

## 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 December 31, 2016, the median 52-week share price return of the Solar Energy industry was 33.0%. Between December 31, 2015 and December 31, 2017, the median EV/EBITDA multiple increased from 7.9 to 17.1. Furthermore, the median price-to-earnings multiple increased from 9.4 to 9.8 over the same period. The median revenue growth and EBITDA margins for the industry for the quarter were 1.5% and 0.3%, respectively.

### Public Company Key Statistics

Median 52-Week  
Return

33%

Median 3-Year CAGR  
Return

-11.3%

Median EV/Revenue  
Multiple

1.1x

Median EV/EBITDA  
Multiple

17.1x

Median Price/Earnings  
Multiple

9.8x

Median EV/Gross CF  
Multiple

11.6x

## Comparable Public Company Market Price Returns as of December 31, 2017

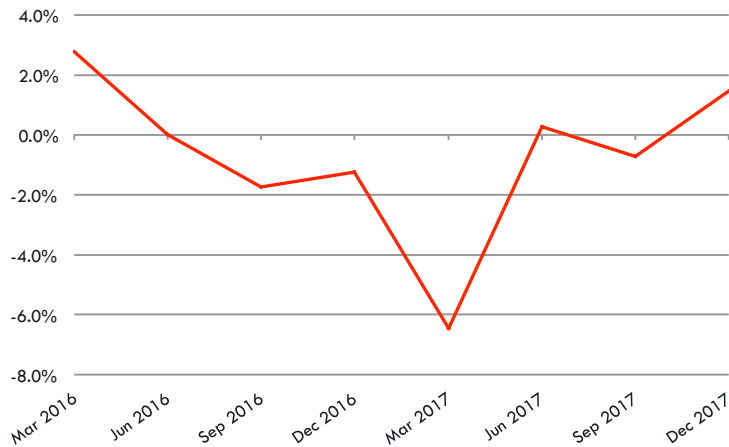
	YTD	3 Month	1 Year	2 Year	3 Year	2016	2015	2014
<b>Ascent Solar Technologies, Inc.</b>	<b>-69.0%</b>	-68.8%	-99.3%	-99.3%	-98.2%	-99.9%	-86.4%	-84.8%
<b>Canadian Solar Inc.</b>	38.4%	29.7%	5.3%	-25.4%	-20.1%	-57.9%	19.7%	-18.9%
<b>China Sunergy Co., Ltd.</b>	95.2%	4.1%	-51.5%	-82.6%	-74.4%	-98.1%	-9.8%	-79.8%
<b>Ellomay Capital Ltd.</b>	11.2%	8.8%	16.0%	2.8%	-3.4%	-6.0%	-11.2%	-0.4%
<b>Enphase Energy, Inc.</b>	<b>138.6%</b>	-36.9%	-56.5%	-66.3%	-53.4%	-71.2%	-75.4%	125.4%
<b>First Solar, Inc.</b>	110.4%	47.2%	-17.7%	-7.9%	-17.5%	-51.4%	48.0%	-18.4%
<b>JA Solar Holdings Co., Ltd.</b>	56.7%	-2.9%	-7.3%	-13.8%	-16.4%	-50.9%	18.5%	-10.7%
<b>JinkoSolar Holding Co., Ltd.</b>	57.9%	25.5%	2.1%	-16.1%	-11.7%	-45.0%	40.4%	-32.7%
<b>Song Da Industry Trade</b>	-6.1%	35.3%	6.9%	-4.9%	-1.3%	0.6%	-18.1%	8.9%
<b>SunPower Corporation</b>	27.5%	53.1%	-39.7%	-42.7%	-38.9%	-78.0%	16.2%	-13.4%
<b>ThinkSmart Limited</b>	-60.5%	-24.8%	N/A	N/A	N/A	N/A	N/A	N/A
<b>Yingli Green Energy</b>	-35.0%	4.6%	-44.1%	-57.0%	-60.7%	-42.6%	-80.7%	-53.5%
<b>Median of Industry Public Companies</b>	<b>33.0%</b>	<b>6.7%</b>	<b>-17.7%</b>	<b>-25.4%</b>	<b>-20.1%</b>	<b>-51.4%</b>	<b>-9.8%</b>	<b>-18.4%</b>

Multiple year periods are calculated as the average annual return.

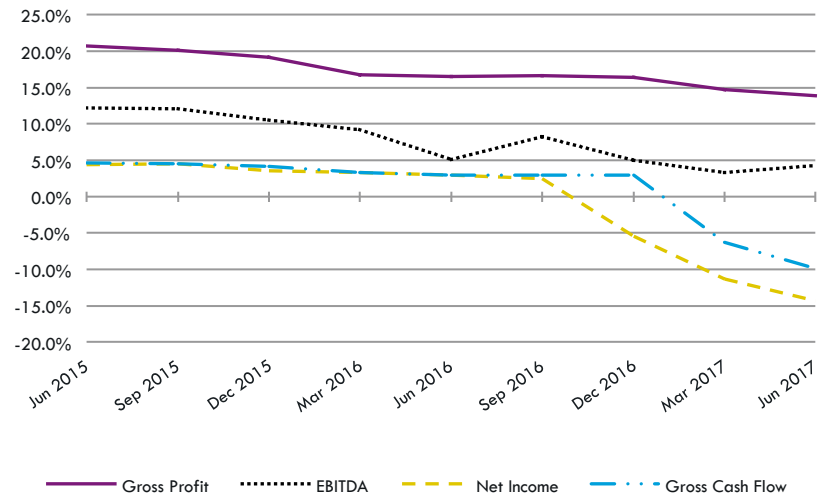
■ Highest Return
 ■ Lowest Return
 ■ Median Return

# 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

	12/31/17	9/30/17	6/30/17	9/30/16	6/30/16	3/31/16	12/31/15	9/30/15
<b>EV/Revenues Multiple</b>	1.1x	0.9x	1.1x	1.2x	0.9x	1.1x	1.3x	1.1x
<b>EV/EBITDA Multiple</b>	17.1x	17.1x	10.9x	6.8x	7.3x	7.2x	9.3x	9.0x
<b>Price/Earnings Multiple</b>	9.8x	4.8x	4.0x	5.4x	6.4x	7.9x	9.7x	7.8x
<b>EV/Gross Cash Flows Multiple</b>	11.6x	12.9x	7.3x	11.2x	13.3x	9.5x	19.7x	12.0x

■ Highest Multiple    
 ■ Lowest Multiple    
 ■ Median Multiple

## Industry Initial Public Offerings—Industry: 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
11/30/17	Zodiac Energy Limited	\$0.43	5.8	\$2.5	\$170.1	\$0.0	\$22.5	(\$9.8)	(\$15.4)	(\$9.8)
11/27/16	Ripasso Energy AB (publ)	\$14.00	17.9	\$250.6	\$2,240.8	\$559.0	\$238.6	(\$111.1)	(\$52.4)	(\$63.5)
8/5/15	Sunrun Inc.	\$18.00	7.0	\$126.0	\$133.3	\$4.7	\$215.4	\$1.7	(\$2.4)	\$3.9
3/26/15	SolarEdge Technologies, Inc.	\$16.00	20.6	\$329.6	\$724.2	\$154.1	\$20.4	(\$117.7)	(\$19.5)	(\$113.4)
9/30/14	Vivint Solar, Inc.	\$8.00	11.5	\$92.0	\$1,151.2	\$299.3	\$124.1	(\$40.7)	(\$47.1)	(\$22.3)
12/12/12	SolarCity Corporation	\$6.00	6.5	\$53.8	\$106.2	\$33.9	\$149.5	(\$26.4)	(\$32.3)	(\$24.0)
3/29/12	Enphase Energy, Inc.	\$11.00	5.8	\$64.2	\$2,587.5	\$1,143.6	\$1,876.2	\$254.9	\$164.9	\$254.9
6/7/07	Yingli Green Energy Holding Company Limited	\$11.00	29.0	\$319.0	\$3,367.9	\$1,414.7	\$1,866.4	\$427.9	\$199.6	\$434.7
5/17/07	China Sunergy Co., Ltd.	\$11.00	8.5	\$93.5	\$176.3	\$77.9	\$149.5	\$16.9	\$11.8	\$18.7
2/6/07	JA Solar Holdings Co., Ltd.	\$15.00	15.0	\$225.0	\$492.9	\$150.0	\$696.5	\$142.5	\$128.4	\$142.5
12/18/06	Trina Solar Limited	\$18.50	5.3	\$98.1	\$112.5	\$44.3	\$91.6	\$14.8	\$10.0	\$15.8
11/16/06	First Solar, Inc.	\$20.00	20.0	\$400.0	\$255.1	\$71.0	\$95.9	(\$5.1)	(\$11.3)	\$2.4
11/8/06	Canadian Solar Inc.	\$15.00	7.7	\$115.5	\$66.3	\$23.2	\$50.7	\$7.8	(\$3.6)	\$8.0
7/10/06	Ascent Solar Technologies, Inc.	\$5.50	3.0	\$16.5	\$0.2	\$0.2	\$0.0	\$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
9/21/17	Ameresco, Inc.	Tesla Motors, Inc.	\$6,543.2	100%
11/1/16	Amyris, Inc.	MJP International Ltd.	\$4.4	80%
5/4/16	Ascent Solar Technologies, Inc.	EDF Renewable Energy	\$34.8	100%
4/29/16	Canadian Solar Inc.	Firststar Development, LLC	\$37.8	100%
9/24/17	Caithness Energy	Global Infrastructure Partners	\$20.0	100%
2/11/16	Gestamp Asetym Solar	KKR & Co. L.P.	\$800.0	80%
11/2/15	Aaron Services Ltd.	Lakehouse plc	\$15.4	100%
10/15/15	Suniva Inc.	Shunfeng International	\$45.0	63%
8/5/15	Energy Source Partners	Revolution Lighting Tech	\$30.1	100%

■ USA
 ■ International
 ■ Highest
 ■ Lowest
 ■ Median

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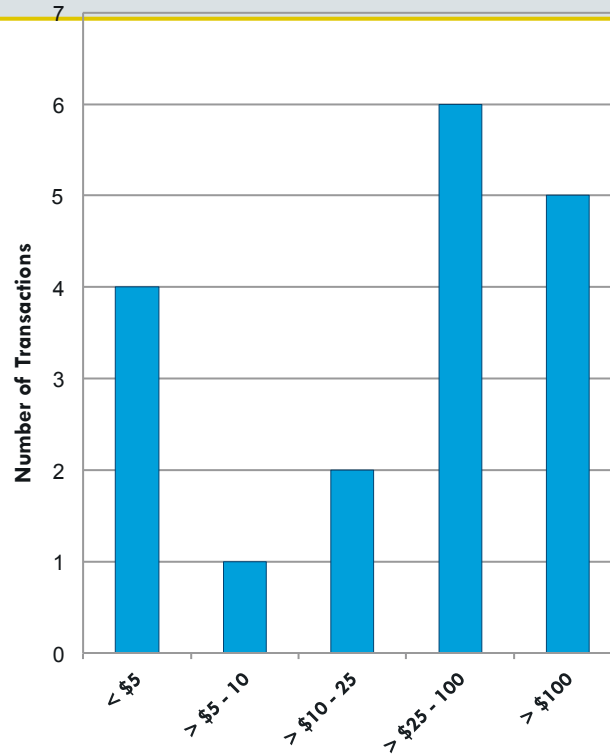
## Recent Merger and Acquisition Transactions for a Majority Stake (dollars in millions)

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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 December 31, 2017





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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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