

## **Concept Statement – Solar Sweep**

### **The Need**

Dust and debris on solar panels can reduce output by **20–50%**, costing operators millions in lost revenue. The issue is most critical for:

- **Utility-scale solar farms:** efficiency drops translate directly into revenue losses.
- **Industrial and commercial users:** factories and warehouses relying on stable energy savings.
- **Residential rooftop solar owners:** households aiming to maximize energy savings and reduce reliance on electricity retailers.

### **Why It Matters**

Manual cleaning is expensive and irregular, costing up to **\$1.1M per 50MW farm**. Many operators avoid frequent cleaning, accepting major efficiency losses. Nationally, with **250 GW of solar PV projected by 2050**, even 20% soiling could waste **50 GW of capacity**—equal to **\$75B in lost capital**. Clean panels are essential for ROI, contract compliance, and grid reliability.

### **The Solution – Solar Sweep**

**Solar Sweep** uses **autonomous drones with AI vision and wide dry brushes** to clean panels efficiently and safely. The system:

- Reduces cleaning costs and recovers lost energy revenue.
- Improves safety by removing workers from hot, high-voltage conditions.
- Conserves water, unlike traditional cleaning systems.
- Operates flexibly across rooftops, solar farms, and remote sites.
- Provides proof of performance through before-and-after imaging.

### **Competitive Advantage**

Existing methods—manual labour, vehicle scrubbers, semi-robots, and hydrophobic films—are costly, unsafe, or limited. **Solar Sweep** combines **mobility, automation, and intelligence** in one system, delivering a scalable, data-backed solution.

### **Step-Change Innovation**

This is not an incremental improvement. Solar Sweep integrates proven drone and robotics technologies into a **specialized, mission-critical solar maintenance tool**. It offers economic, operational, and environmental benefits, making it vital to achieving Australia's long-term solar and Net Zero targets.

## Proposed Architecture

