WebGraphs Guide for Schools

Wetlands Environmental Education Centre

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WebGraphs Introduction

WebGraphs was first introduced in five trial schools in Newcastle in 2005 as a joint project between Newcastle City Council and Energy Australia. The aim was to provide schools with a current source of information so they could effectively monitor and make changes to their energy consumption. Following the successful trial period, WebGraphs was rolled out to all NSW Department of Education and Communities schools as an effective tool to engage students in directing energy sustainability change.

Chapter 1: What are WebGraphs? What do they do?

WebGraphs is an internet based reporting tool developed by Testing Certification Australia, the metering services business division of Energy Australia. It allows students to engage in the collection of data from the school electricity meter. They are able to collect, analyse and monitor the data while linking to cross curricula NSW Department of Education and Communities outcomes.

WebGraphs provides the opportunity for detailed reporting on electricity consumption and CO_2 emissions and managing of energy use within the school. Schools with solar generation capabilities are also able to monitor the amount of energy generated by the school solar power system.

The use of WebGraphs allows students to access graphs and reports, through which they can identify how much energy was used and at what time of the day it was used.

Schools can analyse the data produced to identify peak energy use times, excessive consumption and irregular usage eg weekend and out of school hours excessive use. This data can then be used by schools to develop education and management practices throughout their school and link with monitoring the effectiveness of the School Environmental Management Plan. Students can be actively involved in all of these activities in an engaging and meaningful way.

WebGraphs Information

www.webgraphs.com.au

Username: School DEC ID

Password: to be provided by Austgrid Business Services:

To find out if your school has access to WebGraphs, contact the DEC WebGraphs account administrator:

**Phone**: 1300 76 06 26 **Email:** crm@ausgrid.com.au

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Chapter 2: Basic Use Guide

Logging in

A user name and password is required to access WebGraphs. This is issued on your application. There is the opportunity to retrieve a forgotten password through the '**Forgot password'** link, which will be sent in 5 -10 minutes.

The password can also be changed in the '**Settings > Change Password**' menu item.

START: Go to WebGraphs home page at http://www.webgraphs.com.au
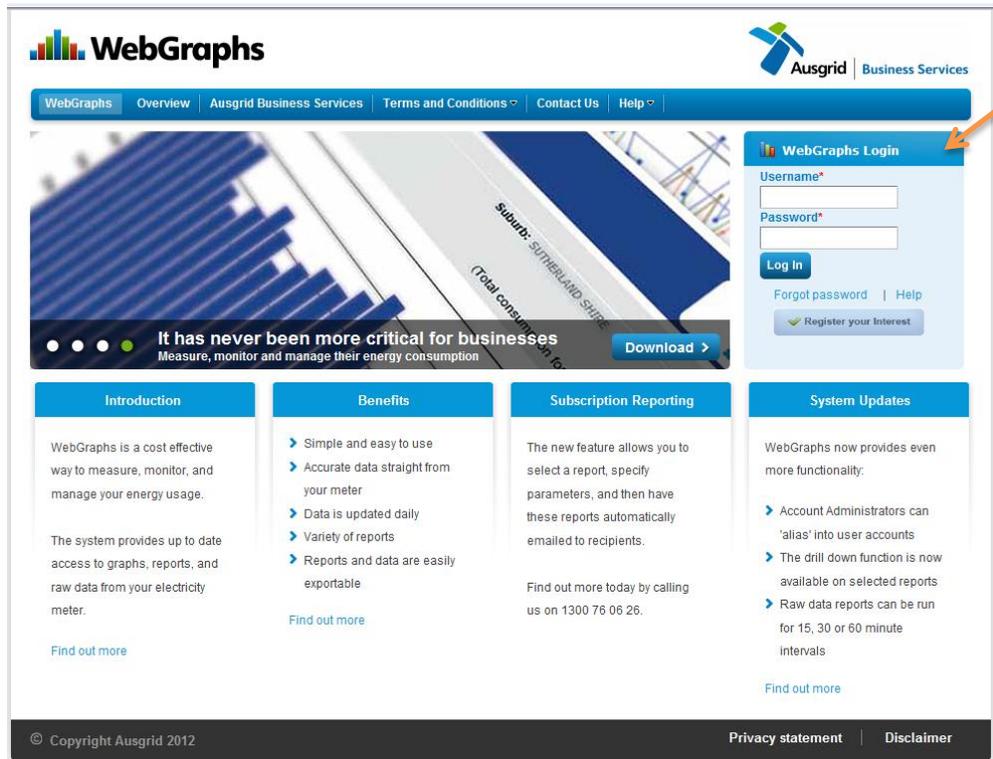

To Log On:

Enter:

User Name

Password

Click:

Log In

Successful Log In will lead directly to the Dashboard page, which displays graphs of:

Bi-Directional Last Month

Bi-Directional Last 13 Months

Generation Last 13 Months

School Hours for Last Week Consumption

Viewing Reports

Reports are available for a range of parameters and a range of reporting views and periods.

They include:

- 30 minute interval data for a day
- Daily data for any period less than 2 months
- Weekly data for any period less than a year
- Monthly data for any period up to 5 years
- Yearly data for up to 5 years.

To view a report:

Click '**Electricity'** from Dashboard Menu Tab. Choose report required from displayed list.

eg. **Bi-Directional Flow Report.**

Choose parameters:

Reporting View: Interval period of report

Reporting Periods: Period of data to be reported

Start Date: Start date of data to be reported
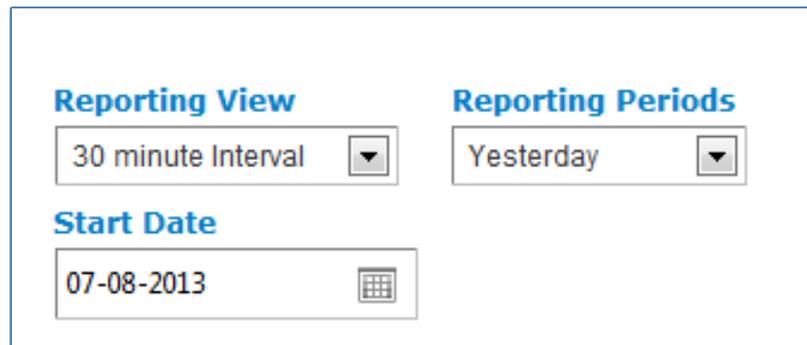
Reporting View

30 minute Interval ▼

Reporting Periods

Yesterday ▼

Start Date

07-08-2013 ▦

NMI Group

Wetlands Environmental Education Centre (5458) ▼

NMI Group (National Metering Identifier): Select from drop down list.
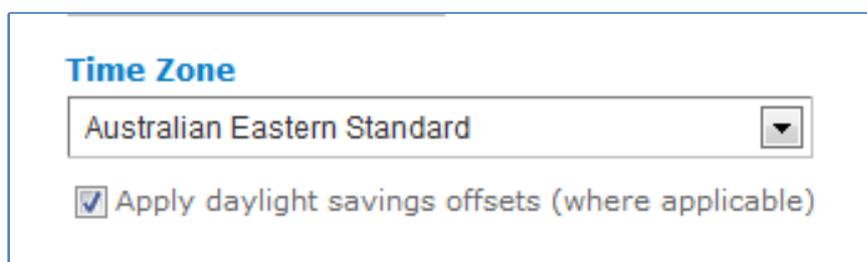
Time Zone

Australian Eastern Standard ▼

☑ Apply daylight savings offsets (where applicable)

Time Zone: Select time zone and daylight savings offsets (where applicable)

Select All NMIs

☐

⊞ ☐ 4103793718(432-434 Sandgate Road, Shortland)
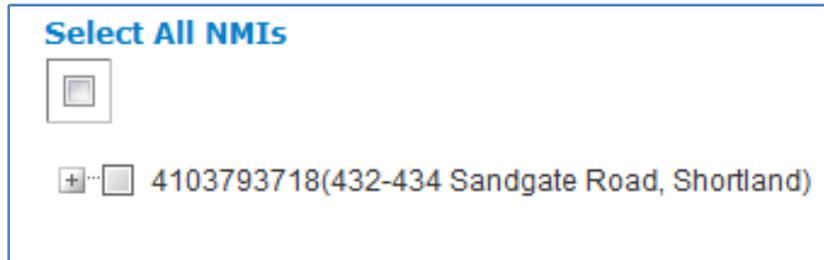
Select NMIs and Meter Points you want included in the report.

(normally **Select All**)

[View Report]

Click **View Report** to run and view the report.

Printing Reports

There are 2 ways to print a report:

1. Exporting to Adobe Acrobat PDF
2. Reporting Services Print functionality (which requires Microsoft's 'SQL Server Reporting Services 2008' to be installed on your computer).

Exporting Reports is the most functional way to use graphs for further interpretation and manipulation.

There are a number of formats within WebGraphs report viewer available for export, including:

- Adobe Acrobat Reader (PDF)
- Microsoft Excel (Data Only)
- Microsoft Excel
- Microsoft word

Once a PDF report is obtained, it may then be saved in another location for future reference. This is helpful when examining reports over a period of time.

To access these from **Reporting Services** window, click **Actions** tab to bring down **Export** menu, which provides choices.
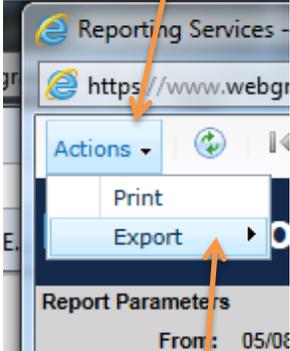
Reporting Services window

Actions tab

Export menu

Chapter 3: Features of WebGraphs

WebGraphs has a number of features which enable you to:

- Get more from your school electricity data
- Understand electricity usage in your school
- Monitor your usage to help you manage and save electricity
- Measure the effects of educating students on behaviours
- Measure the results of retrofitting school buildings

Logging on to WebGraphs links directly to the **Dashboard.** The features of this have been mentioned on Page 3.

Bi-Directional Flow: shows electricity generation and consumption in one report.

Total Consumption for this period: 119,683.661 kWh
Total Generation for this period: 4,621.545 kWh

Total Consumption for this period: 442.240 kWh
Total Generation for this period: 22.428 kWh
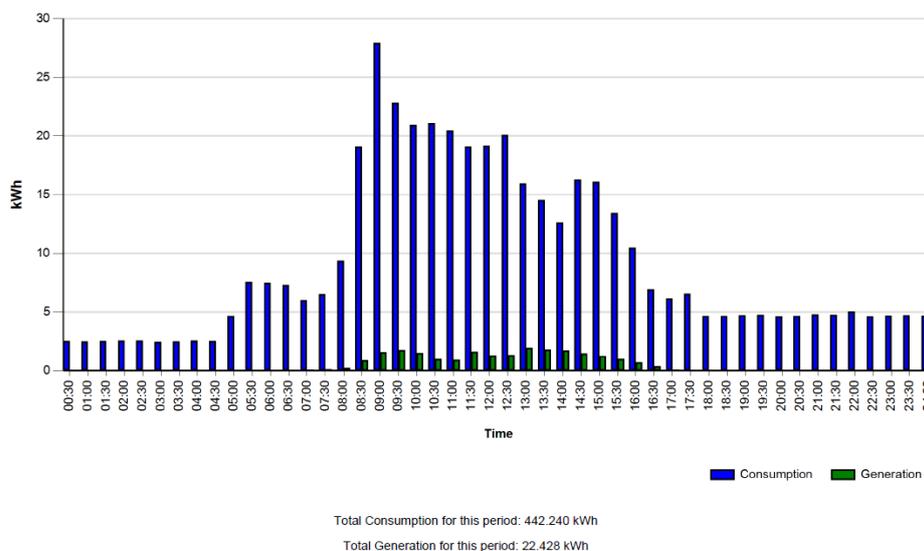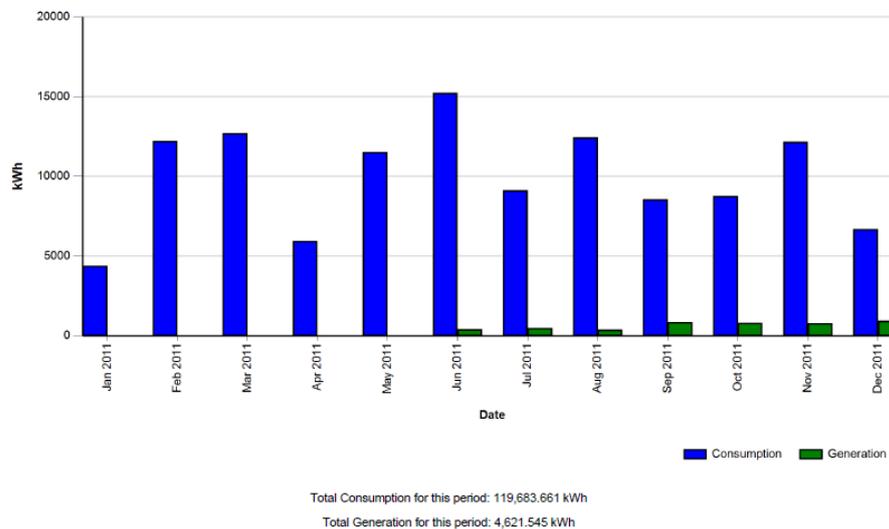
Energy Consumption: shows total energy used for the chosen period.
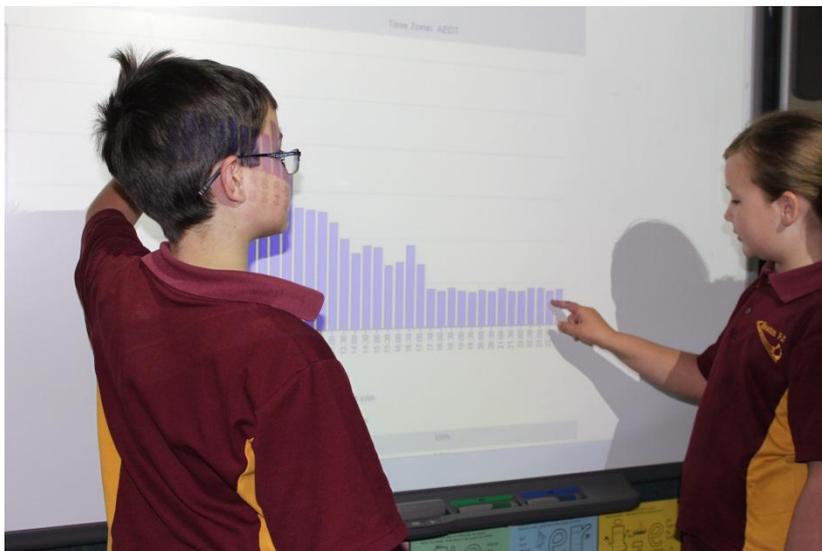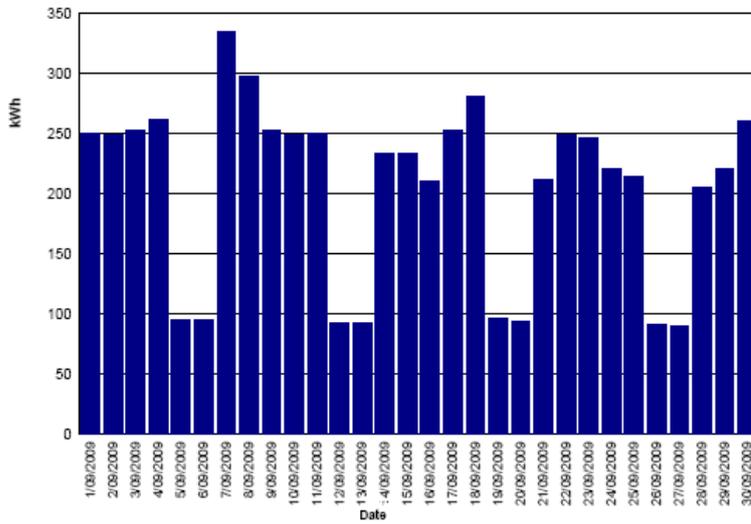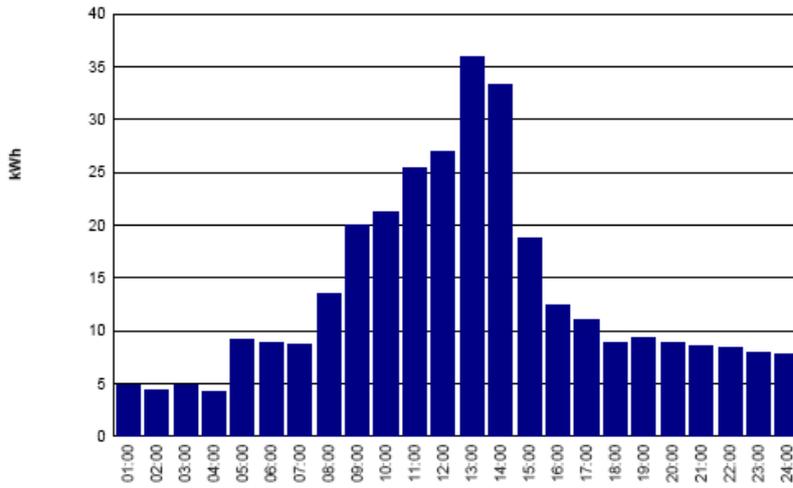
CO2 Emissions: shows total carbon emissions. You can also input % of green energy purchased to see how many tonnes of CO2 are being saved.
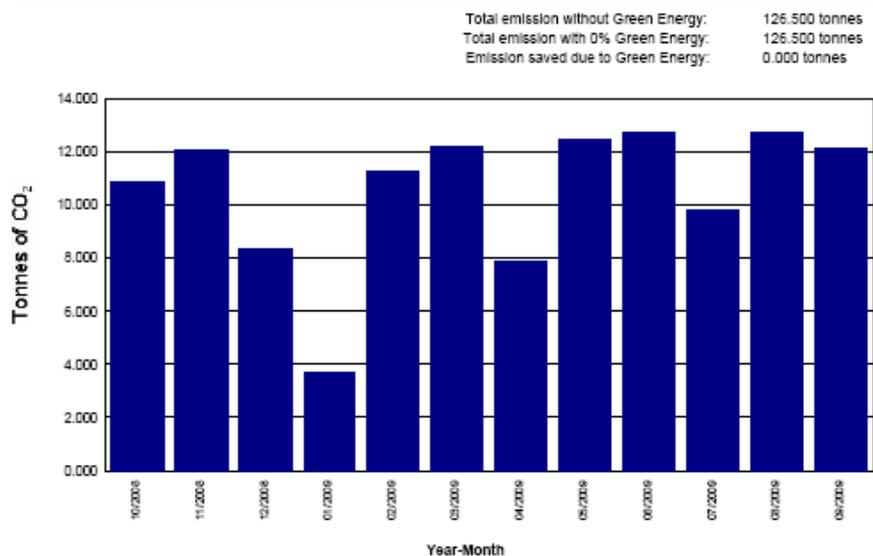
TOU (Time of Use) Energy: shows energy used at different times. There is a 'school' profile in each account. Up to three other TOU profiles can also be set up by the school.

	Period 1	Period 2	Period 3	Period 4	Period 5	Period 6	Period 7	Period 8	Period 9
	School hours	Out of hours	Weekends	Holidays					
Total consumption	47,524	32,080	11,841	823	0	0	0	0	0
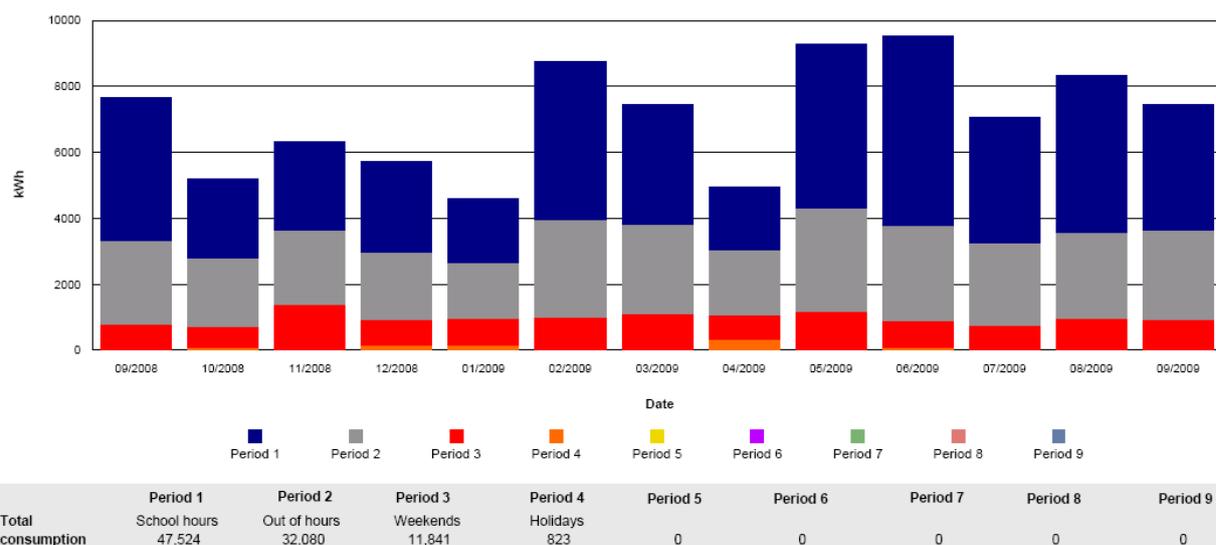
Electricity or Solar Generation: shows electricity generated from school solar panels. Solar generation also shows temperature.

Total Generation for this period:	2,937.195 kWh
CO2 emissions saved due to Green Energy:	3.143 tonnes
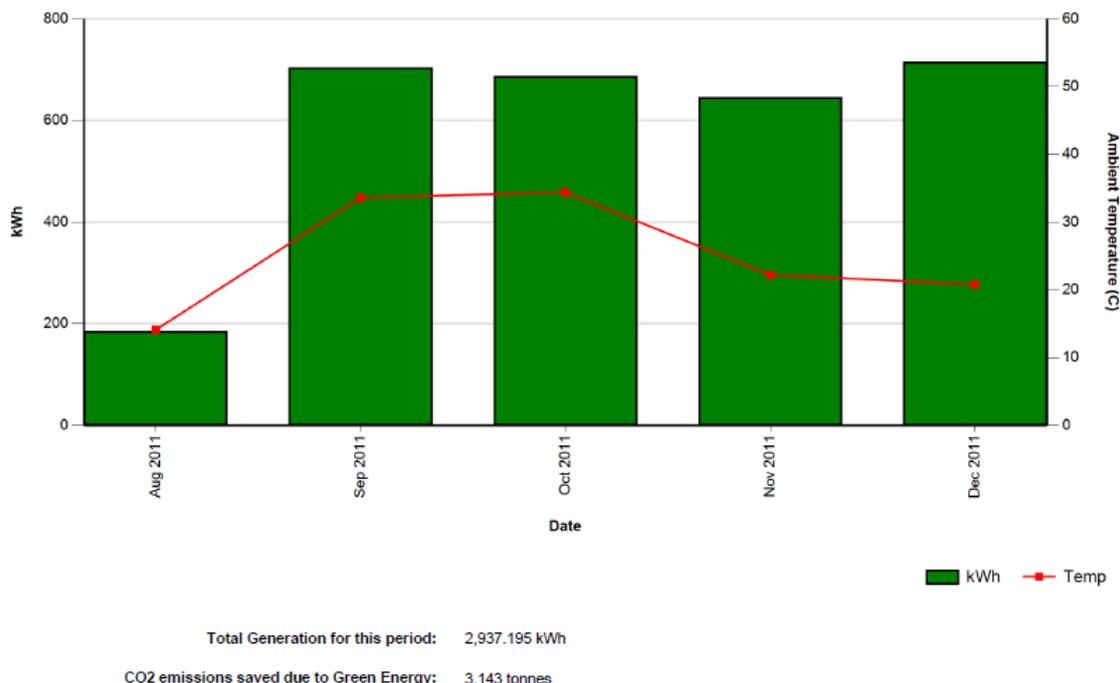
Subscriptions: Can be established to enable set reports to be sent to a specific email account. These can be established for set reports, times of report and frequency by entering:

- **Subscription Title:** the name you wish to call the subscription. (A required field).
- **Email Address:** the location the information will be sent to.
- **Subject:** helps to describe the Subscription. (A required field).
- **Render Format:** select the format from the drop down menu.
- **Comments:** information you would like to appear in the body of the email.
- **Frequency:** how often the report will be sent.
- **Schedule Definition**: the days on which you would like to receive the report.
- **Start and Stop Schedule**: the days on which the Subscription will run. (A required field)
- **Save**: final step to set up a Subscription

The saved Subscriptions can also be edited as required.

A **Subscription** can be set up from the **View Report** page, once the report is generating.

Link to set up a Subscription.

Chapter 4: Using WebGraphs in your school

WebGraphs can be used in any classroom or across the whole school community to engage students, teachers, school staff and the local community in the sustainable use of energy within your school.

In the classroom

WebGraphs can be used in any classroom setting.

WebGraphs can be used in many different forms in the classroom.
Students can view WebGraphs data on a smartboard, desktop computer, laptop, data projector or iPad.

WebGraphs can be brought up onto the screen at regular intervals.
- At a particular time each day a few minutes could be spent examining the graph from the previous 24 hours.
- Alternatively, this could be a weekly event where the previous seven days are examined.
- Other classrooms may choose to examine a graph or series of graphs during one lesson a cycle.
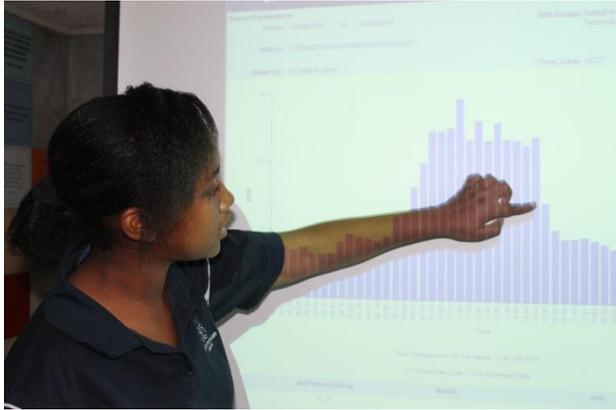
WebGraphs is also useful in classrooms which do not have web access. The appropriate graphs can simply be saved at an earlier time and then used in the classroom. This can be particularly helpful if the web access in your classroom is unreliable. By saving a graph obtained earlier you are assured of success.

Electricity consumption will be the most useful graph to use although Electricity Generation, Time of Use (TOU) and CO2 emissions may be helpful also.

Allowing the students to problem solve using the information contained in the graphs is quite powerful. Let them think deeply about reasons why consumption is higher or lower at particular times and seek possible solutions. It is important that students feel empowered by the information and that they are true stakeholders in this situation.

It is helpful to look out for particularly interesting graphs which will engage the students. Graphs which display school holiday periods, particularly hot or cold weather times, sports carnival days etc may show some interesting results with which the students will engage. Out of hours electricity use is another interesting graph for students to keep examining over time. Focus on what is occurring when all the students have gone home, before teachers arrive etc.

Many simple calculations can be performed using the information obtained on WebGraphs. Students can calculate average energy use per student, average energy use in summer and winter and during school holiday periods.

Across the school community

It is important that WebGraphs is seen as a tool to inform and engage the entire school community in the sustainable use of electricity. Use the information obtained from WebGraphs to keep others informed. Potential audiences are students in other classes, teachers across the school, key staff such as office and support staff. The more information that people within your school have about your electricity use, the better they will be able to make informed decisions to reduce use and be more sustainable.

Staff notifications
Schools could publish the information about their energy use via a staff bulletin on a daily or weekly basis. This could be hard or soft format.

Day	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Consumption kWh	1240	1396	1402	1360	1261	216	215
CO2 emissions (tonnes)	1.2	1.4	1.4	1.3	1.2	0.2	0.2

Student morning messages
Keep the school students body informed and engaged with energy saving initiatives by publishing information in the morning announcements or messages. These may contain an electricity consumption report from the previous day/week/month and how this compares with the previous period of time.

> ## TODAY is Waratah Earth Hour!
> - **Please** switch off all lights throughout the school between 9am and 10.10am (Period 1) to raise awareness of the need to use resources more sustainably and slow the rate of global warming!
> - Open the windows and let the sunshine and fresh air in!
> - The amount of energy saved in this exercise will be measured using Webgraphs and published for all to see.

School Assemblies
Announcements, performances or information provided at school assemblies are a great way of spreading the message about energy saving initiatives in your school and the success of such measures. Students could present information on the assembly each week about electricity use and how this compares with a set target or previous period of time.

Encouraging behaviour change
Use Webgraphs to inform the entire school community about electricity consumption at your school. By informing others of the current situation they will hopefully see a need for

changes in behaviour to reduce electricity consumption. Encourage behaviour change (turn off lights and put up the blinds) and measure the success of such changes using WebGraphs.

Special events

Many schools hold special events throughout the year with the aim of raising awareness about sustainable energy use and reducing electricity consumption (Earth Hour and blackout days). Using WebGraphs, you can measure the success of such events in reducing electricity and then report back to the school the savings made.
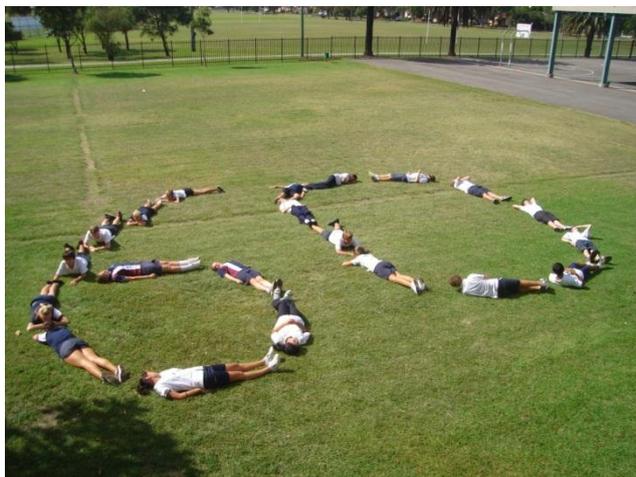
Wider Community

Use information from WebGraphs to inform the wider school community about electricity use in your school and the success of initiatives which are implemented across the school.

P&C Meetings

Presentations can be made at P&C or School Council meetings to describe the current situation regarding school power use and measures being introduced to reduce this figure. Students or key staff members could present at such meetings.

Newsletter Items

Make reports on the school electricity consumption (and generation) a regular part of your school newsletter. Include a Webgraph showing the consumption over the last month or recent period. Photos of students using Webgraphs are a clear way of describing it as a learning and engagement tool in the school. Describe what your school is doing to drive down electricity use and report on the success of such measures using WebGraphs.

TV screen in school entry foyer

Does your school have a TV screen in the entry foyer showing significant events? Why not include a recent WebGraph to illustrate what is occurring along with current electricity reduction targets. This presents a very positive message to school visitors of students actively engaged in learning and taking active participation in global issues.

School sign

Use the changeable school sign to inform the community of significant energy sustainability events and the success of such events using the information obtained from WebGraphs. This is a real eye-catcher for passing motorists.

Engage the media

The local media is very useful in promoting the initiatives which your school is undertaking to reduce electricity consumption. This is a great way to ensure your school receives good news stories which will reach the wider community. Photographic evidence and students engaging with WebGraphs in reporting the success of initiatives is a very powerful image to present to the community.

Post news

Students are on a no-power trip
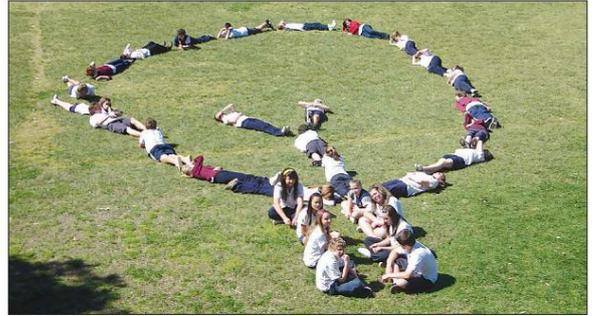
LET THERE BE LIGHT: Callaghan College students form a lightbulb.

WebGraphs on display in office foyer for visiting school community.

Chapter 5: Initiating change as a result of investigating using WebGraphs

Use WebGraphs to highlight areas of concern and investigation

The power of WebGraphs is the speed of which you are able to obtain information. Traditionally schools have relied upon electricity bills to provide information regarding their electricity consumption. Often these bills arrive some three months after the actual consumption period. By the time the bill arrives, the school has no idea why so much power was consumed. The bill simply arrived and was paid.
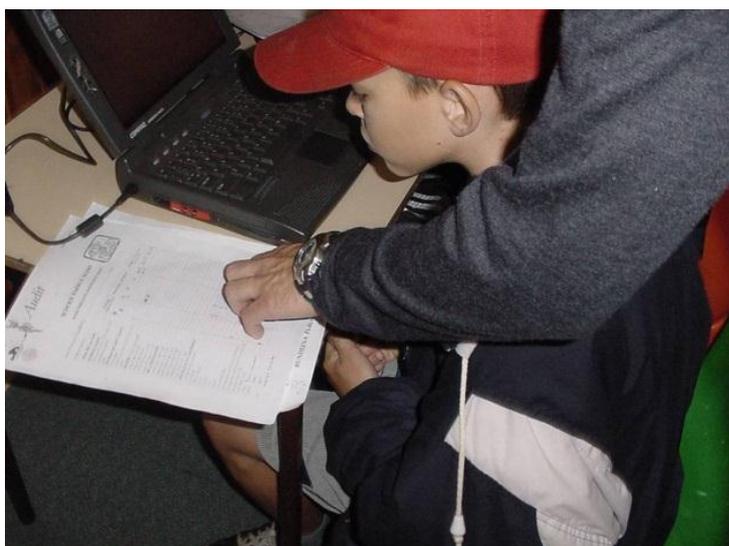
With such current information, schools are now in a position to make changes and reduce their electricity consumption. When changes are made, the school can measure the success of initiatives using WebGraphs rather than waiting for the next power bill to arrive.

❖ **The important point to note here is that all stakeholders in the school are engaged in the process.**

What types of information could WebGraphs uncover?

Schools could use data by analysing WebGraphs to determine why there are electricity spikes on certain days or at certain times of the day. When days or times of high electricity consumption are discovered, questions need to be asked such as:

- **What were the weather conditions on a day where there was an electricity consumption spike?** Information from the Bureau of Meteorology can assist with this process.
- Look for times of the day where power spikes occur. **Do these happen just prior to break times?**
- **Does the power spike when the cleaners arrive early in the morning?** Sometimes cleaners switch all the lights and air conditioners on when they arrive at school in the morning. How could this situation be managed?
- **Is there a rise or fall in electricity consumption at break times?** Investigate the reasons for this.
- **Does the school continue to use electricity when students have left for the day?** What could be causing this?

- **When the school is closed for weekends and holidays does electricity continue to be used?** What could be causing this?
- WebGraphs can even alert the school to a problem with their electricity connection or metering. You may be being charged for an adjacent site's use.

Using Webgraphs, a school can perform simple experiments over a short time period and measure the success 24 hours later. This method can be used in an attempt to discover where or what is using power unnecessarily.

What could be done?

- *Switch off for an hour*
  A simple test that schools can perform quickly and easily. Switch off all the lights for an hour (or another time period). Measure the change and report back to the school community.
- *Switch off for a day*. Schools might like to switch off other appliances at different times and measure the difference. Report back.
- *Lights off in all classrooms at the end of lesson.* Following a simple 'lights off' test, schools might like to adopt a lights off at the end of every lesson based on the data gathered from the test phase. Students could be assigned roles as 'light monitors' or 'carbon cops' to encourage compliant behaviour. They are usually very excited about dobbing in teachers or classes not following the expected behaviour.
- *Day in the dark*. Another way to measure the difference this makes to the school's overall power consumption using WebGraphs. Be mindful of the need to retain appropriate light for work and safety purposes.
- *Pull up blinds and use natural light.* Use this as a simple test case on a nice sunny day where teachers and students are encouraged to use natural light over artificial lighting for a day and then measure the difference and report back to the school community.
- *Dress for the weather campaign.* Many schools suffer from excessive power consumption because people are not dressing according to the weather. Start up a campaign where students, teachers and other school staff are encouraged to dress in clothing suitable for the weather rather than automatically switching on heating or cooling devices in the school. Measure the difference using WebGraphs and report your findings.
- *Cool and warm rooms within acceptable range (use a thermometer).* If heating or cooling is used around the school start up a campaign to ensure that rooms are only

heated or cooled within an acceptable range of temperatures (recommended 21°C - 23°C all year). Purchase simple thermometers for classrooms which can have the range of heating and cooling temperatures added to them and encourage compliance. Determine a test period and compare data from Webgraphs before and after the campaign. Communicate your findings to the school community.

- ❖ **Whatever the initiative or experiment – measure it and report to all stakeholders.**
- ❖ **Give them ownership over changes taking place.**

Change over time

Webgraphs allows a school to gather and monitor change in electricity over longer periods of time. Schools can simply bring up the data live, however, it is quite helpful to export graphs and save these in a location for future reference.

Continuous Improvement

A challenge for schools embarking on an electricity reduction campaign is to maintain momentum. There may be lots of enthusiasm initially to reduce power use but this can often wane after a short time.

- Use WebGraphs to set clear power reduction targets and to keep the school community informed of how they are tracking.
- When targets or milestones are achieved make sure there is a big fuss made about it before setting new targets.
- Success in reducing power consumption could be a good news story for the local media, school newsletter or school sign.
- Determine how much carbon dioxide was saved as a result of the energy reduction achievements.
- Schools could even calculate the amount of money saved through the reduction in power consumed.
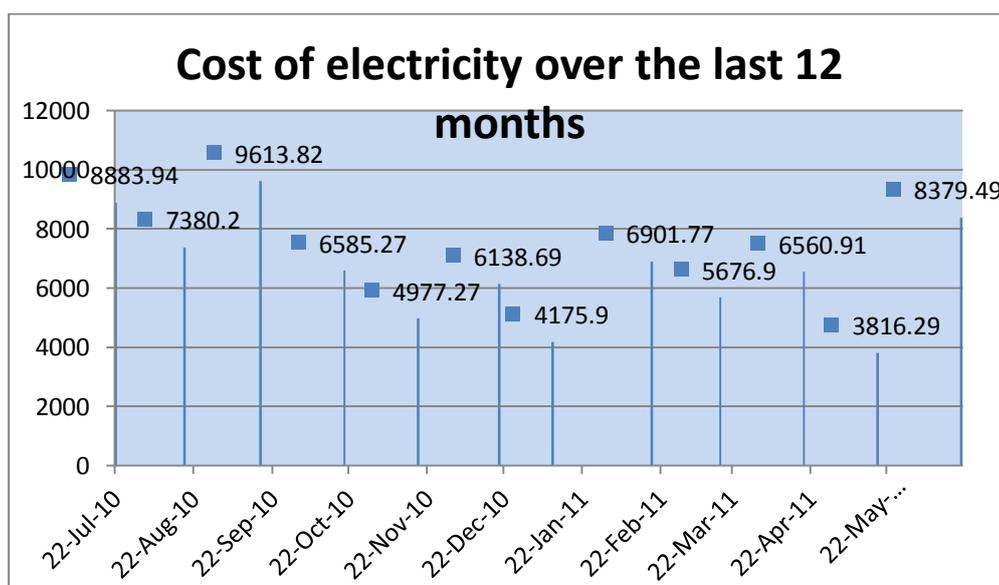
This graph shows how much money the school spends per month on electricity.   (Graph by Tiana R.)