

Techno-Economic Feasibility Study of Aggregated Small Scale Off-grid Photovoltaic Systems for Use by Renters: A Case Study in New York City

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Hardware Expenses for CAPEX Calculations

Smart Controller Prototype Components and Costs as of January 2024			
Item	Cost	Quantity	Total
RASPBERRY PI 4 B 2GB ¹	\$45.0	1	\$45.0
32GB Micro SD card ²	\$9.97	1	\$9.97
USB to USB C cable ³	\$7.99	1	\$7.99
4 Channel Relay ⁴	\$7.45	1	\$7.45
INA260 Power Sensor ⁵	\$9.95	1	\$9.95
30A AC Current Sensor ⁶ + voltage divider	(\$10.95+ \$1)	1	\$11.95
Cable with Plugs ⁷	\$11.99	1	\$11.99
10% Contingency	\$10.43	1	\$10.43
		Total:	\$114.73

Variable Costs				
Component	Unit Cost	Units	Discounts	Total per System
PV modules	\$1/W	Varies	30% Tax Credit	\$0.70 * Array W
PV Mount	\$0.40	Varies	None	\$0.40 * Array W
Power Station	\$149 to \$1800	1	None	\$149 to \$1800

Fixed Costs				
Component	Unit Cost	Units	Discounts	Total per System
Controller (includes sensors and relay)	\$114.73	1	None	\$114.73

¹ <https://www.digikey.com/en/products/detail/raspberry-pi/SC0193-9/10258782>

² https://www.amazon.com/SanDisk-Ultra-UHS-I-Memory-Adapter/dp/B00M55C0NS/ref=sr_1_6?crid=2S5PC9CZ68MO&keywords=32%2Bgb%2Bmicrosd%2Bcard&qid=1705080680&sprefix=32%2Bgb%2Bmicrosd%2Bcard%2Caps%2C93&sr=8-6&th=1

³ https://www.amazon.com/SUNGUY-Android-Charging-Compatible-External/dp/B0B28ZCV2Y/ref=sr_1_12_sspa?crid=YT523Z9SXQKR&keywords=usb%2Bto%2Busb%2Bc&qid=1700844659&s=industrial&sprefix=usb%2Bto%2Busb%2Bc%2Cindustrial%2C88&sr=1-12-spons&sp_csd=d2lkZ2V0TmFtZT1zcF9tdGY&th=1

⁴ <https://www.digikey.com/en/products/detail/sunfounder/TS0011/18668621>

⁵ https://www.digikey.com/en/products/detail/adafruit-industries-llc/4226/10130492?utm_adgroup=&utm_id=go_cm-p-20243063506_adg-ad-dev-c-ext-prd-10130492_sig-CjwKCAiAsIGrBhAAEiwAEzMICxPETNUmYG9-kWaIj2RAUqgJTMoO1AkOilBnkTyZqeJtsIHbcc_MxoC5RUQAvD_BwE&gad_source=1

⁶ <https://www.sparkfun.com/products/11005>

⁷ https://www.amazon.com/DEWENWILS-Extension-Weatherproof-Outdoor-Grounded/dp/B0891VDLV5/ref=sr_1_8?crid=1WYDH986C1QN0&keywords=short%2Bextension%2Bcord&qid=1700844405&s=industrial&sprefix=short%2Bextension%2Bcord%2Cindustrial%2C89&sr=1-8&th=1

