

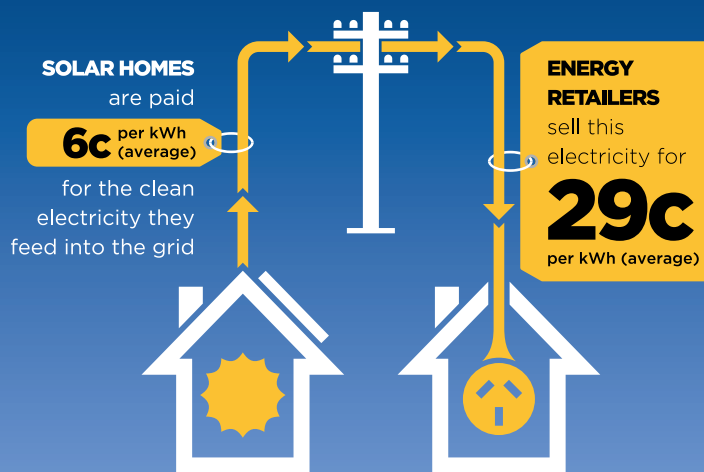
WHY IS SOLAR POWER UNDERVALUED IN AUSTRALIA?

Solar PV owners typically receive around 6c/kWh for their surplus electricity that goes back into the grid. This is then on-sold to neighbours—sometimes travelling only a few metres down the poles and wires—for 29c on average.

Why is there such a big difference?

The price of rooftop solar is determined by state-based regulators who have a very narrow view of what solar electricity is worth, based mainly on the average wholesale value of electricity.

The rules that determine electricity prices are based on an old, centralised model of electricity flowing one way from large coal-fired generators to passive consumers. But with 1.5 million homes and businesses now equipped with solar generators on their rooftops and battery storage about to take off, the future of “distributed energy” is now.



You get 6c for your solar power but the big energy retailers on-sell this for nearly five times that amount.

OUR RESEARCH SUGGESTS EXPORTED SOLAR POWER IS WORTH 10-18c per kWh when all the network, environmental and health benefits are taken into account.



SolarCitizens



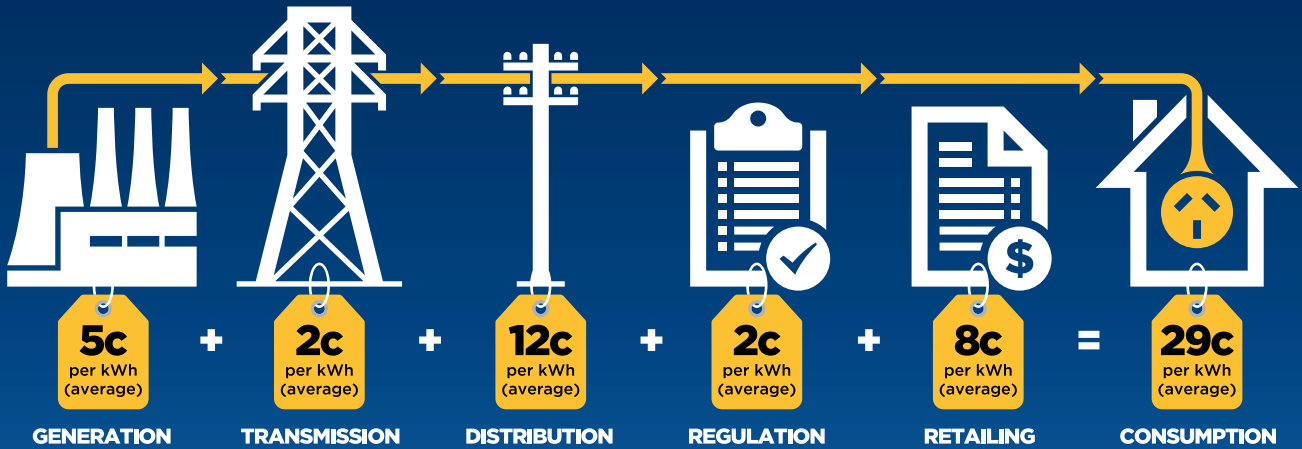
Total Environment Centre
for the future



TASMANIAN RENEWABLE ENERGY ALLIANCE

YOUR ELECTRICITY BILL UNPACKED

Your electricity bill is made up of costs allocated to different parts of the electricity supply system even though you won't see these items on your bill.



The electricity generation costs are around 5c to 6c which is similar to the price set for exported solar.

But solar electricity is often produced at times when electricity is most expensive—such as on hot afternoons when air-conditioners increase demand on the electricity network. The current price for rooftop solar paid by retailers doesn't recognise this.

Then there are the costs for the transmission infrastructure, (the large, 'coathanger' high voltage lines) and distribution (the poles and wires along your street). Rooftop solar doesn't actually travel along transmission lines at all. And it uses far less of the distribution infrastructure. So electricity from rooftop solar shouldn't be charged transmission costs

and should pay less for use of the distribution network. What's more, around 8% of the electricity that travels from large coal and gas fired plants to homes get lost along the way, whereas "distributed" rooftop solar experiences a tiny fraction of these losses.

On top of this, solar is much healthier, cleaner and safer than other forms of grid energy like coal, gas or diesel.

The rules that govern electricity prices were designed to finance the investments of the past, not to build the energy system of the future. But the electricity sector is changing and our rules need to change with it.

A crucial part of this reform is to make sure that the millions of Australians who have invested in solar power get a fair price for the clean energy they feed into the grid.

BECAUSE ROOFTOP SOLAR HAS NO FUEL COSTS, DOESN'T WASTE ENERGY TRAVELLING HUNDREDS OF KILOMETRES AND DOESN'T REQUIRE A LARGE EXPENSIVE GRID IT'S ACTUALLY A MUCH CHEAPER WAY TO GENERATE AND TRADE ELECTRICITY.

A fair price for solar will help create a **cheaper, healthier and more robust electricity system that will benefit all consumers**, whether they are solar owners or not.



WHAT IS ROOFTOP SOLAR REALLY WORTH?

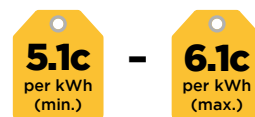
Wholesale energy costs



Wholesale price of electricity

Energy generation is often the only value recognised in setting a value for rooftop solar.

Our calculation of value range



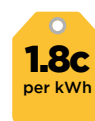
Network savings



Avoided transmission costs

Rooftop solar does not use the transmission network which is 6.3% of energy costs.

Our calculation of value



Reduced distribution costs

Rooftop solar could avoid 0-50% of distribution costs.

Our calculation of value range



Benefits to society and the environment



Reduced CO₂ emissions

Based on a carbon price of \$24-\$31/tonne.

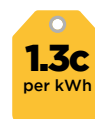
Our calculation of value range



Health benefits

When rooftop solar displaces coal fired electricity the health benefits add up.

Our calculation of value



TOTAL VALUE



Shared benefits



The benefits local solar brings to the electricity system could be shared between solar owners and all other electricity consumers.

AN EXPLANATION OF THE BENEFITS OF ROOFTOP SOLAR

Wholesale price of electricity

Regulators generally use an average wholesale price for energy when calculating solar feed-in tariffs (FITs). Arguably, solar exports are worth more than the average price because (except in Tasmania) they are fed in during times when wholesale energy prices are higher than average. This is in line with the nationally agreed principle that FITs should take into account "the time of day during which energy is exported."

In Victoria, from July 2017 the solar FIT will vary based on the time of day in three bands (peak/shoulder/off-peak), as well as an additional 'critical peak' payment at times of very high wholesale prices.

In addition to the avoided cost of purchasing wholesale electricity, solar PV can play a role in pushing down the wholesale price of electricity for all consumers. This is called the 'merit order effect' and it can be significant when demand and wholesale prices are high.

Avoided transmission costs

Retailers pass charges for the use of the transmission network on to consumers irrespective of whether the energy is sourced via the transmission networks or locally from solar photovoltaic (PV) systems. Customers pay for a service that is not provided (use of the transmission network for the proportion of their energy that comes from distributed generation). Transmission charges should only apply to the electricity actually carried on the transmission network. These savings should be shared with solar owners.

Reduced distribution costs

Distributed generation can place less strain on the distribution network and thereby reduce costs in at least two ways. Firstly, exported energy from solar PV is typically used close to the point of export and therefore makes significantly less use of the 'poles and wires.' Secondly, a significant proportion of the cost of the distribution network is the transformers which convert higher voltages down to 230V. Solar inverters have this capability built in and export power at 230V. The value of solar PV in reducing costs for network operators is highly dependent on time and location, as well as the capacity and asset life cycle of local distribution infrastructure. Our maximum value saving assumes local solar avoids using the high voltage and subtransmission parts of the distribution network, which account for over 50% of costs.

Reduced CO₂ emissions

Each kWh of solar PV that displaces coal-fired electricity avoids carbon pollution worth a minimum of 2.4c to 3.1c using current carbon pricing estimates. Carbon pricing that met the global objective of keeping global warming well below 2°C would translate to a much higher value.

Health benefits

Based on research by the Australian Academy of Technological Sciences and Engineering, each kWh of solar PV that displaces coal fired electricity contributes 1.3c in reduced health costs.

But wait...there are even more benefits!

Distributed renewable energy generation, including solar PV, has many benefits on top of those outlined above. These are real economic advantages even though they cannot be readily translated to a c/kWh value:

- **Direct jobs:** Research by Ernst & Young for the Climate Council has shown that generating 50% of our electricity from renewables by 2030 would lead to over 28,000 new jobs and more than 50% more employment than a business as usual scenario.
- **Industry development:** Beyond the direct jobs in solar installation, building Australia's capacity in emerging technologies such as battery storage, smart grids and demand management will create the jobs of the future as the world moves to a decentralised and decarbonised energy system.
- **Energy security:** An electricity system that is based on distributed local generation from a variety of renewable sources combined with local storage will not only reduce costs, it will make for a more robust and secure system that is less prone to failures caused by centralised infrastructure.
- **Price stability:** Renewable energy technologies have high capital costs, but very low and predictable running costs and the fuel is free of charge! This contributes to long term price stability compared with fossil fuel based alternatives.
- **Energy literacy:** Installation of solar PV gives homeowners a strong interest and motivation to better understand and manage their energy consumption. This will be an important driver of the uptake of new technologies such as local storage, demand management and integration of electric vehicle charging which can ultimately lead to a more flexible and economical electricity system.

ALL CONSUMERS WILL BENEFIT FROM A MOVE TO LOCAL ENERGY PRODUCTION

All consumers should benefit from moving to a modern electricity system which is cleaner and more robust. Prices will be reduced for all consumers because there will be less need for expensive networks and renewable energy has no fuel costs.

Policies and innovative new arrangements such as local energy trading are necessary to ensure the benefits are shared fairly. Sharing distribution cost savings with other consumers is one suggested way of doing this.

Holding back new technologies and relying on existing centralised networks and coal and gas generators will not benefit consumers who are struggling with the cost of living.

Solar owners have already invested over \$8 billion of their own money to build Australia's renewable energy capacity.

WHAT NEEDS TO CHANGE?

- State Governments need to set minimum fair feed-in rates for rooftop solar.
- The price paid to rooftop solar owners should be linked to the wholesale market. Solar is actually produced at peak times during hot days when the sun is shining and air-conditioners raise demand so it is inherently more valuable.
- Rules for network charges should be updated to reflect the fact that rooftop solar makes much less use of network infrastructure. At a minimum, solar should not be charged transmission costs.
- The retail market needs to be opened up so that rooftop solar owners can sell, share or gift their electricity on the grid with appropriate reflective cost of the grid applying.
- The environmental and health benefits of rooftop solar and other renewable sources should be recognised via the feed-in tariff or other mechanisms such as a carbon price on polluting generation.

HELP CREATE A FAIR PRICE FOR SOLAR

For more information and to add your voice visit our website at solarcitizens.org.au/fairprice



SolarCitizens



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This project was funded by Energy Consumers Australia as part of its grants process for consumer advocacy projects and research projects for the benefit of consumers of electricity and natural gas. The views expressed in this document do not necessarily reflect the views of Energy Consumers Australia.