The SolShare technology explained - Residential

Allume

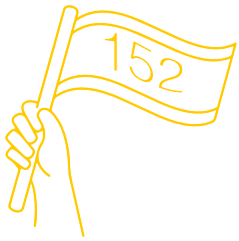
About Allume

Allume is an Australian company making solar accessible to multi-metered buildings. With electricity prices more than doubling in the past ten years, solar has become an increasingly compelling option to reduce power bills and carbon footprints. Millions of households and businesses now now enjoy the benefits of rooftop solar panels.

However, due to the technical and regulatory obstacles of multi-dwelling buildings, apartment residents have been left behind.

Allume has developed a unique distribution technology, called the SolShare, that shares solar electricity between residents in a multi-metered building. Delivering cheap clean power to residents.

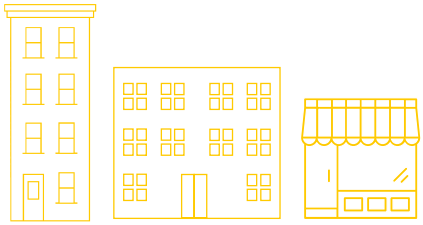
> "With a SolShare system, it's not just the individual residents that gain cheaper, greener electricity, it's the entire building."



Why is it Unique?

Allume's technology is the first of its kind globally. Its behind-the-meter approach allows for solar in multi-metered buildings without any change required to standard metering infrastructure. This minimises the capital expenditure required in existing buildings and reduces the regulatory overhead in greenfield developments.

Allume has applied for the patent rights to their technology across the 152 countries in the Patent Cooperation Treaty.

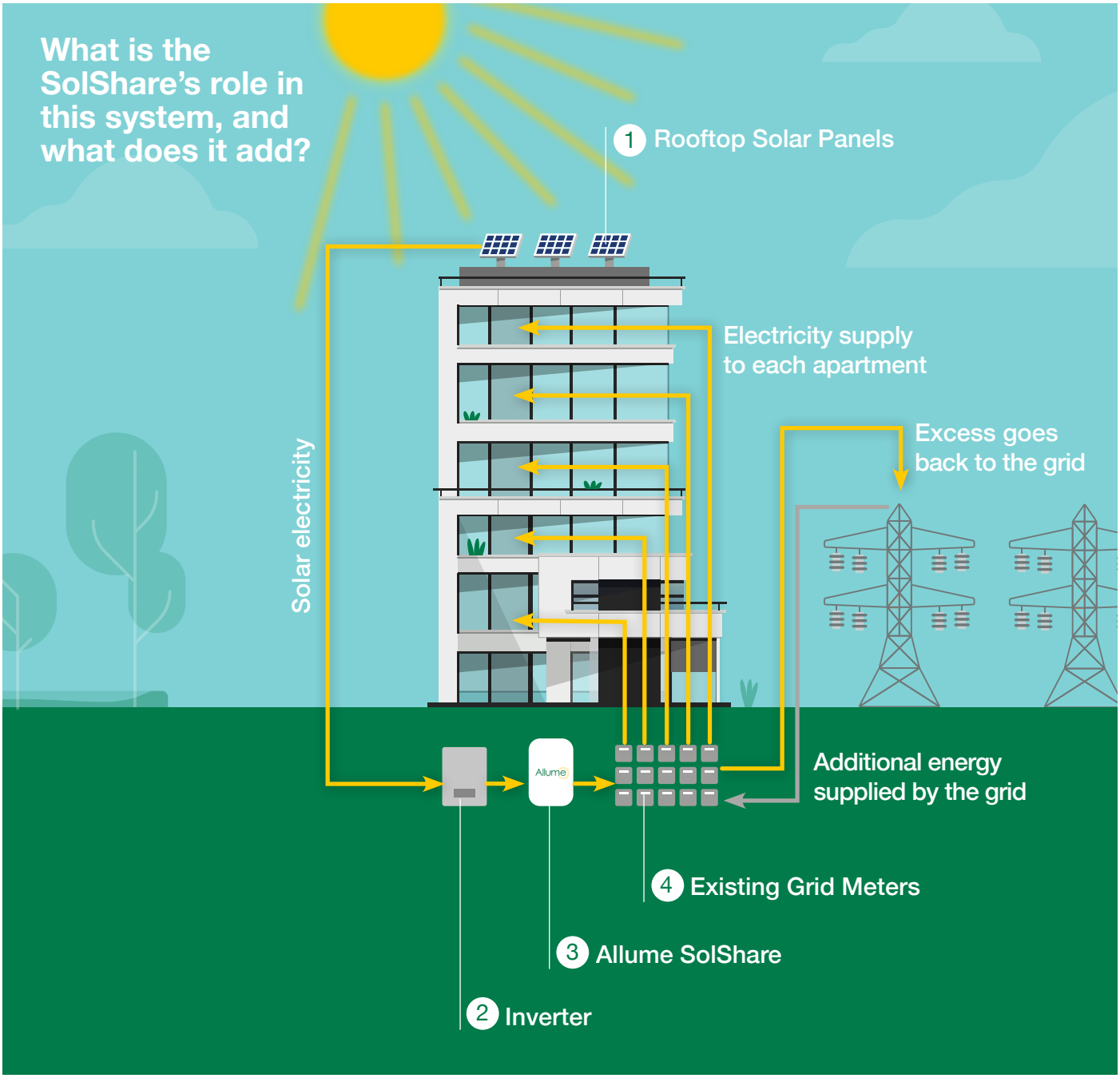


Who Can Benefit?

The SolShare can distribute solar energy to multi-metered buildings with a shared roof. This includes apartment buildings, office blocks, and retail centres.

This document focuses on the SolShare system for residential installations. Please request our PPA Explained document if you are interested in the SolShare for commercial power purchase agreements.

Meet the SolShare. The world's first behind-the-meter solar sharing technology.



The Allume SolShare allows the energy produced by a single solar system to be distributed behind-the-meter across separately metered units, making it unique on the current market.

1. Rooftop solar panels

Solar panels turn light from the sun into free energy for your home. Panels are very sensitive and even produce energy on cloudy days.

2. Inverter

The inverter changes the DC energy created by the solar panels into AC energy. AC energy is what your home needs to power your appliances.

3. SolShare

The SolShare unit sends the energy from the inverter to you and your neighbours. It constantly monitors everyone's energy usage and distributes it in a way that maximises your savings.

4. Existing grid meters

The SolShare connects to each circuit behind their own existing smart meter. Its installation requires no change to the existing electricity metering infrastructure.

Sharing Solar Energy with SolShare

The SolShare allows the equal distribution and sharing of solar energy between the various units of a building. But how does the technology work, and how is the energy distributed equally?

The system distributes power on an on-demand basis to maximise on-site solar usage. Each apartment will have a device that constantly monitors the energy usage (load) and feeds this information to the SolShare unit.

Using this information, the SolShare will direct solar energy to the apartments in relation to how large their load is at any specific time.

This optimised sharing means that the on-site solar usage is 30-35% higher than an individual system, limiting the amount of solar that is not used. The SolShare is the most efficient system to maximise the use of energy generated at any given time. It achieves this by supplying energy to where it is needed most, instead of sending it back to the grid.

Any excess energy not used by an apartment (or common light and power) will be sent back to the grid and compensated for accordingly.

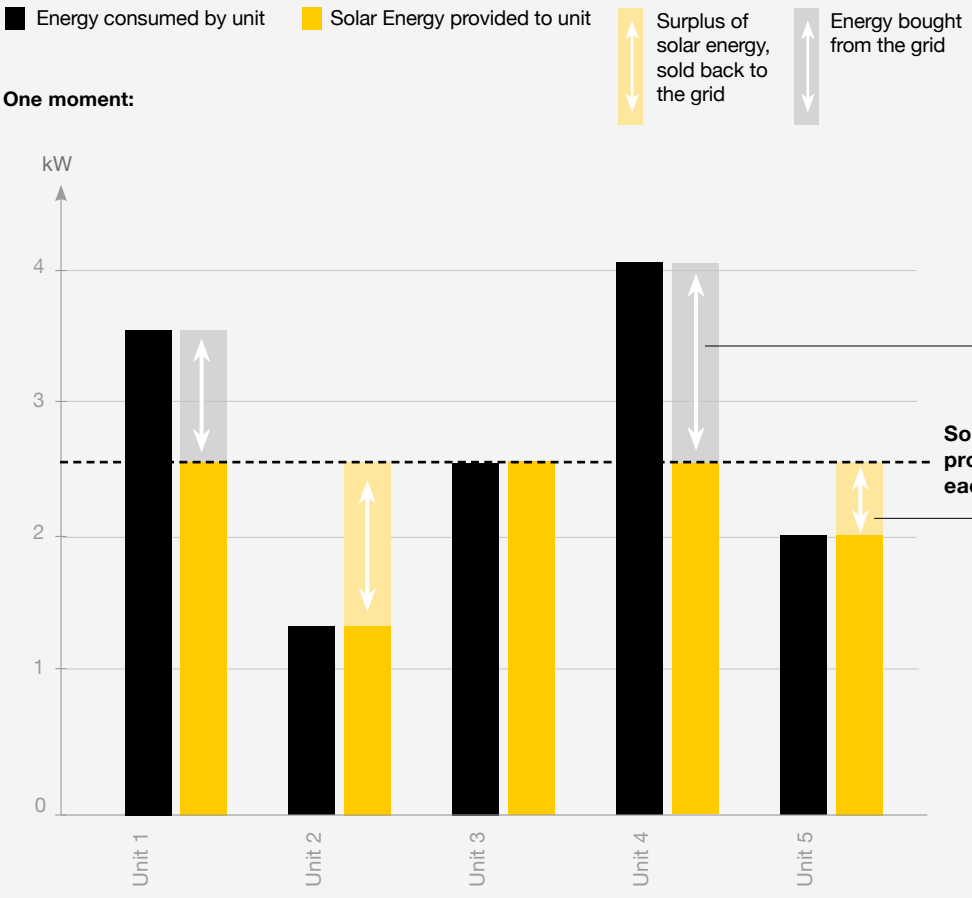
A SolShare system can generate up to 40% savings on your electricity bills

35%

This optimised sharing means that the on-site solar usage is 30-35% higher than an individual system.

Any excess energy not used by an apartment is sent back to the grid and compensated for by your electricity retailer.

Buying and selling energy to and from the grid



When the energy you use is higher than the generated solar, additional energy is bought from the grid.

When the energy you use is less than the generated solar, surplus energy is sold back to the grid and credited to your account.

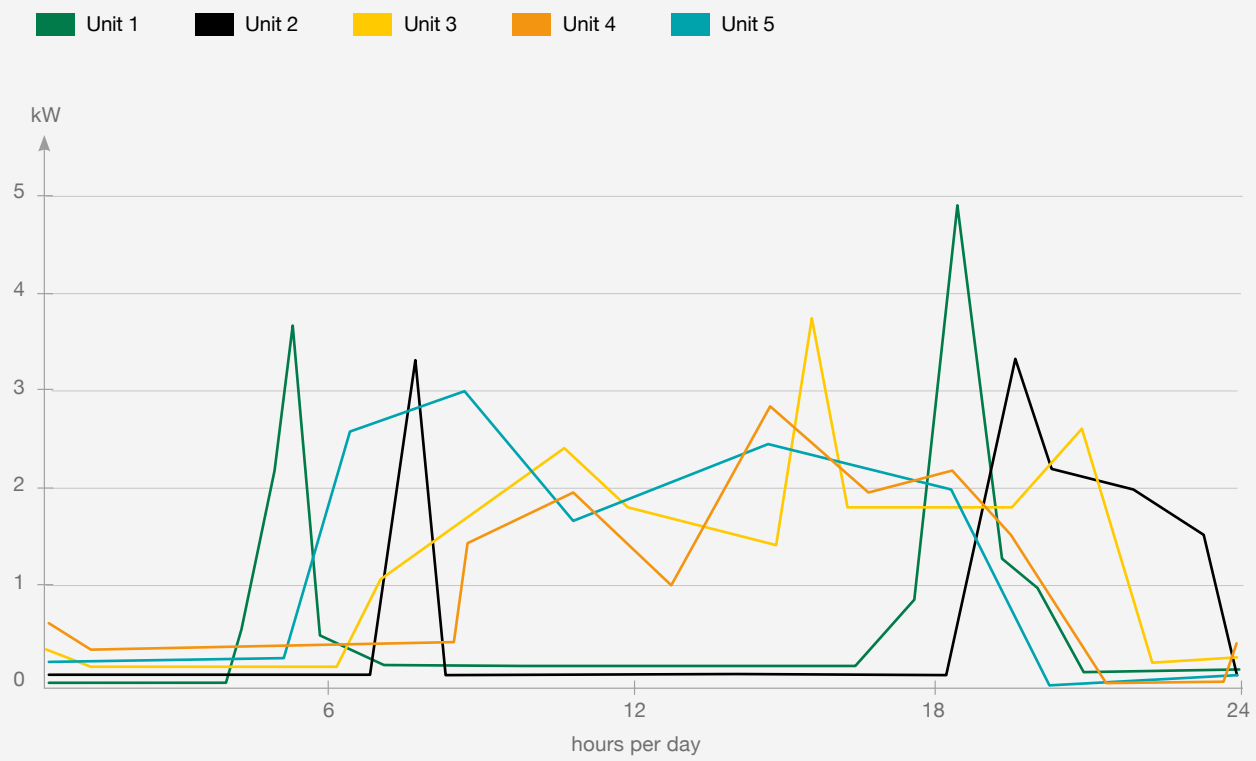
Different energy needs

The SolShare distributes energy to users is a way that maximises savings. It achieves this because you and your neighbours will all use energy at slightly different times. This change in energy usage, called a load profile, means the SolShare can help provide you with as much as 35% more solar energy than an individual system. The more solar energy you use, the more money you save.

The below example shows five SolShare users. The different lines show their varying load profiles throughout a typical day.

Every apartment uses different appliances and amount of energy at various times, so energy will be directed to each one at the most appropriate time to maximise their financial savings. This slight change in when the apartments require energy (called a 'load profile') has a significant, positive effect on maximising the on-site usage.

Graph showing usage and behaviour per flat in a typical day



Unit 1 profile

This type of user is an early riser and is away from home all day. Their main energy consumption is early mornings and evenings.

Unit 2 profile

This type of user is a night owl. They will have a similar profile to the early riser but shifted later in the day.

Unit 3 profile

This type of user is a large family with young children. They will use a lot of energy throughout the whole day.

Unit 4 profile

This type of user works from home. They will use peaks of energy throughout the day.

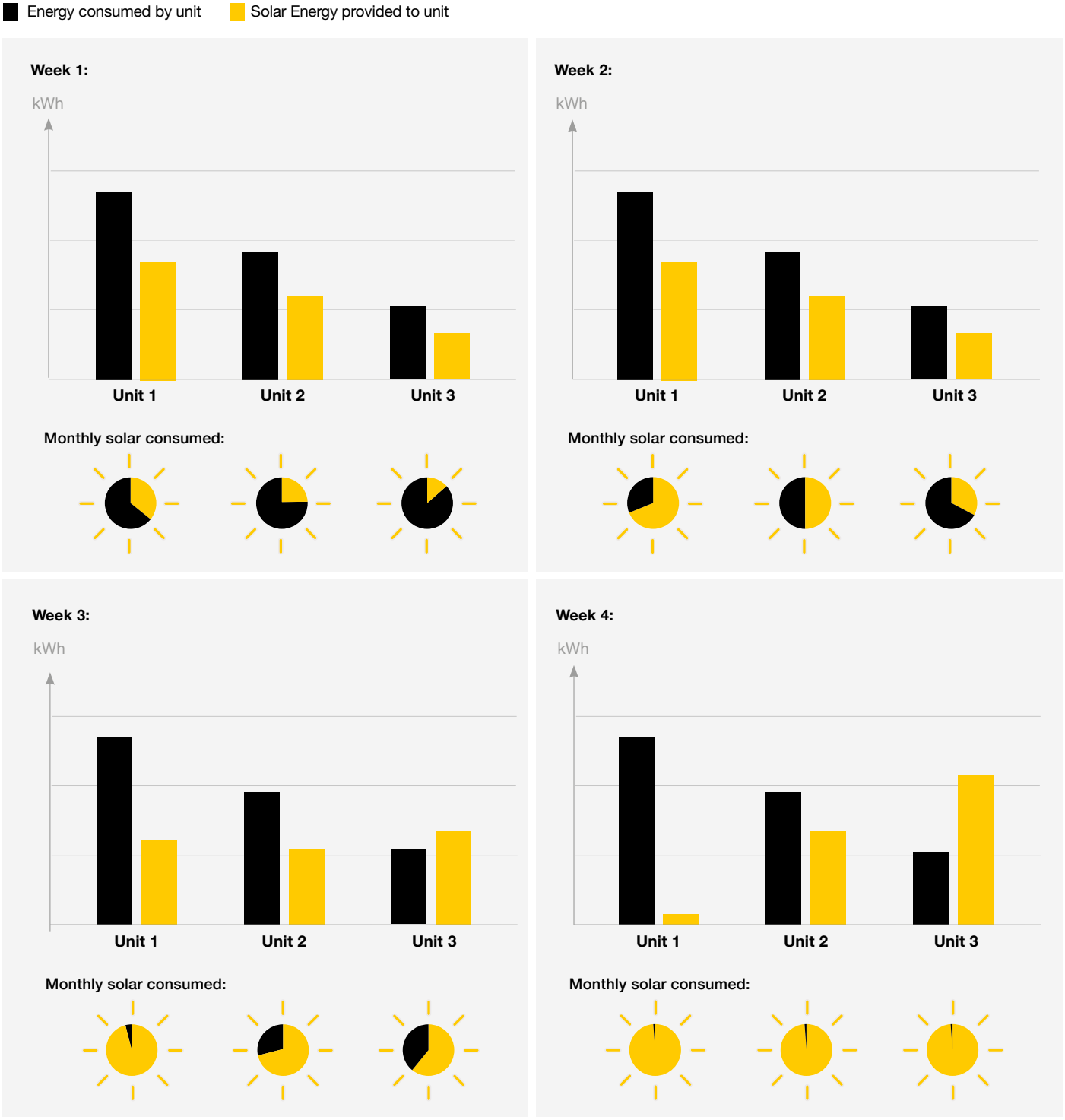
Unit 5 profile

This type of user is retired. They wake up early and go to bed earlier than other users and use a steady amount of energy throughout the day.

The fair energy distribution system

The following graphs show how the SolShare ensures the fair delivery of solar to three units with different energy usage: Unit 1 uses a lot of energy, Unit 2 an average amount, and Unit 3 a low amount. During the month, the SolShare monitors how much solar energy each unit has received and ensures that the same amount has been delivered to each apartment, regardless of their total energy usage.

The solar delivered to each unit is represented in two ways. The bar graphs show the total amount of energy that each unit requires (in black) and the amount of solar that is being delivered (in yellow). The pie charts represent the amount of solar that has been delivered to each apartment (in yellow), with a full pie showing that each apartment has received the same amount of solar over the month, regardless of the individual unit's energy usage.



Although the standard delivery model is an even share, this does not have to be the case if it's not right for your install. Allume can tailor the proportion of solar allowance to each apartment. For example, more can be directed to a three bedroom apartment than a one bedroom, or the system can fully optimise and send the solar exactly where it's needed, regardless of how much a unit has received. Just let Allume know what type of sharing model works for you.

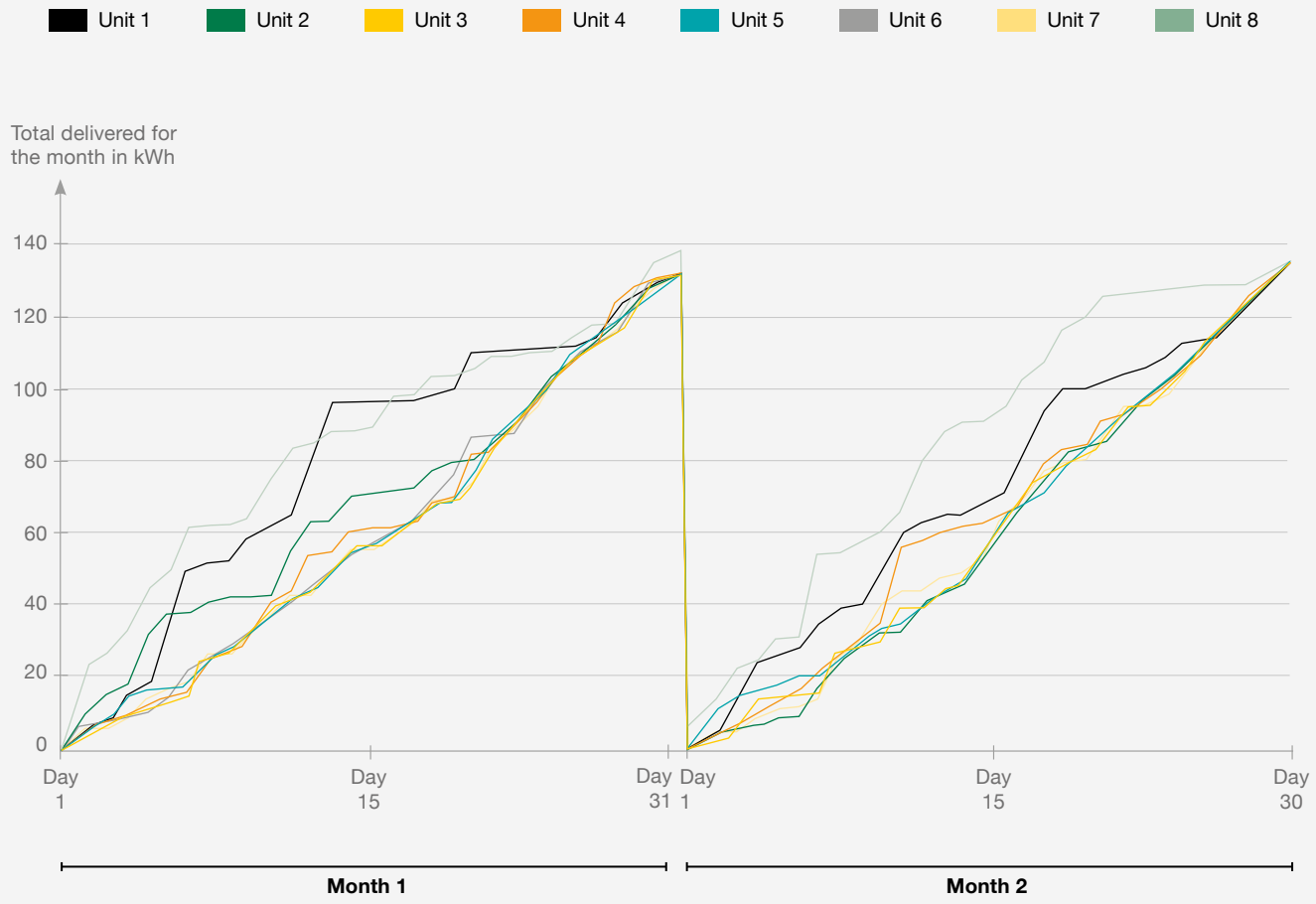
SolShare distribution data from a live installation

This is data from a live SolShare install. The install consists of 8 units of varying energy demands. Every month the SolShare begins recording the amount of solar delivered to each unit. Units 1 and 8 are high energy users and 2-7 are average users. At the beginning of the month, the SolShare sends power at a ratio of the power that is being used, fully optimising on-site solar usage. However, towards the end of the month, the SolShare identifies that units 2-7 have received less than their fair share of solar. The SolShare, therefore, reduces the amount of solar that is sent to units 1 and 8 and distributes the excess to units 2-7.

This active distribution optimises the amount of on-site solar that is consumed, saving each user the most amount from their energy bills, while ensuring that everyone receives their fair share of solar energy.

If the system is unable to equalise the amount of solar delivered to each unit by the end of the month due to unforeseen circumstances, like a few cloudy days, then the difference is rolled over to the following month. An example of this can be seen with unit 8. It received more energy than the other units in the first month so begins the next month at an increased starting point to the other units.

Graph showing solar distribution per flat over two months



"The SolShare is designed to integrate so effortlessly that the resident will only notice one difference - significantly reduced electricity bills."

For more information, please visit:
www.allumeenergy.com.au

Allume Energy Ltd.
info@allumeenergy.com
+61 394 270 005

Allume