

## Appendix: Academic Research Achievements

The renewable energy projects in Mawan Park for research purpose

No.	Research Topic	Specific Research Objectives	Specifications
1	Building-integrated photovoltaic technology	Energy performance; Building-integration issues; Grid-connection issues.	18 PV panels with a rate power of 2.97 kWp
2	Wind power generation technology	Energy performance; Wind turbine development; Wind energy resources; Assessment; Grid-connection issues.	Two 6kW wind turbines
3	Ground-source heat pump technology for heating and cooling	Energy performance; Vertical and inclined boreholes; Cooling and hot water supply issues.	Cooling capacity: 4.5kW Heating capacity: 4.9kW
4	Hybrid solar-wind power generation technology	Energy performance; Simulation verifications; Product development.	Three sets of systems each with a solar PV panel and a small wind turbine
5	PV auto-tracker for power generation	Comparisons between fixed PV arrays and PV array with auto-tracker	one PV module with nominal power output of 165 W
6	Solar lighting technologies	Development of economical and reliable solar lighting systems.	12 No. solar lighting lamps

Output list from the SHK project:

### Development of Advanced Renewable Energy Technologies

#### Journal Papers

- 2007 Yang, H., (L. Lu and W. Zhou), A novel optimization sizing model for hybrid solar-wind power generation system, *Solar Energy*, Vol.81, No.1, pp.76-84, January 2007. (SCI journal)
- 2007 Yang, H., (W Zhou) and Z Fang, Optimal sizing method for stand-alone hybrid solar-wind system with LPSP technology by using genetic algorithm, (accepted and in press), *Solar Energy*, 2007. (SCI journal)
- 2007 (Zhou Wei), Hongxing Yang and Zhaohong Fang, A novel model for PV array energy performance prediction, *Applied Energy*, Vol. 84, No.12, pp.1187-1198, 2007. (SCI journal)

- 2007 (Zhou, W), Yang Hongxing, Lu Lin and Fang Zhaohong, Optimum design of hybrid solar-wind-diesel power generation system using genetic algorithm, *HKIE Transactions*, Vol.14, No.4, Dec 2007.
- 2007 (Cui Ping), Yang H and Fang Z, Numerical analysis and experimental validation of heat transfer in ground heat exchangers in alternative operation modes, *Energy and Buildings*, Volume 40, Issue 6, Pages 1060-1066, 2008. (SCI Journal)
- 2007 Yang, H and (Li Yutong), Potential of building-integrated photovoltaic applications, *Low Carbon Technologies* (accepted and in press), 2007.
- 2007 Yang, H and (Zhou Wei and Lou Chengzhi), Optimum design and techno-economic analysis of a hybrid solar-wind power generation system, (accepted and in press), *Applied Energy*, 2007. (SCI journal)
- 2006 (Cui, Ping), H. Yang and Z. Fang, Heat transfer analysis of ground heat exchangers with inclined boreholes, *Applied Thermal Engineering*, Vol.26, No.11-12, pp.1169-1175, 2006. (SCI journal)
- 2006 (Zhou, Wei), H. Yang and Z. Fang, Wind power potential and characteristic analysis of the Pearl River Deltar region, China, *Renewable Energy*, Vol.31, pp.739-753, 2006. (SCI journal)

### **Conference Papers**

- 2007 Zhou, W and Yang HX, A novel optimal sizing method for design of hybrid solar-wind-diesel power generation systems, Proc. of the 2007 Solar Energy Congress, Beijing, Sep 18-22, 2007.
- 2007 Cui Ping, Yang HX and Fang ZH, Investigation on the Operating Performance of Hybrid Ground Coupled Heat Pump Systems: a Case Study in Hong Kong, Proc. of the 6<sup>th</sup> International Conference on Sustainable Energy Technologies, Santiago, Sep 5-8, 2007.
- 2006 Yang Hongxing, Zhou Wei, Demonstration and Promotion of Renewable Energy Technologies in Hong Kong - The Ma Wan Theme Park, Proc. of the 5th International Conference on Sustainable Energy Technology, Vicenza, Italy, 30 Aug-1 Sep 2006.
- 2006 Cui Ping, Hongxing Yang and Zhaohong Fang, A simulation study on a new hybrid GCHP system in Hong Kong, pp.537-542, Proc. of the 5<sup>th</sup> International Conference on Sustainable Energy Technology, Vicenza, Italy, 30 Aug-1 Sep 2006.
- 2006 Yang Hongxing (*Keynote speaker*) and Li Yutong, Potential of building-integrated photovoltaic applications, Proc. of the 5<sup>th</sup> International Conference on Sustainable Energy Technology, Vicenza, Italy, 30 Aug-1 Sep 2006.