Appendix – II

The references used in the detailed statistics presented in Chapter 4

- Abdul-Wahab, S.A., Charabi, Y., Al-Rawas, G.A., Al-Maamari, R., Gastli, A. and Chan, K. (2015), "Greenhouse gas (GHG) emissions in the Sultanate of Oman", *Greenhouse Gases: Science and Technology*, Vol. 5 No. 3, pp. 339–346.
- Aksoy, U.T. and Inalli, M. (2006), "Impacts of some building passive design parameters on heating demand for a cold region", *Building and Environment*, Vol. 41 No. 12, pp. 1742–1754.
- Al-Awadhi, J.M. and AlShuaibi, A.A. (2013), "Dust fallout in Kuwait city: Deposition and characterization", *Science of the Total Environment*, Elsevier B.V., Vol. 461–462, pp. 139–148.
- Al-Hasan, A.Y. (1998), "A new correlation for direct beam solar radiation received by photovoltaic panel with sand dust accumulated on its surface", *Solar Energy*, Vol. 63 No. 5, pp. 323–333.
- Al-hasan, A.Y. and Ghoneim, A.A. (2005), "A new correlation between photovoltaic panel's efficiency and amount of sand dust accumulated on their surface", *International Journal of Sustainable Energy*, Vol. 24 No. 4, pp. 187–197.
- Al-janabi, A., Kavgic, M., Mohammadzadeh, A. and Azzouz, A. (2019), "Comparison of EnergyPlus and IES to model a complex university building using three scenarios: Free-floating, ideal air load system, and detailed", *Journal of Building Engineering*, Elsevier Ltd, Vol. 22 No. September 2018, pp. 262–280.
- Al-Maamary, H.M.S., Kazem, H.A. and Chaichan, M.T. (2017), "Climate change: The game changer in the Gulf Cooperation Council Region", *Renewable and Sustainable Energy Reviews*, Elsevier Ltd, Vol. 76 No. January 2016, pp. 555–576.
- Al-Otaibi, A., Al-Qattan, A., Fairouz, F. and Al-Mulla, A. (2015), "Performance evaluation of photovoltaic systems on Kuwaiti schools' rooftop", *Energy Conversion and Management*, Elsevier Ltd, Vol. 95, pp. 110–119.
- Albatayneh, A., Alterman, D., Page, A. and Moghtaderi, B. (2018), "Renewable energy systems to enhance buildings thermal performance and decrease construction costs", *Energy Procedia*, Elsevier B.V., Vol. 152, pp. 312–317.
- AlBusairi, H.A. and Möller, H.J. (2010), "PERFORMANCE EVALUATION OF CdTe PV MODULES UNDER NATURAL OUTDOOR CONDITIONS IN KUWAIT", 5th World Conference on Photovoltaic Energy Conversion, 25th European Photovoltaic Solar Energy Conference and Exhibition, Valencia, Spain, pp. 29–36.
- Almufarrej, A. and Erfani, T. (2022), "Modelling the regional effect of transmittance loss on photovoltaic systems due to dust", *International Journal of Energy and Environmental Engineering*, Springer Berlin Heidelberg, No. 0123456789, available at:https://doi.org/10.1007/s40095-022-00510-8.
- Almufarrej, A.M. and Erfani, T. (2021), "Climate, buildings' envelope design and energy patterns: improving energy performance of new buildings in Kuwait", *Engineering, Construction and Architectural Management*, Vol. ahead-of-p No. ahead-of-print, available at:https://doi.org/10.1108/ecam-04-2021-0360.

- Alnaser, N.W. and Flanagan, R. (2007), "The need of sustainable buildings construction in the Kingdom of Bahrain", *Building and Environment*, Vol. 42 No. 1, pp. 495–506.
- Alnaser, W.E. and Alnaser, N.W. (2009), "Solar and wind energy potential in GCC countries and some related projects", *Journal of Renewable and Sustainable Energy*, Vol. 1 No. 2, p. 022301.
- Alqubaisi, A. and Al-alili, A. (2019), "Efficient Residential Buildings in Hot and Humid Regions: The Case of Abu Efficient Residential Buildings in Hot and Humid Regions: The Case of Abu Dhabi, UAE", No. January, available at:https://doi.org/10.5383/ijtee.17.01.004.
- Ascione, F., Bianco, N., Mauro, G.M. and Vanoli, G.P. (2019), "A new comprehensive framework for the multi-objective optimization of building energy design: Harlequin", *Applied Energy*, Elsevier, Vol. 241 No. January, pp. 331–361.
- Asl-Soleimani, E., Farhangi, S. and Zabihi, M.S. (2001), "The effect of tilt angle, air pollution on performance of photovoltaic systems in Tehran", *Renewable Energy*, Vol. 24 No. 3–4, pp. 459–468.
- Atalay, Y., Biermann, F. and Kalfagianni, A. (2016), "Adoption of renewable energy technologies in oil-rich countries: Explaining policy variation in the Gulf Cooperation Council states", *Renewable Energy*, Elsevier Ltd, Vol. 85, pp. 206–214.
- Austin, R. (2018), "Do Vertical Solar Panels Make Financial Sense?", *Understand Solar*, available at: https://understandsolar.com/vertical-solar-panels/%0D.
- Azhar, S., Brown, J.W. and Sattineni, A. (2010), "A case study of building performance analyses using building information modeling", 2010 27th International Symposium on Automation and Robotics in Construction, ISARC 2010, No. June 2018, pp. 213–222.
- Baddock, M.C., Strong, C.L., Murray, P.S. and Mctainsh, G.H. (2013), "Aeolian dust as a transport hazard", *Atmospheric Environment*, Elsevier Ltd, Vol. 71, pp. 7–14.
- Baglivo, C., Congedo, P.M., Di Cataldo, M., Coluccia, L.D. and D'Agostino, D. (2017), "Envelope design optimization by thermal modelling of a building in a warm climate", *Energies*, Vol. 10 No. 11, available at:https://doi.org/10.3390/en10111808.
- Bazaraa, M.S., Sherali, H.D. and Shetty, C.M. (1993), NONLINEAR PROGRAMMING, Theory and Algorithms, 3rd ed., John Wiley & Sons, Inc., Hoboken, New Jersey, USA.
- Bennion, P., Hubbard, R., Hara, S.O., Wiggs, G., Wegerdt, J. and Lewis, S. (2007), "The impact of airborne dust on respiratory health in children living in the Aral Sea region y", pp. 1103–1110.
- Blank, J.E., Tusel, G.F. and Nisanc, S. (2007), "The real cost of desalted water and how to reduce it further", *Desalination*, Vol. 205 No. 1–3, pp. 298–311.
- Bre, F., Silva, A.S., Ghisi, E. and Fachinotti, V.D. (2016), "Residential building design optimisation using sensitivity analysis and genetic algorithm", *Energy and Buildings*, Elsevier B.V., Vol. 133, pp. 853–866.
- Cabanillas, R.E. and Munguía, H. (2011), "Dust accumulation effect on efficiency of Si photovoltaic modules", *Journal of Renewable and Sustainable Energy*, Vol. 3 No. 4, available at:https://doi.org/10.1063/1.3622609.
- Caldas, L.G. and Norford, L.K. (2002), "A design optimization tool based on a genetic algorithm", *Automation in Construction*, Vol. 11 No. 2, pp. 173–184.
- Cassol, F., Schneider, P.S., França, F.H.R. and Silva Neto, A.J. (2011), "Multi-objective optimization as a new approach to illumination design of interior spaces", *Building and Environment*, Elsevier

- Ltd, Vol. 46 No. 2, pp. 331-338.
- Chakraborty, S. and Newton, A.C. (2011), "Climate change, plant diseases and food security: An overview", *Plant Pathology*, Vol. 60 No. 1, pp. 2–14.
- Chang, Y. (2009), "N-Dimension Golden Section Search: Its Variants and Limitations", 2nd International Conference on Biomedical Engineering and Informatics, IEEE, No. 3, pp. 1–6.
- Chantrelle, F.P., Lahmidi, H., Keilholz, W., Mankibi, M. El and Michel, P. (2011), "Development of a multicriteria tool for optimizing the renovation of buildings", *Applied Energy*, Elsevier Ltd, Vol. 88 No. 4, pp. 1386–1394.
- Choi, J.H. (2017), "Investigation of the correlation of building energy use intensity estimated by six building performance simulation tools", *Energy and Buildings*, Elsevier B.V., Vol. 147, pp. 14–26.
- Chowdhury, S. and Al-Zahrani, M. (2013), "Implications of Climate Change on Water Resources in Saudi Arabia", *Arabian Journal for Science and Engineering*, Vol. 38 No. 8, pp. 1959–1971.
- Crawley, D.B., Hand, J.W., Kummert, M. and Griffith, B.T. (2008), "Contrasting the capabilities of building energy performance simulation programs", *Building and Environment*, Vol. 43 No. 4, pp. 661–673.
- Cressie, N. (1988), "Spatial prediction and ordinary kriging", *Mathematical Geology*, Vol. 20 No. 4, pp. 405–421.
- Damerau, K., Patt, A.G. and van Vliet, O.P.R. (2016), "Water saving potentials and possible trade-offs for future food and energy supply", *Global Environmental Change*, Elsevier Ltd, Vol. 39, pp. 15–25.
- Deb, K., Agrawal, S., Pratap, A. and Meyarivan, T. (2000), "A Fast Elitist Non-dominated Sorting Genetic Algorithm for Multi-objective Optimization: NSGA-II. In:, et al. Parallel Problem Solving from Nature PPSN VI", Parallel Problem Solving from Nature PPSN VI. Springer, Berlin, Heidelberg, Vol. 1917, available at:https://doi.org/https://doi.org/10.1007/3-540-45356-3_83.
- Deb, K., Pratap, A., Agarwal, S. and Meyarivan, T. (2002), "A fast and elitist multiobjective genetic algorithm: NSGA-II", *IEEE Transactions on Evolutionary Computation*, available at:https://doi.org/10.1109/4235.996017.
- Delgarm, N., Sajadi, B. and Delgarm, S. (2016), "Multi-objective optimization of building energy performance and indoor thermal comfort: A new method using artificial bee colony (ABC)", *Energy and Buildings*, Elsevier B.V., Vol. 131, pp. 42–53.
- Delgarm, N., Sajadi, B., Delgarm, S. and Kowsary, F. (2016), "A novel approach for the simulation-based optimization of the buildings energy consumption using NSGA-II: Case study in Iran", *Energy and Buildings*, Elsevier B.V., Vol. 127, pp. 552–560.
- Dietz, A.G.H. (1963), "Diathermanous materials and properties of surfaces", *Introduction to the Utilization of Solar Energy, A.M. Zarem, D.D. Erway*, McGraw Hill, New York, pp. 59–86.
- Dodoo, A., Tettey, U.Y.A. and Gustavsson, L. (2017), "Influence of simulation assumptions and input parameters on energy balance calculations of residential buildings", *Energy*, Elsevier Ltd, Vol. 120, pp. 718–730.
- Doukas, H., Patlitzianas, K.D., Kagiannas, A.G. and Psarras, J. (2006), "Renewable energy sources and rationale use of energy development in the countries of GCC: Myth or reality?", *Renewable Energy*, Vol. 31 No. 6, pp. 755–770.

- Eastnorth, M., Region, A. and Country, G.C.C. (2016), "MIDDLE EAST AND NORTH AFRICA REGION Air Pollution: Evidence from the Gulf Environmental Partnership and Action Program", World Banck Group, p. 8.
- El-nashar, A.M. (2009), "Seasonal effect of dust deposition on a field of evacuated tube collectors on the performance of a solar desalination plant", *DES*, Elsevier B.V., Vol. 239 No. 1–3, pp. 66–81.
- El-Nashar, A.M. (1990), "Computer simulation of the performance of a solar desalination plant", *Solar Energy*, Vol. 44 No. 4, pp. 193–205.
- El-Nashar, A.M. (1994), "The effect of dust accumulation on the performance of evacuated tube collectors", *Solar Energy*, Vol. 53 No. 1, pp. 105–115.
- El-Nashar, A.M. (2003), "Effect of dust deposition on the performance of a solar desalination plant operating in an arid desert area", *Solar Energy*, Vol. 75 No. 5, pp. 421–431.
- Elminir, H.K., Ghitas, A.E., Hamid, R.H., El-Hussainy, F., Beheary, M.M. and Abdel-Moneim, K.M. (2006), "Effect of dust on the transparent cover of solar collectors", *Energy Conversion and Management*, Vol. 47 No. 18–19, pp. 3192–3203.
- Enerdata. (2017a), COUNTRY ENERGY REPORT QATAR, available at: https://www.enerdata.net.
- Enerdata. (2017b), COUNTRY ENERGY REPORT, KUWAIT, available at: https://www.enerdata.net.
- Enerdata. (2017c), COUNTRY ENERGY REPORT, UAE, available at: https://www.enerdata.net.
- Enerdata. (2018a), COUNTRY ENERGY REPORT, OMAN, available at: https://www.enerdata.net.
- Enerdata. (2018b), COUNTRY ENERGY REPORT, KSA, available at: https://www.enerdata.net.
- Enerdata. (2018c), COUNTRY ENERGY REPORT, BAHRAIN, available at: https://www.enerdata.net.
- "EnergyPlus: Getting Started Manual". (2018), EnergyPlus, U.S. Department of Energy, U.S.A.
- EPA. (2016), Social Cost of Carbon Dioxide Fact-Sheet, available at: www.epa.gov.
- Evins, R. (2013), "A review of computational optimisation methods applied to sustainable building design", *Renewable and Sustainable Energy Reviews*, Elsevier, Vol. 22, pp. 230–245.
- Fan, Y. and Xia, X. (2017), "A multi-objective optimization model for energy-efficiency building envelope retrofitting plan with rooftop PV system installation and maintenance", *Applied Energy*, Elsevier Ltd, Vol. 189, pp. 327–335.
- Fang, Y. and Cho, S. (2019), "Design optimization of building geometry and fenestration for daylighting and energy performance", *Solar Energy*, Elsevier, Vol. 191 No. November 2018, pp. 7–18
- Ferrara, M., Filippi, M., Sirombo, E. and Cravino, V. (2015), "A simulation-based optimization method for the integrative design of the building envelope", *Energy Procedia*, Elsevier B.V., Vol. 78, pp. 2608–2613.
- Fesanghary, M., Asadi, S. and Geem, Z.W. (2012), "Design of low-emission and energy-efficient residential buildings using a multi-objective optimization algorithm", *Building and Environment*, Elsevier Ltd, Vol. 49 No. 1, pp. 245–250.
- Flowers, M.E., Smith, M.K., Parsekian, A.W., Boyuk, D.S., McGrath, J.K. and Yates, L. (2016), "Climate impacts on the cost of solar energy", *Energy Policy*, Elsevier, Vol. 94, pp. 264–273.
- Foli, R. (2016), "Multi-criterion optimization of building envelope in the function of indoor illumination quality towards overall energy performance improvement", Vol. 114, pp. 302–317.

- Fong, K.F., Hanby, V.I. and Chow, T.T. (2006), "HVAC system optimization for energy management by evolutionary programming", *Energy and Buildings*, Vol. 38 No. 3, pp. 220–231.
- García, I., Raslan, R., Ruyssevelt, P. and Morillón, D. (2017), "ExRET-Opt: An automated exergy / exergoeconomic simulation framework for building energy retrofit analysis and design optimisation", Vol. 192, pp. 33–58.
- Garrison, V.H., Majewski, M.S., Konde, L., Wolf, R.E., Otto, R.D. and Tsuneoka, Y. (2014), "Science of the Total Environment Inhalable desert dust, urban emissions, and potentially biotoxic metals in urban Saharan Sahelian air", *Science of the Total Environment, The,* Elsevier B.V., Vol. 500–501, pp. 383–394.
- Gero, J.S., D'Cruz, N. and Radford, A.D. (1983), "Energy in context: A multicriteria model for building design", *Building and Environment*, Vol. 18 No. 3, pp. 99–107.
- Goossens, D. and Van Kerschaever, E. (1999), "Aeolian dust deposition on photovoltaic solar cells: The effects of wind velocity and airborne dust concentration on cell performance", *Solar Energy*, Vol. 66 No. 4, pp. 277–289.
- H. P. GARG. (1974), "Effect of Dirt on Transparent Covers in Flat-Plate Solar Energy Collectors", *Solar Energy*, Vol. 15, pp. 299–302.
- Hafiz, A., Zafar, M.A., Bashir, M.A., Nasir, M.A., Ali, M. and Siddiqui, A.M. (2017), "Effect of dust deposition on the performance of photovoltaic modules in city of taxila, Pakistan", *Thermal Science*, Vol. 21 No. 2, pp. 915–923.
- Hamdy, M., Hasan, A. and Siren, K. (2011), "Applying a multi-objective optimization approach for Design of low-emission cost-effective dwellings", *Building and Environment*, Elsevier Ltd, Vol. 46 No. 1, pp. 109–123.
- Hamdy, M., Nguyen, A.T. and Hensen, J.L.M. (2016), "A performance comparison of multi-objective optimization algorithms for solving nearly-zero-energy-building design problems", *Energy and Buildings*, Elsevier B.V., Vol. 121, pp. 57–71.
- Haroldson, C. (2017), "Wall-mounted solar: A rising trend or barely hanging on?", Solar Power World Online, available at: https://www.solarpowerworldonline.com/2017/07/wall-mounted-solar-trend/.
- Hassan, A.H., Rahoma, U.A. and Elminir, H.K. (2005), "EFFECT OF AIRBORNE DUST CONCENTRATION ON THE PERFORMANCE OF PV MODULES", *Journal of the Astronomical Society of Egypt*, pp. 24–38.
- Hazelrigg, G.A. (2019), "A Note on the Weighted Sum Method", *Journal of Mehanical Design*, Vol. 141 No. October, pp. 1–2.
- Hegazy, A.A. (2001), "Effect of dust accumulation on solar transmittance through glass covers of plate-type collectors", *Renewable Energy*, Vol. 22 No. 4, pp. 525–540.
- Holland, J.H. (1975), Adaptation in Natural and Artificial Systems: An Introductory Analysis with Applications to Biology, Control, and Artificial Intelligence, Ann Arbor University of Michigan Press 1975.
- Hottel, H.C. and Woertz, B.B. (1942), "Evaluation of flat-plate solar heat collector Trans.", ASME, 64, p. 91.
- Huang, Y. and Niu, J.L. (2016), "Optimal building envelope design based on simulated performance: History, current status and new potentials", *Energy and Buildings*, Elsevier B.V., Vol. 117, pp. 387–398.

- Ibrahim, A. (2011), "Effect of shadow and dust on the performance of silicon solar cell", *Journal of Basic and Applied Sciences Research*, Vol. 1 No. 3, pp. 222–230.
- Imam, S., Coley, D.A. and Walker, I. (2017a), "The building performance gap: Are modellers literate?", *Building Services Engineering Research and Technology*, Vol. 38 No. 3, pp. 351–375.
- Imam, S., Coley, D.A. and Walker, I. (2017b), "The building performance gap: Are modellers literate?", available at:https://doi.org/10.1177/0143624416684641.
- Ineichen, P. (2014), "Long term satellite hourly, daily and monthly global, beam and diffuse irradiance valida- tion. Interannual variability analysis. (Adapted to CM-SAF product from the IEA 2013 report)", CM SAF Climate Monitoring 4th User Workshop, No. March, p. Adapted to CM-SAF product from the IEA 2013 report.
- Jang, S.M. and Hart, P.S. (2015), "Polarized frames on 'climate change' and 'global warming' across countries and states: Evidence from Twitter big data", *Global Environmental Change*, Elsevier Ltd, Vol. 32, pp. 11–17.
- Jiang, H., Lu, L. and Sun, K. (2011), "Experimental investigation of the impact of airborne dust deposition on the performance of solar photovoltaic (PV) modules", *Atmospheric Environment*, Elsevier Ltd, Vol. 45 No. 25, pp. 4299–4304.
- Khalfallah, M.G. and Koliub, A.M. (2007), "Effect of dust on the performance of wind turbines", *Desalination*, Vol. 209 No. 1-3 SPEC. ISS., pp. 209–220.
- Kimber, A., Mitchell, L., Nogradi, S. and Wenger, H. (2006), "The effect of soiling on large grid-connected photovoltaic systems in California and the Southwest Region of the United States", Conference Record of the 2006 IEEE 4th World Conference on Photovoltaic Energy Conversion, WCPEC-4, IEEE, Vol. 2, pp. 2391–2395.
- Krarti, M. and Dubey, K. (2018), "Benefits of energy efficiency programs for residential buildings in Bahrain", *Journal of Building Engineering*, Vol. 18 No. May 2017, pp. 40–50.
- Krogh, A. (2008), "What are artificial neural networks?", *Nature Biotechnology*, Vol. 26 No. 2, pp. 195–197.
- Lartigue, B., Lasternas, B. and Loftness, V. (2014), "Multi-objective optimization of building envelope for energy consumption and daylight", Vol. 23 No. 1, pp. 70–80.
- Lecun, Y., Touresky, D., Hinton, G. and Sejnowski, T. (1988), "A Theoretical Framework for Back-Propagation", *Proceedings of the 1988 Connectionist Models Summer School.*, pp. 21–28.
- Leistner, S., Honold, C., Maierhofer, M., Haase, W., Blandini, L., Sobek, W., Roth, D., et al. (2022), "Research on integral design and planning processes for adaptive buildings", *Architectural Engineering and Design Management*, Vol. 18 No. 3, pp. 241–260.
- Lophaven, S.N., Søndergaard, J. and Nielsen, H.B. (2002), Kriging Toolbox Dace.
- Ma, Y. and Airah, S. (2017), "Comparison of Building Energy Codes in Australia, United States and China for Australian Commercial Building Energy Conservation", No. February 2018, pp. 1–15.
- Mahdavi, A. and Mahattanatawe, P. (2003), "ENCLOSURE SYSTEMS DESIGN AND CONTROL SUPPORT VIA DYNAMIC SIMULATION-ASSISTED OPTIMIZATION Vienna University of Technology", pp. 785–792
- Marks, W. (1997), "Multicriteria optimisation of shape of energy-saving buildings", *Building and Environment*, Vol. 32 No. 4, pp. 331–339.

- Massi Pavan, A., Mellit, A. and De Pieri, D. (2011), "The effect of soiling on energy production for large-scale photovoltaic plants", *Solar Energy*, Elsevier Ltd, Vol. 85 No. 5, pp. 1128–1136.
- Mastekbayeva, G.A. and Kumar, S. (2000), "Effect of dust on the transmittance of low density polyethylene glazing in a tropical climate", *Solar Energy*, Vol. 68 No. 2, pp. 135–141.
- Mazumder, S. (2016), "Solution to a System of Linear Algebraic Equations", *Numerical Methods for Partial Differential Equations*, Elsevier, pp. 103–167.
- Mekhilef, S., Saidur, R. and Kamalisarvestani, M. (2012), "Effect of dust, humidity and air velocity on efficiency of photovoltaic cells", *Renewable and Sustainable Energy Reviews*, Elsevier Ltd, Vol. 16 No. 5, pp. 2920–2925.
- Ministry of Energy (UAE). (2012), "Internal statistical reports and compilations for the GHG inventory for the Third National Communication", 3rd National Communication Framework Convention, December 2012 on Climate Change under the United Nations, available at: https://www.sciencedirect.com/science/article/pii/S0360544214006203.
- Mirsadeghi, M., Cóstola, D., Blocken, B. and Hensen, J.L.M. (2013), "Review of external convective heat transfer coefficient models in building energy simulation programs: Implementation and uncertainty", *Applied Thermal Engineering*, Elsevier Ltd, Vol. 56 No. 1–2, pp. 134–151.
- MOE&W. (2019), Statistical Year Book, Electrical Energy.
- Mohammadi, K. and Khorasanizadeh, H. (2015), "A review of solar radiation on vertically mounted solar surfaces and proper azimuth angles in six Iranian major cities", *Renewable and Sustainable Energy Reviews*, Elsevier, Vol. 47, pp. 504–518.
- Mohan, K.S., Mahapatra, S., Febin, D.J.L., Perumal, T., Raj, S. and Prabhakaran, P. (2022), "Economic Feasibility Studies of Simple and Discounted Payback Periods for 1 MWp Ground Mounted Solar PV Plant at Tirupati Airport", *Smart Grids and Microgrids*, Wiley, pp. 59–73.
- Nahar, N.M. and Gupta, J.P. (1990), "Effect of dust on transmittance of glazing materials for solar collectors under arid zone conditions of India", *Solar and Wind Technology*, Vol. 7 No. 2–3, pp. 237–243.
- Nguyen, A.T., Reiter, S. and Rigo, P. (2014), "A review on simulation-based optimization methods applied to building performance analysis", *Applied Energy*, Elsevier Ltd, Vol. 113, pp. 1043–1058.
- Nimmo, B. and Said, S.A.M.. (1981), "Effects of dust on the performance of thermal and photovoltaic flat plate collectors in Saudi Arabia: preliminary results. United States: N. p., 1981. Web.", *Altern. Energy Sources*, Vol. 1 No. CONF-791204, available at: https://www.osti.gov/biblio/5460905.
- Omidvarborna, H., Baawain, M. and Al-Mamun, A. (2018), "Ambient air quality and exposure assessment study of the Gulf Cooperation Council countries: A critical review", *Science of the Total Environment*, Elsevier B.V., Vol. 636, pp. 437–448.
- Parry, M.L., Rosenzweig, C., Iglesias, A., Livermore, M. and Fischer, G. (2004), "Effects of climate change on global food production under SRES emissions and socio-economic scenarios", Vol. 14, pp. 53–67.
- Paudyal, B.R., Shakya, S.R., Paudyal, D.P. and Das Mulmi, D. (2017), "Soiling-induced transmittance losses in solar PV modules installed in Kathmandu Valley", *Renewables: Wind, Water, and Solar*, Springer Singapore, Vol. 4 No. 1, available at:https://doi.org/10.1186/s40807-017-0042-z.

- Peippo, K., Lund, P.D. and Vartiainen, E. (1999), "Multivariate optimization of design trade-offs for solar low energy buildings", *Energy and Buildings*, Vol. 29 No. 2, pp. 189–205.
- Pernodet, F., Lahmidi, H. and Michel, P. (2009), "Use of genetic algorithms for multicriteria optimization building refurbishment", *IBPSA 2009 International Building Performance Simulation Association 2009*, pp. 188–195.
- Pfenninger, S. and Staffell, I. (2016), "Long-term patterns of European PV output using 30 years of validated hourly reanalysis and satellite data", *Energy*, Elsevier Ltd, Vol. 114, pp. 1251–1265.
- Qasem, H., Betts, T.R., Müllejans, H., AlBusairi, H. and Gottschalg, R. (2014), "Dust-induced shading on photovoltaic modules", *Progress in Photovoltaics: Research and Applications*, Vol. 22 No. 2, pp. 218–226.
- Ramadhan, M. and Naseeb, A. (2011), "The cost benefit analysis of implementing photovoltaic solar system in the state of Kuwait", *Renewable Energy*, Elsevier Ltd, Vol. 36 No. 4, pp. 1272–1276.
- Rashdi, W.S.S.W.M. and Embi, M.R. (2016), "Analysing Optimum Building form in Relation to Lower Cooling Load", *Procedia Social and Behavioral Sciences*, The Author(s), Vol. 222, pp. 782–790.
- Reay, D., Sabine, C., Smith, P. and Hymus, G. (2007), Intergovernmental Panel on Climate Change. Fourth Assessment Report. Geneva, Switzerland: Inter-Gov- Ernmental Panel on Climate Change. Cambridge; UK: Cambridge University Press; 2007. Available from: Www. Ipcc.Ch., Intergovernmental Panel on Climate Change., available at:https://doi.org/10.1038/446727a.
- Reiche, D. (2010), "Energy Policies of Gulf Cooperation Council (GCC) countries-possibilities and limitations of ecological modernization in rentier states", *Energy Policy*, Elsevier, Vol. 38 No. 5, pp. 2395–2403.
- Sacks, J., Welch, W.J., Mitchell, T.J. and Wynn, H.P. (1989), "Design and Analysis of Computer Experiments", *Statistical Science*, Vol. 4 No. 4, pp. 15–51.
- Said, S.A.M. (1990), "Effects of dust accumulation on performances of thermal and photovoltaic flat-plate collectors", *Applied Energy*, Vol. 37 No. 1, pp. 73–84.
- Salahuddin, M. and Gow, J. (2014), "Economic growth, energy consumption and CO2 emissions in Gulf cooperation council countries", *Energy*, Elsevier Ltd, Vol. 73, pp. 44–58.
- Salata, F., Golasi, I., Domestico, U., Banditelli, M., Lo Basso, G., Nastasi, B. and de Lieto Vollaro, A. (2017), "Heading towards the nZEB through CHP+HP systems. A comparison between retrofit solutions able to increase the energy performance for the heating and domestic hot water production in residential buildings", *Energy Conversion and Management*, Elsevier Ltd, Vol. 138, pp. 61–76.
- Salim, A., Huraib, F. and Eugenio, N. (1988), "PV power-study of system options and optimization", Eedings of the 8th European PV Solar Energy Conference.
- Salim, A.A. and Eugenio, N.N. (1990), "A comprehensive report on the performance of the longest operating 350 kW concentrator photovoltaic power system", *Solar Cells*, Vol. 29 No. 1, pp. 1–24.
- Sarver, T., Al-Qaraghuli, A. and Kazmerski, L.L. (2013), "A comprehensive review of the impact of dust on the use of solar energy: History, investigations, results, literature, and mitigation approaches", *Renewable and Sustainable Energy Reviews*, Elsevier, Vol. 22, pp. 698–733.
- Sayigh, A.A.M., Al-Jandal, S. and Ahmed, H. (1985), "DUST EFFECT ON SOLAR FLAT SURFACES DEVICES IN KUWAIT."

- Sayyah, A., Horenstein, M.N. and Mazumder, M.K. (2014), "Energy yield loss caused by dust deposition on photovoltaic panels", *Solar Energy*, Elsevier Ltd, Vol. 107, pp. 576–604.
- Shah, A.H., Hassan, A., Laghari, M.S. and Alraeesi, A. (2020), "The influence of cleaning frequency of photovoltaic modules on power losses in the desert climate", *Sustainability (Switzerland)*, Vol. 12 No. 22, pp. 1–15.
- Sheikholeslami, R. and Razavi, S. (2017), "Progressive Latin Hypercube Sampling: An efficient approach for robust sampling-based analysis of environmental models", *Environmental Modelling & Software*, Vol. 93, pp. 109–126.
- Shi, L., Zhang, H., Li, Z., Luo, Z. and Liu, J. (2018), "Optimizing the thermal performance of building envelopes for energy saving in underground office buildings in various climates of China", *Tunnelling and Underground Space Technology*, Elsevier, Vol. 77 No. 66, pp. 26–35.
- Simões, N., Prata, J. and Tadeu, A. (2014), "Contribution of linear thermal bridges to the overall thermal performance of the building envelope: Dynamic analysis", *WIT Transactions on the Built Environment*, Vol. 142, pp. 321–332.
- Srinivas, N. and Deb, K. (1994), "Muiltiobjective Optimization Using Nondominated Sorting in Genetic Algorithms", *Evolutionary Computation*, Vol. 2 No. Sep, pp. 221–248.
- Staffell, I. and Pfenninger, S. (2016), "Using bias-corrected reanalysis to simulate current and future wind power output", *Energy*, Elsevier Ltd, Vol. 114, pp. 1224–1239.
- Statistics Department & Information Center. (2021), Statistical Year Book Electrical Energy 2020, Kuwait.
- Sulaiman, S.A., Hussain, H.H., Siti, N., Leh, H.N. and Razali, M.S.I. (2011), "Effects of Dust on the Performance of PV Panels", Vol. 5 No. 10, pp. 2028–2033.
- Suliman, S.A., Hussain, A.H., Nik Leh, N.S.H. and Razali, M.S.I. (2012), "Effects of Dust on the Performance of PV Panels", *International Journal of Modern Education and Computer Science*, Vol. 4 No. 10, pp. 26–32.
- Sullivan, R., Lee, E.S. and Selkowitz, S.E. (1992), "A Method of Optimizing Solar Control and Daylighting Performance in Commercial Office Buildings", *Lawrence Berkeley National Laboratory University of California*, No. September, pp. 35–43.
- Tiene, S., Bragadin, M.A. and Ballabeni, A. (2018), "A Genetic Algorithm-based approach for Project Management and developed design of construction", *Techne*, Vol. 16, pp. 131–141.
- Tolba, M.K. and Saab, N.W. (2009), *Arab Environment: Climate Change Impact of Climate Change on Arab Countries*, available at: http://www.afedonline.org/afedreport09/Full English Report.pdf.
- Torres, S.L. and Sakamoto, Y. (2007), "Facade design optimization for daylight with a simple genetic algorithm", *IBPSA 2007 International Building Performance Simulation Association 2007*, pp. 1162–1167.
- Tronchin, L., Manfren, M. and Nastasi, B. (2018), "Energy efficiency, demand side management and energy storage technologies A critical analysis of possible paths of integration in the built environment", *Renewable and Sustainable Energy Reviews*, Elsevier Ltd, Vol. 95 No. June, pp. 341–353.
- Wakim, F. (1981), "Introduction of PV power generation to Kuwait", *Kuwait Institute for Scientific Researchers (KISR)*.

- Wang, S. and Jin, X. (2000), "Model-based optimal control of VAV air-conditioning system using genetic algorithm", *Building and Environment*, Vol. 35 No. 6, pp. 471–487.
- Ward, R., Choudhary, R., Heo, Y. and Rysanek, A. (2016), "Exploring the impact of different parameterisations of occupant-related internal loads in building energy simulation", *Energy and Buildings*, Elsevier B.V., Vol. 123, pp. 92–105.
- WMO. (2013), Establishing a WMO Sand and Dust Storm Warning Advisory and Assessment System Regional Node for West Asia: Current Capabilities and Needs, WMO-NO. 1121, World Meteorological Organization.
- Wright, J. and Mourshed, M. (2009), "Geometric optimization of fenestration", *IBPSA 2009 International Building Performance Simulation Association 2009*, pp. 920–927.
- Yamada, M. (2016), "Vision 2030 and the Birth of Saudi Solar Energy", *Middle East Institute*, No. july, p. 13.
- Yang, K.H. (2018), "Stepping Through Finite Element Analysis", *Basic Finite Element Method as Applied to Injury Biomechanics*, Elsevier, pp. 281–308.
- Yang, M. Der, Lin, M. Der, Lin, Y.H. and Tsai, K.T. (2017), "Multiobjective optimization design of green building envelope material using a non-dominated sorting genetic algorithm", *Applied Thermal Engineering*, Elsevier Ltd, Vol. 111, pp. 1255–1264.
- Yousif, J.H., Al-Balushi, H.A., Kazem, H.A. and Chaichan, M.T. (2019), "Analysis and forecasting of weather conditions in Oman for renewable energy applications", *Case Studies in Thermal Engineering*, Elsevier Ltd, Vol. 13 No. October 2018, p. 100355.
- Yu, W., Li, B., Jia, H., Zhang, M. and Wang, D. (2015), "Application of multi-objective genetic algorithm to optimize energy efficiency and thermal comfort in building design", *Energy and Buildings*, Elsevier B.V., Vol. 88, pp. 135–143.
- Zeedan, A., Barakeh, A., Al-Fakhroo, K., Touati, F. and Gonzales, A.S.P. (2021), "Quantification of pv power and economic losses due to soiling in Qatar", *Sustainability (Switzerland)*, Vol. 13 No. 6, available at:https://doi.org/10.3390/su13063364.
- Zhang, A., Bokel, R., Dobbelsteen, A. Van Den, Sun, Y., Huang, Q. and Zhang, Q. (2017), "Optimization of thermal and daylight performance of school buildings based on a multi-objective genetic algorithm in the cold climate of China", *Energy & Buildings*, Elsevier B.V., Vol. 139, pp. 371–384.
- Zhang, L., Zhang, L. and Wang, Y. (2016), "Shape optimization of free-form buildings based on solar radiation gain and space efficiency using a multi-objective genetic algorithm in the severe cold zones of China", *Solar Energy*, Elsevier Ltd, Vol. 132, pp. 38–50.
- Zhou, X., Hong, T. and Yan, D. (2014), "Comparison of HVAC system modeling in EnergyPlus, DeST and DOE-2.1E", *Building Simulation*, Vol. 7 No. 1, pp. 21–33.
- Zhou, Y.P., Wu, J.Y., Wang, R.Z., Shiochi, S. and Li, Y.M. (2008), "Simulation and experimental validation of the variable-refrigerant-volume (VRV) air-conditioning system in EnergyPlus", *Energy and Buildings*, Vol. 40 No. 6, pp. 1041–1047.
- Zorrilla-Casanova, J., Piliougine, M., Carretero, J., Bernaola-Galván, P., Carpena, P., Mora-López, L. and Sidrach-de-Cardona, M. (2013), "Losses produced by soiling in the incoming radiation to photovoltaic modules", *Progress in Photovoltaics: Research and Applications*, Vol. 21 No. 4, pp. 790–796.