

## Solar Energy

### INDUSTRY SUMMARY

COGENT VALUATION identified **Solar Energy** publicly traded companies, IPOs, and recent M&A transactions within the Solar Energy industry, which provides a basis for market and transaction pricing that can be used by your firm in estimating market sentiment and its impact on your firm's value. Over the last year since September 30, 2017, the median 52-week share price return of the Solar Energy industry was -0.4%. Between September 30, 2016 and September 30, 2018, the median EV/EBITDA multiple increased from 7.6 to 19.4. Furthermore, the median price-to-earnings multiple increased from 5.1 to 6.2 over the same period. The median revenue growth and EBITDA margins for the industry for the quarter were 0.0% and 1.2%, respectively.

### Public Company Key Statistics

Median 52-Week  
Return

**-.4%**

Median 3-Year CAGR  
Return

**-4.4%**

Median EV/Revenue  
Multiple

**1.4x**

Median EV/EBITDA  
Multiple

**19.4x**

Median Price/Earnings  
Multiple

**6.2x**

Median EV/Gross CF  
Multiple

**29.7x**

## Comparable Public Company Market Price Returns as of September 30, 2018

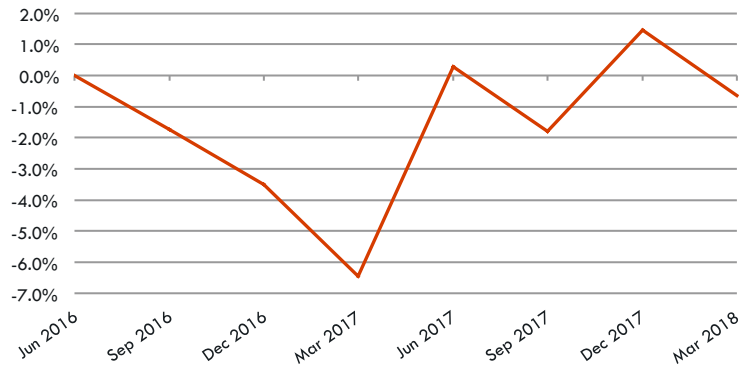
	YTD	3 Month	1 Year	2 Year	3 Year	2016	2015	2014
<b>Ascent Solar Technologies, Inc.</b>	<b>-93.9%</b>	-44.4%	-68.8%	-98.0%	-97.2%	-99.9%	-86.4%	-84.8%
<b>Canadian Solar Inc.</b>	-14.0%	-3.5%	32.6%	-8.1%	-21.3%	-57.9%	19.7%	-18.9%
<b>China Sunergy Co., Ltd.</b>	-14.6%	-14.9%	-34.9%	-67.0%	-72.7%	-98.1%	-9.8%	-79.8%
<b>Ellomay Capital Ltd.</b>	-8.0%	-1.4%	10.2%	2.0%	1.4%	-6.0%	-11.2%	-0.4%
<b>Enphase Energy, Inc.</b>	<b>101.2%</b>	89.6%	233.6%	40.0%	-29.8%	-71.2%	-75.4%	125.4%
<b>First Solar, Inc.</b>	-28.3%	5.1%	161.9%	1.8%	5.9%	-51.4%	48.0%	-18.4%
<b>JA Solar Holdings Co., Ltd.</b>	-55.2%	-12.1%	0.3%	-12.7%	-11.8%	-50.9%	18.5%	-10.7%
<b>JinkoSolar Holding Co., Ltd.</b>	13.9%	-24.1%	10.1%	-6.6%	-10.7%	-45.0%	40.4%	-32.7%
<b>Song Da Industry Trade</b>	-13.4%	-15.6%	-7.6%	-15.6%	-7.9%	0.6%	-18.1%	8.9%
<b>SunPower Corporation</b>	74.4%	-5.3%	30.8%	-40.2%	-36.6%	-78.0%	16.2%	-13.4%
<b>ThinkSmart Limited</b>	-13.7%	21.9%	-49.0%	N/A	N/A	N/A	N/A	N/A
<b>Yingli Green Energy</b>	-91.9%	-0.6%	-22.6%	-39.4%	-55.1%	-42.6%	-80.7%	-53.5%
<b>Median of Industry Public Companies</b>	<b>-14.0%</b>	<b>-4.4%</b>	<b>5.2%</b>	<b>-12.7%</b>	<b>-21.3%</b>	<b>-51.4%</b>	<b>-9.8%</b>	<b>-18.4%</b>

Multiple year periods are calculated as the average annual return.

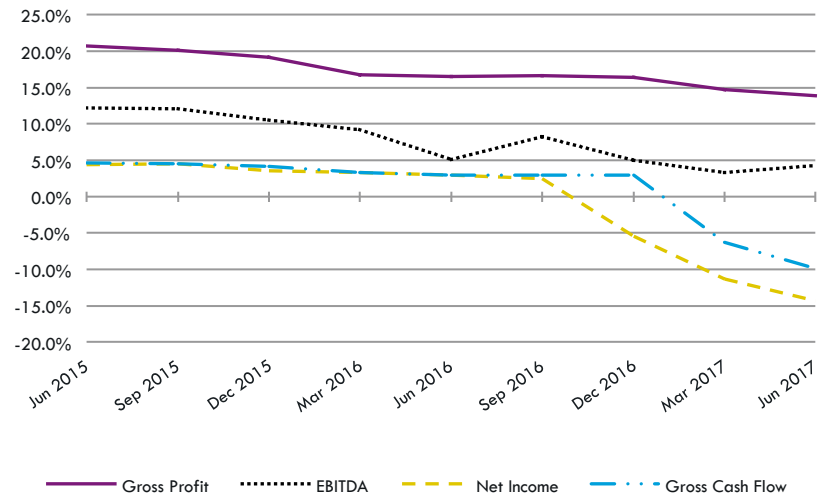
■ Highest Return
 ■ Lowest Return
 ■ Median Return

# Industry Revenue Growth and Profit Margins for the Past Two Years

Median Quarterly Revenue Growth of All Solar Energy Companies



Median Gross Profit, EBITDA, Net Income, and Gross Cash Flow Margins



## Public Company Median Multiples by Quarter

	9/30/18	6/30/18	3/31/18	12/31/17	9/30/17	6/30/17	3/31/17	12/31/16
<b>EV/Revenues Multiple</b>	1.4x	1.4x	1.0x	1.1x	0.9x	1.1x	1.3x	1.1x
<b>EV/EBITDA Multiple</b>	19.4x	13.0x	15.7x	10.9x	7.3x	7.2x	9.3x	9.0x
<b>Price/Earnings Multiple</b>	6.2x	14.4x	15.0x	4.0x	6.4x	7.9x	9.7x	7.8x
<b>EV/Gross Cash Flows Multiple</b>	29.7x	19.6x	15.0x	7.3x	13.3x	9.5x	19.7x	12.0x

■ Highest Multiple    
 ■ Lowest Multiple    
 ■ Median Multiple

## Industry Initial Public Offerings - Solar Energy

(dollars in millions, except share prices)

Offer Date	Company Name	Offer Price	Shares Offered	Amount Raised	Total Assets	Debt	LTM Revenues	LTM EBITDA	LTM Net Income	LTM Cash Flows
4/4/18	TaylorMade Renewables Limited	\$0.54	3.2	\$2.5	\$170.1	\$0.0	\$3.0	(\$9.8)	(\$15.4)	(\$9.8)
3/23/18	PT Sky Energy Indonesia Tbk	\$0.03	203.3	\$250.6	\$2,240.8	\$559.0	\$30.7	(\$111.1)	(\$52.4)	(\$63.5)
2/1/18	Solex Energy Limited	\$0.81	1.4	\$126.0	\$133.3	\$4.7	\$5.3	\$1.7	(\$2.4)	\$3.9
11/30/17	Zodiac Energy Limited	\$0.81	2.0	\$329.6	\$724.2	\$154.1	\$2.6	(\$117.7)	(\$19.5)	(\$113.4)
11/27/16	Ripasso Energy AB (publ)	\$0.43	5.8	\$92.0	\$1,151.2	\$299.3	\$2.7	(\$40.7)	(\$47.1)	(\$22.3)
8/5/15	Sunrun Inc.	\$14.00	17.9	\$53.8	\$106.2	\$33.9	\$238.6	(\$26.4)	(\$32.3)	(\$24.0)
3/26/15	SolarEdge Technologies, Inc.	\$18.00	7.0	\$64.2	\$2,587.5	\$1,143.6	\$215.4	\$254.9	\$164.9	\$254.9
9/30/14	Vivint Solar, Inc.	\$16.00	20.6	\$319.0	\$3,367.9	\$1,414.7	\$20.4	\$427.9	\$199.6	\$434.7
12/12/12	Tesla Energy Operations, Inc.	\$8.00	11.5	\$93.5	\$176.3	\$77.9	\$124.1	\$16.9	\$11.8	\$18.7
3/29/12	Enphase Energy, Inc.	\$6.00	6.5	\$225.0	\$492.9	\$150.0	\$149.5	\$142.5	\$128.4	\$142.5
5/13/10	JinkoSolar Holding Co., Ltd.	\$11.00	5.8	\$98.1	\$112.5	\$44.3	\$274.7	\$14.8	\$10.0	\$15.8
6/7/07	Yingli Green Energy Holding Company Limited	\$11.00	29.0	\$400.0	\$255.1	\$71.0	\$241.3	(\$5.1)	(\$11.3)	\$2.4
5/17/07	China Sunergy Co., Ltd.	\$11.00	7.7	\$115.5	\$66.3	\$23.2	\$149.5	\$7.8	(\$3.6)	\$8.0
2/6/07	Ascent Solar Technologies, Inc.	\$5.50	3.0	\$16.5	\$0.2	\$0.2	\$89.2	\$0.0	(\$7.2)	\$0.0
12/13/05	Suntech Power Holdings Co. Ltd.	\$15.00	26.4	\$395.7	\$135.2	\$51.3	\$174.7	\$44.0	\$31.1	\$46.6
5/31/16	GTN Limited	nm	nm	\$115.5	\$176.3	\$71.0	\$149.5	\$1.7	(\$3.6)	\$3.9

Multiple year periods are calculated as the average annual return.

■ Highest Return    
 ■ Lowest Return    
 ■ Median Return

## Recent Merger and Acquisition Transactions for a Majority Stake (dollars in millions)

Transaction Date	Target	Acquirer	Transaction Size	% Bought
7/19/18	FOTOVOLTAICO SOLAR Y ENERGIAS RENOVABLES FOTOSOLAR, S.L.	Plenium Partners Asset Management, S.G.E.I.C., S.A.; Helia Renovables, FCR	\$345.7	100%
4/19/18	Aerospace Baykee	Beijing Aerospace Changfeng	\$37.2	51%
11/21/16	SolarCity Corporation (nka: Tesla Energy Operations, Inc.)	Tesla Motors, Inc.	\$6,543.2	100%
11/1/16	Human Energy Alliance Labs	MJP International Ltd. (nka: Bionovate Technologies Corp.)	\$4.4	80%
5/4/16	Global Resource Options	EDF Renewable Energy	\$34.8	100%
4/29/16	Desri Portal Ridge	Firstar Development, LLC	\$37.8	100%
3/24/16	Caithness Energy	Global Infrastructure Partners	\$20.0	100%
2/11/16	Gestamp Asetym Solar	KKR & Co. L.P.	\$800.0	63%
8/5/15	Aaron Services Ltd.	Lakehouse plc (nka: Sureserve Group plc)	\$15.4	100%

■ USA
 ■ International
 ■ Highest
 ■ Lowest
 ■ Median

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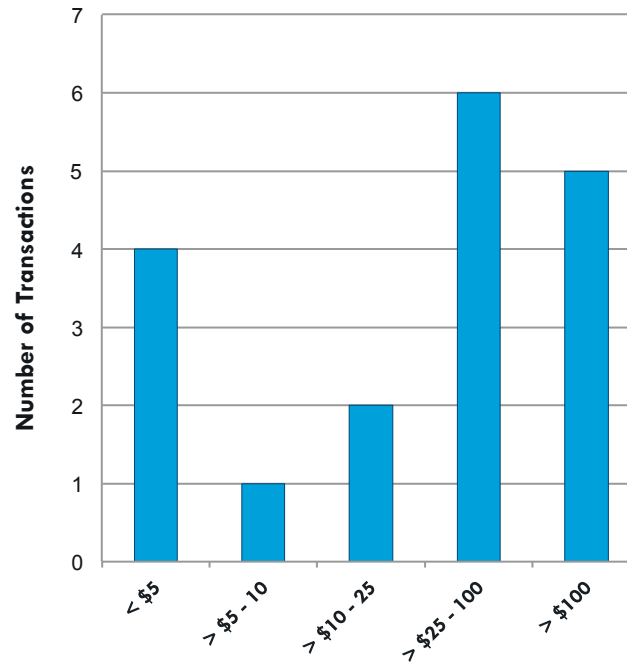
## Recent Merger and Acquisition Transactions for a Majority Stake (dollars in millions)

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Transaction Date	Target	Acquirer	Transaction Size	% Bought
7/30/15	<b>Solairedirect SA</b>	<b>ENGIE SA</b>	\$275.4	95%
6/25/15	<b>Solar Alliance of Amer.</b>	<b>Finavera Wind Energy</b>	\$5.0	100%
5/28/15	<b>Solar Juice Pty Ltd.</b>	<b>SPI China (HK) Limited</b>	\$28.0	80%
5/13/15	<b>REC Solar ASA</b>	<b>Bluestar Elkem Investment</b>	\$634.4	100%
3/30/15	<b>Recurrent Energy, LLC</b>	<b>Canadian Solar Inc.</b>	\$265.0	100%
12/31/14	<b>Next Phase Solar, Inc.</b>	<b>Enphase Energy, Inc.</b>	\$2.5	100%
11/18/14	<b>Avacos Solar</b>	<b>ONEnergy Inc.</b>	\$1.4	100%
11/4/14	<b>Hudson Energy Solar Corp.</b>	<b>SunEdison, Inc.; TerraForm Power, Inc.</b>	\$56.0	100%
9/22/14	<b>Tripod Energy AB</b>	<b>Innotech Solar AS</b>	\$6.4	100%
<b>Median of the 18 M&amp;A Transaction Targets</b>			<b>\$32.4</b>	<b>100%</b>

USA
  International
  Highest
  Lowest
  Median

## Recent Merger and Acquisition Transactions for a Majority Stake (dollars in millions) as of September 30, 2018





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**Definitions of Financial Terms Used in this Quarterly Industry Update:**

**Enterprise Value (EV):** Market Value of Equity + Market Value of Debt —Cash

**Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA):** Profitability metric sometimes also referred to as operating profit or operating earnings.

**Gross Cash Flows:** Net Income + Depreciation and Amortization Expense

**Latest Twelve Months (LTM):** Financial information is as of the latest twelve months through the date of this Quarterly Industry Update.

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