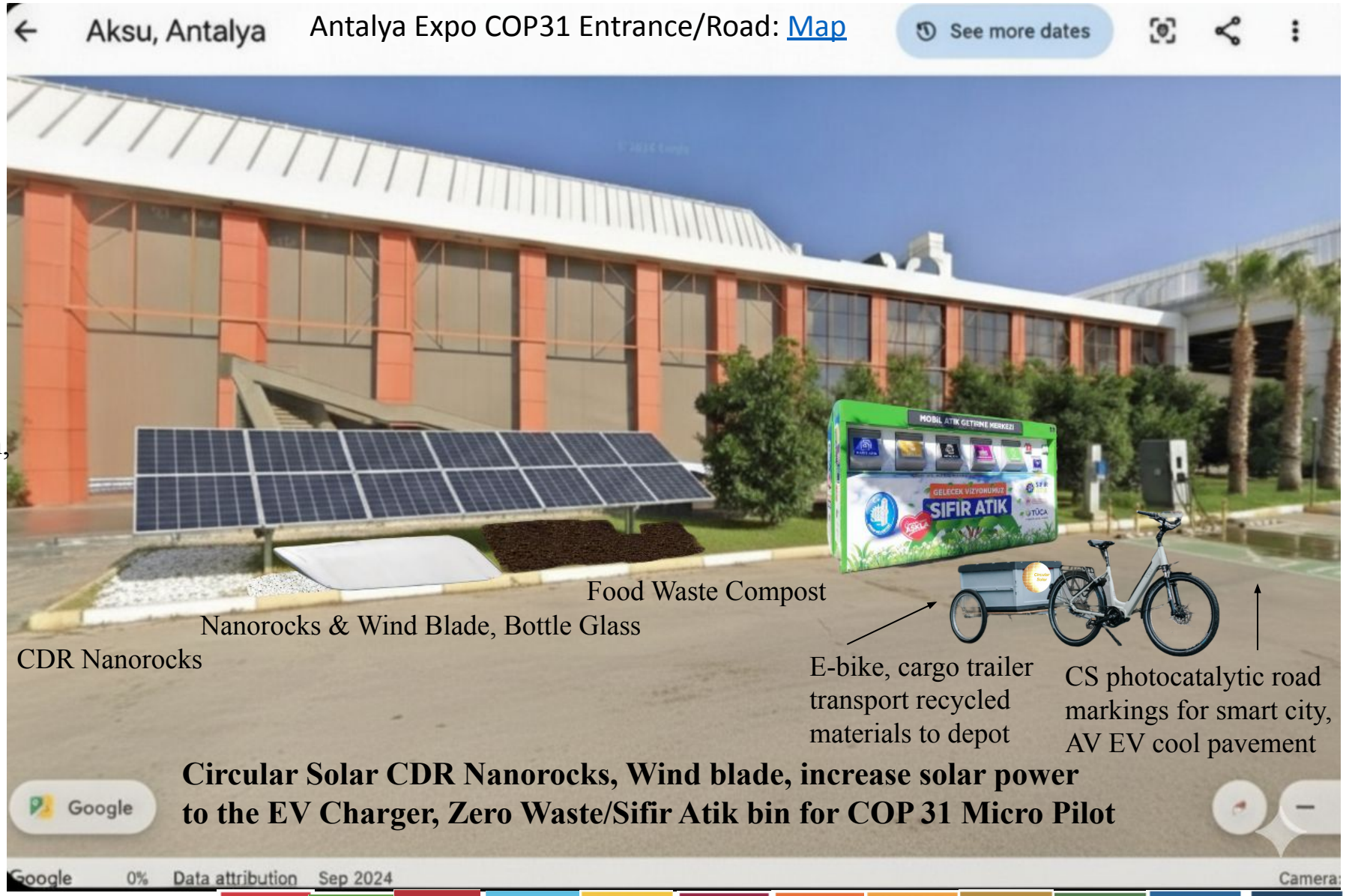
This entire design (including recycling bins at EV charging stations) was recommended to the U.S. CalRecycle 2026 Zero Waste Plan, see slide 4/9, "Homeless-to-Housed" jobs idea, which was also designed for peace/post conflict jobs, New Gaza reconstruction, recycling, energy jobs (concept described in slide 4). Materials feedstock "responsible AI" smart city, road infrastructure (scaling up our 2008 infrastructure micro pilot). Recycling, litter clean-ups are included in school curriculum, potentially with NVIDIA Deep Learning Institute and this pilot can scale to schools to power E-mobility transportation.

Partner recommendations:
Epri (U.S., EU, Gulf)
ACWA Power and Masdar
Epri OPAI MCD collaboration (NVIDIA)
Zero Waste Foundation
COP31
Board of Peace
Whitehouse AI TaskForce

Antalya Expo COP31 Entrance/Road: Map



Circular Solar CDR Nanorocks, Wind blade, increase solar power to the EV Charger, Zero Waste/Sifir Atik bin for COP 31 Micro Pilot

SUSTAINABLE DEVELOPMENT GOALS

Consumers can see a micro perspective for how improving their recycling efforts can support energy dense Circular Solar.

See whitepapers for financial, social, post conflict reconstruction cost benefits.

The Future of Gaza with Circular Solar. A COP31 micro example also demonstrates scale to new Gaza, where rubble is turned into Nanorocks:

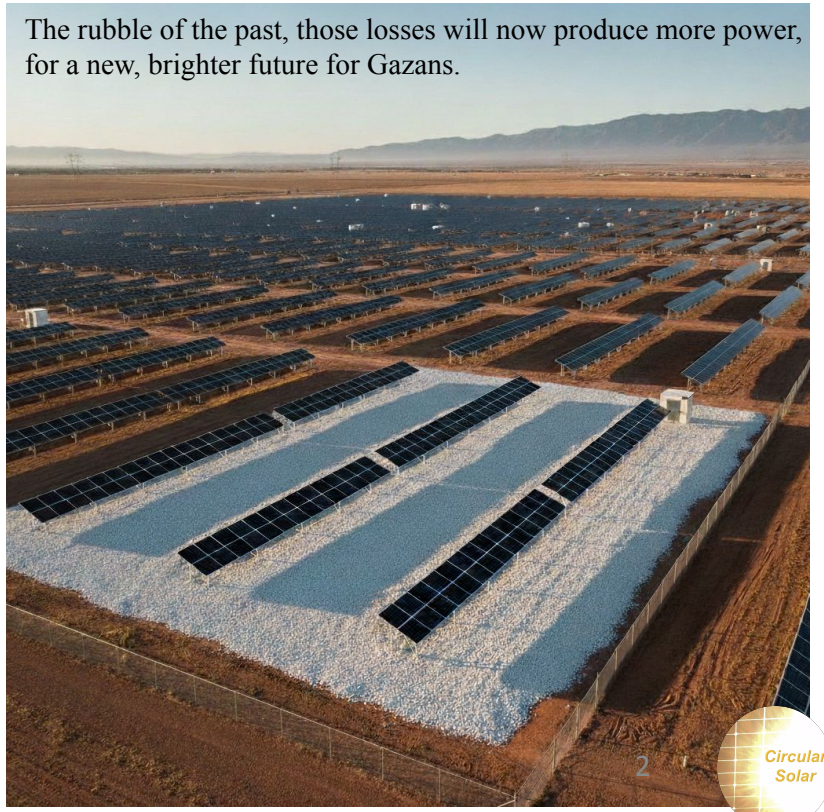
Ground Material	Albedo Value	Expected Bifacial Gain	Output vs. Baseline Monofacial
Brown Soil / Dark Grey Gravel	15% – 25%	**~5% Gain**	Operates at the lower end of bifacial potential. Darker gravel can sometimes underperform soil if it creates micro-shadows.
Circular Solar Nanorocks	65%+	**~23% Gain**	High-reflectance white materials can boost energy production by >**18%** compared to dark surfaces.

Today

- **85% of buildings & infrastructure damaged or destroyed**

Albedo Value of Rafah Rubble **Gain: 5%**

Transformed, by Gazans, into Nanorocks **Gain: 23%**



Circular Solar

With **Nanorocks** part of Circular Solar farms we effectively add "virtual" expansion to the solar farm without installing a single extra panel and instead supports local labor and materials with landfill diversion.

Strategic Fit for the Board of Peace and UN, World Bank:
All three entities have expressed a preference for technologies that offer **Circular Economy** benefits. Nanorocks fits this mandate because:

1. **Rubble Utilization:** It can potentially use processed concrete from destroyed buildings as the base material. **For 1000MW, 5M tons of rubble could be repurposed!**

2. **Land Efficiency:** Because of the **23% Bifacial Gain**, the Board can generate the same amount of power using 25% less land compared to standard ground-mount systems—a critical factor in a high-density area like Gaza.

3. **Diffuse Scattering**: Unlike flat surfaces, the "circular" nature of Nanorocks scatters light in all directions, ensuring more uniform irradiance across the panel.

4. **Self-Cleaning:** Nanorocks break down organic pollution, grime, keeping the "floor" bright and maintaining peak gain without manual washing, maintaining albedo in dusty, high-grime environments reducing water demand for cleaning in a water scarce region which requires desalination plants.

5. **Thermal Efficiency**: Highly reflective ground keeps the immediate environment cooler. Standard dark ground can heat panels and lower efficiency; white surfaces can keep panels **5°C – 10°C cooler**, adding a secondary boost to performance. See next video demo in Antalya 2023 (to help end war, rebuild) IR/Thermal camera data.

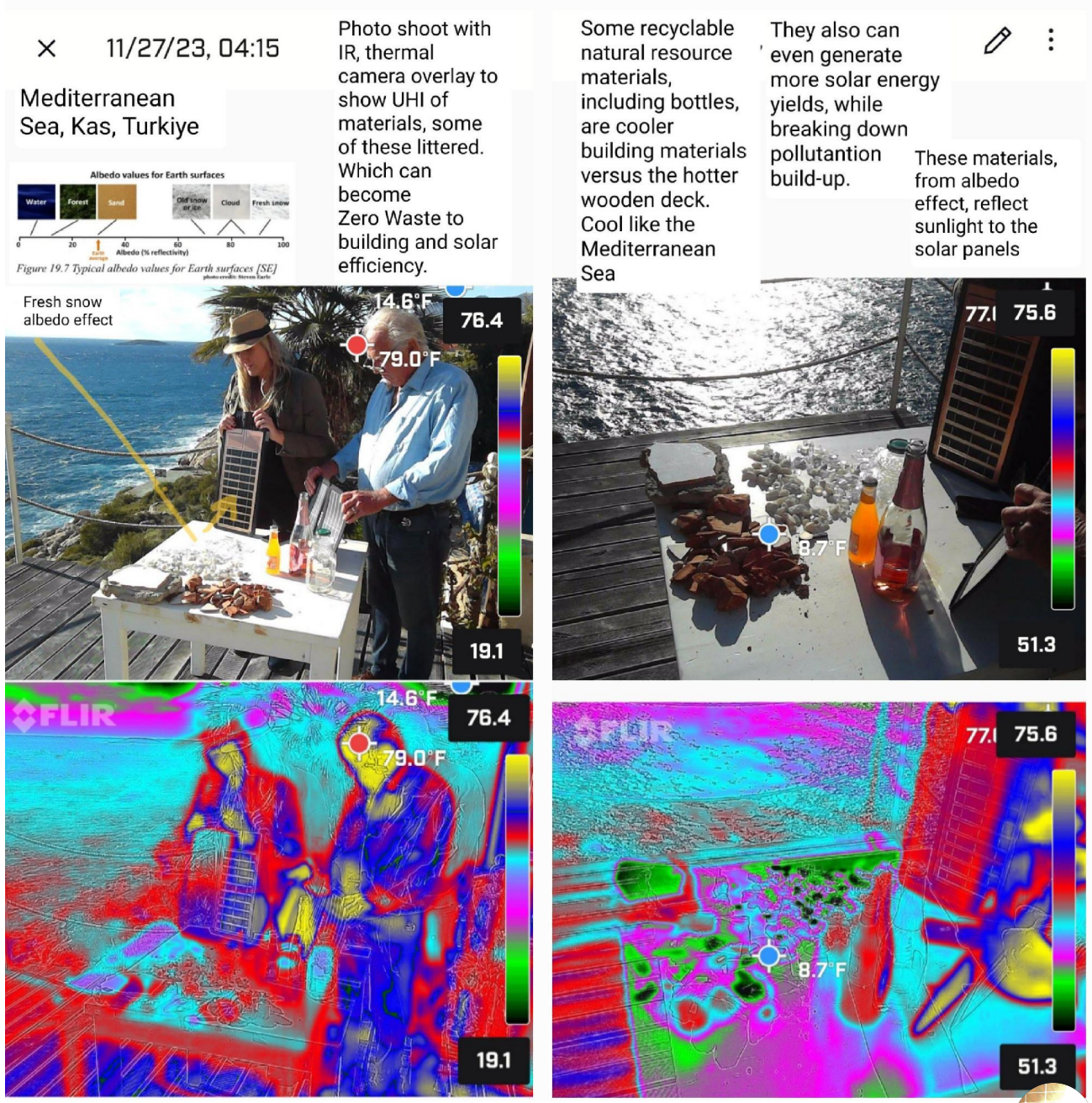
6. **Recycling concrete waste** from war/rubble which creates new jobs for young people without degrees, or certifications, can perform the labor for Circular Solar Nanorocks. The project meets various UN sustainable goal categories. Recycled aggregates should qualify for EU or GCC carbon credits (recycled aggregates).

7. **Supporting the UN Charter by meeting 11/17 sustainable development goals (SDGs):**

Circular Solar

Circular Solar for the UN Zero Waste Initiative:
circular materials for peace, reconstruction, energy efficiency

This video was partially filmed and shared in Antalya province, Turkiye, in November 2023, to support Turkiye for COP31, global UN Zero Waste initiative expansion and to encourage an end to the wars in Gaza and Ukraine – showing new job opportunities in recycling, reconstruction and energy from consumer materials and war debris/rubble concrete.



Learn more about UN Habitat Zero Waste: https://unhabitat.org/advisoryboardzerowaste
Turkiye Zero Waste Foundation: https://sifiratikvakfi.org/en
US, CalRecycle, 2026 Zero Waste Plan Draft: https://calrecycle.ca.gov/zerowasteplan/
Circular Solar's recommendations, to the 2026 Zero Waste Plan, SB1013, SB54, including Homeless-to-Housed job program: https://circularsolar.net/our-thinking
Wind blade, nacelle reuse with Nanorocks as the highest density solar-bess project: https://circularsolar.net/cs-wind%2C-recycling%2C-ai

Nanorocks by Circular Solar; a Zero Waste Airport COP31 CDR project.
Installed by September 2026 at Istanbul, Ankara and Antalya Airports, launched by Turkish Airlines!

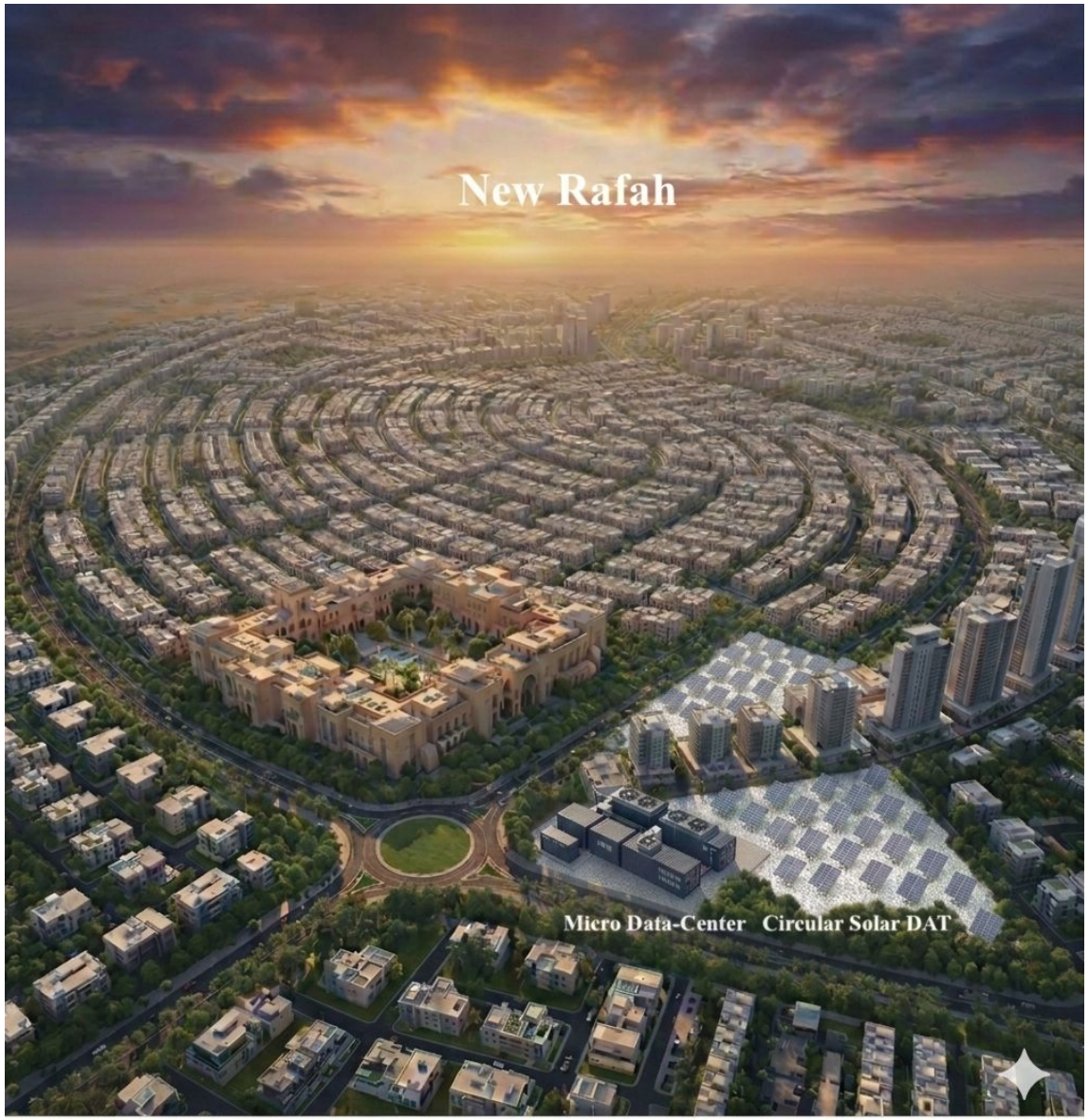
Before landing, the Captain or crew can let passengers know about this CDR project working to reduce their footprint. Then when they get off the plane and see how IST is a “Zero Waste Certified” airport. They will be reminded of the project including recycled Zero Waste construction materials. Digital screens can also show video of how this can scale in Gaza and Ukraine post-war rubble reconstruction with schools, hospitals, smart cities and AI data-centers powered by Circular Solar farms with Nanorocks, reminding passengers of the humanitarian support required for these regions which is also supported by the UN, Turkish leadership and Turkish Airlines.

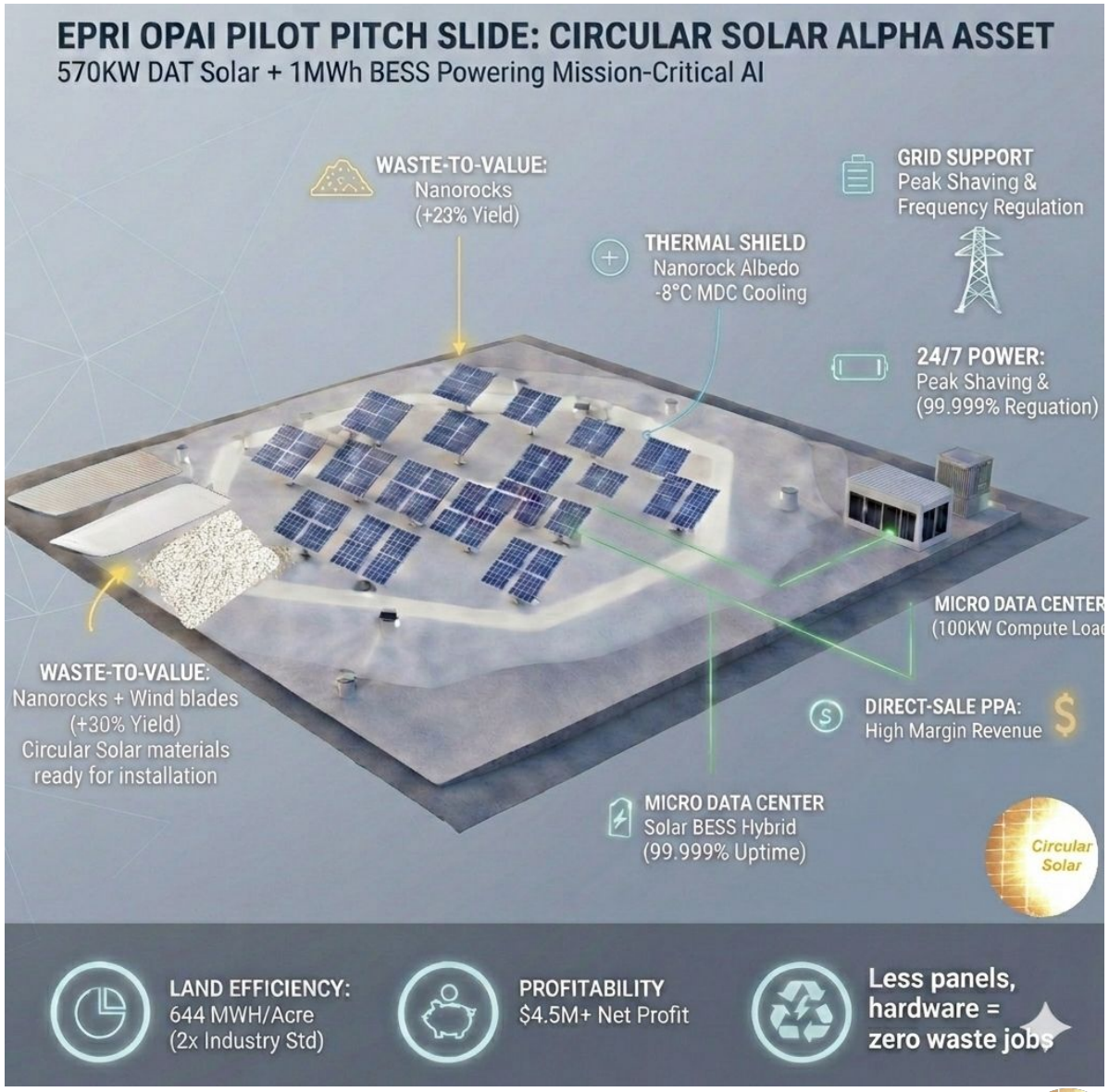
Category	1 MW Baseline (5% Gain)	1 MW Nanorocks (18 - 23% Gain)
Physical Build Size	1.0 MW (DC)	1.0 MW (DC)
Total Acres Required	4.75 Acres	**3.45 Acres (1.30 Saved)**
Rubble Utilized (7" base)	0 Tons	3,700 Tons
Direct Community Labor	$0	$85,000 (Initial + Refresh)
Hardware & Install CAPEX	$680,000	$667,200
Circular Solar IP & Tech Fee	$0	$40,032 (6% of Capex)
Total Initial CAPEX	**$680,000**	**$707,232**
---	---	---
Gross 25-Year Revenue	$3,547,000	**$4,154,300**
Est. Carbon Credits ($21/ton)*	$0	$105,000
Total Operational Costs (O&M)	($250,000)	($125,000)
Year 12 Refresh (Labor/Materials)	$0	($95,000)
CS 2.0% Royalty	$0	**($83,086)**
U.S. Gov 0.5% Royalty	$0	**($20,772)**
---	---	---
Net 25-Year Profit (Owner)	**$2,617,000**	**$3,235,442**
Total Net Advantage	—	**$618,442**

** Due to costs of CC auditing >10MWs is required*

Category	1 GW Baseline (5% gain)	1 GW Circular Solar (18 - 23% gain)
Physical Build Size	1,000 MW	1,000 MW
Total Acres Required	4,750 Acres	**3,450 Acres (1,300 Saved)**
Rubble Utilized (7” base)	0 Tons	**3.7 Million Tons**
Direct Community Labor	$0	$85,000,000
Hardware & Install CAPEX	$680,000,000	$667,200,000
Circular Solar IP & Tech Fee	$0	$40,032,000
Total Initial CAPEX	**$680,000,000**	**$707,232,000**
---	---	---
Gross 25-Year Revenue	$3,547,000,000	**$4,154,300,000**
Est. Carbon Credits ($21/ton)	$0	$105,000,000
Total Operational Costs (O&M)	($250,000,000)	($125,000,000)
Year 12 Refresh (Labor/Mat.)	$0	($95,000,000)
CS 2.0% Royalty	$0	**($83,086,000)**
U.S. Gov 0.5% Royalty	$0	**($20,771,500)**
Net 25-Year Profit (Owner)	**$2,617,000,000**	**$3,235,442,500**
Total Net Advantage	—	**$618,442,500**

Circular Solar DAT for within New Rafah's community and for Micro data-centers supporting AI for all:





Category	1 MW Baseline (Grid)	1 MW CS Nanorocks (Grid)	570 kW CS DAT (AI Inference)
Physical Build Size	1.0 MW (DC)	1.0 MW (DC)	**0.57 MW (DC)**
Total Acres Required	4.75 Acres	3.45 Acres	**2.30 Acres**
Rubble Utilized (7" base)	0 Tons	**5,000 Tons**	**3,300 Tons**
Hardware & Install CAPEX	$680,000	$667,200	**$1,083,000** ($1.90/W)
Circular Solar IP & Tech Fee	$0	$40,032 (6%)	**$64,980** (6%)
Total Initial CAPEX	**$680,000**	**$707,232**	**$1,207,980**
---	---	---	---
Effective Rate per kWh	$0.065 (Grid)	$0.065 (Grid)	**$0.130 (AI)**
Gross 25-Year Revenue	$3,547,000	$4,154,300	**$7,060,000**
Est. Carbon Credits ($21/ton)*	$0	$105,000	**$88,000**
Total Operational Costs (O&M)	($250,000)	($125,000)	**($110,000)**
Year 12 Refresh (Labor/Mat.)	$0	($95,000)	**($80,000)**
CS 2.0% Royalty	$0	($83,086)	**($141,200)** (Based on $7.06M)
U.S. Gov 0.5% Royalty	$0	($20,772)	**($35,300)** (Based on $7.06M)
---	---	---	---
Net 25-Year Profit (Owner)	**$2,617,000**	**$3,235,442**	**$5,493,520**
Total Net Advantage	---	**$618,442**	**$2,876,520** (Relative to Baseline)

**Due to costs of CC auditing >10MWs is required*

Now we see 100MW equivalent, including where clusters of Circular Solar DAT can power MDCs/AI within New Rafah and other phases of the New Gaza:

Category	100 MW Baseline (Grid)	100 MW Nanorocks (Grid)	57 MW CS DAT (AI Inference)
Physical Build Size	100.0 MW (DC)	100.0 MW (DC)	**57.0 MW (DC)**
Total Acres Required	475 Acres	345 Acres	**230 Acres**
Rubble Utilized	0 Tons	**500,000 Tons**	**330,000 Tons**
Hardware & Install CAPEX	$90,000,000 ($0.90/W)	$88,000,000	**$108,300,000** ($1.90/W)
Circular Solar Tech Fee (6%)	$0	$5,280,000	**$6,498,000**
Total Initial CAPEX	**$90,000,000**	**$101,780,000**	**$120,798,000**
---	---	---	---
Effective Rate per kWh	$0.065 (Grid)	$0.065 (Grid)	**$0.130 (AI)**
Gross 25-Year Revenue	$354,700,000	$415,430,000	**$706,000,000**
Est. Carbon Credits ($21/ton)	$0	$10,500,000	**$8,800,000**
Total Operational Costs (O&M)	($25,000,000)	($12,500,000)	**($11,000,000)**
Year 12 Refresh	$0	($9,500,000)	**($8,000,000)**
CS 2.0% Royalty	$0	($8,308,600)	**($14,120,000)**
U.S. Gov 0.5% Royalty	$0	($2,077,200)	**($3,530,000)**
---	---	---	---
Net 25-Year Profit (Owner)	**$239,700,000**	**$293,544,200**	**$549,352,000**
Total Net Advantage	---	**$53,844,200**	**$309,652,000** (vs Baseline)

Economic Impact Highlights

Yield Efficiency: The increase from a 5% to 23% bifacial gain adds **$618 million** in direct energy revenue over the project's life. This allows the 1 GW nameplate capacity to perform with the output of a **1.23 GW** standard facility of .20 albedo.

Asset De-Risking: Allocating a **0.5% royalty ($20.7M)** to the U.S. Government establishes a formal diplomatic interest in the project's security and longevity, potentially lowering insurance costs and attracting institutional capital.

Operational Savings: The engineered Nano Rock bed significantly reduces vegetation and soil erosion management, cutting long-term O&M costs by **50%** compared to traditional "brown dirt" installs.

Community Investment: The project injects **$85 million** directly into local labor markets for the initial processing and periodic "refresh" of the Nanorock surface, fostering regional stability and buy-in.

Circular Solar DAT for adjacent micro data-centers (especially well suited to inference loads): This holds the biggest upside potential for revenue and ensuring AI for all – which would support better healthcare to help manage post war health impacts (physical to mental) or school curriculum which also educates to create tolerance for other people, cultures, religions and of course - recycling.

For years, our family has envisioned the Circular Solar DAT farms within New Gaza. With Nano Rocks made from rubble, to double as a memorial space. Where Gazans can try to find a sense of closure, a place to remember their lost loved ones and also a place to pray ; as the Circular Solar Light (which can occupy one DAT array with Nanoracks, perhaps just outside the DAT farm; which may be secured) as already prototyped since 2022, it creates a visual display, signal for the Call To Prayer (Adhan). People who live in the apartments with balconies, they can see this light illuminating (at dawn and night) the rubble/memorial – which now has a new purpose, creating additional energy, supporting local needs or AI MDC power to ensure peace and prosperity.

Revised Drivers of the $618M Advantage:

1. The "Soiling" Effect & Yield Recovery

- **The Problem**: On standard "Brown Dirt" sites, wind and maintenance vehicles kick up fine particulates that settle on the glass, reducing efficiency by 5% to 15% in weeks.
- **The Nanoracks Solution**: By locking down **5 million tons** of rubble per 1,000 MW, you eliminate the source of the dust.
- **The Benefit**: You maintain the **23% gain** longer. Panels stay cleaner, avoiding the "sawtooth" efficiency drops seen on dirt sites.

2. Radical Reduction in Water Demand

- **The Baseline**: A 1,000 MW farm on dirt requires millions of gallons of water annually for panel "scrubbing".
- **The Nanoracks Advantage**: Because there is no loose soil, the frequency of cleaning cycles is reduced by **50% or more**.
- **Cost Impact**: This is the primary reason your O&M costs drop from **$250M to $125M** in the 1,000 MW model.

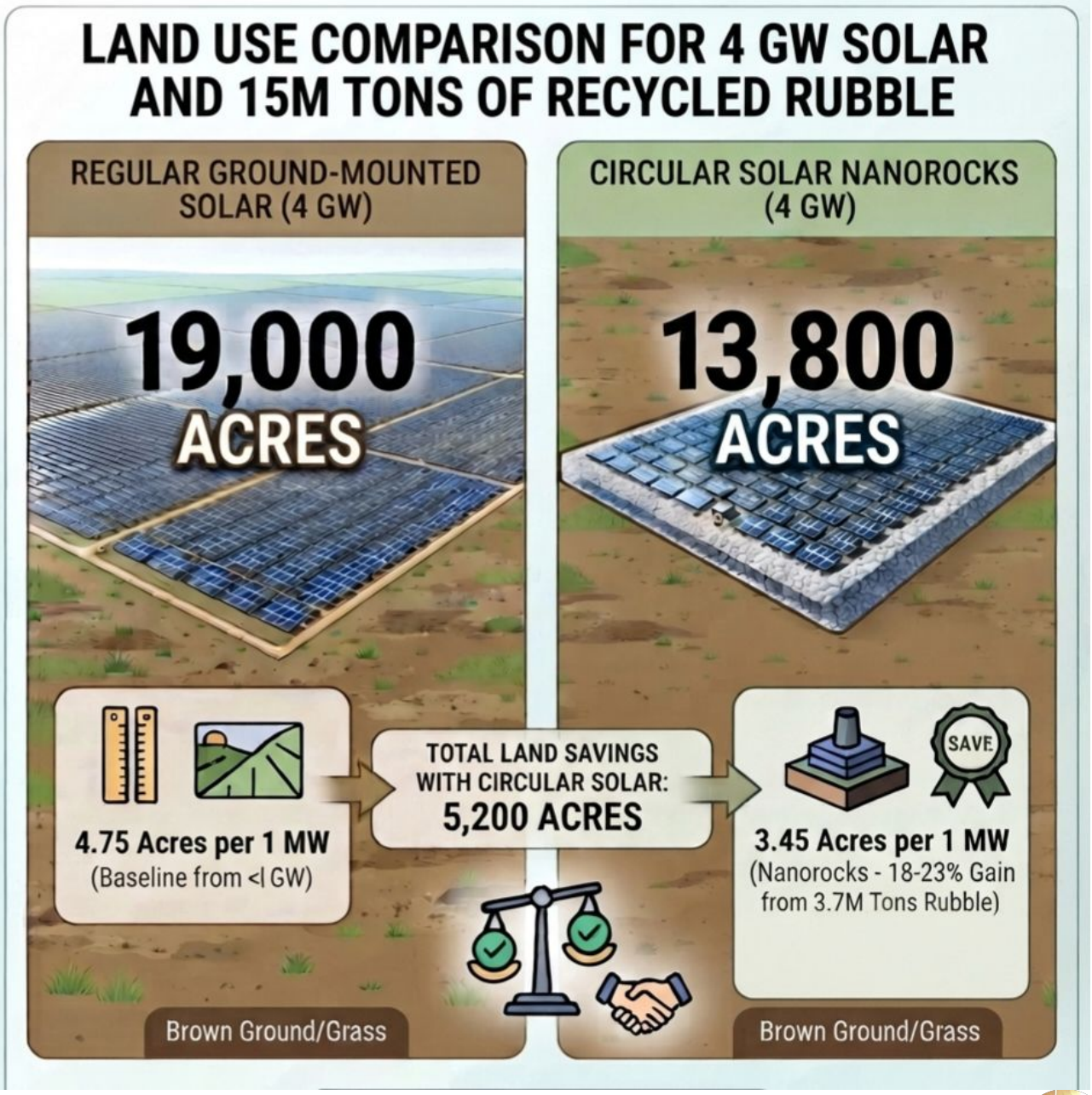
3. "Albedo" and Thermal Cooling

- **Reflectivity**: Nanoracks reach an albedo value of **65%+**, reflecting significantly more light to the back of bifacial panels than brown soil (15%-25%).
- **Heat Dissipation**: Bare dirt absorbs heat, raising ambient temperatures and decreasing panel efficiency by roughly **0.4% per 1°C**. The porous Nano Rock layer allows for better airflow, keeping the panels cooler and closer to peak performance.

4. Erosion and Structural Integrity

- **Eliminating "Washout"**: Dirt sites suffer from erosion that can undermine racking foundations.
- **Zero Weeding**: Using processed material as a "hardscape" eliminates the need for herbicides or mowing. This keeps community labor focused on high-value **refresh tasks** ($85M total) rather than low-value weeding.

5. Significant land savings. From 20 -30% pending SAT or DAT. The entire project was designed, decades in the making, was to both divert materials from landfills, repurpose versus downcycle which costs more energy and emissions and reduce unemployment rates for low skilled jobs, to boost clean, homegrown solar-bess energy. All together, this is how we deter conflicts and wars.



Goal	Description	Circular Solar Contribution
SDG 1 & 4	No Poverty, Quality Education	Living wages, housing for the previously homeless. Including post conflict, faster, better education (AI)
SDG 3 & 6	Good Health, Clean Water	**Pollution degradation** (NOx/PFAS reduction) in communities cleaner stormwater runoff.
SDG 7	Affordable & Clean Energy	>18% solar yields supporting affordable solar- BESS for housing to AI DCs, grid stability.
SDG 8	Decent Work	Career pathways in the green tech and AI-sorting sector.
SDG 9	Industry & Innovation	**AI-driven mining** and high-tech e-waste repurposing.
SDG 11	Sustainable Cities	**UHI reduction** and urban waste-to-resource management.
SDG 12	Responsible Consumption	Closing the loop on wind blades, nacelles and construction waste.
SDG 13	Climate Action	Direct methane reduction and lower carbon concrete.
SDG 17	Partnerships	Global UN Zero Waste initiatives through resource management.

More recent real-life micro tests in a high pollution area to ensure soiling removal and energy results back up previous years of testing, since 2022. The testbed was made to simulate third-party outdoor lab testing facility to verify and improve the technology, seen here: https://circularsolar.net/innovation-%26-testing

SAT and DAT will be the primary type of Circular Solar farm as they maximize the utility of high-albedo surfaces by creating a dynamic, optimized "viewing angle" for the rear side of bifacial modules.

Solar Panel Yield: Fixed Vertical vs Single-Axis Tracker with High Albedo (0.75 Nanorocks)

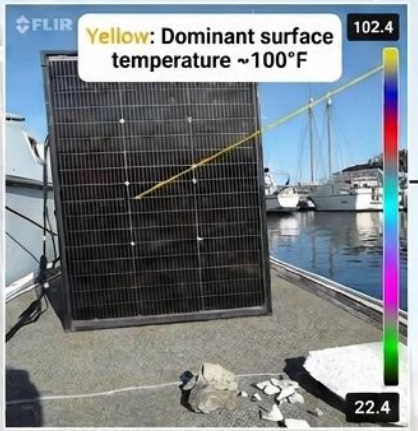
Vertical Fixed Real-Life Results by Circular Solar

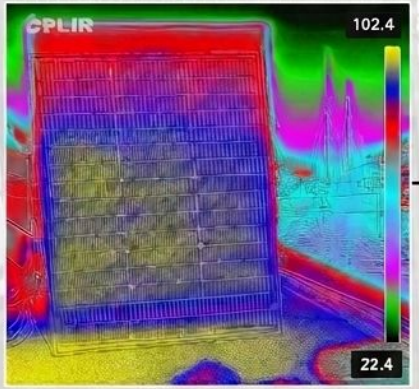
Wh	Original (0.20 albedo fixed vertical)	Single-Axis Tracker + 0.20 albedo	Fixed Vertical + 0.75 albedo	Single-Axis Tracker + 0.75 albedo
	390	468-500	419-441	527-575
		+20%-25%	+7.5%-13%	+35-47%
%				

- Vertical Fixed Real-life test validated 7.5-13% gain
- Bifacial reflection + cooling benefit
- Tracker adds major front-side uplift

Impact of Surface Albedo and Temperature on Solar Panel Energy Yield: A Comparative Study

(A) Case Study 1: Brown (Low Albedo) Concrete





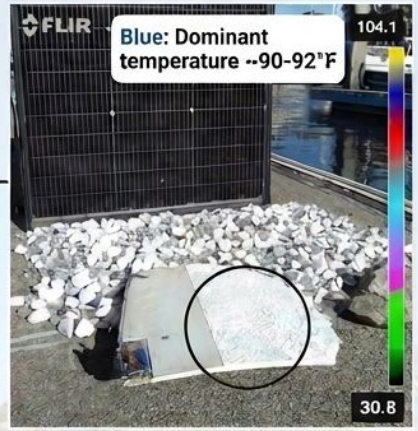
Scenario: Solar Panel on Brown Concrete.
Outcome: Higher Operating Temperatures, Lower Albedo

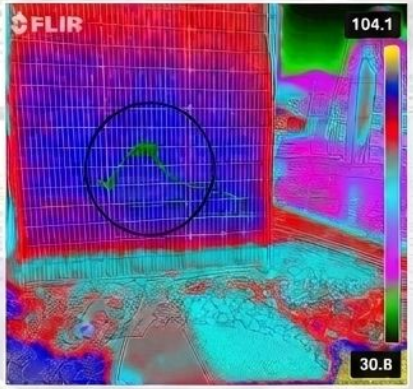
70F day high (feels like 76F)

Increased Thermal Noise / Reduced Panel Efficiency

Reduced Thermal Noise / Enhanced Panel Efficiency

(B) Case Study 2: White Circular (High Albedo) Solar Materials



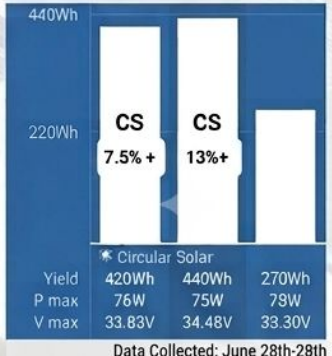


Scenario: Solar Panel with White Circular materials.
Outcome: Lower Operating Temperatures, Higher Albedo

- Albedo values where Circular Solar generated 7.5-13% more solar yield:
  - Circular Solar Albedo: 0.85
  - Brown Concrete Albedo: 0.15

Wh Comparison

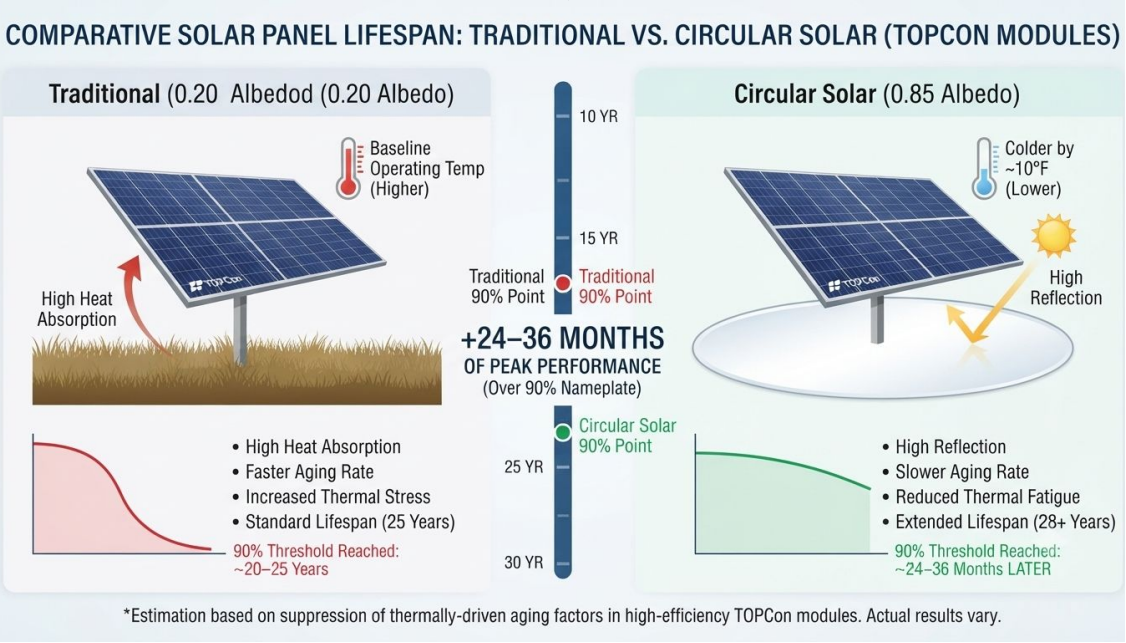
Surface	Temp	Yield
Brown Concrete	Hotter (~100°F)	390 Whs (Baseline)
White Circular Materials	Cooler (~90°F)	420-440 Whs (7.5-13%+ Increase)

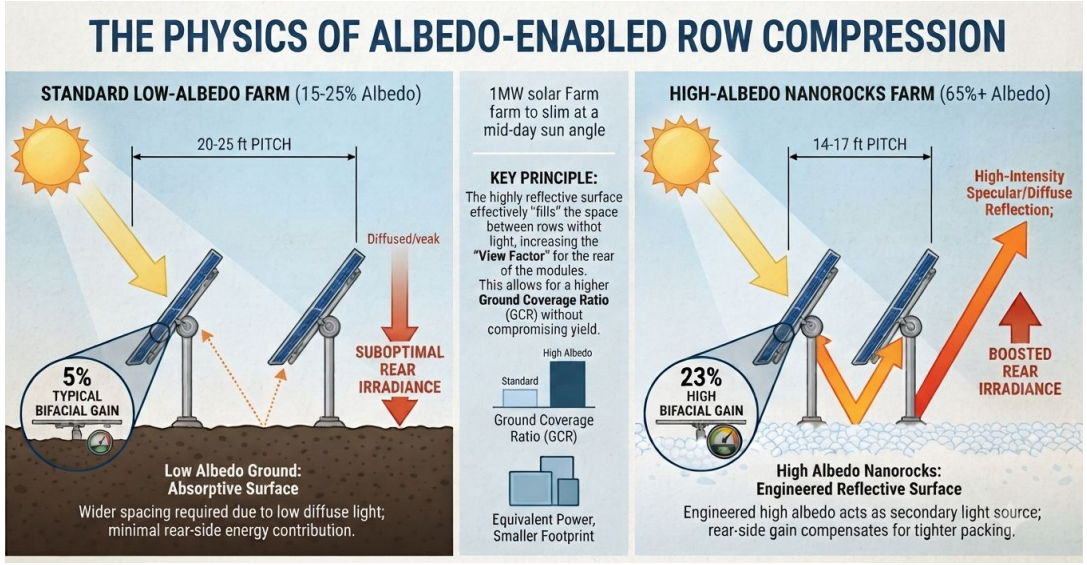


Data Collected: June 28th-28th

Circular Solar farms require less land as our technology supports tighter row pitch.

.75%+ albedo effect materials offer thermal efficiency, cooler panel surfaces temperatures as seen in the previous slide reduces panel degradation.





TRANSFORMING GAZA'S LANDSCAPE: The Future of Circular Solar.

GROUND TYPE: Brown Soil / Dark Grey Gravel | ALBEDO: 15-25%

- **Expected Bifacial Gain: ~5%**
- **Land Required (1MW): 4.75 Acres**
- **Average Row Pitch: 20-25 ft**

Operates at lower end of bifacial potential. Darker surfaces absorb light rather than reflecting it, limiting rear-side energy harvest.

GROUND TYPE: Green Grass / Vegetation | ALBEDO: 15-25%

- **Expected Bifacial Gain: 3-7%** (accounting for refroreflection)
- **Land Required (1MW): 4.75 Acres** (requires same spacing as soil to manage shading)
- **Average Row Pitch: 20-25 ft**

Technically brighter than dark soil, but grass traps light and intruduces maintenance challenges (shading, mowing) that limit real-world gains.

GROUND TYPE: Circular Solar Nanorocks | ALBEDO: 65%+ (Engineered White Surface)

- **Expected Bifacial Gain: ~23%**
- **Land Required (1MW): 3.45 Acres** **(30% Land Saved!)**
- **Average Row Pitch: 14-17 ft**

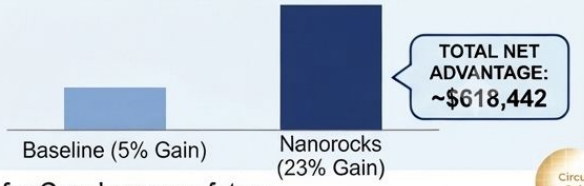
Transformed debris becomes a high-performance reflector. Maximizes rear-side "view factor" and energy density, allowing tighter packing.

Total Net Advantage: 1MW Farm (25-Year)

Total Net 1MW Farm

Increased Revenue

Land Savings



Turning rubble into revenue: A sustainable path for Gaza's energy future.

The Future of Gaza with Circular Solar. A COP31 micro example also demonstrates scale to new Gaza, where rubble is turned into Nanorocks:

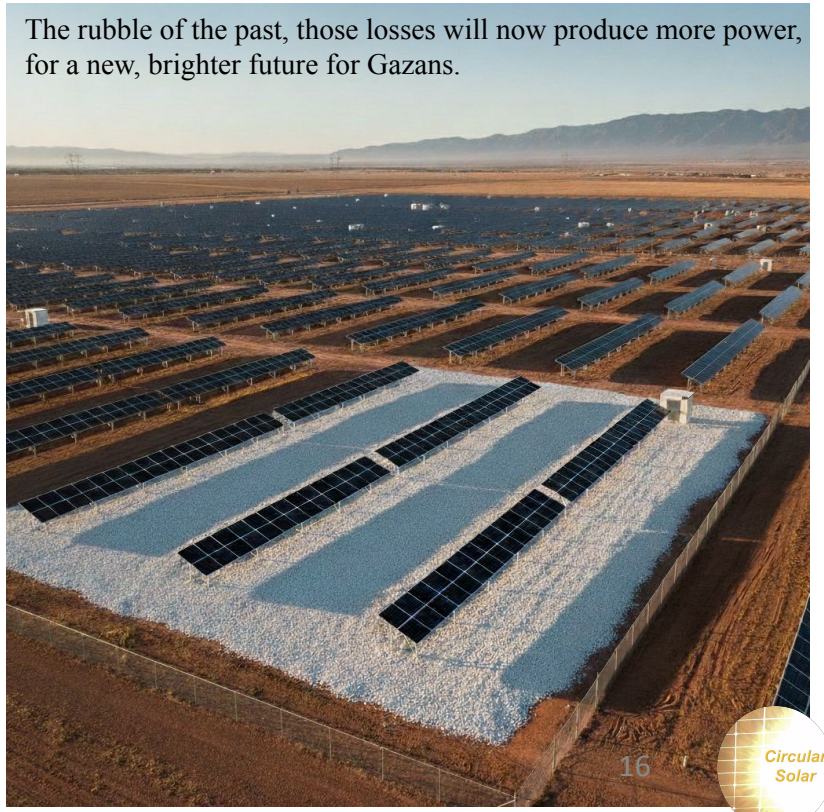
Ground Material	Albedo Value	Expected Bifacial Gain	Output vs. Baseline Monofacial
Brown Soil / Dark Grey Gravel	15% – 25%	**~5% Gain**	Operates at the lower end of bifacial potential. Darker gravel can sometimes underperform soil if it creates micro-shadows.
Circular Solar Nanoracks	65%+	**~23% Gain**	High-reflectance white materials can boost energy production by >**18%** compared to dark surfaces.

Today

- **85% of buildings & infrastructure damaged or destroyed**

Albedo Value of Rafah Rubble **Gain: 5%**

Transformed, by Gazans, into Nanorocks **Gain: 23%**



New Gaza or Ukraine: reconstruction of highway, Circular Solar Farm and ERW(enhanced rock weathering) soil restoration:

1. Recycled rubble generating additional solar energy, EoL Wind materials for BESS storage meeting 2026 EU Circular Economy Act.
2. All with Pollution Management for cleaner groundwater runoff.
3. Enhanced Rock Weathering for soil restoration and durable CDR CM (carbonated materials) from enhanced RCA.

For Ukraine, reusing EoL Wind nacelle's shipped from Germany for BESS and Inverter storage increasing efficiency.

Additionally, sections of EoL wind blades for Circular Solar Wind Farms can be shipped on rail with nacelle BESS and secured over the gravel for >.85% albedo value.

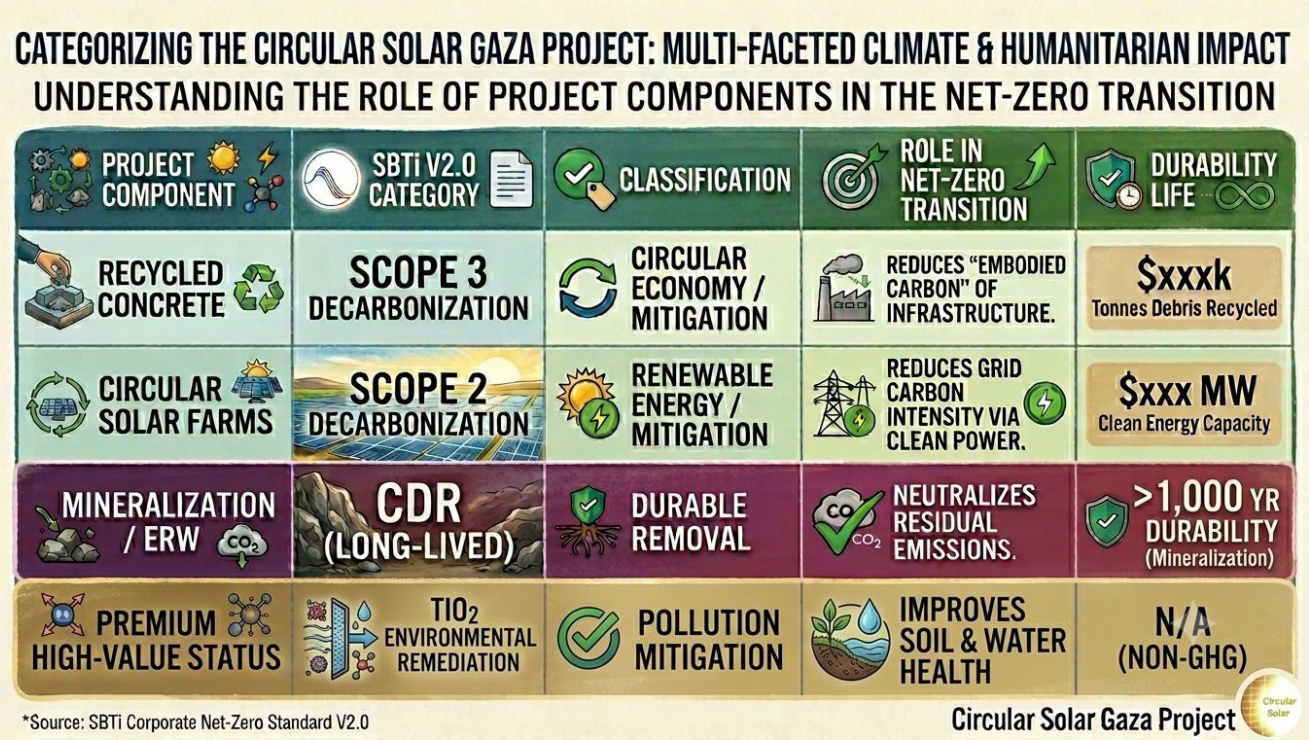
Nanorocks .65 albedo boost solar efficiency, cooler solar panels and provide fire mitigation.

UAV/Drone charging, launch section for Agriculture work or provide video footage to first responders in vehicle accidents.

CIRCULAR SOLAR GAZA AND UKRAINE PROJECTS: INTEGRATED CLIMATE MITIGATION & DURABLE REMOVAL FRAMEWORK

- **Climate Mitigation** for Scope 2 (Solar) and Scope 3 (Recycled Concrete) activities.
- **Durable Removal** from high-permanence CDR (Mineralization/ERW), a high value component for long-term net-zero goals.

Project Component	SBTi V2.0 Category	Classification	Role in Net-Zero Transition
Recycled Concrete	Scope 3 Decarbonization	Circular Economy / Mitigation	Reduces "embodied carbon" of infrastructure.
Circular Solar Farms	Scope 2 Decarbonization	Renewable Energy / Mitigation	Reduces grid carbon intensity via clean power.
Mineralization / ERW	**CDR (Long-Lived)**	**Durable Removal 1,000 year**	Neutralizes residual emissions (centuries+).
TiO2 Photocatalyst	Pollution Mitigation	Environmental Remediation	Improves local air and water quality.



[Assessment based on the new June 2026 Corporate Net-Zero Standard V2.0]

- Team Circular Solar LLC, at CircularSolar.net is a small team under 5 people.

- Recycling solution to improve Wind, concrete/construction waste recycling rates by at least 5% to 95%, goal 100%.

- Next steps, pilots in Europe, USA, Middle East.

Circular Solar

Cherise Petker, Founder, Circular Solar LLC
CircularSolar.net CircularSolar@outlook.com