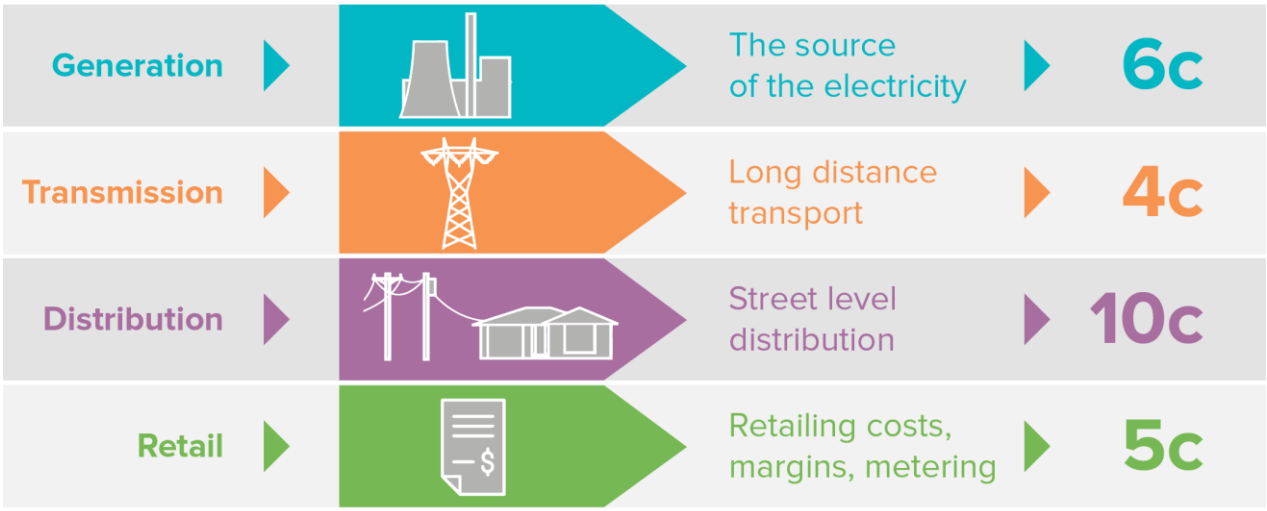
Mode Electrical 40 kW installation, UTas Inveresk

WHY IS SOLAR POWER UNDERVALUED IN TASMANIA?

Solar PV owners receive only 6c/kWh when they export their surplus electricity back into the grid. This is then on-sold to neighbours - travelling perhaps only a few metres down the poles and wires - at 15-25c /kWh. Why is solar electricity valued at a quarter of other grid electricity?

To understand this we need to look closely at the different components of electricity costs.

Your electricity bill is made up of four main components:



TasNetworks percentage component of typical residential bill applied to 25c.

As can be seen, the generation costs are around 6c which is the same as the price for exported solar.

Then there are the costs for transmission and distribution.

The thing is exported solar doesn't use transmission lines at all. And it uses far less of the distribution infrastructure. On top of this, solar is much healthier, cleaner and safer than other forms of grid energy like coal, gas or diesel.

Electricity prices are set by national rules that are designed for a centralised system of big generators and passive consumers. These rules are 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.

Electricity from rooftop solar shouldn't be charged transmission costs at all and should pay less for use of the distribution network. If these costs were not imposed, solar owners would automatically receive an extra 7 or 8c for their electricity making solar much more attractive and in the process providing cheaper electricity for all consumers.

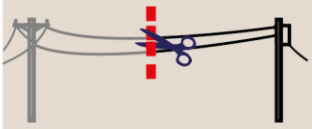
The Tasmanian Economic Regulator has recommended that solar owners receive 6.6c/kWh for exported electricity (the feed-in tariff or FiT) for the next financial year.

The Regulator has based the FiT only on those components that are direct savings to retailers under the current electricity rules, even though the stated aim of the national electricity market is to meet the "long term interests of consumers of electricity".

Many of the benefits of rooftop solar PV (employment creation, energy security, environmental benefits) are seen as 'external' to the electricity system. The focus on short term and visible costs leads to all forms of new renewable energy generation being undervalued.

Political leadership is necessary to set a FiT rate which returns Tasmania to a 100% renewable energy supply and builds the energy system of the future.

What is a fair price for solar?

	Tas Regulator	Our estimate of value		Assumptions and notes
	c/kWh	min c/kWh	max c/kWh	
Savings to retailers				
 Wholesale price of electricity	6.2	6	8	These are the only benefits reconised by the Economic Regulator.
Avoided network losses	0.3	0.1	0.1	
NEM fees	0.1	0.1	0.1	
Benefits to the electricity system				
 Avoided transmission costs	0.0	3.7	3.7	Transmission costs contribute 15% to a typical residential bill. 15% of 25c=3.7c
 Reduced distribution costs	0.0	4	6	Distribution costs contribute 41% to a typical residential bill. Half of this cost equals 5c.
Benefits to society and the environment				
 Reduced CO_2 emissions	0	2.4	3.1	Based on a carbon price of $24-$31/tonne. A significantly higher price may be needed to meet 1.5°C goal.
 Health benefits	0	1.3	1.3	From solar PV that displaces coal fired electricity.
TOTAL	**6.6**	**17.6**	**22.3**	

Other benefits

Distributed renewable energy generation, including solar PV, has many additional advantages. These are real economic advantages for Tasmania even though they cannot be readily translated to a c/kWh value:

- **Direct jobs:** At its peak the Tasmanian solar industry created the equivalent of around 450 full time jobs. Since the reduction in the FiT around half these jobs have been lost. Increasing the rate of installation of solar in Tasmania back to its previous level would generate approximately 200 additional full time jobs. These highly skilled jobs are located throughout the state. Many more jobs would be created with a more ambitious goal for solar.
- **Industry development**: Beyond the direct jobs in solar installation, building Tasmania'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**: Distributed PV contributes to diversity of supply and makes Tasmania's electricity system less dependent on rainfall, or single points of failure such as Basslink.
- **Price stability**: Renewable energy technologies have high capital costs, but very low and predictable running costs. This contributes to long term price stability compared with fossil fuel based alternatives.
- **Energy literacy**: Installation of solar PV gives homeowner 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 ultimately can lead to a more flexible and economical electricity system.

Notes on cost components

Wholesale price of electricity

The FiT is based on the regulated wholesale price of electricity, which in Tasmania is based on Victorian prices. It does not take into account either the current cost of generating from gas and diesel, or the long term likely costs of gas fired electricity and Victorian imports as dam levels are rebuilt. The cost of diesel generation is likely to be over 30c/kWh but solar owners are paid a small fraction of this.

Avoided network losses

Typically, 8% of centrally generated electricity is lost in the transmission and distribution networks. Distributed solar PV avoids almost all these losses because the energy is used in the immediate vicinity. We have used a lower figure than the Economic Regulator because we believe that no transmission costs and reduced distribution costs should be charged for solar PV.

Transmission costs

Retailers pass on to consumers charges for the use of the transmission network irrespective of whether the energy is sourced via the transmission networks or locally from solar PV. 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.

Distribution costs

There are at least two ways in which distributed generation makes less use of the distribution network and reduces its costs. 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'. Also 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.

Reduced CO_2 emissions

Each kWh of solar PV that displaces imported coal fired electricity creates a reduction in CO_2 emissions that is 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

The best available Australian research suggests that each kWh of solar PV that displaces coal fired electricity contributes 1.3c in reduced health costs. The health impacts of coal fired electricity are felt mainly on the mainland but this should not absolve Tasmania from the moral obligation to reduce these impacts when they arise from generating electricity imported into Tasmania.

I Want Energy installation, Risdon

Who will invest in the electricity system we need?

On average, Tasmania generates less electricity than it uses, with the balance being imported from Victoria. Additional on-island renewable generation is required to rebuild depleted dam levels and become 100% renewable. It is state government policy that new investment in electricity generation will be private, and Hydro Tasmania does not have the capital to invest in new generation. Solar owners cover the capital cost of their own installation which both feed energy back into the grid and reduces the need for imported or centrally generated electricity. Support for solar PV is one cost effective way of encouraging private investment in renewable energy.

Tasmanian solar owners have already invested well over $120m of their own money to build the state's renewable energy capacity.

Planning for future technology

New technologies including home energy storage, electric vehicles and home energy management systems will radically transform the way our energy network operates. In this scenario, distributed energy generation and storage will move from a passive system that feeds energy into the grid only when the sun shines, to an integral part of a robust system that matches supply and demand in the most cost effective way. We need innovative arrangements such as time based FiTs to provide incentives for these new technologies. But the Economic Regulator says it is too soon to assess these benefits and that the existing FiT arrangements should apply for the next three years.

Sending the wrong message

Throughout the National Electricity Market, tariffs (the way your electricity bill is calculated) are being changed. This is in large part a reaction to the over-investment in network infrastructure which massively increased electricity prices in the five years to 2013. The theory is that if tariffs are more 'cost reflective' consumers will be motivated to use the network more efficiently and costs will be constrained. The practical result is that networks want to increase fixed charges and charge customers for their peak demand, while reducing the c/kWh component of bills. Some networks have tried to introduce these changes just for solar owners. But higher fixed charges and lower consumption charges will discourage energy conservation and make solar PV less worthwhile. Ultimately these changes risk encouraging some customers to leave the grid entirely. This will drive up costs for remaining customers. Tariff structures need to encourage investment in solar and energy efficiency and reward energy fed back into the grid when it is most needed, not drive customers away.

Tariff structures need to encourage investment not drive customers away.

Find out more

For more information see the TREA submission Valuing Solar for Tasmania's Future, our article How much new renewable energy does Tasmania need and the Annotated Bibliography on FiT Methodology.

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