

## **Industry, Energy, and the Ballarat West Employment Zone (BWEZ)**

The BWEZ, without a number of innovative features that provide treated industry grade water, low emission energy (including heat energy) or other major cost-saving or 'green' drawcards for industry, is likely to attract an array of industry that will be relatively unexceptional in their use and need for energy – electricity, transport fuels, and cooling and thermal energy of a range of temperatures.

In such a 'business as usual' case the electricity requirement would be delivered via a new 15 MW capacity sub-station being installed to supply the BWEZ and new residential subdivisions. Heating needs of industry would be produced principally from natural gas, and this will require a new main pipeline from the eastern side of Ballarat. Transport fuels for the transport hub will be delivered by B-Double transport from the Shell refinery outside Geelong. Water for the BWEZ would be delivered as largely as potable quality from the town water supply, possibly including for industrial uses.

In this form of the BWEZ the rising cost of fossil sourced energy in a carbon-constrained future, the increasing costs of fossil transport fuels, the inefficiencies of producing heating and cooling at each factory or business – all this means no real differentiation of the BWEZ from any development closer to Melbourne or Geelong. It would mean an opportunity lost to do it better in various ways. And possibly in ways that treat the BWEZ and the contiguous residential subdivision as being two parts of a whole, rather than as two generally unrelated developments.

The contiguous suburban subdivisions to the south eventually housing 30-40,000 people in 12-14,000 homes will have a very significant requirement for energy (as heat, cooling, electricity and transport fuels), potable water, and for all services including disposal of grey water and sewage as well as putrescible waste and solid municipal waste.

These requirements for energy and services, along with the present pattern of use of personal vehicles for even the shortest personal shopping or social trips, will obviously put an increasing strain on the City services delivery and infrastructure. However it is possible that the development of the BWEZ could offer many areas for reduction of these strains by attracting businesses or industrial plants to the BWEZ that will provide some of these services, including of production of renewable energy and of treatment of sewage and other putrescibles wastes and recycling of suburban grey water.

### **An alternate development option for the BWEZ includes many aspects that would make the BWEZ (and hence Ballarat) a leader in sustainability, energy efficiency and renewable energy in Australia**

- Supply of district heat and cooling, and possibly electricity and biomethane, to some or all parts of the suburban developments.
- Treatment of putrescibles wastes, grey water and sewage in an anaerobic digester – with industrial grade water being one product, and heat and electricity (and possibly cooling) being others. An option is to upgrade the biogas (60-70% methane) to biomethane (about 98% methane) for use as a vehicle fuel or general substitute for natural gas.

- Supply of industrial quantities of heat energy as both 80-110 C (hot water under pressure) and 180-250 C (as steam) to industries both on the BWEZ, and to adjacent industries or new housing developments
- Potential for production of electricity of the order of 15 MW within the BWEZ.
- Use of BWEZ heat production for biofuels production on the BWEZ area.
- The existence of low emission (non-carbon taxed) heat from a BWEZ district heating plant to attract industries to the site from beyond Ballarat. These would include food processing, conversion of sorted MSW to refuse-derived pellets, production of wood pellets, and other industries requiring large volumes of low cost heat year-round.
- Boosting of heat energy supply (and cooling) by industrial scale solar thermal hot water collectors
- Commercial and industrial waste separation and recycling centre, including a city drop-off recycling centre
- Industries specialising in recycling and remanufacture, as well as in building products related to energy efficiency (ie double and triple glazing retrofit kits)

The outcomes of this approach would be to attract new industry, and the sort of small to medium enterprises that would prefer to relocate to an innovative centre that combines many of the elements of sustainability, innovation, energy efficiency and renewable energy.

**The approach on the BWEZ could be extended to the adjacent new suburbs –**

- Walking and bike paths and bike storage designed into the planning layout, including to and within the BWEZ
- Household, institution and commerce waste recycling and handling centres
- Rooftop hot water solar heating – including for commerce and institutions
- Requirement for eaves on all houses and other elements of solar passive design and orientation on site, insulation and double glazing, use of pellet heaters or heat pumps, built into planning rules for subdivision
- Water recycling and community street water and rooftop water collection and storage systems
- High efficiency public transport feeder systems (ie as in Canberra a bus interchange system incorporated into planning)

**Altogether the implementation of these options has the potential to**

- cut the BWEZ's and contiguous suburb's use of energy from fossil sources by up to 50% (and hence the emissions by a similar amount),
- reduce personal vehicle use by up to 30% (within the suburban development area, and from there for workers going to the BWEZ),
- significantly reduce net water draw on the city supply ,
- reduce costs of heat energy for BWEZ industry by a significant and increasing amount, attract new innovative businesses and 'green' professionals to the BWEZ and suburban developments,
- reduce waste to landfill, and stimulate recycling, and energy from waste
- put Ballarat City in the lead in Australia among regional cities
- significantly reduce City GHG emissions over time