ENERGY TERRAIN

October Newsletter

Latest updates on Energy Terrain and Solar Power Purchase Agreements

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Alternatives for used panel disposal: Overcoming the solar e-waste problem in the years to come

As the world embraces solar as a green technology, solar panels have the potential to become a large electronic waste (“e-waste”) problem in the years to come. In this month’s newsletter we discuss possible ways to tackle this problem.

In recent years, the solar photovoltaic (PV) panel industry has boomed. Panels have the ability to generate reliable clean power. However, solar panels do not last forever. According to most manufacturers, their typical operational life is 25 years. By 2050 an estimated 900,000 tons of solar panels waste is predicted to exist in Australia alone, with a worldwide figure of 60 million tons. At the moment there are no laws to regulate PV waste. So what possibilities are there to tackle this problem? Is recycling the only way forward?

Recycling **Solar Panels**

Recycling of PV panels is considered one of the best solutions to prevent them ending up in landfill. Unfortunately today, landfill is their most common destination, despite their high recyclability. This is not sustainable, as they contain a few toxic elements. Generally, glass is a major contributor (75%) to the total weight of PV modules and the rest includes polymer, aluminium, silicon, copper and little amounts of tin, silver and lead.

While almost 90% of glass and silicon can be reused for producing new panels, elements like lead and tin can cause environmental and health issues if they leak into groundwater and soil, making the landfill option risky. In Australia, Reclaim PV is the only dedicated photovoltaic recycler and claims to be able to recycle 90% of the materials in a Solar Panel.

Material	Percentage contribution to total weight of Panel	Value (AUD)
Glass	75%	$0.40
Polymer	10%	$0.09
Aluminium	8%	$0.20
Silicon	5%	$0.21
Copper	1%	$0.85
Silver, Tin & Lead	1%	$6.40

***Table 1:** Material contribution by weight and Value breakdown by materials in a solar panel*

A stripped solar panel does not have much value. All those components and elements add up to a total of just over $8. The breakdown of value can be seen in Table 1.

The energy that goes into recycling costs more than the PV panel scrap value. Therefore, recyclers end up charging the customer for recycling their panels ($30 per panel). As the value recovered from those parts won't pay for the cost of recycling, some government incentives are needed. If not, a more energy efficient recycling process should be an important point of study in the coming years.

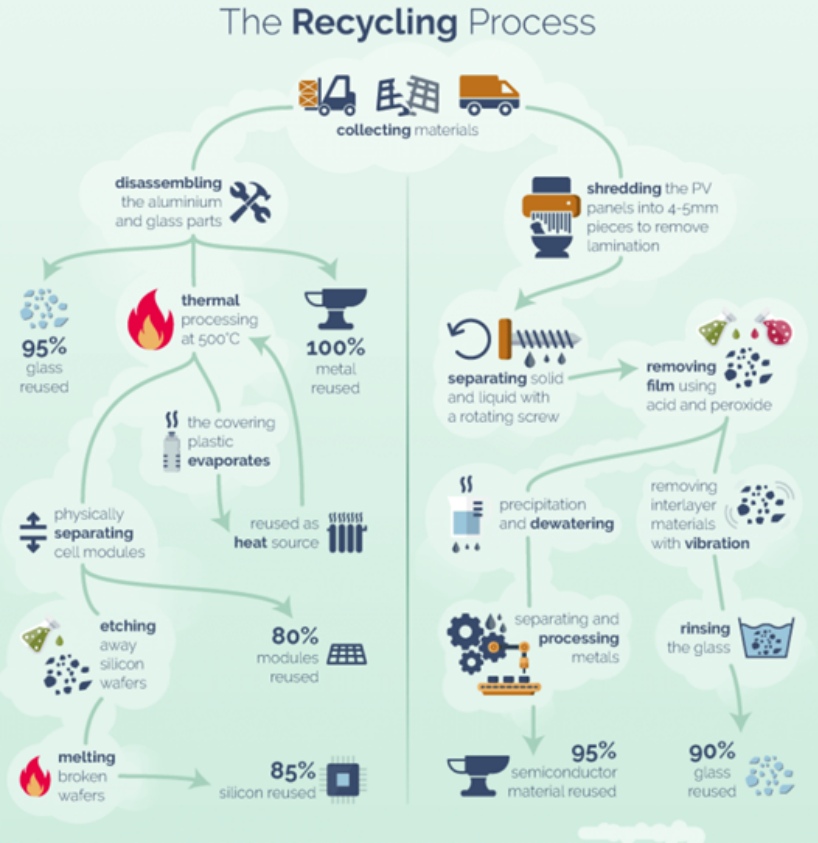

Figure 1: *Recycling process*

Moreover, the energy used to transport PV panels to the recycling facility, then powering the recycling process may be sourced from burning fossil fuels. This could turn the recycling alternative into a non-sustainable option if the newly produced PV panel cannot offset the carbon footprint that was generated to recycle and manufacture it in the first place.

A possible solution could be powering the recycling plant and transportation using clean energy. In France, the energy for powering the PV recycling plant predominantly comes from nuclear and renewable energy. Germany employed biogas powered trucks for collecting garbage to displace fossil fuel consumption for transportation. Following these sustainable ways will make the recycling process a better option.

Resale Market **of PV Panels**

According to many manufacturers warranties, a PV panel should still produce 90% of its original rated power output on its tenth birthday, and 80% when it reaches the end of its 25 year lifetime. In reality for the majority of PV panels out there, a mere 8% drop in efficiency has been observed by the end of 25 years. In addition, good quality PV panels would work for up to 40 years with reduced power capacity.This gives the resale of PV panels a good prospect. Historically, the demand for used PV panels is low.

One of the main reasons for this is the solar rebates (STCs) offered by the Australian government are not applicable when installing used panels. Thankfully in recent years, there has been a slight increase in demand for used PV panels, especially for those which are less than 10 years old. Online marketplaces like EnergyBin and Pvxchange are some of the best options when considering the resale or purchase of used PV panels. Let us review these two options now.

EnergyBin is an American based wholesale business-to-business solar exchange platform, where people can buy and sell used PV panels. Access to this marketplace is done via a monthly subscription . According to EnergyBin, 2020 has been a good year for used PV panels, with one member (Jay's Energy), selling 25MW worth of used PV panels. The buyers are looking for panels with an age of 10 years or less and at least 50% to 75% of price reduction, compared to new modules.

Pvxchange is a German based company with a marketplace for worldwide distribution of PV components. It is considered the world's biggest brokerage platform for solar modules and PV components, with more than 10,000 registered users. The webshop contains a catalogue allowing companies easy access to thousands products. pvXchange also offers its clients individual technical advice and support.

Donating Panels **for Charity**

If the panel performance is low after many years of usage they may not be suitable for trading on marketplaces like those discussed above. So what then? An estimated 50,000 still-functioning PV panels end up in landfill every day. Instead of throwing them for scrap or sending it to recycling facilities, donating them to charity projects is an interesting option to consider. Organisations such as GoodSun will use these modules to light up schools, hospitals, orphanages, and homes of poor and needy communities.

Figure 2: Source: GoodSun, Solar Power in Africa

940 million people worldwide still don't have access to electricity. So Installing these donated PV panels in indigenous and rural communities have the potential to change lives. Imagine a world where everyone has access to clean energy, this sort of work can be a small but important step in realising this vision.

Solar PPAs **and Panels Disposal**

Energy Terrain is committed to seeing a world powered by renewable energy. We want to see sustainability as the underlying thread of everything we do. Solar Power Purchase Agreements (Solar PPAs) can be a pathway for a responsible disposal of used panels.

Through a Solar PPA, Energy Terrain owns the solar system on the roof of businesses and sells the energy at very competitive rates. Our company can handle the final destination of modules, letting businesses focus on their core activities and know that they are part of a greater vision for a sustainable world for generations to come.

Click here to see how much CO_2 you can abate, and learn what your estimated annual savings would be.

Contact us today to see how much you can save
info@energyterrain.com | **1300 814 845**