Project:	*Heartwood Solar II*	Engineer:	*Z. Ebenroth*
Client:	*Heartwood Solar II, LLC*	Issue Date:	*12/17/25*
Location:	*Fayette Township*	Revision:	*1*

OPINION OF PROBABLE COST - PV PLANT DECOMISSIONING - SAT

The Heartwood Solar II Project is a proposed 140 Megawatt (MW) solar electric generating facility using ground mounted photovoltaic panels. The vast majority of the site is currently in agricultural use, most of it farmed in row crops. At the end of the project's life, the land will be reclaimed to reengage farming activities to the extent practicable and acceptable to the landowner. This estimate contains a fenced in project area of approximately 1,033 acres, located entirely within Fayette Township, Hillsdale County, Michigan. The expected life of the project is up to 40 years.

This opinion of probable costs is based on the engineer's experience in the design and construction of energy facilities and is subject to final engineering. This opinion is also based on our experience supervising the construction of PV plants and supervising the demolition of other non-PV facilities. Costs are estimated with best practices at today's values. **See Table 3: Opinion of Probable Cost - PV Plant Decommissioning for a detailed breakdown of the project.**

This opinion assumes a third-party contractor, experienced in the construction and decommissioning of PV facilities will lead the effort. The reported costs include union labor, permitting, materials, taxes, insurance, transport costs, equipment rental, contractor's overhead, and contractor's profit. Labor costs have been estimated using regional labor rates and labor efficiencies from the Bureau of Labor Statistics.

This opinion of cost has been split between plant disassembly, site restoration, and salvage, which reflects the overall decommissioning process. The PV plant will first be disassembled, with all above and below grade components removed. This includes all buried cables, conduits, and foundations. Costs for disassembly are overall less than those for original assembly of the facility. While PV modules will need to be removed by hand to retain their salvage value, the racks, buried cables, and concrete can be removed by machine to increase efficiency. It is assumed that concrete, gravel, and fiber optic cable do not have salvage value and will be disposed of off-site. Other materials are assumed to have salvage value and can be sold at market prices. **The total disassembly and disposal costs for the project is approximately $6,502,985. See Table 3: Opinion of Probable Cost - PV Plant Decommissioning** for a detailed breakdown of the project. Methodology for disassembly of the PV systems can be found in Table 1.

It is expected that the entire site will be re-seeded with native grasses and vegetation. Planting of trees, shrubs, and other woody vegetation (re-forestation) or other beautification is not included in the costs. It is assumed that mulching and stabilization of seeded areas will only be required where gravel roads or concrete foundations were removed. The remainder of site will already be vegetated and disassembly activities will not significantly disturb the vegetation. Seeding in those areas is included as a precautionary measure. **The total costs for site restoration of the project is approximately $468,229. See Table 3: Opinion of Probable Cost - PV Plant Decommissioning for a breakdown of Site Restoration Costs.**

Any permits required will be included as part of the decommissioning effort. Erosion and sediment control best management practices will be installed during decommissioning. Administration fees are projected as 5% of the net decommissioning costs.

Salvage values have been estimated using publicly available data from http://www.scrapmonster.com. Inverters were priced at the rate for Complete Computers, which is lower than what could be attained if they were disassembled on site. Transformers were priced at 80% of the market rate for Sealed Unit Transformers. PV modules were assumed to have residual value as functioning units. They are priced assuming the power output degrades at 0.4% per year for 25 years, and 5% are broken during disassembly. The modules were assumed to have a market price of $0.05/W, which is less than half of the price projection for new modules made by the Department of Energy in year 25. It is assumed that module recycling will be $50/module plus transportation cost to the nearest recycling facility. Due to uncertainty of the salvage market in the future, the reported salvage value in the decommissioning summary has been reduced to 1/3 its original value.

Inflation was not included in this original estimate. However, the estimated decommissioning costs will be updated on a five year basis using the average Consumer Price Index to account for inflation. Detailed assumptions and the total opinion of costs for decommissioning is provided on the next sheets. **The total salvage value for the project is approximately $5,247,127. See Table 3: Opinion of Probable Cost - PV Plant Decommissioning.**

This opinion of probable costs is based on the engineer's experience in the design and construction of energy facilities and are subject to final engineering. The engineer accepts no liability for errors, omissions, or the accuracy and adequacy of this opinion. It is a violation of state law for any person, unless they are acting under direction of a licensed professional engineer to alter this document in any way. **The net decommissioning cost for the project is approximately $1,724,088 after salvage value has been included. See Table 3: Opinion of Probable Cost - PV Plant Decommissioning.**

TABLE 1: PV PLANT ANTICIPATED DISASSEMBLY METHODS

ITEM	DISASSEMBLY METHOD
PV Modules	Hand Removal. Place modules face down on pallets, tape wire ends, tied down and transport via skid-steer to staging location. Assumed 5% breakage, salvage value for crystalline, no salvage for thin-film.
Inverters	Removal by crane and transport via flat-bed to staging location. Assume no disassembly. Assumed salvage value.
Transformers	Removal by crane and transport via flat-bed to staging location. Assume no disassembly. Oil removal performed by scrap facility. Assumed salvage value.
Racking Frame	Stabilize w/ machine. Cut legs and lower to ground level. Cut cross beams to appropriate size and transport via dump truck to staging location. Assumed salvage value.
Racking Posts	Remove via post-puller and transport via dump truck to staging location. Assumed salvage value.
Racking Wiring	Disconnect PV connectors, cut cable ties, and remove wires from cable tray. Transport via dump truck to staging area. Assumed salvage value.
Underground Cable	Excavate to cable depth at one end of trench. Use tractor or backhoe pull out all cables in common trench. Cables are direct buried so complete excavation of trenches is not required. Transport via dump truck to staging area. Assumed salvage value.
Fence	Machine roll fence fabric. Remove posts via post-puller and transport via dump truck to staging location. Assumed salvage value.
Concrete	Remove with excavator and jack hammer. Backfill and compact as needed. Transport via dump truck to staging area. Assumed offsite disposal.
Gravel	Remove with skid steer with sweeper. Transport via dump truck to staging area. Assumed offsite disposal.
Offsite Disposal	Assumed disposal at $95/ton or $45/CY including tipping fee.
Re-Seeding	Re-seed using an ATV-pulled drill seeder, at 5lbs bulk seed per acre of native grasses. Stabilize and mulch on areas where concrete or gravel was removed only.
Re-Grading	Minor re-grading will be done to restore the site to pre-construction condition.
Erosion & Sediment Control	Install silt fence around project perimeter. Install tracking control at site entrance and replace once during disassembly. Remove at end of disassembly.

TABLE 2: GENERATION SUBSTATION ANTICIPATED DISASSEMBLY METHODS

ITEM	DISASSEMBLY METHOD
Steel Structures	Disassembled, lowered by crane, and transported via flat-bed to staging location. Assumed salvage value.
Circuit Breakers	Removed from pads and transported via flat-bed to staging location. Assumed no salvage value, and no difference in recycling vs. disposal cost.
Power & Instrument Transformers	Removal by crane and transport via flat-bed to staging location. Assume no disassembly or oil removal of small units, oil drained from main power transformer prior to transport. Assumed salvage value.
Disconnect Switches	Removal by crane, disassemble, and transport via flat-bed to staging location. Assumed salvage value for metal components. Insulators assumed no value.
Insulators and Arresters	Removal from supports. Assumed no salvage value.
Primary Conductor	Cut cable and bus pipe at ends and transport to staging location. Assumed salvage value.
Underground Cable	Excavate to cable depth at one end of trench. Use tractor or backhoe remove all cables and conduits in common trench. Transport via dump truck to staging area. Assumed salvage value.
Pre-Fab Steel Buildings	Rough disassembly on site. Assumed salvage value.
Control Panels	Removal of electronic components. Rough disassembly. Assumed salvage value for electronic and metal components.
Fence	Machine roll fence fabric. Remove posts via post-puller and transport via dump truck to staging location. Assumed salvage value.
Concrete	Remove with excavator and jack hammer. Transport via dump truck to staging area. Assumed offsite disposal.
Gravel	Remove with skid steer with sweeper. Transport via dump truck to staging area. Assumed offsite disposal.
Offsite Disposal	Assumed disposal at $95/ton or $45/CY including tipping fee.
Re-Seeding & Re-Grading	Re-seed using an ATV-pulled drill seeder, at 3.2lbs per acre of native grasses. Use rough grading machine to lower substation pad to native elevation.

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TABLE 3: OPINION OF PROBABLE COST - PV PLANT DECOMISSIONING - ANNUAL INFLATION=0% - END OF LIFE: YEAR 40

DISASSEMBLY & DISPOSAL

ITEM	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL
1.0	PV Modules (560W)	437,900	$ 2.46	$ 1,077,234.00
1.1	PV Modules Recycling (560W)	21,895	$ 52.00	$ 1,138,540.00
2.0	PV Inverter(s) (4.4 MVA)	42	$ 793	$ 33,306.00
3.0	PV Transformer(s) (4.4 MVA)	42	$ 396	$ 16,632.00
4.0	Racking Frame (Single Axis)	4,379	$ 112	$ 490,448.00
5.0	Racking Posts	65,685	$ 11	$ 722,535.00
6.0	Tracker Motors	4,379	$ 14	$ 61,306.00
7.0	Racking Wiring	7,358,483 LF	$ 0.05	$ 367,924.15
8.0	Underground Cable (LV, MV, Comm)	1,529,538 LF	$ 0.45	$ 688,292.10
9.0	PV Plant Fence	85,615 LF	$ 1.70	$ 145,545.50
10.0	Interconnection Facilities	1 LS	$ 405,420.62	$ 405,420.62
11.0	Concrete	129 CY	$ 111	$ 14,319.00
12.0	Gravel	14,458 CY	$ 21	$ 303,618.00
13.0	Offsite Disposal by Volume	14,589 CY	$ 45	$ 656,505.00
14.0	General Conditions Buffer (Per MW Est)	140 MW	$ 2,724	$ 381,360.00
			SUBTOTAL	$ 6,502,985.37

SITE RESTORATION

ITEM	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL
15.0	Seeding	1,033 ACRES	$ 86	$ 88,838.00
16.0	Grading	1 LS	$ 223,007	$ 223,007.00
17.0	Erosion and Sediment Control	1 LS	$ 156,384	$ 156,384.00
			SUBTOTAL	$ 468,229.00

SALVAGE

ITEM	DESCRIPTION	QUANTITY	UNIT PRICE	TOTAL
18.0	PV Modules (560W)	416,005	$ 24	$ 9,984,120.00
19.0	PV Inverter(s) (4.4 MVA)	42	$ 9,921	$ 416,682.00
20.0	PV Transformer(s) (4.4 MVA)	42	$ 28,122	$ 1,181,124.00
21.0	Racking Frame (Single Axis)	17,942,953 LBS	$ 0.05	$ 897,147.65
22.0	Racking Posts (20ft)	14,450,700 LBS	$ 0.05	$ 722,535.00
23.0	Tracker Motors	236,466 LBS	$ 0.19	$ 44,928.54
24.0	Interconnection Steel Structures	48,082 LBS	$ 0.05	$ 2,404.10
25.0	Interconnection Power & Instrument Transformers	355,421 LBS	$ 0.05	$ 17,771.05
26.0	Interconnection Disconnect Switches (1 & 3-Phase)	7,532 LBS	$ 0.65	$ 4,895.80
27.0	Interconnection Primary Conductor	10,447 LBS	$ 0.65	$ 6,790.55
28.0	Interconnection Pre-Fab Steel Buildings	34,500 LBS	$ 0.05	$ 1,725.00
29.0	Control Panels	1,000 LBS	$ 0.05	$ 50.00
30.0	Electronic Controls	383 LBS	$ 0.14	$ 53.62
31.0	LV Wiring (PV Plant & Interconnection)	926,625 LBS	$ 2.17	$ 2,010,776.25
32.0	MV Wiring	506,041 LBS	$ 0.89	$ 450,376.49
			SUBTOTAL	$ 15,741,380.05

TOTAL DISASSEMBLY, DISPOSAL, & SITE RESTORATION COST	$	*6,971,214.37*
TOTAL SALVAGE VALUE [1/3 subtotal due to uncertainty]	$	*5,247,126.68*
NET DECOMISSIONING COST	$	*1,724,087.69*
NET DECOMISSIONING COST WITH 5% ADMINISTRATION FEE	$	*1,814,829.14*
NET DECOMISSIONING COST WITH ADDITIONAL $200,000 ADMINISTRATIVE FEE	$	*2,014,829.14*

Atwell, LLC

Zachary Ebenroth
Engineer

12/17/2025
Date