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Committee Policy, Finance and Strategy
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Energy Savings During Power Shortage

1. Purpose

To provide the Committee with a range of electricity saving options for approval.

2. Background

A deteriorating position with respect to the amount of water available for hydro electricity generation in New Zealand has been well documented in the media over the past few weeks. Recently the Government and the electricity industry called for 10 percent savings and the Government has requested the state sector achieve 15 percent savings.

Attachment 1 is the water storage situation for hydro generation as at 2 May 2003. It is apparent that the storage at present lies between the 1992 and 2001 shortage events. In 2001, the requests to save power were made in July of that year.

There are a number of power usage situations under the direct or partial control of the Greater Wellington Regional Council. These are outlined in the next section together with power savings options. Of the electricity used directly by the Council, about 95 percent is used for wholesale water supply treatment and distribution.

3. Electricity Saving Options

3.1 Regional Council Centre and Other Buildings

A memo was issued to all staff at the end of April about the need to conserve electricity and a number of measures were outlined. Other activities that the Council is undertaking were mentioned, for example, turning off the air conditioning/heating system in the Regional Council Centre half an hour earlier than usual.

3.2 Wholesale Water Supply

3.2.1 Operational Changes

The computerised operating system that controls part of the wholesale water supply system is normally set to achieve the minimum marginal production cost for water treatment and distribution. Electrical usage, chemicals and waste product disposal (for surface water plants) are the three input factors to calculate the marginal production cost. The system can be altered to achieve minimised electricity consumption, but doing so increases the overall operating costs. The reason being that the additional chemicals used in water treatment at the surface water plants cost more than the savings from reduced electricity consumption.

This type of operating change was made during the 2001 electricity shortage. Electricity savings of 22% were achieved but the marginal production costs increased by \$24,000 a month. The monthly cost, based on current chemical and electricity purchase prices, is expected to be slightly less than \$24,000 because of subsequent changes in the price relativity of electricity and chemicals. The estimated additional monthly cost figure was not available at the time this report was prepared.

As Councillors are aware, it has been particularly dry in Wellington over the last few months. While there is an adequate supply of water to treat, it is a mix of aquifer water and surface sourced water. At present, it is not possible to switch to a full energy minimisation mode as there is inadequate water in the rivers. The full change can be made as soon as there is adequate rainfall, a partial change can be made in the interim.

3.2.2 Source Water Change for Petone

The Petone area is normally supplied with water from the Waterloo water treatment plant (WTP). It is possible to supply the area from the Wainuiomata WTP. This results in a 1 percent power saving but does give the Petone area water that is both chlorinated and fluoridated, the normal supply does not contain these products. Even without the current energy shortage, Petone will be supplied from Wainuiomata for about four weeks during the period mid May to mid June because of Hutt City's extensive reconstruction works at the Seaview roundabout and the need to alter water supply pipework.

3.2.3 Diesel Substitution for Electrical Energy

There are a number of standby generators installed at water treatment plants and the Te Marua pump station as well as direct drive diesel motors at the Waterloo WTP. During the last power shortage, diesel equipment was not used as the energy supplier (TrustPower) would not agree to reimburse the Council for the extra costs to operate the diesel equipment. The additional cost of using all the available diesel plant is about \$144,000 a month. Genesis Power, our current energy supplier has recently submitted a proposal to the Council (and Genesis' other customers) to operate standby generators between 6am and 7pm. This proposal is being studied at present. An initial response is that it is reasonable in that Genesis Power will cover the Council's operating costs.

Potential electricity savings by Greater Wellington Water by diesel substitution are as follows, assuming all diesel equipment operates as required during each 24 hour period.

<i>Site</i>	<i>Percentage saving of Greater Wellington Water's (GWW) total electricity consumption</i>
Wainuiomata WTP	6%
Waterloo WTP	15%
Te Marua WTP	6%
Te Marua Pump Station	12%

Genesis Power would request the times during which all the diesel equipment would operate. This is likely to be 6am to 7pm seven days a week.

On a cumulative basis, the maximum potential electricity savings from all the water supply initiatives are:

<i>Site or Initiative</i>	<i>Potential percentage saving at each site of the GWW total electricity consumption</i>	<i>Percentage cumulative savings</i>
Operational Changes		
Power minimisation mode of operating	22%	22%
Changing the water source for the Petone area	1%	23%
Diesel Substitution		
Wainuiomata WTP	6%	29%
Waterloo WTP	15%	44%
Te Marua WTP	6%	50%
Te Marua Pump Station	12%	62%

Genesis Power's proposal is for operation of the diesel equipment for about 13 hours a day, hence the savings would not be as high as 62%. Probably overall savings in the order of 45-50% can be achieved.

3.2.4 Discussion with the Four City Councils

The four city water supply customers have been consulted about the energy saving proposal. At the time this report was finalised, all the responses were not available. An update will be provided at the Committee meeting.

3.2.5 Saving Water

The electricity industry is promoting shorter shower times in households as a means of saving power (where hot water cylinders are electric). Greater Wellington should fully endorse this aspect as multiple savings occur, namely;

- reduced electricity as less hot water is used
- reduced electricity in the treatment and distribution of the potable water as the volume is less
- reduced electricity in the pumping and treatment of the waste water.

Generally using less water for whatever reason will reduce electricity demand.

3.3 Public Passenger Transport

Stagecoach Wellington are considering whether trolley buses can be withdrawn by 8.30pm each weekday.

This would reduce Stagecoach's power usage by an estimated 12%.

These changes would be cost neutral to the Council and we understand could be implemented at one week's notice.

Further savings might be available by withdrawing trolley buses between the morning and evening peaks, however, this will require extensive re-rostering and would require a longer lead time.

4. Communications

Appropriate media releases will be prepared.

5. Recommendations

That the Committee recommend to Council that it:

1. **receive** the report.
2. **note** the contents of the report.
3. **approve** operating the wholesale water supply system in an electrical energy minimisation mode commensurate with the availability of river water for treatment.
4. **approve** the Divisional Manager Utility Services entering into an agreement with Genesis Power for diesel equipment to operate instead of electrically operated equipment, subject to the Divisional Manager being satisfied with the terms of the confidential commercial agreement.
5. **note** the action taken concerning the Regional Council Centre and similar facilities.
6. **note** the action that may be taken regarding the trolley buses operated by Stagecoach Wellington.
7. **support** the communication to reduce water usage as a means of saving electricity.

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Attachment 1: New Zealand Daily Storage graph