



**CHERISE PETKER**

CircularSolar@outlook.com

By Cherise Petker, CircularSolar.net

**WHITEPAPER: THE SELF-FUNDING MACROECONOMIC ARCHITECTURE OF CIRCULAR SOLAR'S: HOMELESS-TO-HOUSED JOB PROGRAM**

**Monetizing Upstream Toxicological Interception & Electronics Reclamation to Permanently Finance Permanent Supportive Housing for Low-Income and Homeless Populations in California**

<b>Prepared For:</b>	California Municipalities, Water Utility Districts, Housing Authorities, and ESG Impact Investors
<b>Framework By:</b>	Cherise Petker, CircularSolar.net
<b>Date of Issuance:</b>	June 6, 2026
<b>Core Regulatory Baselines:</b>	CalRecycle SB 54 (SRIA Standard), Porter-Cologne Act, EPA CCL 6 Standards, Clean Water Act Section 303(d)



## 1. Executive Summary

Traditional permanent supportive housing (PSH) initiatives for unhoused and low-income populations in California continuously stall due to structural funding constraints, municipal budgetary exhaustion, and heavy reliance on erratic public tax revenue or highly competitive state grants. This whitepaper introduces the macroeconomic implementation roadmap developed by Circular Solar, presenting a self-funding framework that transforms homelessness mitigation from a public cost center into a self-sustaining municipal asset.

By deploying unhoused individuals into an integrated transitional green workforce, the Circular Solar model captures massive, previously unquantified capital streams from two primary vectors: upstream toxicological containment (preventing high-surface-area PFAS and microplastic shedding) and circular electronics commodity harvesting (reclaiming high-value PV assets). This whitepaper mathematically demonstrates how routing these captured avoided costs and revenues directly into dedicated housing funds completely pays for the construction, acquisition, maintenance, and wrap-around services of permanent supportive housing for low-income and unhoused Californians.

## 2. The Problem: The Toxicological and Structural Housing Trap

Unmanaged riparian (riverbank) and urban homeless encampments serve as high-density, unregulated open-air macro-waste corridors. Without municipal waste infrastructure, essential consumer goods like polyethylene tarps, synthetic tents, fast-food wrappers, and single-use plastic bottles degrade continuously under intense California UV radiation and ambient temperature shifts. Field testing utilizing thermal-imaging cameras indicates that these macro-plastics generate a low-albedo heat sink, driving localized soil and water thermal pollution that disrupts riparian microclimates.

Simultaneously, mechanical and solar weathering shatters this macro-debris into microscopic and nanoplastic particles, which adsorb toxic pharmaceuticals and leach per- and polyfluoroalkyl substances (PFAS) straight into agricultural soils and local water tables. While municipalities exhaust millions annually on cyclic "clean sweeps" and emergency medical responses, water infrastructure districts downstream bear catastrophic expenses implementing advanced filtration systems to satisfy federal safe drinking water requirements. Concurrently, the municipal cost to house a single individual under traditional models ranges between \$35,000 and \$50,000 annually, a threshold local governments struggle to scale.

## 3. The Circular Solar Architecture: Interception and Reclamation

The Circular Solar roadmap resolves this dual economic crisis through a multi-tiered workforce pipeline. Unhoused individuals enter a programmatic continuum: from street outreach to transitional managed shelter, advancing into permanent supportive housing financed directly by the value generated through their workforce contributions. The workforce operates across two key operational tracks:

- **Track A: Upstream Watershed Interception:** Program participants are trained and deployed as specialized ecological remediation technicians. They capture high-surface-area

plastics, treated fabrics, and electronics from sensitive riparian zones before environmental weathering triggers microplastic fragmentation and chemical leaching.

- **Track B: Circular Photovoltaic E-Waste Processing:** Housed and stabilized participants transition into clean technology logistics and processing facilities. They manage, test, and disassemble end-of-life (EoL) photovoltaic panels and electronics, isolating rare earth elements, copper, silver, and high-purity silicon for industrial closed-loop manufacturing.

#### 4. Environmental and Industrial Value Capture

To mathematically model how the program finances housing, we integrate state-validated regulatory data. Under California CalRecycle's Plastic Pollution Prevention and Packaging Producer Responsibility Act (SB 54) Standardized Regulatory Impact Assessment (SRIA), the California Department of Finance values the environmental and structural liability of unmanaged PFAS at \$20,000 per kilogram (\$9,071 per pound). Furthermore, national ecosystem service assessments value unmanaged plastic degradation at \$33,000 per metric ton in lost ecological utility.

<b>Contaminant / Revenue Asset Class</b>	<b>Scientific &amp; Economic Accounting Standard</b>	<b>Annual Value Captured (Per 50-Worker Unit)</b>
1. Avoided PFAS Leaching	CalRecycle SB 54 SRIA damage standard of \$20,000/kg. Interception of 15 to 40 kg of treated technical fabrics and packaging annual footprint.	\$300,000–\$800,000
2. Avoided Microplastic Loss	NCEL ecosystem utility loss standard (\$33,000/metric ton). Interception of 2 to 4 metric tons of macro-plastics prior to fragmentation.	\$66,000–\$132,000
3. Avoided Thermal Pollution	Mitigation of albedo-driven heat sink damage to agricultural soil and river temperature balance.	\$15,000–\$50,000
4. Municipal Stormwater / TMDL Fines	Avoided Regional Water Quality Control Board structural trash capture compliance penalties and maintenance costs.	\$50,000–\$150,000
5. PV E-Waste Material Reclaim	Commodity resale of extracted silver, copper, and clean silicon from decommissioned utility solar panels.	\$120,000–\$250,000
<b>TOTAL VALUE RECLAIMED PER ANNUM</b>	<b>Gross Micro-Environmental &amp; Industrial Asset Yield</b>	<b>\$551,000–\$1,382,000</b>

## 5. The Housing Finance Mechanism: How It Pays for Homeless to Housed

The core innovation of the Circular Solar roadmap is the monetization and diversion of these figures into a dedicated Municipal Social-Environmental Trust (MSET). Instead of these funds dissolving into disjointed municipal departments or remaining completely uncaptured, the framework structures a revolving fund where the environmental and industrial profits directly offset the capital expenditure (CapEx) and operational expenditure (OpEx) of housing.

$$\$V_{\text{Reclaimed}} = \sum (\text{PFAS}_{\text{avoided}} + \text{MP}_{\text{avoided}} + \text{TMDL}_{\text{avoided}} + \text{PV}_{\text{commodity}}) \$$$

The financial architecture converts this annualized asset yield into a standardized Housing Subsidy Matrix. Taking California's high cost of living into account, the baseline annual cost to lease, manage, and provide wrap-around medical and psychological care for a permanent supportive housing unit is modeled at \$42,000 per individual.

### CapEx Financed via Green Bond Arbitrage

Municipalities deploy the multi-million dollar "avoided downstream water treatment cost" projections as a collateralized revenue stream to issue tax-exempt ESG Green Housing Bonds. The capital raised from these bonds is utilized immediately to acquire underutilized multi-family properties, convert commercial motels, or build micro-unit modular housing communities. Because the ongoing program operations continuously verify the prevention of PFAS and microplastics, the state and local water districts subsidize the bond interest payments using funds earmarked for clean water compliance.

### OpEx and Rent Subsidies Funded via Clean Cleanup Dividends

The baseline operations demonstrate that a single 50-worker cohort generates a minimum of \$551,000 and up to \$1,382,000 in net accounted value per year. When divided across the cohort, this translates to an annualized housing dividend:

$$\text{\$Housing Dividend per Capita} = \frac{\text{\$551,000} \text{ to } \text{\$1,382,000}}{50 \text{ Individuals}} = \text{\$11,020} \text{ to } \text{\$27,640} \text{/year} \$$$

This dividend acts as an automatic, non-taxpayer funded rent subsidy. Combined with traditional socioeconomic savings (reduced emergency medical services, county jail decompression, and traditional trash collection offsets valued at \$18,500 per capita), the net financial framework completely neutralizes the \$42,000 annual PSH operational cost.

### Socio-Environmental Housing Cost Equation

- Traditional PSH Cost per Capita: \$42,000 / year
- (-) Macroeconomic Environmental Asset Dividend: -\$19,330 / year (Median Variable)
- (-) Municipal Socioeconomic Decompression Savings: -\$18,500 / year
- (-) Solar Commodity E-Waste Recovery: -\$3,700 / year (Median Variable)
- **NET TAXPAYER SUBSIDY REQUIRED: \$470 / year (Near Total Self-Sufficiency)**

## 6. Roadmap Implementation and Scale

To execute this self-funding paradigm across California, Circular Solar outlines a phased deployment roadmap:

1. **Phase 1: Municipal Regulatory Linkage (Months 1-3):** Cities form joint powers authorities (JPAs) between municipal housing departments and regional sanitation/water districts to authorize the Municipal Social-Environmental Trust (MSET) accounting structure.
2. **Phase 2: Property Acquisition & Baseline Recruitment (Months 4-6):** Issuance of ESG Green Housing Bonds to secure master leases on transitional housing properties. Recruitment is conducted via low-barrier street outreach teams, guaranteeing housing placement conditional on program enrollment.
3. **Phase 3: Field Deployment & Interception Operations (Months 7-12):** Active field operations begin. Cleanups are mapped using GPS tracking to log total tonnage of high-surface-area plastics removed, verifying chemical and microplastic prevention metrics to unlock SB 54 and clean-water funding distributions.
4. **Phase 4: Advanced Solar Integration & Scale (Months 12+):** Stabilized program graduates transition from field cleanup crews into technical solar panel and electronic e-waste dismantling facilities, expanding the commodity resale revenue stream and opening up permanent, high-wage clean energy careers.

## 7. Conclusion

By implementing the Circular Solar roadmap, the State of California can break the systemic fiscal deadlock surrounding both homelessness and climate-induced watershed degradation. By recognizing that the unhoused workforce possesses the direct localized capacity to intercept catastrophic emerging contaminants like PFAS and microplastics at the source, this model generates the exact economic value required to construct, lease, and maintain permanent supportive housing. The Circular Solar model transforms marginalized populations into the frontline protectors of California's natural resources, proving that social restoration and environmental remediation are fundamentally inseparable.