List of Mandatory Reading Materials for the Course AAE-E1000 Autumn 2021

To be read before each lecture

1. **Introduction to energy systems** - Ilkka Keppo

    a. Grubler A., Johansson TB, Mundaca L et al. (2012) Chapter 1 - Energy Primer. In *Global Energy Assessment - Toward a Sustainable Future*, Cambridge University Press, Cambridge, UK and New York, NY, USA and the International Institute for Applied Systems Analysis, Laxenburg, Austria, pp. 99-150. https://iiasa.ac.at/web/home/research/Flagship-Projects/Global-Energy-Assessment/GEA_Chapter1_lowres.pdf
    b. Unruh G.C (2000) Understanding carbon lock-in. *Energy Policy* 28(12): 817-830. DOI: 10.1016/S0301-4215(00)00070-7
2. **Residential and industrial energy demand** - Ilkka Keppo & Henrik Holmberg

    a. Siitonen S, Tuomaala M and Ahtila P (2010) Variables affecting energy efficiency and CO2 emissions in the steel industry. *Energy Policy* 38(5). Greater China Energy: Special Section with regular papers: 2477–2485. DOI: 10.1016/j.enpol.2009.12.042.
    b. Ürge-Vorsatz D, Cabeza LF, Serrano S et al. (2015) Heating and cooling energy trends and drivers in buildings. *Renewable and Sustainable Energy Reviews 41:* 85-98. DOI: 10.1016/j.rser.2014.08.039.
3. **HVAC technology and energy in buildings** - Risto Kosonen

    a. Hirvonen J, Heljo J, Jokisalo J, et al. (2021) Emissions and power demand in optimal energy retrofit scenarios of the Finnish building stock by 2050. *Sustainable Cities and Society* 70: 102896. DOI: 10.1016/j.scs.2021.102896.
    b. Watch the video available under “Lecture 3” in “Lectures and lecture slides
    c. Go through the slides “HVAC- Technology for Healthy Buildings and Sustainable Society” under “Lecture 3” in “Lectures and lecture slides
4. **Solar Power Utilization and Markets** - Mika Järvinen

    a. Flowers ME, Smith MK, Parsekian AW, et al. (2016) Climate impacts on the cost of solar energy. *Energy Policy* 94: 264–273. DOI: 10.1016/j.enpol.2016.04.018.
5. **Wind Power and Geothermal Energy**- Mika Järvinen & Johannes Isohookan

    a. Oestergaard & Lund, 2011. A renewable energy system in Frederikshavn using low-temperature geothermal energy for district heating. Applied Energy 88: 479-87. https://doi.org/10.1016/j.apenergy.2010.03.018

    b. Hvelplund F, Østergaard PA and Meyer NI (2017) Incentives and barriers for wind power expansion and system integration in Denmark. *Energy Policy* 107: 573–584. DOI: 10.1016/j.enpol.2017.05.009.

6. **Energy Storage** - Annukka Santasalo-Aarnio

    a. Dehghani-Sanija et al., 2019. Study of energy storage systems and environmental challenges of batteries. Renewable and Sustainable Energy Reviews 104: 192–208. https://doi.org/10.1016/j.rser.2019.01.023

    b. Javed MS, Zhong D, Ma T, et al. (2020) Hybrid pumped hydro and battery storage for renewable energy based power supply system. *Applied Energy* 257: 114026. DOI: 10.1016/j.apenergy.2019.114026.

7. **Bioenergy** - Mika Järvinen

    a. Chia SR, Nomanbhay SBHJM, Chew KW, et al. (2022) Algae as potential feedstock for various bioenergy production. *Chemosphere* 287: 131944. DOI: 10.1016/j.chemosphere.2021.131944.

8. **Nuclear Energy** - Jaakko Leppänen

    a. Mignacca B, Locatelli G and Sainati T. (2020) Deeds not words: Barriers and remedies for Small Modular Nuclear Reactors. *Energy* 206: 118137. DOI: 10.1016/j.energy.2020.118137.

9. **Renewables inside the power infrastructure** - John Millar

    a. Lund et al., 2015. Review of energy system flexibility measures to enable high levels of variable renewable electricity. Renewable and Sustainable Energy Reviews 45: 785-807. https://doi.org/10.1016/j.rser.2015.01.057.

10. **Energy system in transition** - Ilkka Keppo

    a. Wilson C, Grubler A, Bento N, et al. (2020) Granular technologies to accelerate decarbonization. *Science* 368(6486). American Association for the Advancement of Science: 36–39. DOI: 10.1126/science.aaz8060.

11. **Energy technology materials** - Annukka Santasalo-Aarnio

    a. Kleijn et al., 2011. Metal requirements of low-carbon power generation. *Energy* 36: 5640-5648. https://doi.org/10.1016/j.energy.2011.07.003

12. **Future trends for energy systems and technology** - Ilkka Keppo

    a. Trutnevyte E, McDowall W, Tomei J, et al. (2016) Energy scenario choices: Insights from a retrospective review of UK energy futures. *Renewable and Sustainable Energy Reviews* 55: 326–337. DOI: 10.1016/j.rser.2015.10.067.