

A 100% RENEWABLE ELECTRICITY SYSTEM FOR NEW ZEALAND

What: Seminar by Ian Mason, Department of Civil and Natural Resources Engineering, University of Canterbury, Christchurch, New Zealand

When: Wed. October 12 2011, 9:30 – 10:30 am

Where: Room 660, Engineering and Computer Science Bldg. (ECS), University of Victoria

Live Webstream: www.pics.uvic.ca/broadcast.php



New Zealand's electricity system is dominated by hydro generation (54%), augmented with about 31% fossil-fuelled generation plus contributions from geothermal, wind and biomass resources. In order to explore the potential for a 100% renewable electricity generation system with substantially increased levels of wind penetration, fossil-fuelled electricity production was removed from a historic three year data set (2005-2007) and replaced by modelled electricity production from wind and geothermal resources. Generation mixes comprising 53-61% hydro, 22-25% wind, along with geothermal, biomass, and additional peaking options, were found to be feasible, while maintaining net hydro storage. However, several important issues remained unresolved. Maximum and minimum lake levels fluctuated more widely than those historically measured, and wind and hydro energy spillage occurred. In order to meet residual power deficits (> 1100 MW peaking plant) the equivalent in demand-side measures or a combination of both were indicated. Finally, the study period did not include any particularly dry hydrological years. This seminar will summarise the 2005-2007 study and demonstrate solutions to the problems of hydro and wind energy spillage, peaking and security of supply in a particularly dry hydrological year.

Dr. Ian Mason is a Research Fellow in Environmental and Energy Engineering, and a Senior Fellow in Carbon Management at the University of Canterbury. Although an environmental engineer by training, Ian's research interests are now focused on organizational responses and actions on climate change, carbon neutrality, renewable energy systems, and carbon capture and storage. His carbon management research, entitled "Carbon Neutrality – fact or fiction?", looks at New Zealand organizations, and is funded by a Marsden Grant (NZ\$824,000) administered by the Royal Society of New Zealand. He teaches a final year course on sustainable energy systems into the BE (Hons.) Natural Resources degree.

Coffee/tea and baked goods will be available.