batubara dan panas bumi Indonesia tahun 2025*. Kementerian Energi dan Sumber Daya Mineral.

Barcelona, H., Senger, M., & Yagupsky, D. (2021). Resource assessment of the Copahue geothermal field. *Geothermics*, *90*, 101987. https://doi.org/10.1016/j.geothermics.2020.101987

Bergman, T. L., & Lavine, A. S. (2017). *Fundamentals of Heat and Mass Transfer, 8th Edition* (8th ed.). John Wiley & Sons, Inc.

Budiono, A., Suyitno, S., Rosyadi, I., Faishal, A., & Ilyas, A. X. (2022). A Systematic Review of the Design and Heat Transfer Performance of Enhanced Closed-Loop Geothermal Systems. *Energies*, *15*(3), 742. https://doi.org/10.3390/en15030742

Çengel, Y. A., & Ghajar, A. J. (2020). *Heat and mass transfer : fundamentals & applications* (6th ed.). Mcgraw-Hill Education.

Chaichan, M. T., Kazem, H. A., Al-Ghezi, M. K. S., Ali, Ali, A. J., Sopian, K., Amir, A., Nor, W., Takriff, M. S., & Al-Amiery, A. A. (2023). Optimizing MWCNT-Based Nanofluids for Photovoltaic/Thermal Cooling through Preparation Parameters. *ACS Omega*, *8*(33), 29910–29925. https://doi.org/10.1021/acsomega.2c07226

Chen, J., & Li, L. (2020). Thermal Conductivity of Graphene Oxide: A Molecular Dynamics Study. *JETP Letters*, *112*(2), 117–121. https://doi.org/10.1134/s0021364020140015

Chiasson, A. D. (2016). *Geothermal Heat Pump and Heat Engine Systems Theory and Practice*. Chichester, Uk John Wiley & Sons, Ltd.

Choi, J. A., Kim, J. H., & Ji, S. W. (2025). Fluid–Structure Interaction Analysis and Experimental Study for the Structural Safety of Hydrogen Refueling Nozzle. *International Journal of Automotive Technology*, *26*(4), 1147–1157. https://doi.org/10.1007/s12239-025-00215-x

COMSOL. (n.d.). *COMSOL Learning Center*. COMSOL. Retrieved May 5, 2026,

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Gao, Y., Xi, Y., Zhenzhong, Y., Sasmito, A., Mujumdar, A., & Wang, L. (2021). Experimental investigation of specific heat of aqueous graphene oxide Al2O3 hybrid nanofluid. *Thermal Science*, *25*(1 Part B), 515–525. https://doi.org/10.2298/tsci190404381g

He, Y., Jia, M., Li, X., Yang, Z., & Song, R. (2021). Performance analysis of coaxial heat exchanger and heat-carrier fluid in medium-deep geothermal energy development. *Renewable Energy*, *168*, 938–959. https://doi.org/10.1016/j.renene.2020.12.109

Huang, X., Wang, J., Eres, G., & Wang, X. (2011). Thermophysical properties of multi-wall carbon nanotube bundles at elevated temperatures up to 830K. *Carbon*, *49*(5), 1680–1691. https://doi.org/10.1016/j.carbon.2010.12.053

IRENA. (2025). *Tableau*. Tableau.com. https://public.tableau.com/shared/KS3B8R38N?:display_count=n&:showVizHome=no#

Kementerian Energi dan Sumber Daya Mineral. (2025). *Indonesia Siap Jadi Negara Produsen Listrik Panas Bumi Terbesar Dunia*. ESDM. https://www.esdm.go.id/id/media-center/arsip-berita/indonesia-siap-jadi-negara-produsen-listrik-panas-bumi-terbesar-dunia

Kómar, L., Wallner, S., & Kocifaj, M. (2022). The significant impact of shape deviations of atmospheric aerosols on light monitoring networks. *Monthly Notices of the Royal Astronomical Society*, *512*(2), 1805–1813. https://doi.org/10.1093/mnras/stac548

Kuron, M. (2015, January 6). *3 Criteria for Assessing CFD Convergence - Engineering.com*. Engineering.com. https://www.engineering.com/3-criteria-for-assessing-cfd-convergence/

Lewis, C. D. (1982). *Industrial and Business Forecasting Methods*. Butterworth-Heinemann.

Maior, I., Badea, G. E., Stănășel, O. D., Sebeșan, M., Cojocaru, A., Petrehele, A. I. G., Creț, P., & Blidar, C. F. (2025). Chemical Composition and Corrosion—Contributions to a Sustainable Use of Geothermal Water. *Energies*, *18*(14), 3634. https://doi.org/10.3390/en18143634

ManchesterCFD. (2016, June 1). *All there is to know about different mesh types in CFD!* Manchestercfd. https://www.manchestercfd.co.uk/post/all-there-is-to-know-about-different-mesh-types-in-cfd

McFarland, M. (2001). *Biosolids Engineering*. McGraw Hill Professional.

Oezcan, M. (2020, January 6). *How to Check Convergence of a CFD Simulation?* SimScale. https://www.simscale.com/knowledge-base/how-to-check-convergence-of-a-cfd-simulation/

Pambudi, N. A. (2018). Geothermal power generation in Indonesia, a country within the ring of fire: Current status, future development and policy. *Renewable and Sustainable Energy Reviews*, *81*, 2893–2901. https://doi.org/10.1016/j.rser.2017.06.096

Ponomarev, A., Egorushkin, V., Bobenko, N., Barabashko, M., Rezvanova, A., & Belosludtseva, A. (2022). On the Possible Nature of Armchair-Zigzag Structure Formation and Heat Capacity Decrease in MWCNTs. *Materials*,

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GADJAH MADA
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15(2), 518–518. https://doi.org/10.3390/ma15020518

Prasher, R., Song, D., Wang, J., & Phelan, P. (2006). Measurements of nanofluid viscosity and its implications for thermal applications. *Applied Physics Letters*, *89*(13). https://doi.org/10.1063/1.2356113

Qiao, M., Jing, Z., Feng, C., Li, M., Chen, C., Zou, X., & Zhou, Y. (2024). Review on heat extraction systems of hot dry rock: Classifications, benefits, limitations, research status and future prospects. *Renewable & Sustainable Energy Reviews*, *196*, 114364–114364. https://doi.org/10.1016/j.rser.2024.114364

Reddy, J. N. (2018). *Introduction to the Finite Element method.* McGraw-Hill.

REN21. (2025). *Renewables 2025 Global Status Report Collection*. REN21 Renewables Now. https://www.ren21.net/gsr-2025/technologies/geothermal/

Shi, G., Wang, J., & Gates, I. D. (2024). Investigation of enhanced geothermal system in the Basal Cambrian Sandstone Unit, Alberta, Canada. *Heliyon*, *10*(2), e24763–e24763. https://doi.org/10.1016/j.heliyon.2024.e24763

solids4foam. (2023, August 22). *The finite volume method for solid mechanics, 3rd UCL OpenFOAM Workshop, London, UK.* YouTube. https://www.youtube.com/watch?v=Y9Jju-oO_9Q

Song, X., Zheng, R., Li, G., Shi, Y., Wang, G., & Li, J. (2018). Heat extraction performance of a downhole coaxial heat exchanger geothermal system by considering fluid flow in the reservoir. *Geothermics*, *76*, 190–200. https://doi.org/10.1016/j.geothermics.2018.07.012

Trong Tam, N., Viet Phuong, N., Hong Khoi, P., Ngoc Minh, P., Afrand, M., Van Trinh, P., Hung Thang, B., Żyła, G., & Estellé, P. (2020). Carbon Nanomaterial-Based Nanofluids for Direct Thermal Solar Absorption. *Nanomaterials*, *10*(6), 1199. https://doi.org/10.3390/nano10061199

Versteeg, H. K., & W Malalasekera. (2007). *An introduction to computational fluid dynamics : the finite volume method* (2nd ed.). Pearson Education.

Wahid, M. N., Asif, M., Khan, M. I., & Khalid, M. (2025). A strategic analysis of geothermal energy for sustainable energy transition: Case study from Indonesia. *Energy Conversion and Management: X*, *28*, 101303. https://doi.org/10.1016/j.ecmx.2025.101303

Weisstein, E. W. (n.d.). *Oblate Spheroid*. Mathworld.wolfram.com. https://mathworld.wolfram.com/OblateSpheroid.html

Wollblad, C. (2018, June 13). *Your Guide to Meshing Techniques for Efficient CFD Modeling*. COMSOL. https://www.comsol.com/blogs/your-guide-to-meshing-techniques-for-efficient-cfd-modeling

Zhang, Y., Yu, C., Li, G., Guo, X., Wang, G., Shi, Y., Peng, C., & Tan, Y. (2019). Performance analysis of a downhole coaxial heat exchanger geothermal system with various working fluids. *Applied Thermal Engineering*, *163*, 114317. https://doi.org/10.1016/j.applthermaleng.2019.114317