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PV Value Chain Mapping

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Value Chain PV

1. Raw Material Supply

- Mining of quartz
- Processing into metallurgical-grade silicon
- Purification into polysilicon for PV use

2. Ingot and Wafer Production

- Producing monocrystalline or multicrystalline ingots
- Cutting ingots into thin silicon wafers

3. Cell Manufacturing

- Creating PN junctions through doping
- Adding anti-reflective coatings
- Printing metal contacts (e.g., screen printing)

4. Module Assembly

- Connecting cells into strings
- Laminating cells with encapsulation layers
- Adding protective materials like tempered glass and back sheets

5. System Integration

6. Deployment & Installation

- Installation in residential, commercial, or utility-scale settings
- Connecting to power grids or off-grid systems

7. Operation & Maintenance (O&M)

- Performance monitoring
- Cleaning and minor repairs
- Diagnosing and fixing efficiency issues

- ## 8. End-of-Life Management
- Recycling silicon, glass, and metals
 - Safe disposal of residual materials