

Circular Solar Wind: What if the problem with wind is a solution for solar-battery projects and even as pollution control infrastructure?

Renewable energy, storage and decarbonization solutions:

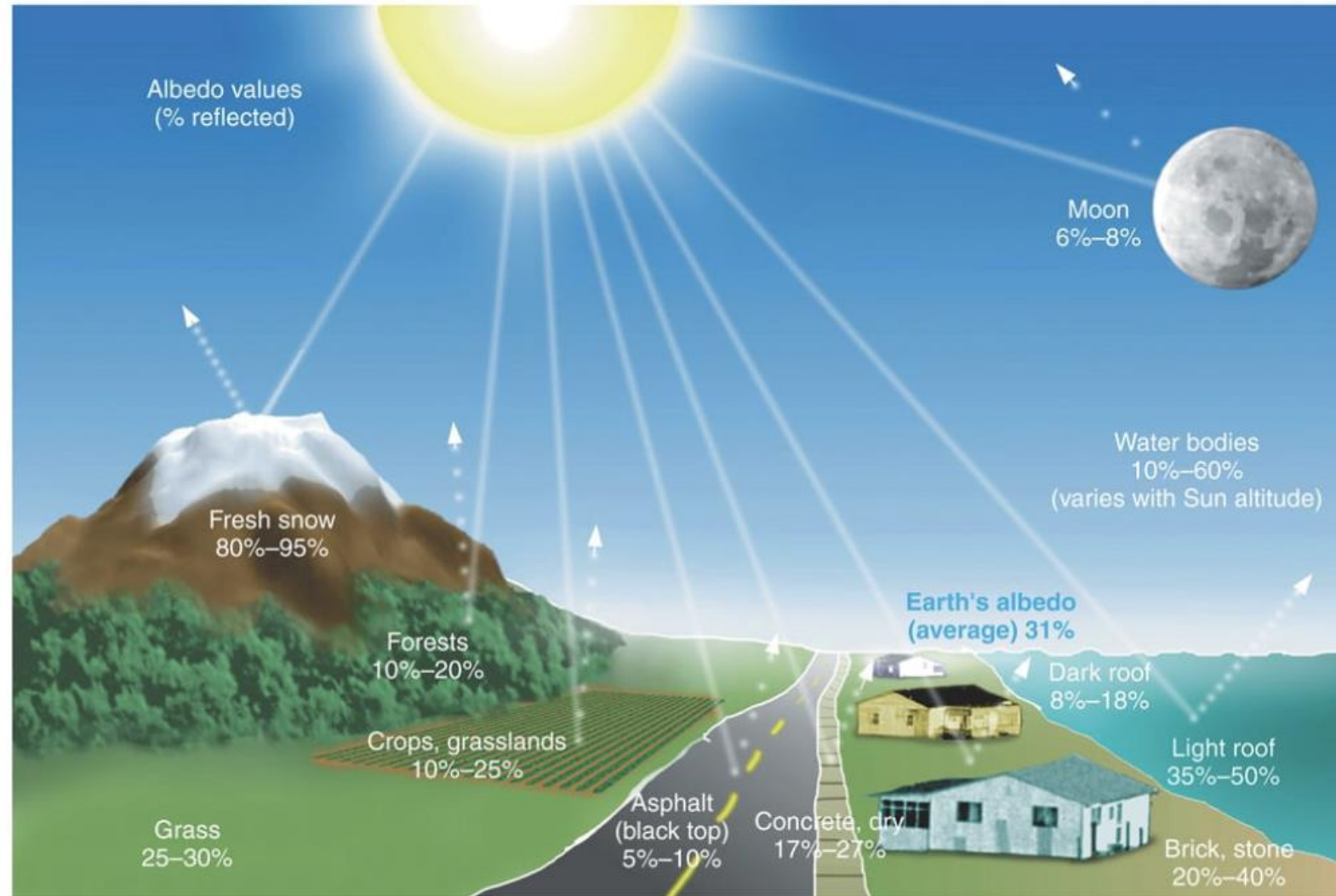
Wind, Solar, Batteries, hybrid and electric vehicles, CCS to low carbon fuels and future hydrogen.

Wind problems: extending lifecycle and useful, economic higher recycling rates of blades and nacelle's are in demand:

- Recycling rates of blades average at around 90%.
- Those opposing wind point to their impact on landfills.
- Solutions include downcycled as an SCM for concrete.
- Or as WtE fuel; which plastic, toxin emissions and its a low BTU value at a cement kiln.
- Reuse or repurposing is of the highest value for the Circular economy and environmental impact.
- Wind Europe has suggested a 2025 landfill ban on blades.
- Failure include from corrosion, cyber events, oil leaks, fires; which impact environmental health of the land or water.

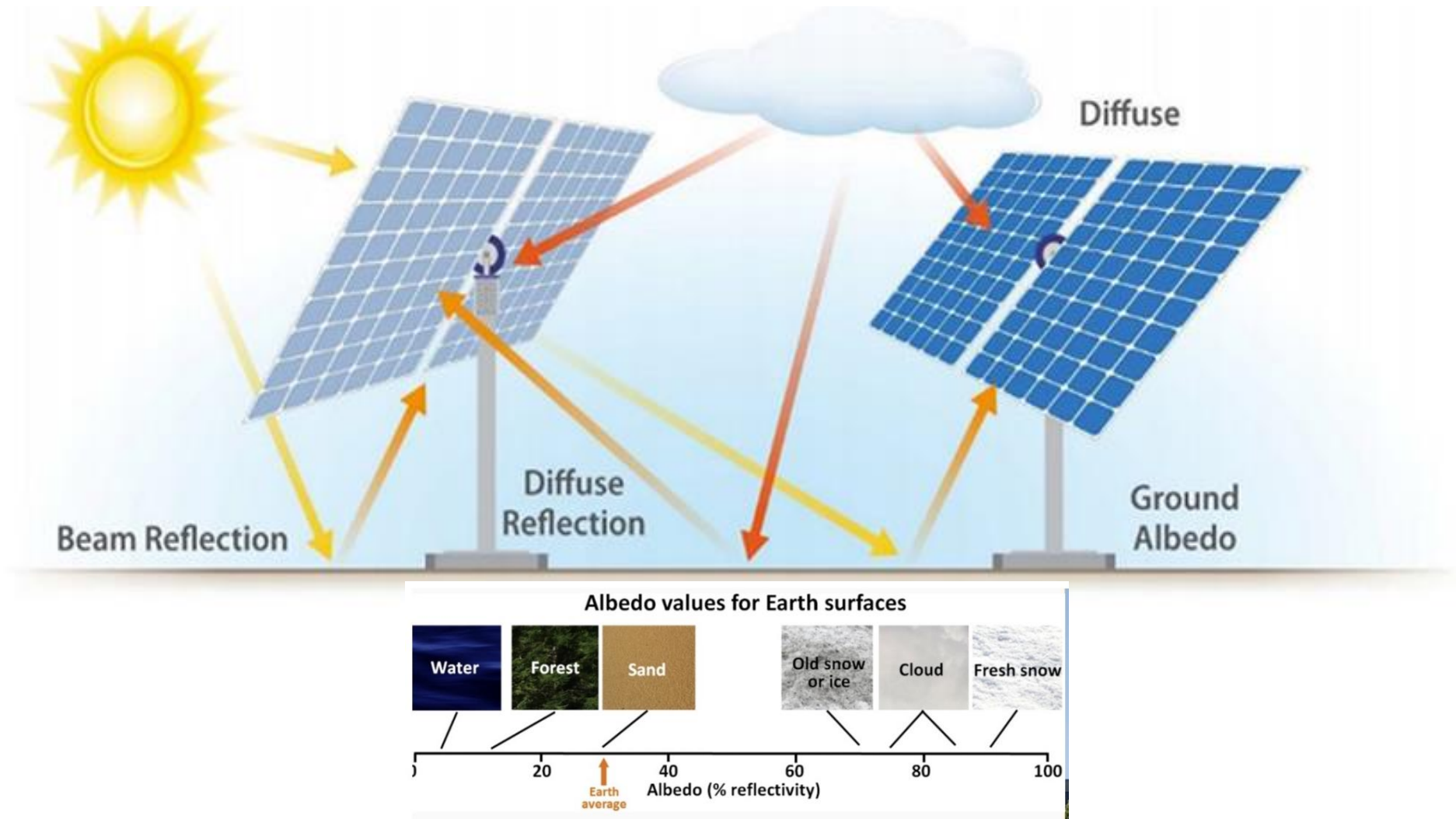


Let's look at Albedo Values: since recycled Wind either whole or downcycled can simulate high albedo value Fresh Snow



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Albedo, the percentage of available sunlight reflected back into space, varies from surface to surface. Photo: Pearson Prentice Hall Inc.



How does it work? Let's start with learning about how bifacial solar panels work?

- They have a transparent glass backsheet where the rear/bifacial side also collects sunlight to convert to electricity.
- On average the rear side could collect up 70 - 85% of the frontside, but that is rare.
- Bifacial output varies highly on ground Albedo Values and tilt/angle.

Landfill problems repurposed for infrastructure, carbon reduction & energy demands

Circular Solar’s innovation can use these materials to reduce landfill waste and increase solar output while passively capturing and converting CO2 to be inert.

Divertible Waste, Feedstock Materials:

- 1. Glass bottles
- 2. Wind turbine blades
- 3. Concrete

Use Cases include On Demand Infrastructure & Decarbonizing Industry:

- 1. Solar-battery farms, sustainable buildings, solar canals, public works, EV charging stations.
- 2. Oil & gas, mining, cement, auto, agriculture.
- 3. CDR (carbon dioxide reduction) until Zero.



Three Landfilled Wastes: Bottle, Jar Glass, Wind Blades, Concrete

Three Resources In Landfills That Can Simulate Snow, Clouds



Solar Tests, September 26th 2022 nearly 5pm, sun off to the side, backside tests

Asphalt output
is 40 Watts:



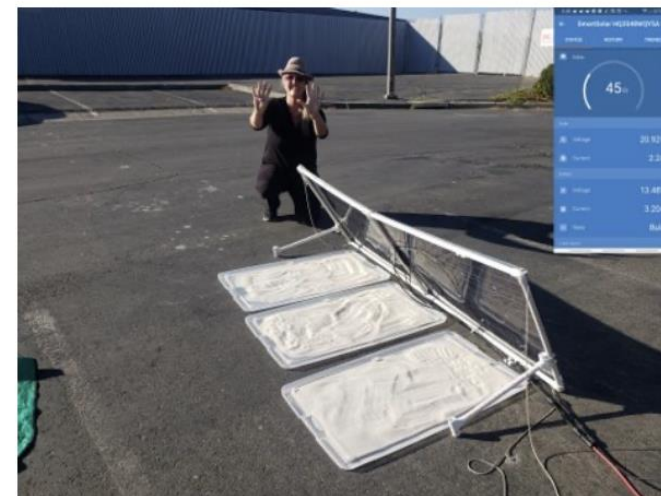
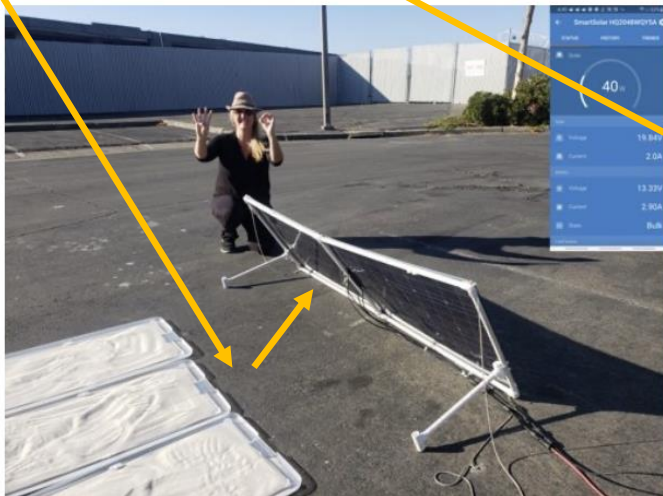
Recycled Glass
Mulch 45W



White Quartz
Sand 45W



Brown Tarp
41W, Green
42W



As the sun circles around this fixed tilt, nearly vertical, ground mounted bifacial panel you can see the MPPT charge controller verifies the benefits. All testing materials seen next slide.

We see a 12.5% energy yield increase.

Plus these materials cool the earth by reflecting heat island effect, supporting 1.5C Paris Agreement threshold.



[Short video of materials/test setup](#)

[Then video tested/metered on floating minigrd](#)



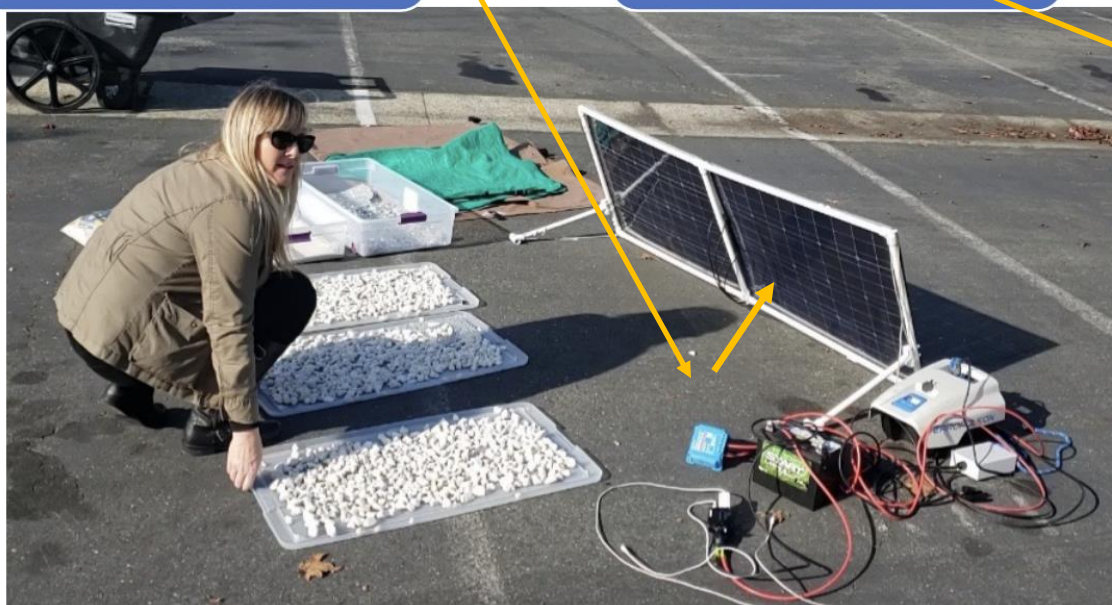
Same parking lot location December 2022

Field tests of solar infrastructure materials, aggregates and tarps simulating organics:

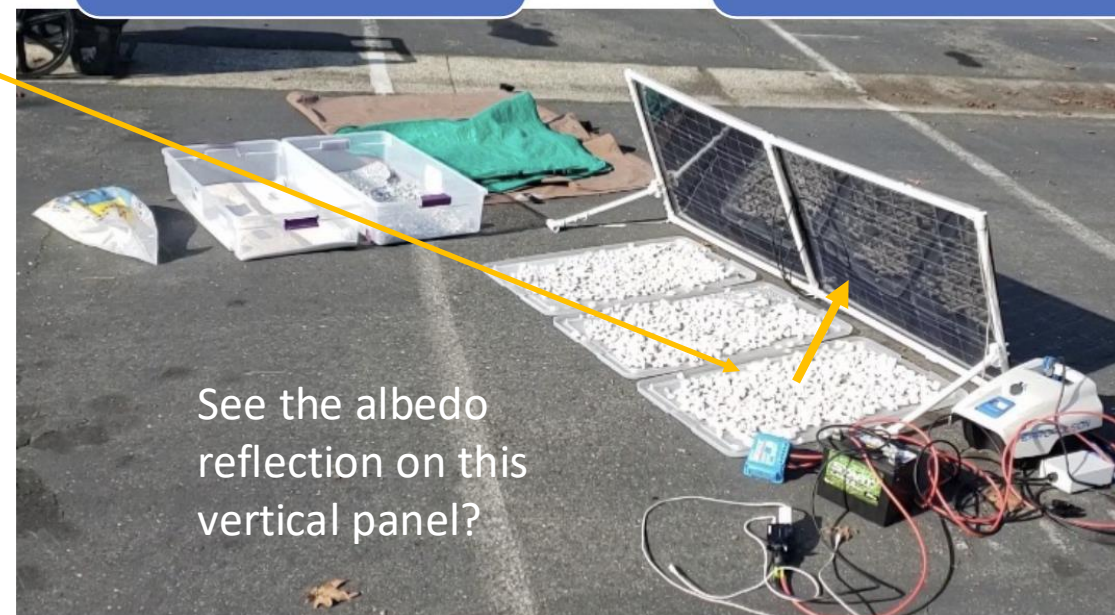
Previous tests, brown canvas 41W

Green tarp 42W

Sand, glass and white marble/limestone 44W-46W



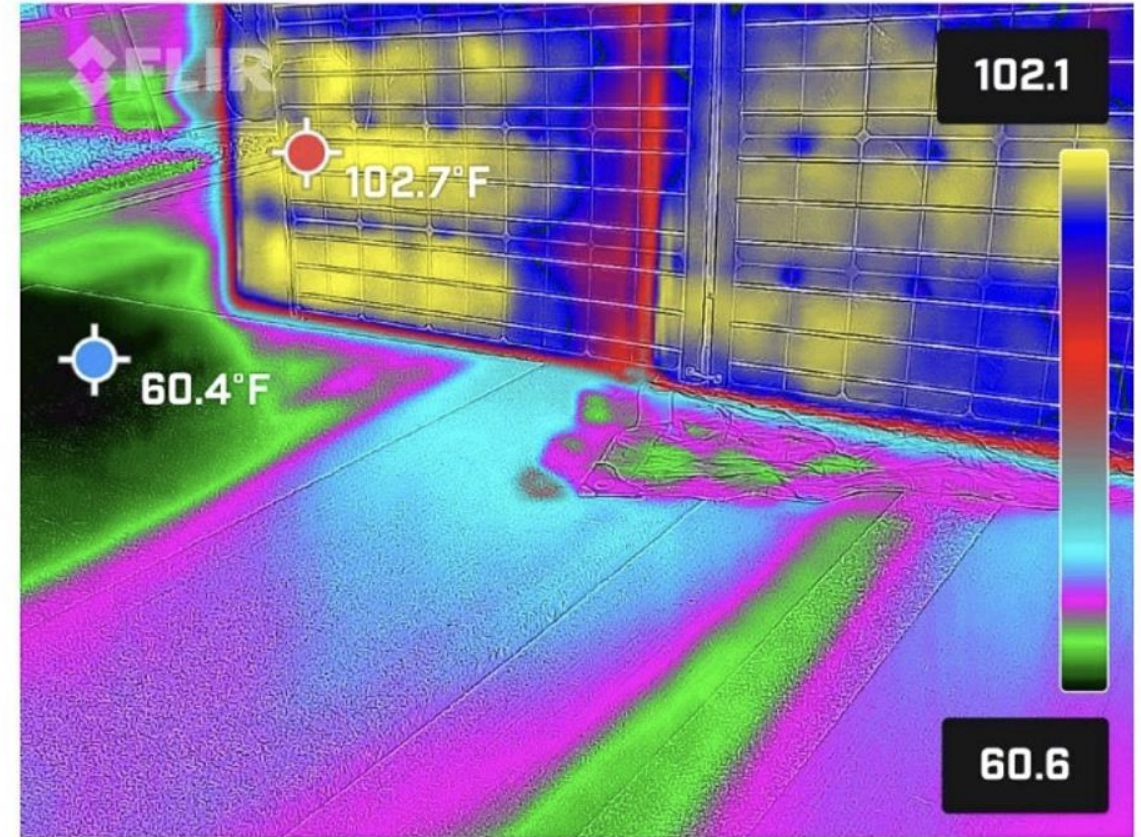
These two 80 watt flexible bifacial panels are connected in parallel to cables wired to a Bluetooth MPPT solar charge controller to meter and record materials changing the solar output to 48V LFP or 12V Lead Acid batteries and while charging or operating electronics.



Notice the reflectivity. Material tests include the parking lot rubberized asphalt, white quartz sand, clear reflective glass, green plastic tarp for grass, brown canvas tarp for dirt/mulch and white marble for limestone. Certain waste or recycled materials can emulate these. Using white marble aggregates above.

December 24th, 12PM

Circular Solar cooling concrete, IR validates on the solar panel



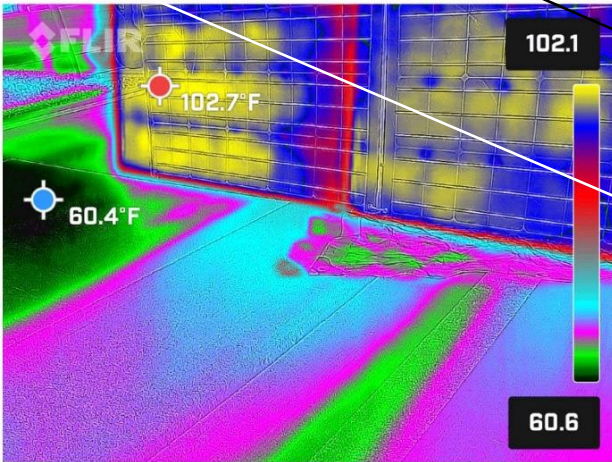
Product: Circular Solar applied at glass supplier's parking lot in Arizona



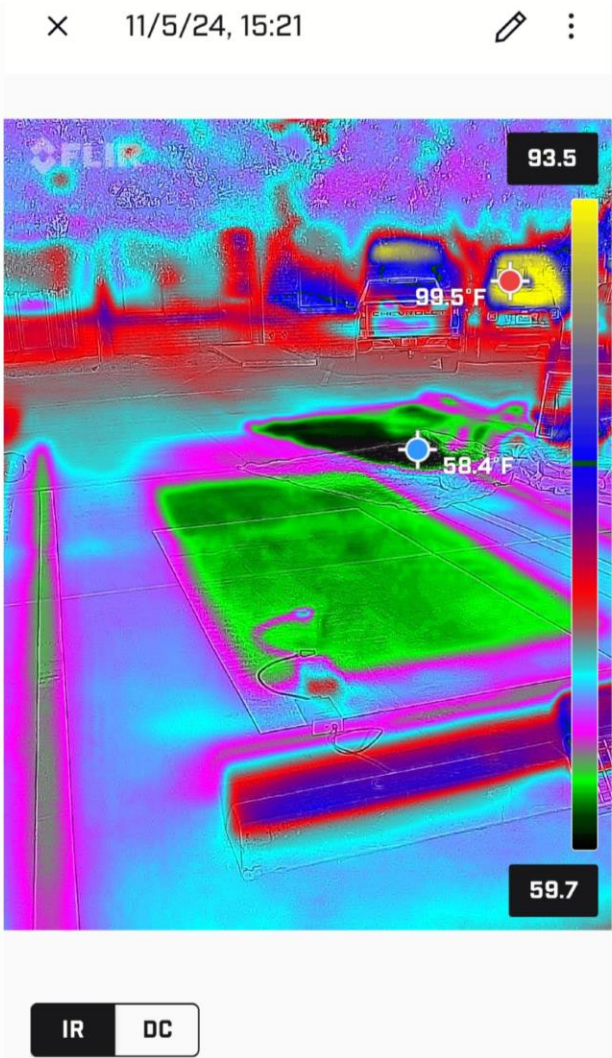
EV, Solar CDR and Cooling: EV/Port charging applications, scalable to data-center buildings.

Hot concrete in Arizona (location below) will stay cooler when EVs, park or charge over the space. Both wired but especially future wireless induction charging remains cooler, thus improving charging efficiency and component, battery lifecycle, due to less heat losses as the product is reflective and has a cooler UHI (urban heat island effect). When not charging vertical or canopy solar can be added and the product generates higher solar output. Additionally, the CDR breakdown airborne accumulated ICE vehicle or data center fossil generator power emissions to tire dust

Circular Solar is also a data-center rooftop, reflective, circular, CO2 removal product, as seen here over concrete, it is almost as cool as the plastic tarp



[Wireless induction pad over concrete](#)



Circular Solar has completed the MOU as [an Epri-Open Ai Consortium Member](#): as a potential “use-case” pilot with utilities and hyperscalers with four use-cases: 1. as a CDR project. 2. as a PPA with the highest possible daily solar yields. 3. Our product for data-center infrastructure, especially cooler rooftops by reducing airborne dust buildup, retaining high albedo effect to reduce interior water use for cooling as seen in previous slide. 4. Which can breakdown PFAS in the event of leak within the data-center or as pollution outside the building; see side five for pollution breakdown which includes PFAS water and airborne pollution from Radius Recycling (automobile shredder residue [ASR PFAS](#)).

- 1. Coolest, CDR carbon removal rooftop (less water required for interior cooling).
- 2. Cooler EV charging spaces for employees or autonomous fleets (slide 12) which doubles as higher efficiency, faster charging vehicle to data-center).

- 3. Hybrid DAC Wind (slide 10)
- 4. Circular Solar Wind: EoL wind blades repurposed below solar panels, with CDR (slides 7-10). Texas and California have wind blades being decommissioned now ideal this project.



The Lancium Clean Tech data center campus is being constructed by contractor DPR Construction in Abilene, Texas, with Crusoe Energy as its developer.

Circular Solar CDR Wind Blades Repurposed Into Energy.

Left: Dual axis circular CSP (concentrated solar power) where fresh snow albedo may offer <50% higher daily solar yields vs fixed horizontal. Solar efficiency records are expected (which may already have been achieved in 2023 for a fixed mount panel; see slide 6).

This dual axis option would be ideal with sections of cut blades surrounding panels in four corner patterns to mirror all light possible. Landfilled waste into CSP!

Additionally, these are hosts for CDR (carbon dioxide removal) coating removing vehicle to data center generator emissions buildup; byproduct water, soil amendment. 12 months controlled mCDR study results on slide 6.

Middle: Single axis tracking may offer more energy versus vertical.

Right: near Summer Solstice, East - West orientation, the CS Blade's fresh simulation of fresh snow, cloud white albedo effect can generate >15% more power on one side vs brown albedo value.



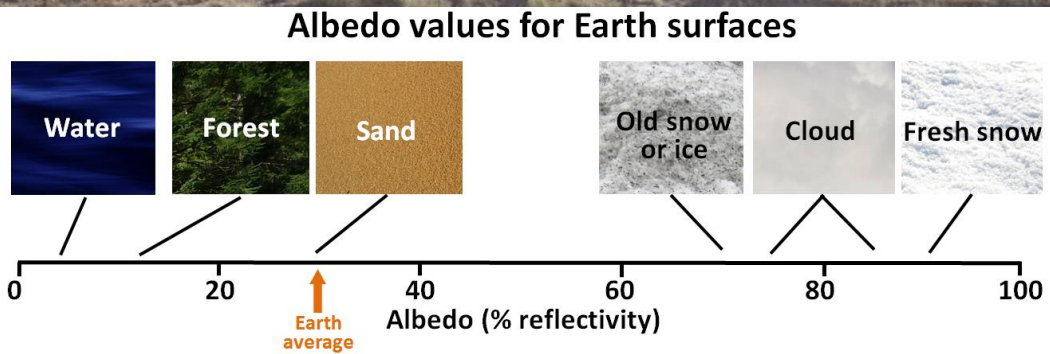
Circular Solar is patent-pending

CircularSolar.net

Rural Agricultural, Highway, Rail CDR

[Video: Live energy validating 25% higher output](#)

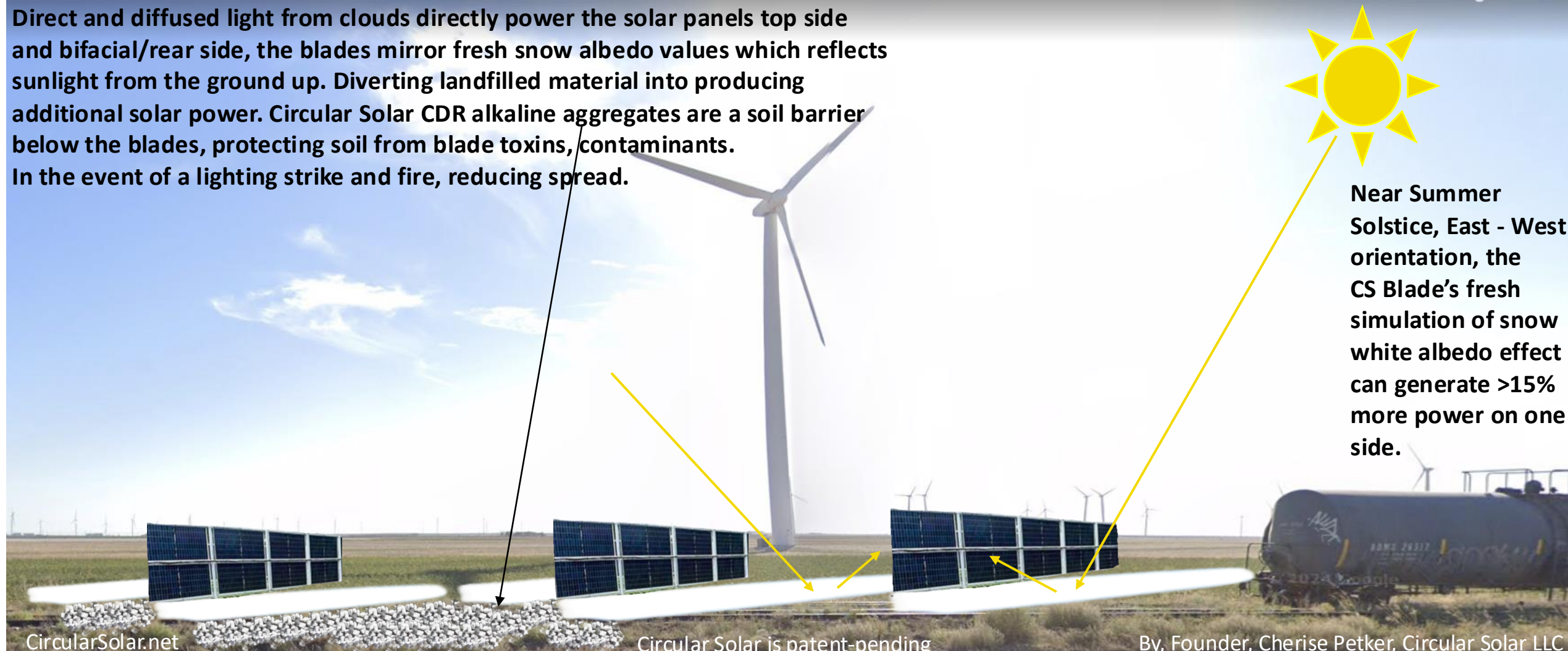
Website page about [Albedo Effect here](#)



Direct and diffused light from clouds directly power the solar panels top side and bifacial/rear side, the blades mirror fresh snow albedo values which reflects sunlight from the ground up. Diverting landfilled material into producing additional solar power. Circular Solar CDR alkaline aggregates are a soil barrier below the blades, protecting soil from blade toxins, contaminants. In the event of a lighting strike and fire, reducing spread.



Near Summer Solstice, East - West orientation, the CS Blade's fresh simulation of snow white albedo effect can generate >15% more power on one side.



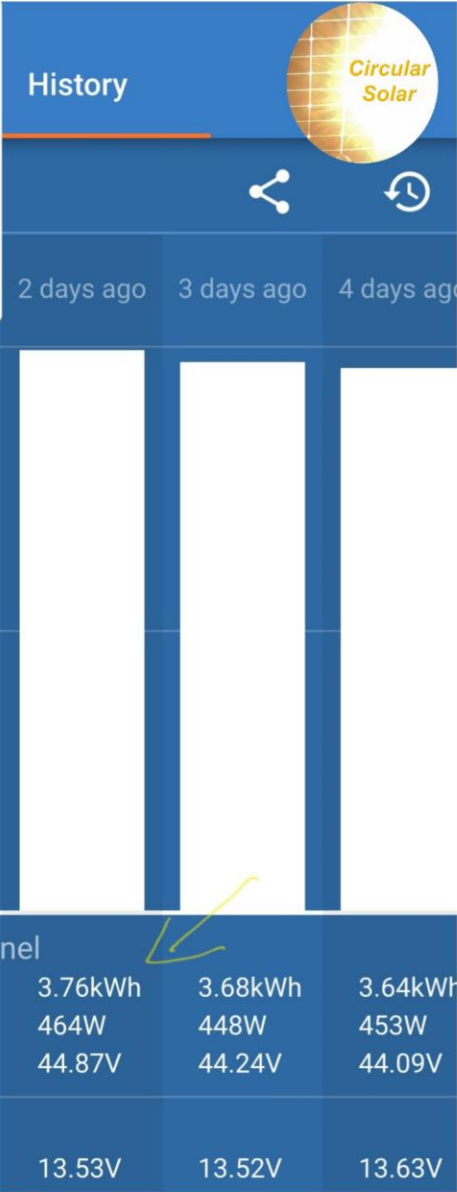
CircularSolar.net

Circular Solar is patent-pending

By, Founder, Cherise Petker, Circular Solar LLC

1. A global solution for recycling EoL waste onsite, reusing it back into energy production and host for carbon removal technology.
2. Reusing blades with the Circular Solar CDR technology (that's also applied to in-use Wind) generates 15%+ solar energy yields and work for 20+ years in solar PPA.
3. Solar-bess costs are separate, 80% of the normal EoL wind decommissioning/recycling/landfill costs (\$6-11k/blade) go towards construction, CDR, CS IP fee. The wind project owner saves 20% and will most likely become the solar PPA. It is expected to offer >15% more power. Circular Solar LLC receives a % of the PPA rev.
4. Additional hybrid CDR & power microgrid for onsite EV charging station can be installed utilizing our [pavement product](#).
5. Passive DAC/CDR project produces additional PV energy, removes 1 ton CO2/year from 10,000sq.ft. with CDR; as low as \$100.00/CO2 carbon offset (goal by 2028).
6. Demonstrations of [carbon removal](#) on fiberglass composite by a freeway, port & [live energy tests](#) of CS CDR making more pv energy, [fixed horizontal](#), up [to 26% eff](#).

Summer Solstice,
new solar yield
record for CS of
3.76 kWhs made
from a single, 20%
efficiency, fixed
445w bifacial perc



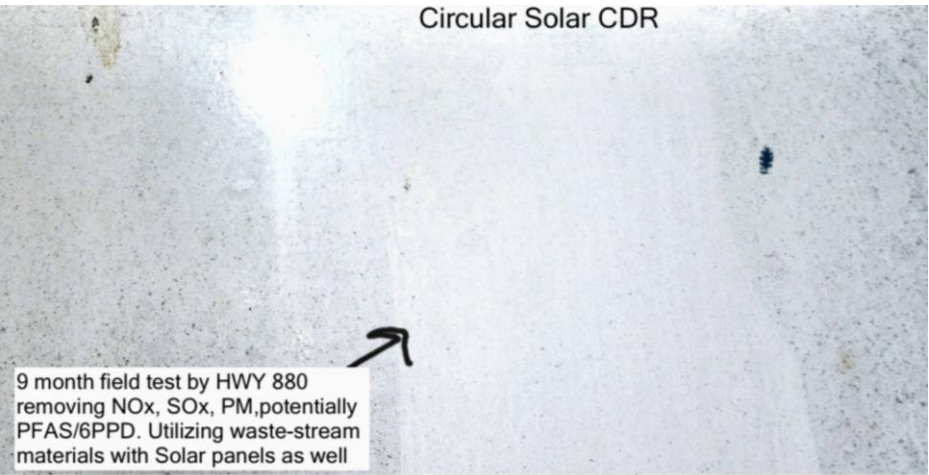
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Project Circular Solar CDR (pollution removal):
21-month and 9-month field CDR rooftop, over a waterway

field tests: These materials, ERW limestone marble, recycled glass, composite, vinyl are coating with the nanotechnology to act as low-tech DAC (direct air capture), ERW, mCDR infrastructure and energy generating materials which capture and remove small amounts of airborne carbon, pm (particulate matter) from Port of Oakland activities, including Radius Recycling, rail, HWY 880 passenger vehicles and trucks including organic microplastic (such as from tire dust) emissions. The photocatalytic process removes or breakdown these harmful pollutants into less harmful matter.

Over two-year field test for turbocharged ERW of dolomite, limestone marble: left untreated, right treated since 3/2023 >



Airborne pollutants CDR 21 months

"rooftop" vinyl bimini



Road marking and rooftop test strips. 3.5 months old comparison example; center untreated.

EoL, restored composite simulating wind blades, towers breaking down pollutants which offers anti-corrosion benefits.

Circular Solar CDR Wind, reducing corrosion, failure: with prior pollution control slides in mind, then its EoL materials reused as CDR by road ports, transportation, data-centers using fossil fuel backup generators, placed below solar generating more power and batteries in nacelle's.

An optional addition would be using vertical solar, for grid tie or micro battery grid, solar that would be boosted by the additional albedo effect of Circular Solar CDR.

Vehicle, Trucking, & Rail emissions such as NO_x, SO_x, particulate matter pollution are within 1,000 feet of freeways. 2,000/tons/mile/lane/year are emitted, most freeways have four lanes with rail emissions or 8,000/tons/year per mile.

Airborne vehicle exhaust, brake, tire dust, freight truck, rail emissions build-up in the sky onto Wind energy and their EoL materials placed below, generating higher solar yields,

[Demo video](#) of exhaust emissions onto the materials, improving solar efficiency.

CS OAE growth from wind turbine runoff, and shoreline

< **Shipping CDR**, here is Port of Rotterdam, NL. Circular Solar would love to pilot here because we've already proven the technologies working, removing any wind pollution buildup and emissions buildup by as demonstrated by Port of Oakland. Improving plant, soil health (2008 example [in a road](#)) and now ocean alkalinity restoration; [12-month example of algae bloom and restoration](#) and [here](#) and visual [of ship emissions](#)

Rotterdam is a bunker hub for fossil fuels – high emitter.

4/2025: IMO agrees to a [global carbon pricing: \\$100 or \\$380](#).

Heat stress on cattle is a growing problem

In Kansas during the 2022 heatwaves, there were 2,000 cattle deaths.

In Europe, due to heat stress, dairy cows milk yield may decrease by about 2.8% and farmers may expect financial losses in the Summer season of about [5.4% of their monthly income](#).

Circular Solar Wind Canals or Cattle Shade can mitigate this problem. And in-use Wind could add the carbon, dust, heavy metal removal coating for healthier water runoff sequestered the soil, farm, creek below.



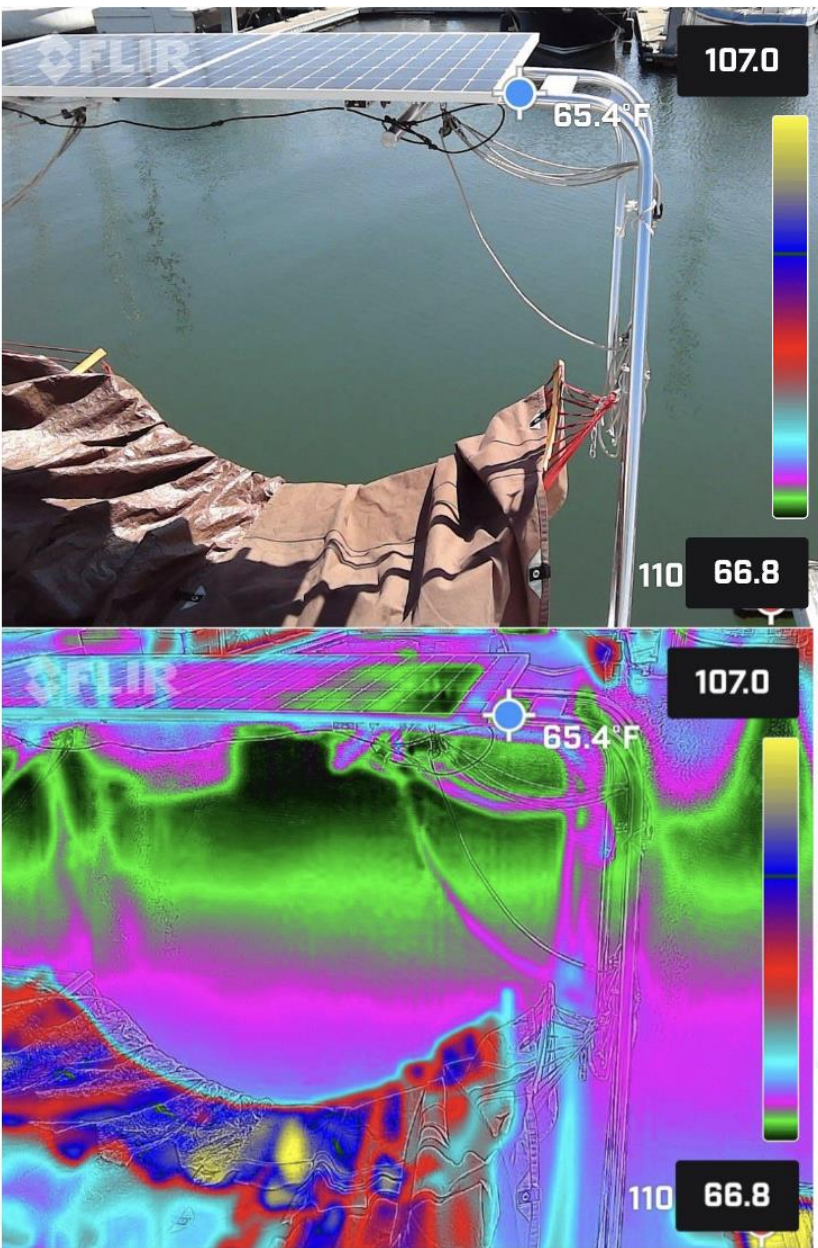
Kansas officials say weather conditions made it hard for cows to cool down in an intense heat wave. Here, cattle graze near wind turbines in Hays, Kansas, in 2017.

Daniel Acker/Bloomberg via Getty Images

Blades reused as mounting hardware for Agrivoltaic Canopy



Our prototype and thermal tests reveal up to 30F cooler surfaces temperatures from solar panel shade which is mounted onto reflective white composite simulates high albedo value snow. The shade cools off cattle and provides colder and less water evaporation, healthier marine ecosystem. CDR ERW (enhanced rock weathering) with limestone, recycled concrete can be added



How does shade over this waterway or a solar canal benefit fish behavior?
[Let's see here](#)

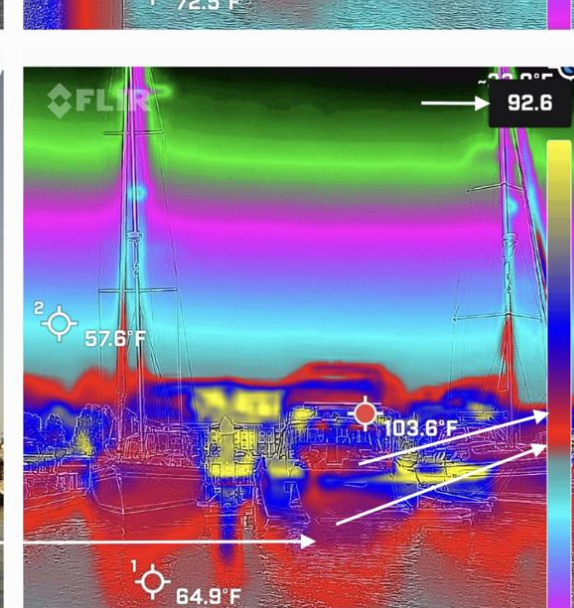
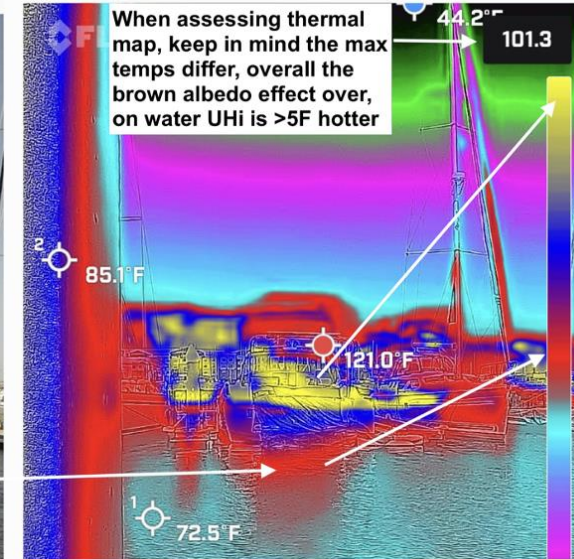
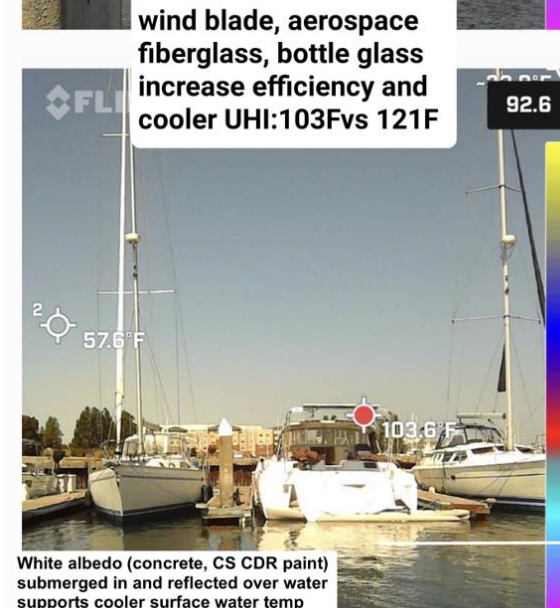
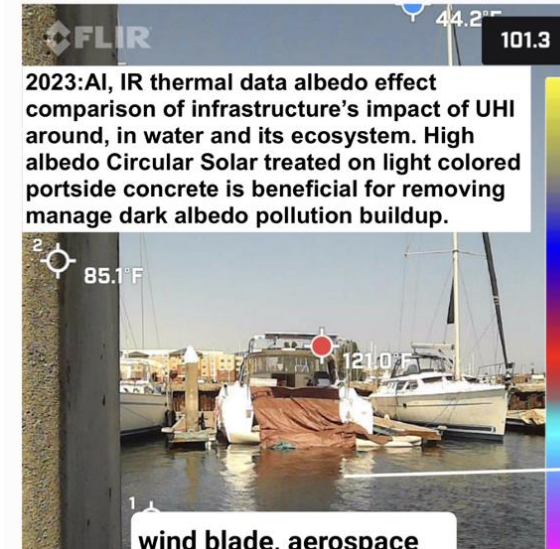
Unshaded: 95 – 107F
Shaded 72F

Large decommissioned wind blades.

Floating solar-battery charging stations



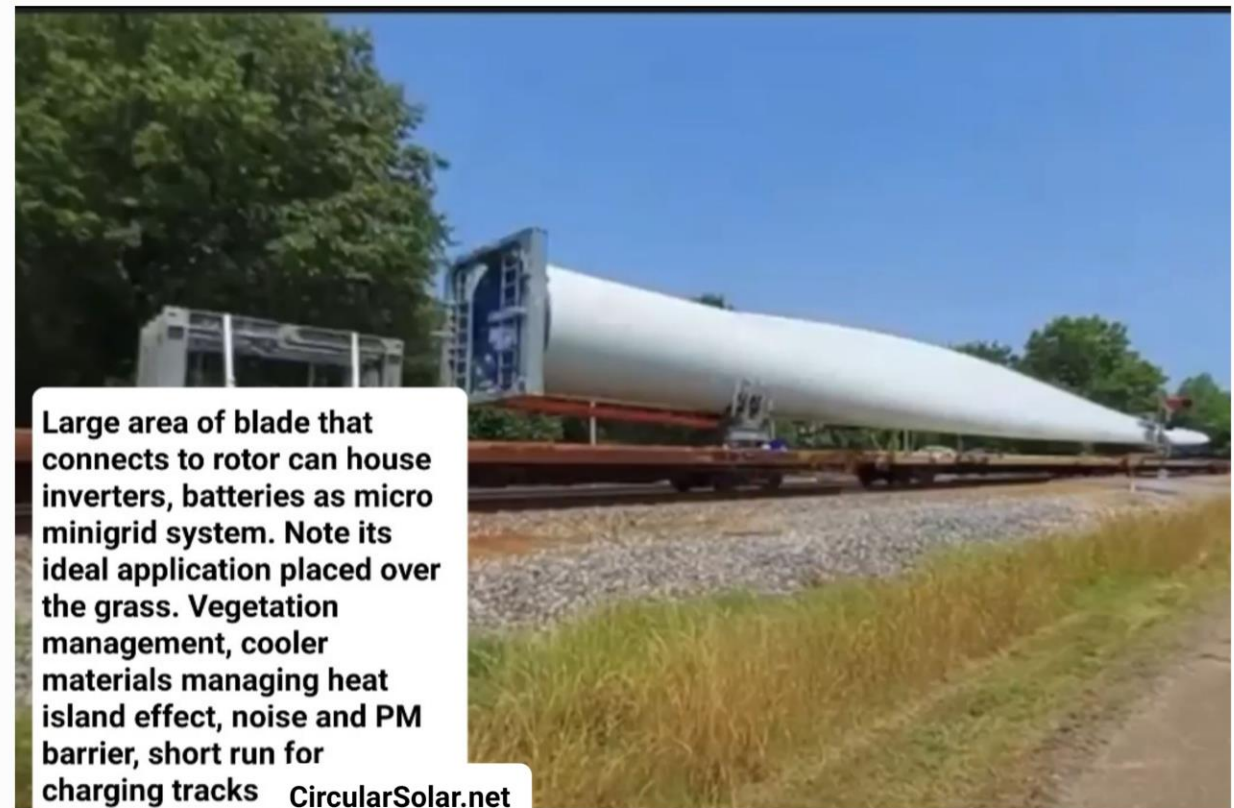
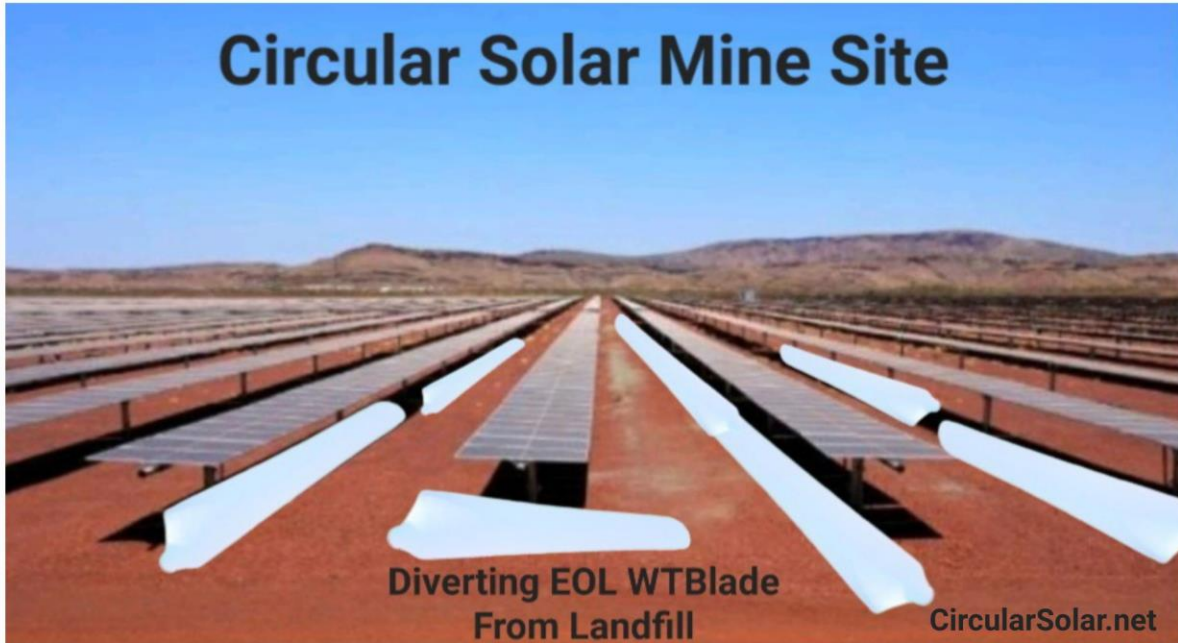
Decommissioned wind composite floating solar-battery charging stations on moorings also offers both shade and its high albedo value has a cooling UHI impact on the water.



Current Mine Site Solar



Circular Solar Mine Site



Circular Solar mine sites: a new community benefit as a landfill diversion solution, CDR tech to reduce mine site dust/pm, recycle e-waste associated to recommend energy into circular metals/minerals.

Larger blades are solar-rail mounting infrastructure with CDR to reduce diesel-electric emissions while providing its power. Designed for mine sites as well.

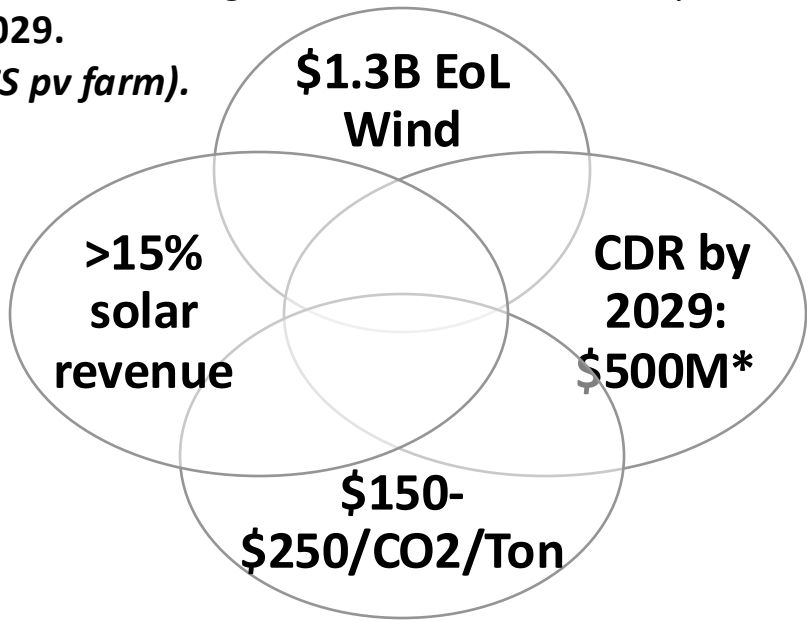
Of the three recycling values, let's focus on reusing/recycling EoL wind blades, nacelle's, for project Circular Solar CDR, where there will be 500,000 tons by 2030, at a 5.6B value by 2033.

This waste to energy and carbon removal breakthrough could attain 25% of the market share, or \$1.3B by 2033. By 2033 Wind, Glass Concrete recycling values total \$20.3B. Circular Solar CDR utilizes recycled material from each sector and if 5% were utilized in our solar farms or EV charging products this accounts for: \$1B

Circular Solar generates an additional 15% or more solar daily yields. In the case of 20% yield increase, a 20% efficiency panel would be 24% eff. CDR becomes a solution to a growing waste and recycling industry into CDR infrastructure, which seeks a \$100/ton/CO2 removal by 2030. Solar is the highest demand renewable energy source and this generates record efficiency.

Circular Solar could be a unicorn, \$1B value by 2029.

Seeking \$2M seed, \$1.2M FOAK funding (1MW CS pv farm).



Circular Solar is a viable solution as the answer to three industry problems: recycling EoL wind (glass, concrete), CDR (carbon dioxide removal) as solutions to one another: cashflow, divert materials from landfill and CO2 emissions avoidance from transporting up to 1 Ton/12T EoL*, solar efficiency increases thus revenue to lower the cost of hybrid wind-solar-battery microgrids.

* For example; in California where all blades are shipped out of state to TX, WY, OK, IA where about 1,400 miles of diesel trucking for 12 tons of wind blades is almost 3 tons of carbon emissions. Circular Solar CDR removes this carbon and annual tons thereafter. *CDR is expected to be a [\\$25B market by 2029](https://circularsolar.net/); Circular Solar CDR products make up 2% CDR market it's \$500M marketshare.

Circular Solar is patent-pending, tech, innovation, R&D by Circular Solar LLC <https://circularsolar.net/> Contact: Founder, Cherise Petker Info@CircularSolar.net

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- Team Circular Solar LLC, at CircularSolar.net is a small team under 5 people.
 - Recycling solution to improve Wind recycling rates by at least 5%.
 - With goals to pilot in Europe, Middle East and California

