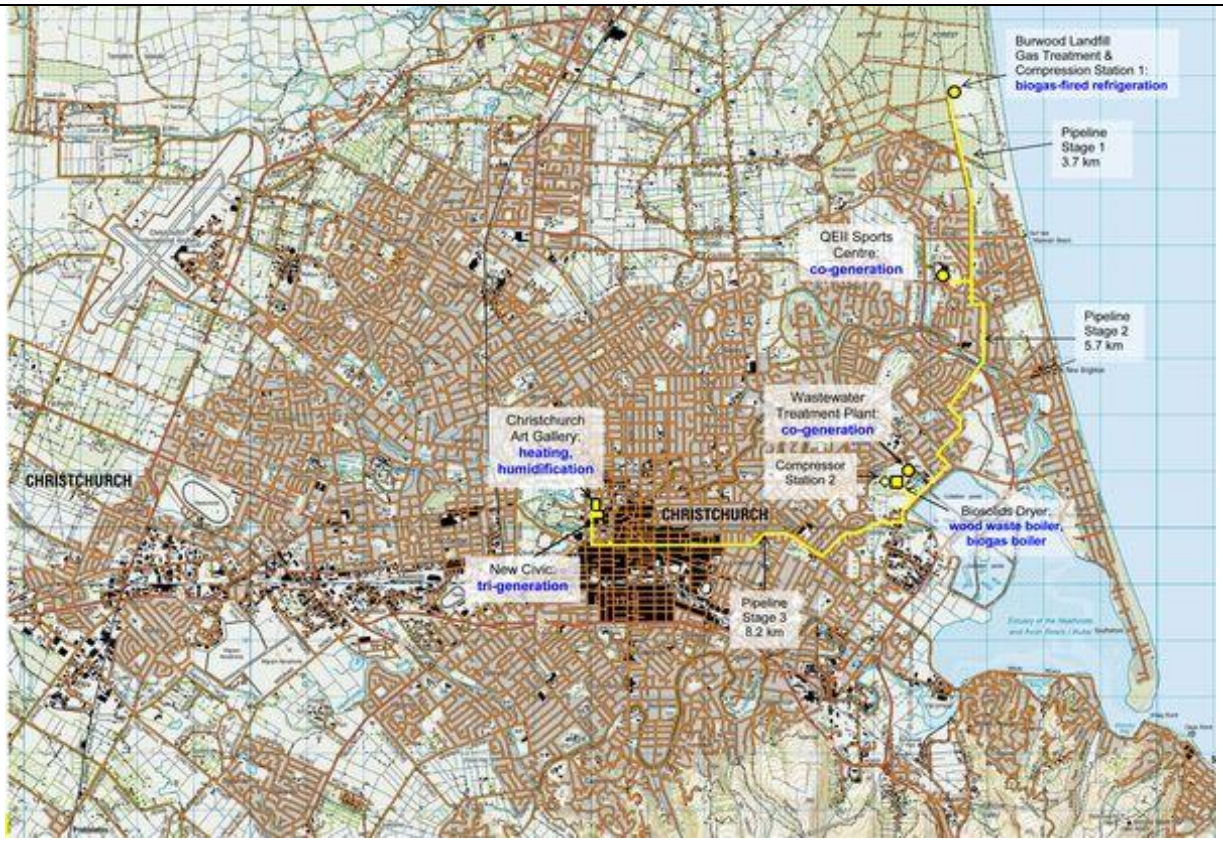
City-Wide Renewable Energy Utilisation System – Christchurch (NZ)

Keywords	**Renewable Energy, Biogas, Biomass**
Main photos	
Objectives of the action	Between 2006 and 2010, Christchurch has developed and implemented a comprehensive and integral system for the utilisation of bio energy (biogas, biomass, biodiesel) across the city, with an objective to make a significant break-through towards renewable energy at the city public buildings and facilities. While individual components of the system are well known and proven technologies, the use of them in an integral system allows to utilise the available renewable energy resources in the most efficient manner. This is achieved by the use of various energy conversion technologies and by the elimination of the need to flare excessive amounts of biogas.
Description of the action	The system includes the following components: • construction of a landfill gas collection and treatment system at City's landfill site • installation of a biogas-fired refrigeration plant for landfill gas treatment • construction of a city-wide, 18-km long network of biogas pipelines and compressor stations • installation of a co-generation plant at QEII sports centre and conversion of heating boilers to biogas • conversion of heating and humidification equipment at Christchurch Art Gallery to biogas • installation of a tri-generation plant at the Christchurch Civic Building that uses biogas for simultaneous generation of electricity, heat and refrigeration, which provides best possible efficiency all year round • operation of 2.5 MWe co-generation plant, as well as a 4.5 MW waste wood boiler for biosolids drying and another 4.5 MW biogas-fired boiler for biosolids drying (the latter acting as a flare for excess amounts of biogas at times), at the city Wastewater Treatment Plant • conversion of 6 diesel-fired heating boilers at various Council facilities to 100% biodiesel • integration of long term sustainability in the system through the planned replacement of landfill gas with digester gas as the landfill gas supply diminishes with time.

Results / Achievements	The result of the project implementation: • fossil fuels displaced: 48 GWh annually • CO_2 emission reduction: 52,000 tonnes annually • peak electricity load reduction 700 kW • payback period for investment 2.7 years. As a result of the project, the share of local renewable energy in Christchurch City Council's operations increased from 10% (2006) to over 50% (2010).
Friendly advice for replication	While biogas and woody biomass may be considered cheap (or even free) energy sources, their quantity is in fact limited and it is therefore important to utilise the sources at best possible efficiency and avoid flaring off. This can be achieved by using diverse energy conversion technologies that complement each other.
Online information	*www.ccc.govt.nz/thecouncil/howthecouncilworks/energyefficiencyatthecouncil/projects/wastetorenewableenergyburwoodlandfill.aspx* Video clips are attached to the above web page.
Further information	**Contact person:** Name Leonid Itskovich Position Energy Manager Organisation Christchurch City Council Tel +64 3 9418793 E-mail leonid.itskovich@ccc.govt.nz Website www.ccc.govt.nz