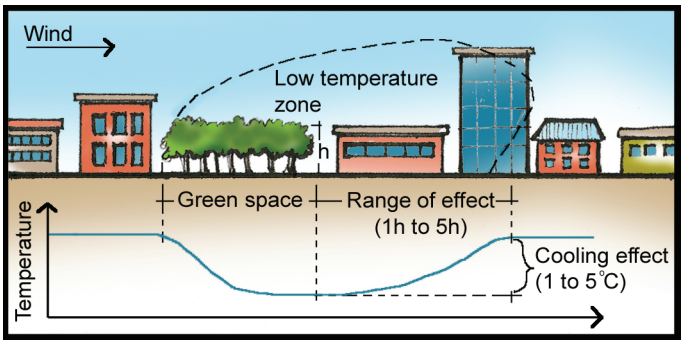

4.8 Energy conservation: landscape

Parks and other green space buffers can reduce energy consumption by lowering adjacent air temperatures. Summer cooling effects of 1 to 5 °C can extend 1 to 5 tree heights into the built-up area. To maximize cooling, locate buffers at frequent intervals. Each degree reduction can lower electricity demand for cooling by 2 to 4 percent.

4.8 References

Akbari, H. 2002. Shade trees reduce building energy use and CO2 emissions from power plants. Environmental Pollution. 116: S119-S126.

Akbari, H.; Pomerantz, M.; Taha, H. 2001. Cool surfaces and shade trees to reduce energy use and improve air quality in urban areas. Solar Energy. 70: 295-310.

Bernatzky, A. 1982. The contribution of trees and green spaces to a town climate. Energy and Buildings. 5: 1-10.

Chang, C.; Li, M.; Chang, S. 2007. A preliminary study on the local cool-island intensity of Taipei city parks. Landscape and Urban Planning. 80: 386-395.

Georgi, N.J.; Zafiriadis, K. 2006. The impact of park trees on microclimate in urban areas. Urban Ecosystems. 9: 195-209.

Givoni, B. 1991. Impact of planted areas on urban environmental quality: a review. Atmospheric Environment. 25B: 289-299.

Honjo, T.; Takakura, T. 1990. Simulation of thermal effects of urban green areas on their surrounding areas. Energy and Buildings. 15/16: 443-446.

McPherson, E.G. 1988. Functions of buffer plantings in urban environments. Agriculture, Ecosystems and Environment. 22/23: 281-298.

McPherson, E.G.; Simpson, J.R. 2003. Potential energy savings in buildings by an urban tree planning programme in California. Urban Forestry and Urban Greening. 2: 73-86.

Meleason, M.A.; Quinn, J.M. 2004. Influence of riparian buffer width on air temperature at Whangapoua Forest, Coromandel Peninsula, New Zealand. Forest Ecology and Management. 191: 365-371.

Oke, T.R.; Crowther, J.M.; McNaughton, K.G. [and others]. 1989. The micrometeorology of the urban forest. Philosophical Transactions of the Royal Society of London Series B Biological Sciences. 324: 335-349.

Saito, I.; Ishihara, O.; Katayama, T. 1991. Study of the effect of green areas on the thermal environment in an urban area. Energy and Buildings. 25/26: 493-498.

Simpson, J.R.; McPherson, E.G. 1996. Potential of tree shade for reducing residential energy use in California. Journal of Arboriculture. 22: 10-18.

Spronken-Smith, R.A.; Oke, T.R.; Lowry, W.P. 2000. Advection and the surface energy balance across an irrigated urban park. International Journal of Climatology. 20: 1033-1047.

Spronken-Smith, R.A.; Oke, T.R. 1998. The thermal regime of urban parks in two cities with different summer climates. International Journal of Remote Sensing. 19: 2085-2104.

Stathopoulos, T.; Chiovitti, D.; Dodaro, L. 1994. Wind shielding effects of trees on low buildings. Building and Environment. 29: 141-150.

Taha, H.; Akbari, H.; Rosenfeld, A. 1991. Heat island and oasis effects of vegetative canopies: micro—meteorological field-measurements. Theoretical and Applied Climatology. 44: 123-138.

Upmanis, H.; Eliasson, J.; Lindqvist, S. 1998. The influence of green areas on nocturnal temperatures in a high latitude city (Goteborg, Sweden). International Journal of Climatology. 18: 681-700.

Vu, T.C.; Asaeda, T.; Abu, E.M. 1998. Reductions in air conditioning energy caused by a nearby park. Energy and Buildings. 29: 83-92.

Wang, F. 2006. Modelling sheltering effects of trees on reducing space heating in office buildings in a windy city. Energy and Buildings. 38: 1443-1454.