References

[1] H. J. Smith, "Paris impacts," *Science (80-.).*, vol. 364, no. 6435, pp. 39.6-40, 2019.

[2] B. Kroposki *et al.*, "Achieving a 100% Renewable Grid: Operating Electric Power Systems with Extremely High Levels of Variable Renewable Energy," *IEEE Power Energy Mag.*, vol. 15, no. 2, pp. 61–73, 2017.

[3] B. Cleary, A. Duffy, B. Bach, A. Vitina, A. O'Connor, and M. Conlon, "Estimating the electricity prices, generation costs and CO2 emissions of large scale wind energy exports from Ireland to Great Britain," *Energy Policy*, vol. 91, no. 2016, pp. 38–48, 2016.

[4] ADB and UNDP, "Assessment of Sri Lanka's Power Sector-100% Electricity Generation Through Renewable Energy by 2050," p. 122, 2017.

[5] IEA PVPS, *Trends 2016 in Photovoltaic Applications: Survey Report of Selected IEA Countries between 1992 and 2015*. 2016.

[6] "The Sunshot Initiative.," *Office of ENERGY EFFICIENCY & RENEWABLE ENERGY*. [Online]. Available: https://www.energy.gov/eere/solar/sunshot-initiative. [Accessed: 18-Jan-2020].

[7] M. Ram *et al.*, "GLOBAL ENERCY SYSTEM BASED ON 100% RENEWABLE ENERGY - POWER SECTOR. Study by Lappeenranta University of Technology and Energy Watch Group, Lappeenranta, Berlin, Nowember 2017," 2017.

[8] F. Blaabjerg, K. Ma, and D. Zhou, "Power electronics and reliability in renewable energy systems," *IEEE Int. Symp. Ind. Electron.*, pp. 19–30, 2012.

[9] U. Tamrakar, D. Shrestha, M. Maharjan, B. P. Bhattarai, T. M. Hansen, and R. Tonkoski, "Virtual inertia: Current trends and future directions," *Appl. Sci.*, vol. 7, no. 7, 2017.

[10] J. Eto *et al.*, "Use of Frequency Response Metrics to Assess the Planning and Operating Requirements for Reliable Integration of Variable Renewable Generation," no. December 2010, p. LBNL-4142E, 2010.

[11] P. Kundur, *Power System Stability and Control*. New York: McGraw-Hill, 1994.

[12] M. Dreidy, H. Mokhlis, and S. Mekhilef, "Inertia response and frequency control

techniques for renewable energy sources: A review," *Renew. Sustain. Energy Rev.*, vol. 69, no. November 2015, pp. 144–155, 2017.

[13] U. Tamrakar, D. Shrestha, M. Maharjan, B. P. Bhattarai, T. M. Hansen, and R. Tonkoski, "Virtual inertia: Current trends and future directions," *Appl. Sci.*, vol. 7, no. 7, pp. 1–29, 2017.

[14] "Electricity Ten Year Statement (ETYS)," 2014. .

[15] "UK Future Energy Scenarios," 2013. [Online]. Available: http://www2.nationalgrid.com/%0AWorkArea/DownloadAsset.aspx?Id=10451. [Accessed: 18-Jan-2020].

[16] H. P. Beck and R. Hesse, "Virtual synchronous machine," *2007 9th Int. Conf. Electr. Power Qual. Util. EPQU*, 2007.

[17] Q. C. Zhong and G. Weiss, "Synchronverters: Inverters that mimic synchronous generators," *IEEE Trans. Ind. Electron.*, vol. 58, no. 4, pp. 1259–1267, 2011.

[18] R. Hesse, D. Turschner, and H. P. Beck, "Micro grid stabilization using the virtual synchronous machine (VISMA)," *Renew. Energy Power Qual. J.*, vol. 1, no. 7, pp. 676–681, 2009.

[19] Y. Chen, R. Hesse, D. Turschner, and H. P. Beck, "Improving the grid power quality using virtual synchronous machines," *Int. Conf. Power Eng. Energy Electr. Drives*, no. May, pp. 1–6, 2011.

[20] Y. Hirase, K. Abe, K. Sugimoto, and Y. Shindo, "A grid-connected inverter with virtual synchronous generator model of algebraic type," *Electr. Eng. Japan (English Transl. Denki Gakkai Ronbunshi)*, vol. 184, no. 4, pp. 10–21, 2013.

[21] K. Sakimoto, Y. Miura, and T. Ise, "Stabilization of a power system with a distributed generator by a Virtual Synchronous Generator function," *8th Int. Conf. Power Electron. - ECCE Asia "Green World with Power Electron. ICPE 2011-ECCE Asia*, no. 2, pp. 1498–1505, 2011.

[22] D. Remon, A. M. Cantarellas, J. D. Nieto, W. Zhang, and P. Rodriguez, "Aggregated model of a distributed PV plant using the synchronous power controller," *IEEE Int. Symp. Ind. Electron.*, vol. 2015-Septe, pp. 654–659, 2015.

[23] J. Alipoor, Y. Miura, and T. Ise, “Power system stabilization using virtual synchronous generator with alternating moment of inertia,” *IEEE J. Emerg. Sel. Top. Power Electron.*, vol. 3, no. 2, pp. 451–458, 2015.

[24] M. P. N. Van Wesenbeeck, S. W. H. De Haan, P. Varela, and K. Visscher, “Grid tied converter with virtual kinetic storage,” *2009 IEEE Bucharest PowerTech Innov. Ideas Towar. Electr. Grid Futur.*, no. 1, pp. 1–7, 2009.

[25] F. Katiraei and M. R. Iravani, “Power management strategies for a microgrid with multiple distributed generation units,” *IEEE Trans. Power Syst.*, vol. 21, no. 4, pp. 1821–1831, 2006.

[26] N. Pogaku, M. Prodanović, and T. C. Green, “Modeling, analysis and testing of autonomous operation of an inverter-based microgrid,” *IEEE Trans. Power Electron.*, vol. 22, no. 2, pp. 613–625, 2007.

[27] N. Ertugrul, “Battery storage technologies, applications and trend in renewable energy,” *IEEE Int. Conf. Sustain. Energy Technol. ICSET*, vol. 0, pp. 420–425, 2017.

[28] H. Budde-Meiwes *et al.*, “A review of current automotive battery technology and future prospects,” *Proc. Inst. Mech. Eng. Part D J. Automob. Eng.*, vol. 227, no. 5, pp. 761–776, 2013.

[29] B. Dunn, H. Kamath, and J. M. Tarascon, “Electrical energy storage for the grid: A battery of choices,” *Science (80-.).*, vol. 334, no. 6058, pp. 928–935, 2011.

[30] “Sunrun’s Brightbox Specifications.” [Online]. Available: https://www.sunrun.com/solar-battery-storage/battery-specs. [Accessed: 18-Jan-2020].

[31] D. T. Ton and M. A. Smith, “The U.S. Department of Energy’s Microgrid Initiative,” *Electr. J.*, vol. 25, no. 8, pp. 84–94, 2012.

[32] C. M. Franck, “HVDC circuit breakers: A review identifying future research needs,” *IEEE Trans. Power Deliv.*, vol. 26, no. 2, pp. 998–1007, 2011.

[33] M. G. Simões *et al.*, “Smart-grid technologies and progress in Europe and the USA,” *IEEE Energy Convers. Congr. Expo. Energy Convers. Innov. a Clean Energy Futur. ECCE 2011, Proc.*, pp. 383–390, 2011.

[34] Z. Shuai *et al.*, "Microgrid stability: Classification and a review," *Renew. Sustain. Energy Rev.*, vol. 58, pp. 167–179, 2016.

[35] W. Yibo and X. Honghua, "Research and practice of designing hydro/photovoltaic hybrid power system in microgrid," *Conf. Rec. IEEE Photovolt. Spec. Conf.*, pp. 1509–1514, 2013.

[36] M. A. Elgendy, B. Zahawi, S. Member, and D. J. Atkinson, "Assessment of Perturb and Observe MPPT Algorithm Implementation Techniques for PV Pumping Applications," vol. 3, no. 1, pp. 21–33, 2012.

[37] H. Malek and Y. Chen, "BICO MPPT : A Faster Maximum Power Point Tracker and Its Application for Photovoltaic Panels," vol. 2014, no. Ic, 2014.

[38] U. Tamrakar *et al.*, "Comparative analysis of current control techniques to support virtual inertia applications," *Appl. Sci.*, vol. 8, no. 12, 2018.

[39] K. Visweswara, "An Investigation Of Incremental Conductance Based Maximum Power Point Tracking For Photovoltaic System," *Energy Procedia*, vol. 54, pp. 11–20, 2014.

[40] S. Z. Mirbagheri, S. Mekhilef, and S. M. Mirhassani, "MPPT with Inc . Cond method using conventional interleaved boost converter," *Energy Procedia*, vol. 42, pp. 24–32, 2013.

[41] MathWorks, "MPPT Algorithm." [Online]. Available: https://www.mathworks.com/solutions/power-electronics-control/mppt-algorithm.html. [Accessed: 18-Jan-2020].

[42] V. Karapanos, S. W. . De Haan, and K. Zwetsloot, "Testing a Virtual Synchronous Generator in a Real Time Simulated Power System," *Int. Conf. Power Syst. Transients IPST 2011*, vol. 31, no. February, 2011.

[43] H. Bevrani, T. Ise, and Y. Miura, "Virtual synchronous generators : A survey and new perspectives," *Int. J. Electr. POWER ENERGY Syst.*, vol. 54, pp. 244–254, 2014.

[44] L. Malesani and P. Tomasin, "PWM Current Control Techniques of Voltage Source Converters - A Survey," pp. 670–675.

[45] A. Rizqiawan, P. Hadi, and G. Fujita, "Development of grid-connected inverter

experiment modules for microgrid learning,” *Energies*, vol. 12, no. 3, pp. 1–16, 2019.

[46] PES, *IEEE Recommended Practice for Excitation System Models for Power System Stability Studies*, vol. 2005, no. April. 2006.

[47] NEPLAN AG, “Exciter models - Standard Dynamic Excitation Systems in NEPLAN Power System Analysis Tool,” pp. 1–185, 2013.

[48] J. Oliver, “[1] J. Oliver, ‘HYDRAULIC TURBINE AND TURBINE CONTROL MODELS FOR SYSTEM PYNAMIC STUDIES,’ J. Chem. Inf. Model., vol. 53, no. 9, pp. 1689–1699, 2013.HYDRAULIC TURBINE AND TURBINE CONTROL MODELS FOR SYSTEM PYNAMIC STUDIES,” *J. Chem. Inf. Model.*, vol. 53, no. 9, pp. 1689–1699, 2013.

[49] A. D. Rajapakse and D. Muthumuni, “Simulation tools for photovoltaic system grid integration studies,” *2009 IEEE Electr. Power Energy Conf. EPEC 2009*, pp. 1–5, 2009.

[50] O. Tremblay, L. A. Dessaint, and A. I. Dekkiche, “A generic battery model for the dynamic simulation of hybrid electric vehicles,” *VPPC 2007 - Proc. 2007 IEEE Veh. Power Propuls. Conf.*, no. August 2015, pp. 284–289, 2007.