

Understanding Solar Feed-in Credits

The installation of solar panels helps schools to reduce their energy bills and, in some cases, receive credit from electricity retailers for surplus power fed back into the electricity grid. It must be understood, however, that the scale of benefits will be different for each school.

This document is intended to provide schools with a clear understanding as to when surplus energy is generated and whether or not schools are likely to receive credit for surplus energy fed into the grid.

Feed-in Tariffs

Feed-in tariffs reimburse you for any surplus power your solar electricity system feeds back into the electricity grid that supplies energy to the state. This applies only at times when your solar panels create more energy than you are using.

Feed-in tariffs are offered to you by your energy retailer, which is Power Direct for schools using less than 160MWh annually, and Red Energy for schools using greater than 160MWh annually. The appointment of energy retailers is negotiated via the Victorian Government State Purchasing Contract by which all Victorian government schools are bound.

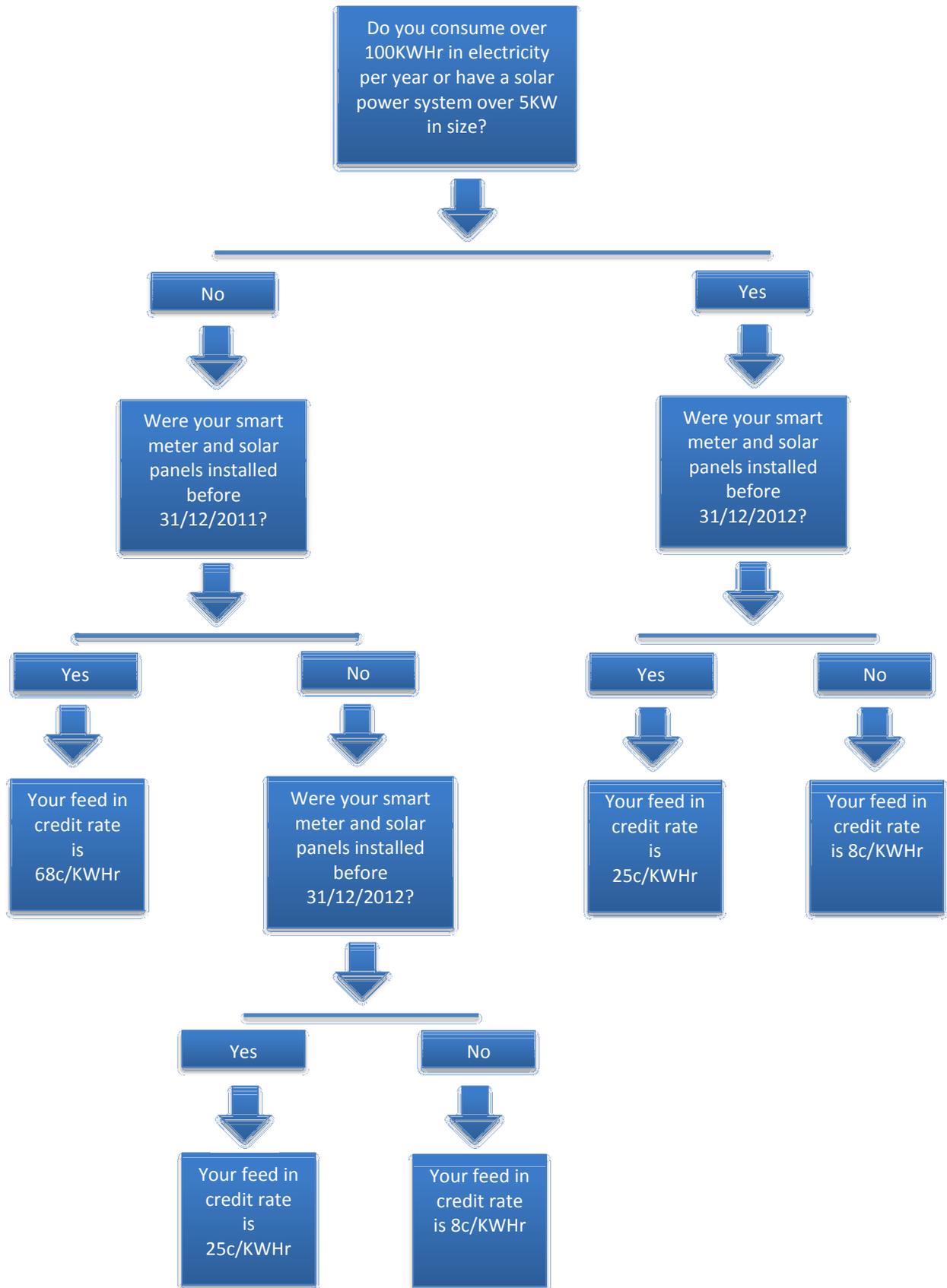
Before you can receive feed-in tariffs, your meter must be programmed to feed electricity into the grid. Your energy retailer will be able to confirm whether or not it has been programmed for this.

Determining What Feed In Tariff You Are On

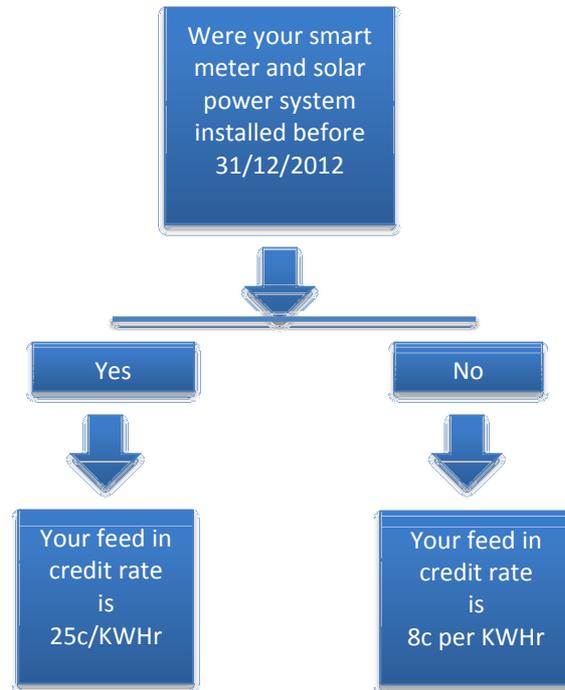
The tariff rate your school will receive for surplus power depends on your energy retailer, your annual electricity consumption, the size of your solar system and the date your solar system was installed.

The following flow charts have been created to advise schools which tariff they are likely to receive for surplus solar power fed back into the electricity grid.

Schools Paying Electricity Bill to Powerdirect



Schools Paying Electricity Bill to Red Energy



Understanding When Solar Feed-In Credits Are Earned

Will I receive credit with Feed-in-Tariffs?

Generally, schools will not produce surplus energy during the school day. Schools are also limited in their ability to create surplus energy during weekends and holidays depending on their base load and the capacity of the solar panels (in kW). The base load is the energy used for basics like security lighting, water heating, refrigeration, appliance standby, computers left on, etc. It is the minimum energy load that a school consumes and can range from less than a kilowatt for small schools to about 20kW for bigger schools. For a better understanding of the base load, see Figure 1.

The typical school energy usage pattern

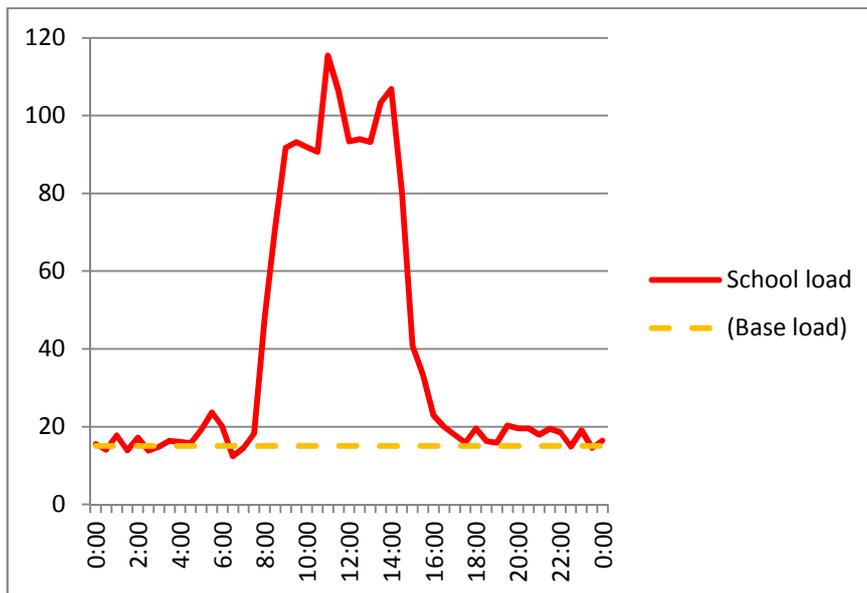


Figure 1. Typical school electricity consumption profile

The peaks above the base load in the middle of the day are due to typical school day operations including lighting, heating, air conditioning and computer usage. Everything below the dotted line makes up the base load. If a school is diligent about turning off appliances such as air conditioners, hot water heaters, computers, lighting and boiling hot water units it can significantly reduce this base load figure. For a smaller school shutting such appliances down could reduce the base load by an amount that would allow it to feed electricity into the grid from their solar power system.

Small Schools

Typical school day for small school

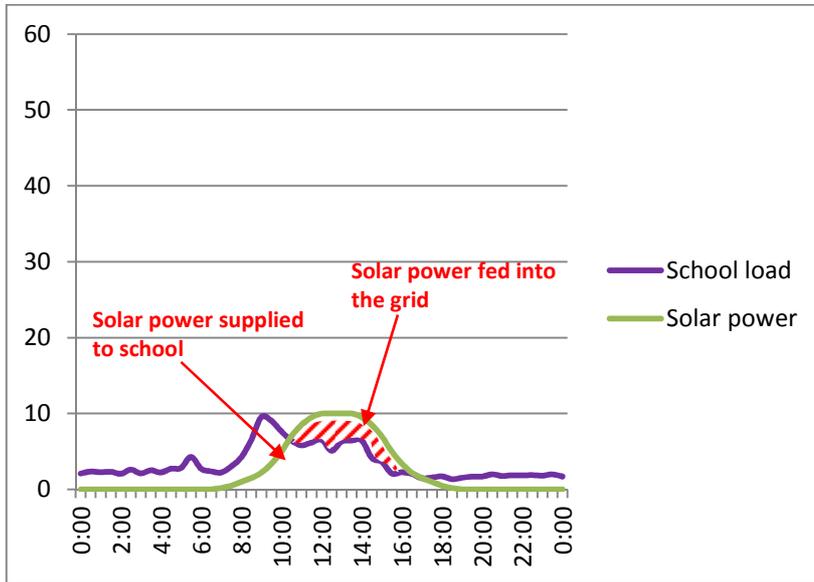


Figure 2. Typical small school electricity consumption and solar power production profile

The solar power might exceed the school usage for part of the day, when the solar radiation is strongest; therefore there is a small amount of power fed into the grid resulting in the school receiving a credit for this electricity, which will appear as a separate line item on its electricity bill. In this case the daily purchase of grid electricity is also reduced significantly (~50%) by the amount of solar electricity created on-site that is used throughout the school.

Typical holiday or weekend for small school

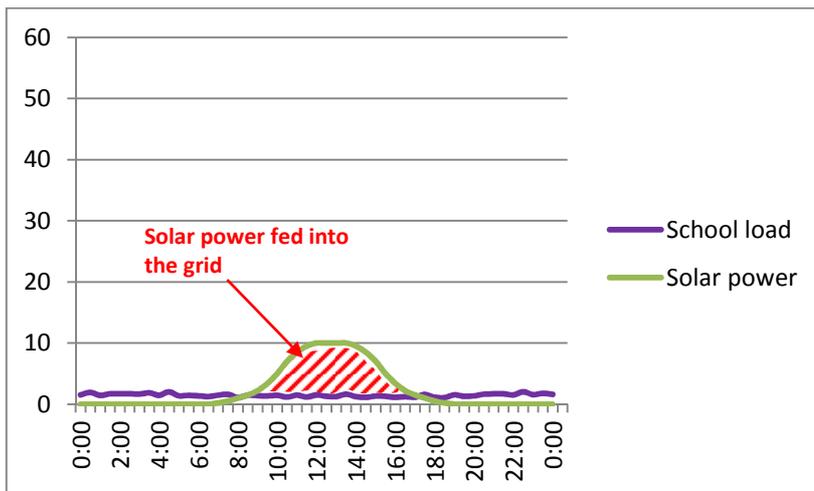


Figure 3. Typical holiday or weekend electricity consumption and solar power production profile

The solar power generated exceeds the school's usage significantly for most daylight hours, and there will be significant credit for power fed into the grid. In this case the daily purchase of grid electricity is also reduced significantly (~30%) due to the solar electricity being created on-site.

Medium-Sized Schools

Typical school day for medium-size school

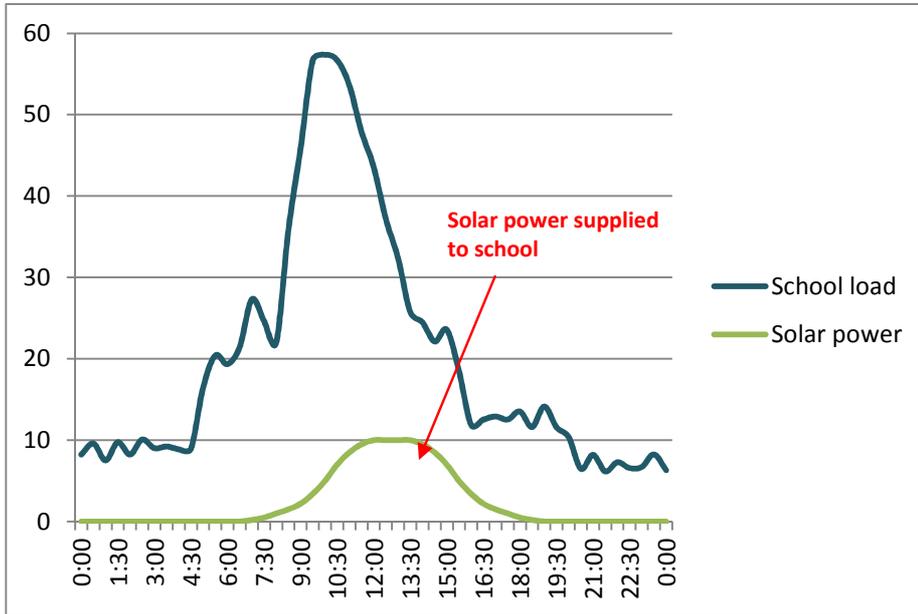


Figure 4. Typical electricity consumption profile for a medium sized school

The solar power does not exceed the school’s usage, therefore there is no power fed into the grid and no credit. In this case however, the daily purchase of grid electricity is still reduced (~10%) due to the solar electricity being created on-site.

Typical holiday or weekend for medium-size school

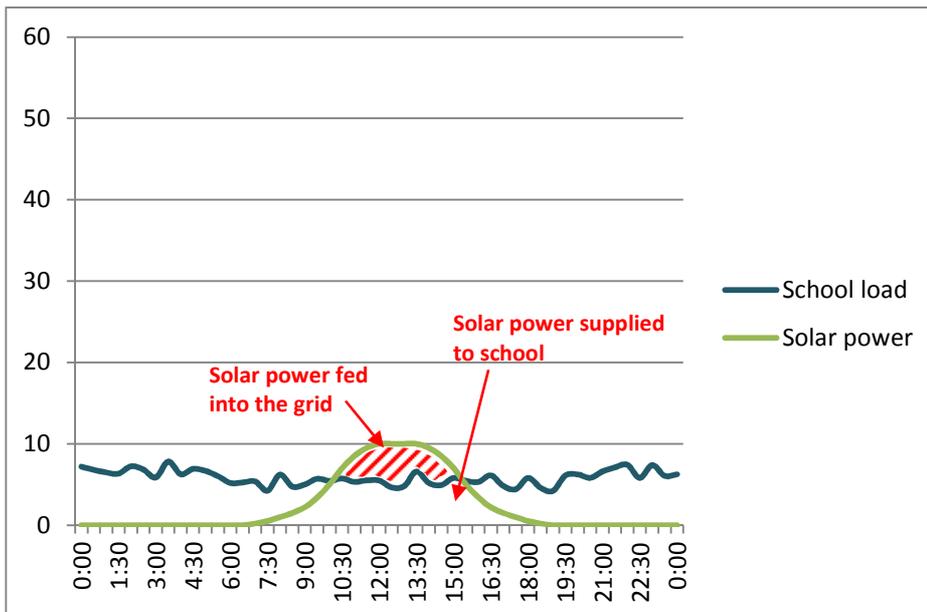


Figure 5. Typical electricity consumption and solar power production profile for a medium sized school

The solar power exceeds the school’s usage for a few hours and will provide some credit for power fed into the grid. In this case the electricity drawn from the grid is also reduced significantly (25-30%) due to the solar electricity being created on-site.

Large Schools

Typical school day for large school

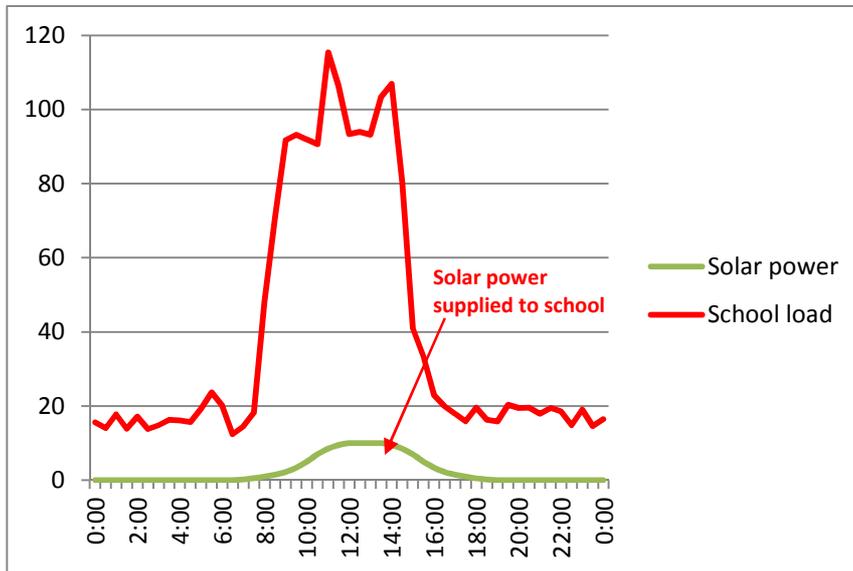


Figure 6. Typical electricity consumption profile for a large school

The solar power produced does not exceed the school's usage, therefore there is no power fed into the grid and no credit. However, the daily purchase of grid electricity is slightly reduced (<5% in this case) due to the solar electricity being created on-site.

Typical holiday or weekend for large school

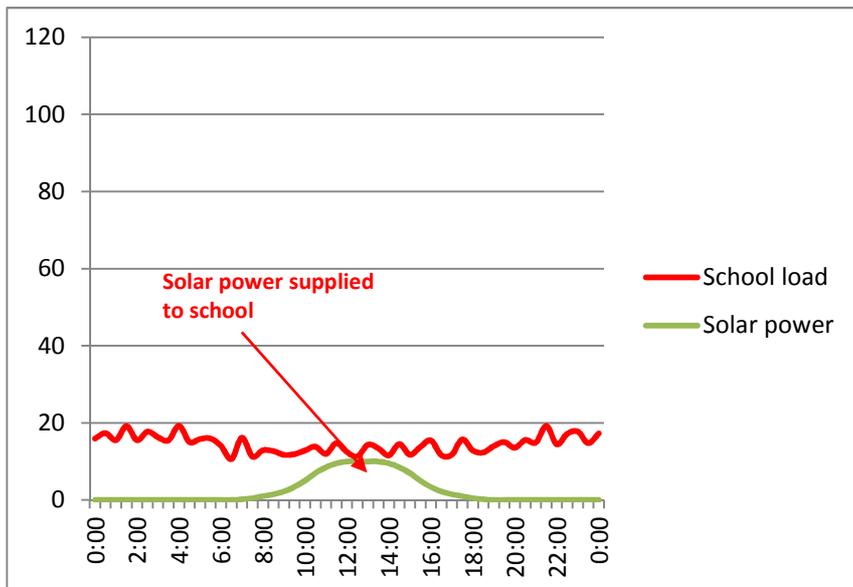


Figure 7. Typical solar electricity consumption and power production for a large school

Because of the high base load, solar power does not exceed the school's usage, therefore there is no power fed into the grid and no financial credits, even on holidays. However, the daily purchase of grid electricity is slightly reduced (~20% in this case) due to the solar electricity being created on-site.

Factors Impacting The Performance Of Your Solar Power System

Many different factors can impact the performance of your solar power system. If you feel the performance of your system is lacking, investigate and address the following:

- Positioning of the solar panels: Panels perform best when facing north. When facing east or west they do not produce as much power.
- Other work conducted to the roof area: Is there a chance cabling could have been accidentally cut or damaged?
- Shade coverage: Are other buildings/trees causing shade coverage to any of the panels? A small amount of shade can dramatically reduce performance.
- Monitoring devices: If you have a Data Collection, Storage and Visualisation System (which monitors via a website how much power the panels are producing), have you checked this to ensure the system is working on a daily basis?
- Inflated calculations: The 'reimbursement' or \$ amount displayed on some data monitoring systems may not be 100% accurate as it may not take into account the discounted price that schools pay for electricity via the State Purchasing Contract.
- Additional power use: Have there been uncharacteristic causes for additional power use (e.g. extra maintenance to school, out of hours additional use of gymnasium)?

If the above options have been investigated and you still believe your system is not working as effectively as possible, contact your original installer or local electrician to further investigate. Alternatively, contact the [Clean Energy Council](#) for a list of accredited installers.

If there are safety concerns surrounding your solar power system, contact [Energy Safe Victoria](#) for a list of accredited electricians.

Likely Outcomes From Installation Of Solar Panels

*Table assumes 20-30% base load consumption and 200 school days/ annum

**The table assumes that the potential average output of a 1kW Solar PV system is approximately 1700kWh/annum.

***The table is relevant for a single electricity account. For schools with more than one electricity account, the table can be applied to the account that solar is connected to.

Example Solar PV Capacity	Annual School Electricity Consumption (kWh/annum)					
	<20,000	20,000-60,000	60,000-100,000	100,000-140,000	140,000-180,000	180,000+
2kW	The school is likely to create a small amount of surplus power on weekends and holidays, but not much during the school day. Electricity bills should decrease noticeably due to reduced consumption..	The school should see a small drop in energy bills, and possibly even feed a small amount electricity into the grid (depending on the base load of the school).	The school could see a small drop in energy bills, but won't receive any credit for surplus power fed into the grid due to its high base load energy consumption.	The school could see a small drop in energy bills, but this saving could be absorbed by changes in running the school – such as an increase in school use outside hours or additional ITC equipment.	It is unlikely that the school will see a noticeable drop in energy bills. Savings made would probably be absorbed by changes in running the school – such as an increase in school use outside hours or additional ITC equipment.	It is unlikely that the school will see a noticeable drop in energy bills. Savings made would probably be absorbed by changes in running the school – such as an increase in school use outside hours or additional ITC equipment.
5kW	The school should create a good amount of surplus power on weekends and holidays, and possibly some on school days. The school should see a significant impact to the energy bill due to the surplus power.	The school is likely to create a reasonable amount of surplus power on weekends and holidays, but not much during the school day. Electricity bills will decrease noticeably due to reduced consumption and credit for surplus power.	There should be a noticeable drop in the school's energy bills, but it is unlikely that the school will produce any feed in credit for surplus energy.	The school will probably not receive any feed-in credit due to a high base load, but should see a drop in energy bills.	The school is unlikely to receive any feed-in credit due to a high base load, but should see a modest drop in energy bills.	The school should see a small drop in power bills, but savings could still be absorbed by changes in the running of the school – such as an increase in school use outside hours or additional ITC equipment.
10kW	The school should create a considerable amount of surplus power on weekends, holidays and often on school days. The solar panels could even produce as much energy as the school uses, and there should be a big impact on the energy bill	The school should create a considerable amount of surplus power on weekends and holidays, and possibly some on school days. The school should see a significant impact on the energy bill.	The school should produce a good amount of surplus power on weekends and holidays, but not much if any during the school day. The school's electricity bills will decrease noticeably with reduced consumption.	The school will reduce purchased energy consumption and bills noticeably, and should feed a small amount of electricity into the grid on holidays and weekends.	The school will probably not receive any feed-in credit due to a high base load, but should see a noticeable drop in energy bills.	The school is unlikely to receive any feed-in credit due to a high base load, but should see a minor drop in energy bills.

Example Solar PV Capacity	Annual School Electricity Consumption (kWh/annum)					
	<20,000	20,000-60,000	60,000-100,000	100,000-140,000	140,000-180,000	180,000+
15KW	The school should create a significant amount of surplus power on weekends, holidays and often on school days if appliances and computers are turned off outside school hours. There should be a very significant impact on the electricity bill	The school should export a significant amount of power to the grid on weekends and holidays. The school should also see a very noticeable drop in electricity consumption on their bill.	The school should produce enough power to have a significant impact on the electricity bill. If all computers and appliances that can be are turned off after hours then the school may be able to export some power to the grid	The school will see a reduction in electricity bills but only export power to the grid if they are exceptional at turning off computers and appliances after school hours	The school will notice a reduction in electricity bills but is unlikely to export any power to the grid	The school will notice a slight drop in electricity bills but will not export any power to the grid as the school has too many servers and appliances running after hours
20KW	The school should produce a very significant amount of surplus power on weekends and holidays if appliances and computers are turned off outside school hours. There should be a very significant impact on the electricity bill with the school being able to export some power during school hours.	The school should generate a large amount of surplus power on weekends and holidays, and export a significant amount of power during school hours. The school should also see a very significant reduction in their electricity bill.	The school electricity bill will reduce dramatically. If all computers and appliances that can be are turned off after hours then the school will be able to export a reasonable amount power to the grid	The school will see quite a significant reduction in electricity bills but only export power to the grid if they are very adept at turning off computers and appliances after school hours	The school will see a sizable reduction in their electricity bill and could possibly export some power to the grid if their computers, electric hot water services and any air conditioners are turned off after school hours	The school will certainly notice a drop in their electricity bills but are unlikely to export any power to the grid as the school has too many servers and appliances running after hours

Contacts

Billing and other invoicing or supply matters should first be raised with the appropriate retailer. These are:

- **Red Energy** – for all sites with usage of >160MWh pa (megawatt hours per annum)

Phone 03 9425 0590 or email duff.brett.a@edumail.vic.gov.au.

- **Powerdirect** – for all sites with usage of <160MWh pa

Phone 03 8805 6699 6823 or email info@powerdirect.com.au.

For issues surrounding mandated electricity State Purchase Contracts, which cover all electricity supplied to schools, contact your regional office facilities manager or email procurement@edumail.vic.gov.au.