

# HOW MUCH WASTE IS GENERATED FOR EVERY 1 MW OF SOLAR INSTALLED?



**WITHOUT WASTE DIVERSION**



**WITH WASTE DIVERSION**



**1 MW =**



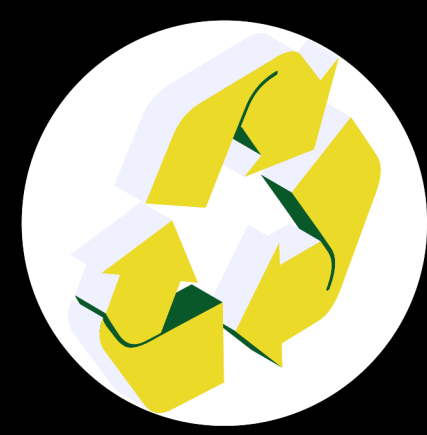
For every 1 MW of solar installed ~3-7+ hauls of 40' yard containers go to the landfill

## CARBON EMITTED TO REPLACE LANDFILLED MATERIALS

<b>1 T WOOD</b>	1/2 ton CO2 wasted
<b>1 T CARDBOARD</b>	4 tons CO2 wasted
<b>1 T STEEL</b>	2.57 tons CO2 wasted

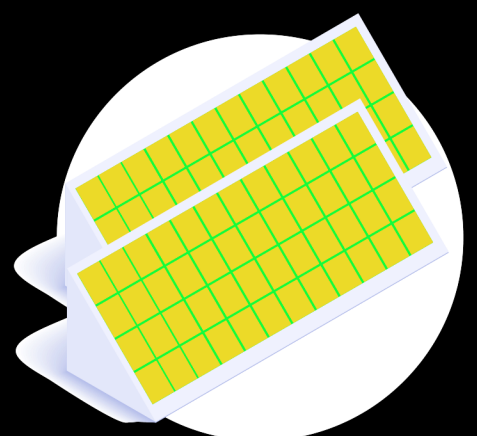
## CARBON SAVED WHEN MATERIALS ARE RECYCLED

<b>1 T WOOD</b>	1/2 ton CO2 saved
<b>1 T CARDBOARD</b>	4 tons CO2 saved
<b>1 T STEEL</b>	2.57 tons CO2 saved



## BACKGROUND, DESCRIPTION, DELIVERY AND LEARNING OBJECTIVE

We have collected data on waste diversion efforts before and after recycling processes have been implemented on utility-scale solar installation sites up to 250MW. Our mission is to drive the circular economy within the solar industry; this topic is important as it highlights how much waste is generated for every megawatt of solar installed and where that waste goes.



## INTRODUCTION

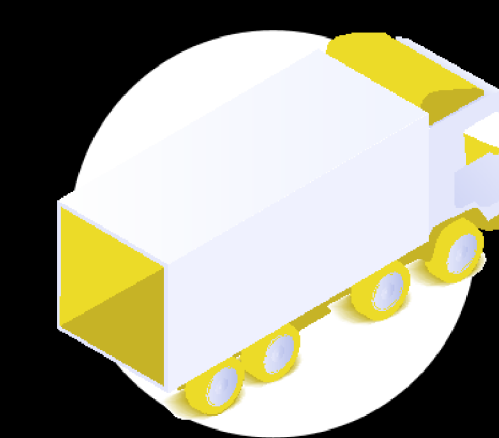
Utility-scale solar, while known for bringing clean energy to the masses, currently needs to improve waste management practices on large-scale solar installation sites. At present, the common practice is to landfill waste at the end of a project. On average, for every 1 MW of solar installed, about five hauls of 40-foot yard containers are disposed of in landfills. This study aims to assess the amount and types of waste currently discarded in a typical large-scale solar installation site and to evaluate the potential for waste diversion. We hypothesize that fewer, ideally zero, landfill hauls will be required with proper upstream changes, waste management and recycling practices, resulting in minimal landfill waste and a reduced environmental impact.



## CONCLUSIONS

Our study findings confirm an average of 5 hauls per 1MW from both our survey and onsite data collection. We conclude that much of the waste currently sent to landfill from large solar installation sites can be recycled and condensed to reduce hauls. However, when material separation and recycling were put into place, a reduced amount of hauls to the landfill were required. On some sites, the packaging was 100% recyclable, which resulted in zero landfill hauls, demonstrating the potential that upstream supply chain decisions can have downstream.

This highlights an opportunity to improve the environmental footprint of solar installations by recovering and recycling materials that would otherwise be discarded. By implementing better waste management practices that prioritize material recovery, on average, 3 tons of waste from every 1 MW can be diverted from landfills and instead recycled and recovered to be reincorporated into the economy.

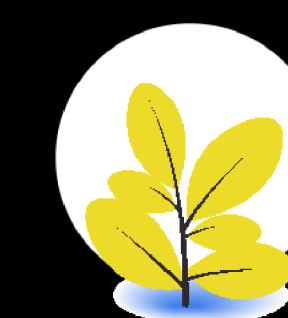


## RESULTS

- An average of 4.65 tons of waste requiring five hauls are generated for every 1 MW of solar installed; in most cases, this waste goes to landfill unnecessarily.
- Installers have an opportunity to clean up operations and reduce waste.
- Implementing better waste management practices can significantly reduce landfill waste and improve the environmental footprint of solar installations.



We recommend following Green Clean Solar's publications for further insights and updates on large-scale solar waste management. The next steps in our research include exploring upstream supply chain solutions for a zero-waste solar installation and researching ways to subsidize recycling on solar sites. We aim to make material recovery second nature for the renewable energy industry by making it financially beneficial and improving brand reputation for those who are proactive.



## METHODS

We used a two-pronged approach to gather data. A survey was disseminated, asking general contractors of large-scale utility solar sites to share the number of 40-foot yard containers they use per 1 MW of solar installed. hauls of waste.