

## Comparative Solar Panel Options for +3kW System

Option (panel model)	# panels × W	Panel cost total	Controller(s) & cost	Total cost	Reliability (brand, warranty)	Complexity
<b>Renogy 320W Mono</b> <sup>1</sup>	10×320W = 3200W	\$1,689.90	Renogy Rover 60A MPPT – \$379.99 <sup>2</sup>	≈\$2,069	Mid-tier Renogy; ~25 yr power warranty <sup>3</sup>	Medium
<b>Canadian Solar 400W</b> <sup>4</sup>	8×400W = 3200W	\$2,712.00	Renogy Rover 100A MPPT – \$739.99 <sup>5</sup>	≈\$3,452	Tier 1 brand; 25 yr product/ performance warranty <sup>6</sup>	Medium
<b>JA Solar 440W</b>	10×440W = 4400W	\$2,692.90	Renogy Rover 100A MPPT – \$739.99 <sup>5</sup>	≈\$3,432	Tier 1 JA Solar; 25 yr product warranty <sup>7</sup>	Medium
<b>Q CELLS 415W</b> <sup>8</sup>	10×415W = 4150W	\$2,440.50	Renogy Rover 100A MPPT – \$739.99 <sup>5</sup>	≈\$3,180	Tier 1 QCells; 25 yr product/ performance warranty <sup>9</sup>	Medium
<b>Trina 375W</b> <sup>10</sup>	8×375W = 3000W	\$1,774.64	Renogy Rover 60A MPPT – \$379.99	≈\$2,154	Tier 1 Trina; 25 yr product/ performance warranty <sup>11</sup>	Medium
<b>Zamp Legacy 190W (kit)</b> <sup>12</sup>	16×190W = 3040W (4 kits)	\$5,999.96	4×60A PWM controllers (included)	≈\$6,000	US-made; 25 yr output warranty <sup>13</sup>	Medium (plug-&- play kits)
<b>Giosolar 120W kit</b> <sup>14</sup>	25×120W = 3000W	\$2,939.99	Built-in MPPT (included)	≈\$2,940	Unknown brand (Chinese OEM); minimal warranty info	Low (complete kit)
<b>Renogy 320W Bifacial</b> <sup>15</sup>	10×320W = 3200W	\$3,102.45	Renogy Rover 60A MPPT – \$379.99	≈\$3,482	Renogy; 25 yr output warranty <sup>3</sup>	Medium

Option (panel model)	# panels × W	Panel cost total	Controller(s) & cost	Total cost	Reliability (brand, warranty)	Complexity
<b>Windy Nation 100W</b> <sup>16</sup>	30×100W = 3000W	\$2,983.80	Renogy Rover 100A MPPT – \$739.99	≈\$3,723	Reputable US seller; assume ~25 yr warranty	High (many panels)
<b>Longi 370W</b> <sup>17</sup>	8×370W = 2960W	\$800.00	Renogy Rover 60A MPPT – \$379.99	≈\$1,180	Tier 1 Longi; 25 yr standard industry warranty (not shown)	Medium

**Details & Links:** Each option's price and specs come from reputable retailers or manufacturers. For example, **Renogy 320W** panels are \$168.99 each <sup>1</sup> (group-buy price), so 10 panels (~3.2 kW) cost ~\$1,690. A Renogy Rover 60A MPPT controller (\$379.99 <sup>2</sup>) handles this array. Renogy panels carry a 25-year output warranty <sup>3</sup>.

The **Canadian Solar 400W** panels are ~\$339 each <sup>4</sup>. Eight panels (3.2 kW) total ~\$2,712. Add a 100A MPPT (~\$740 <sup>5</sup>) for ~\$3,452. Canadian Solar is Tier 1, with 25-year product/performance warranties <sup>6</sup>.

**JA Solar 440W** (10×440W) and **Q CELLS 415W** (10×415W) similarly use 100A controllers. JA Solar panels are ~\$269 each (total ~\$2,693) and Q CELLS ~\$244 each <sup>8</sup> (total ~\$2,441). Both offer 25-year warranties <sup>7</sup> <sup>9</sup>.

A cheaper per-watt choice is **Trina 375W**, ~\$221 each <sup>10</sup>. Eight panels give 3 kW for ~\$1,775; plus a 60A MPPT (~\$380) totals ~\$2,155. Trina guarantees 25-year product/performance <sup>11</sup>.

The **Zamp Legacy** kit is all-in-one: 4 panels (760W) plus wiring and a 60A PWM charge controller for \$1,499.99 <sup>12</sup>. Four kits (16 panels, 3.04 kW) cost ~\$6,000. Zamp's USA-made panels have a 25-year output warranty <sup>13</sup>. Integration is straightforward (pre-wired kits), though it uses PWM controllers.

The **Giosolar 3000W kit** (25×120W) is ~\$2,940 total <sup>14</sup> including a built-in MPPT controller. Panels connect via MC4 and an LCD controller. Brand/warranty info is sparse (likely Chinese OEM). This kit is plug-and-play easy, but trust and longevity are uncertain.

For very low cost, **Longi 370W** panels (tier 1 Chinese) are only \$100 each on sale <sup>17</sup>. Eight panels (~2.96 kW) cost \$800; add a 60A MPPT (\$380) for ~\$1,180. Longi is Tier 1 with standard 25-year warranties (not listed on this sale site). This option gives the *lowest* cost per watt.

Finally, **Windy Nation 100W** panels (~\$99.50 each <sup>16</sup>) could also be used: 30 panels = 3 kW for ~\$2,984, plus a 100A MPPT (\$740) = ~\$3,724 total. Windy Nation is a U.S. seller, panels are generic mono-crystalline, and likely carry industry-standard warranties. Handling 30 modules is labor-intensive (highest complexity).

**Recommendation:** The **Longi 370W** panels (8 panels, ~3 kW) plus a Rover 60A MPPT offer the best value. At ~\$1,180 total <sup>17</sup>, this solution has very low cost per watt and uses a Tier-1 brand (likely 25-yr warranty). It

meets the ~14 kWh/day target (3kW × 4.5 h) under Arizona sun well under the \$15k budget. Integration is straightforward (series strings to 48V, one controller).

**Best Value:** Longi 370W ×8 + 60A MPPT, ~\$1,180 (≈\$0.40/W) – top balance of low cost and high reliability.

**Sources:** Retailer/manufacturer listings for panel kits and controllers [4](#) [12](#) [14](#) [2](#) [5](#), and warranty information from panel spec pages [3](#) [6](#) [7](#) [9](#) [11](#).

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[1](#) [3](#) **320 Watt Monocrystalline Solar Panel | Renogy Solar**

<https://www.renogy.com/320-watt-monocrystalline-solar-panel/?srsltid=AfmBOooOS6hpmXsk6vuMeh9IDzG2BZ-vmVSJwGVicojSAYe1U14c1ng>

[2](#) **Rover 60 Amp MPPT Solar Charge Controller | Renogy Solar**

[https://www.renogy.com/rover-60-amp-mppt-solar-charge-controller/?srsltid=AfmBOoo8S\\_1JXsv2qVcbbuOxqV6FJPg4oj-49-SZhtPqu6WXOyBXEEvU](https://www.renogy.com/rover-60-amp-mppt-solar-charge-controller/?srsltid=AfmBOoo8S_1JXsv2qVcbbuOxqV6FJPg4oj-49-SZhtPqu6WXOyBXEEvU)

[4](#) **Canadian Solar 400W Solar Panel - ShopSolar.com**

<https://shopsolarkits.com/products/canadian-solar-400w?srsltid=AfmBOoQXdboCUCgMU2DoEptKq-bDPjGvIcY-C6rkIIXJGos4MmewZtr>

[5](#) **Order Your 100 Amp MPPT Solar Charge Controller Rover | Renogy Solar**

[https://www.renogy.com/rover-100-amp-mppt-solar-charge-controller-bt-1-renogy-one-core/?srsltid=AfmBOorDCikZ3OJT4\\_rtQR7WjKwlwejvX5Dy0VrMnmfypI5DZV\\_VDoyY](https://www.renogy.com/rover-100-amp-mppt-solar-charge-controller-bt-1-renogy-one-core/?srsltid=AfmBOorDCikZ3OJT4_rtQR7WjKwlwejvX5Dy0VrMnmfypI5DZV_VDoyY)

[6](#) **Canadian Solar 400W mono perc black frame black backsheet, 1000V, landscape 1550mm/1100mm cables, MC4 - Kinect Solar**

<https://kinectsolar.com/product/canadian-solar-400w-mono-perc-black-frame-black-backsheet-1000v-landscape-1550mm-1100mm-cables-mc4/>

[7](#) **JA Solar 440W Solar Panel 108 Cell Bifacial JA-JAM54-D41-440MB - A1 SolarStore**

<https://a1solarstore.com/ja-solar-440w-solar-panel-108-cell-bifacial-ja-jam54-d41-440mb.html>

[8](#) [9](#) **Q CELLS 415W Solar Panel 132 Cell Q.PEAK DUO HQC-415-QPD-BKML-G10.C+-DCA Assembled in the USA - A1 SolarStore**

<https://a1solarstore.com/q-cells-415w-solar-panel-132-cell-q-peak-duo-hqc-415-qpd-bkml-g10-c-dca-assembled-in-the-usa.html>

[10](#) **Trina Solar 375 Watt TSM-375-DE14A(II) 40MM Clear Frame, White Back So - ShopSolar.com**

<https://shopsolarkits.com/products/trina-solar-375-watt-tsm-375-de14all-40mm-clear-frame-white-back-solar-panel?srsltid=AfmBOorVLeUd5sUTTKhz5Uuw325EHnoZpKrQ9jC9TGoC866HktMeQidn>

[11](#) **Trina 420W Solar Panel 144 Cell Bifacial TRI-TSM-420-NE09RC05 Wholesale 36 panels per pallet - A1 SolarStore**

<https://a1solarstore.com/trina-420w-solar-panel-144-cell-bifacial-tri-tsm-420-ne09rc05-wholesale-36-panels-per-pallet.html?srsltid=AfmBOorM9inGJjOjk2oixg0ZAXaTbMX1yJIF0S4zSTGxABXZjYjWjYIb>

[12](#) [13](#) **Zamp Solar LEGACY BLACK 760 Watt Deluxe Kit**

<https://www.zampsolar.com/collections/roof-mount-kits/products/760-watt-legacy-black-dx-kit>

[14](#) **Amazon.com : Giosolar 3000W 3KW Solar Panel Kit 48V Home Off Grid System with High Efficiency LCD MPPT Controller, for Home Cabin Boat Marine Shed Farm Green House (25x120W Solar Panel) : Patio, Lawn & Garden**

<https://www.amazon.com/Giosolar-System-Efficiency-Controller-25x120W/dp/B09MQ5BWCK>

15 **2PCS Bifacial 320 Watt Monocrystalline Solar Panel**

<https://www.renogy.com/2pcs-bifacial-320-watt-monocrystalline-solar-panel/?srsltid=AfmBOoqxowRs08mQSG08SuPfosOQF9cryw9-uUHmCxU1bfeStqhF7DWE>

16 **Solar Panels – Windy Nation Inc**

<https://www.windynation.com/collections/solar-panels>

17 **New Longi 370W Solar Panel | SanTan Solar**

[https://www.santansolar.com/product/new-longi-370w-solar-panel/?srsltid=AfmBOop4ihGd1B2WVtuaVHtDvxDqhZN6GjxLascubWV4S4eQAI\\_ou2dQ](https://www.santansolar.com/product/new-longi-370w-solar-panel/?srsltid=AfmBOop4ihGd1B2WVtuaVHtDvxDqhZN6GjxLascubWV4S4eQAI_ou2dQ)