
Bulletin: 245

Event: Geothermal61

Date: Tuesday, 28 February 2006 (GMT+12:00) Auckland, Wellington

Field Trip Name: Wairakei Geothermal Power

Weather: Fine and warm

Field Trip Place: Wairakei

Where's Donald: Taupo

Diary number of total: 1 of 4

Hi Everybody

A wonderfully warm and sunny summers day after the southerly howled through last night and just right for flying from Christchurch to Rotorua. I was Out to the airport and airborne by 11.38am. Quickly we climbed to 11 000 m and I settled back for a very smooth 55 minute flight to Rotorua before driving down to Wairakei, just outside Taupo

This field trip is about generating electricity from the heat within the earth and I thought about how much extra electrical energy each of us is demanding, as we get more and more appliances around us. As I sat and looked at the lights above saying No Smoking and Buckle Up I thought of these three terms I heard recently.

The first is a Wall Wart

A Wall Wart is the small black transformer that you use to charge cell phones and other battery operated devices. They get there name because they are ugly, often fit the wall plug badly and spend most of their time perched on a wall. The annoying way a Wall Wart prevents you using the next plug is deliberate, because they get so warm they need the space around them. Another Wall Wart close by would simply cause them to overheat.

The real trouble with Wall Warts is that they are often left switched on even though no they are not charging anything. The effect in NZ of wall warts can be estimated by assuming 1 in 4 people have one turned on now. If each draws 0.1 Amps at 12 Volts. That####s 1 million people drawing 1.2 Watts or 1.2 Megawatts of power that needs to be generated. Leave a Wall Wart running for a year and this becomes about 10 Kilowatts which costs about one dollar fifty cents, all for no real work.

The second is a Vampire

Vampires are electrical equipment that are sleep but are seldom off. You can easily tell a vampire because it can be woken up using a remote control or a sleep button. Examples are computers and television sets. Vampires are put into sleep mode to save power but also to reduce the start up that some people find frustrating. A TV will need about 300 Watts when running but in sleep mode it####s only 30 Watts. However for a million TV####s in NZ this equals 30 Mega watts or one whole Wairakei generator. In the USA vampires apparently consume electricity equal to the electricity use of Greece, Peru, and Vietnam combined. I got this from a newspaper article called Energy Savers the Real Stars, in The Christchurch Press.

The third is a Flashing Twelve

A Flashing Twelve is a person who is poor at handling modern technology. The name comes from the fact that when you walk into their house a digital clock will be flashing 12.00 because they can not figure out how to set it. To be kind, it might be that when the power goes off the equipment is too dumb to remember the time and the person simply gets sick of resetting it. Just try sleeping in a room with a flashing 12 display and you will surprised how bright it is, because almost 15 Watts of power is being used to drive it. Two separate surveys have found that 17 and 25 percent of digital clocks flash like this.

By now we were heading over the Taranaki coast and shortly after flew past the huge bulk of Mt Ruapehu. Ruapehu is the at the boundary of the Taupo Volcanic Zone and it was a sure sign we

were getting close. Unfortunately the window seat I had was above the wing so I only just managed to get the photo opposite for you.

A smooth touchdown in Rotorua and it was away in the rental car , south to Wairakei. An hour later and the amazing cooling tower at Ohaaki power station came into view. We just had to stop and have a look. Like Wairakei Contact Energy's Ohaaki power station is geothermal but instead of using the waters of the nearby Waikato River for all the cooling the tower does the job. The 105m high tower, has 20 000 tonnes of water circulating in it and is especially designed to withstand wind and earthquakes. It is the only tower of its type in NZ but like the numerous ones scattered across Europe at nuclear power stations. A great advantage of this Ohaaki system is that geothermal water can be reinjected into the borefield which helps to conserve the resource. Opened in 1989 Ohaaki provides 3 percent of our electricity yet few people have heard of it.

As stood outside and looked at the hot pipes and hissing steam valves. questions came pouring to mind. I was keen to get started at Wairakei tomorrow and have them answered. There is so much neat science at work around here.

Do join us tomorrow , but go and kill a vampire or wall wart first.

Cheers

Donald

Competition

The geothermal field trip competition starts tomorrow folks.



Heading out to Christchurch airport along Memorial Ave on a summers day.



Just after takeoff and heading north across the Canterbury Plains



Crossing the Taranaki coastline with Wanganui City below and Mt Taranaki in the distance



Another set of lighting but with instructions this time



The summit of Ruapehu from 11 000 metres



We descend over Rotorua city at the southern end of Lake Rotorua



Heading south along the Rotorua to Taupo state highway



The cooling tower of Ohaaki power station besides SH1



Donald standing outside the Ohaaki geothermal power station



The classic photo of the volcanoes of Tongariro National Park across a hazy Lake Taupo