October 25, 2019

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October 25, 2019

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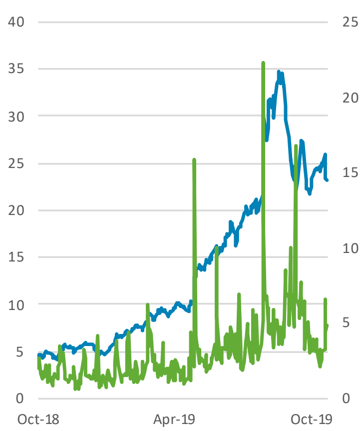
Enphase Energy (ENPH US)

Share Price	$ 23.21
YTD Change	**391%**
Market Cap (mln)	$ 2,831
P/E	209.99

Enphase Energy (ENPH US) last share price in USD (blue, left) and volume (green, right, mln shares)



Source: Bloomberg October 24, 2019

Enphase Energy (ENPH US)

Stealing from Tomorrow

- **Stuffed:** We think that Enphase is pulling forward sales and stuffing distribution channels in order to make sales appear better than they are. We have analyzed industry reports and estimate that an amazing seven months of inventory is sitting in distribution channels, versus industry norms of about four to six weeks. We believe Enphase is losing market share in solar inverters.
- **Margin boosting:** Inventory build started with the installation of Enphase's new COO in Q2 2017, who was elevated to CEO in September of that year. Kothandaraman's arrival coincided with the dizzying ascent of gross margins from 18% to 34% over nine quarters in which ENPH consistently shipped more product than appears to have been installed. Enphase's disclosures since late 2017 appear to have moved farther and farther from reality. The company has stopped disclosing key metrics and started to stonewall analysts, all the while awarding more shares to top management.
- **Being run for the money:** A last-minute bailout by a VC in 2016 ushered in a new set of managers who, in our opinion, focused on cutting pennies from cost and handsomely rewarding executives without regard to company culture or morale. Meanwhile, former employees tell us that Ahmad Chatila, ex-CEO of SunEdison, who precipitated the biggest bankruptcy of 2016, is acting as shadow CEO.

October 25, 2019

- **SunPower: Buying a Channel** Enphase acquired SunPower's microinverter business. What they got was a sales agreement that has not helped market share. Management of the two companies are close, and SunPower is a major holder of the stock.
- **Asymptotic Growth for Management to Hit Targets:** Q1 and Q2 2019 is where revenue growth, margin and implied market share have unbelievably shot up, leading the share price to double. Management have sold down shares and hit massive bonus targets.

Summary

Enphase has gone from a bankruptcy risk to an ostensibly thriving enterprise in less than three years. The company ships more microinverters every quarter; analysts crow about its rising market share; and its technology is universally admired.

Enphase has created a culture throttled by consultant-driven bean-counting, in which top management is rewarded for posting heroic results quarter to quarter. This short-termism would explain why ENPH, based on our analysis, is pulling forward sales from the future while management appears to mislead shareholders about market share. In reality,

- Channels are stuffed to the breaking point with product
- Market share is in decline
- The company is coasting on engineering achievements contributed by employees who were fired or left some time ago.

In Q2 2019 alone, we estimate that nearly three months of sales were pulled forward. Investors appear unaware of the disconnect between Enphase's reported shipments and market reality. We, on the other hand, recognize a pattern of increasingly poor disclosure around market share coupled with evasive and blustering discussions.

The most comprehensive market data in the industry shows Enphase has not won back share from dominant competitor SolarEdge, which explains Enphase's stubborn silence on this topic. Wood Mackenzie, formerly Greentech Media, is the gold standard for solar market share data, relied upon by groups like the Solar Energy Industries Association (SEIA). Per analysis of publicly disclosed portions of that data, which is based on reported installations rather than shipments, Enphase's organic market share (absent the SunPower acquisition) has declined significantly over the past two years. Enphase's market share disclosures have gone from robust to nonexistent in a year and a half, while management has grown more evasive as time wears on.

The numbers we report exclude revenue acquired from SunPower, a deal that raises separate questions about management's ability to formulate a sustainable growth strategy. SunPower's share in the inverter market has declined since Enphase acquired the unit.

Enphase bears a raft of uninspired characters at the helm—in addition to an undisclosed puppetmaster, disgraced former SunEdison CEO Ahmad Chatila. Yet ENPH stock trades at 7.0x TTM sales, with consensus 2021E revenues in excess of $950 mln, an impressive 135% higher than what

Enphase's culture is all about consultant-driven bean-counting, while top management reaps the outsized rewards in return for posting heroic results quarter to quarter.

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“The bullshitter… does not reject the authority of the truth, as the liar does, and oppose himself to it. He pays no attention to it at all. By virtue of this, bullshit is a greater enemy of the truth than lies are.” – Harry G. Frankfurt, On Bullshit

Enphase brings in today.[1] Why would any company priced to such perfection want to spoil the fun for investors, especially when its executives have showered themselves with more and more cash and share compensation?

The Enphase that has emerged from reorganization is a business that steals from tomorrow to show profits and sales growth today. Over 19 calls with former employees and distribution partners, we have found a slapdash, incestuous, and aggressive management approach that has driven much of the institutional knowledge from the company.

We want to be clear that Enphase’s legacy technology, while expensive, is best-in-class, and the company sits in a growing industry. The problem with Enphase, which is distinct from the claims raised in a September 2019 short report by Citron Research, is that management’s poor and self-serving choices have stripped the business bare. The continuously delayed launch of the next-generation IQ8/Ensemble and the problematic manufacturing move from China to Mexico are emblems of Enphase’s strategic decrepitude.

The Enphase bull case revolves around growing market share, a gifted executive team, and innovative R&D. We debunk these misperceptions below, each in turn.

The Disconnect Between Sales and Installations

ENPH’s unit shipment disclosures fail to mesh with competitors' data. Given Enphase management’s problematic incentive structure, we believe ENPH and its executives have ample motivation to cover up the truth.

The vast majority of ENPH’s microinverters sold are for residential solar applications, and ~75% of its revenues are in the United States.[2] Accordingly, the U.S. residential market is existentially important for the company.

We extrapolate from publicly disclosed authoritative installation data from Wood Mackenzie—sourced directly from the participating companies, including Enphase—to identify the discrepancy between shipments and actual installations in the market. Using the most conservative assumptions, we conclude that Enphase has at least seven months of product sitting in distributor channels that it has recognized as sold but that has not been installed.

1 Bloomberg data

2 ENPH Q2 2019 10-Q, p. 8

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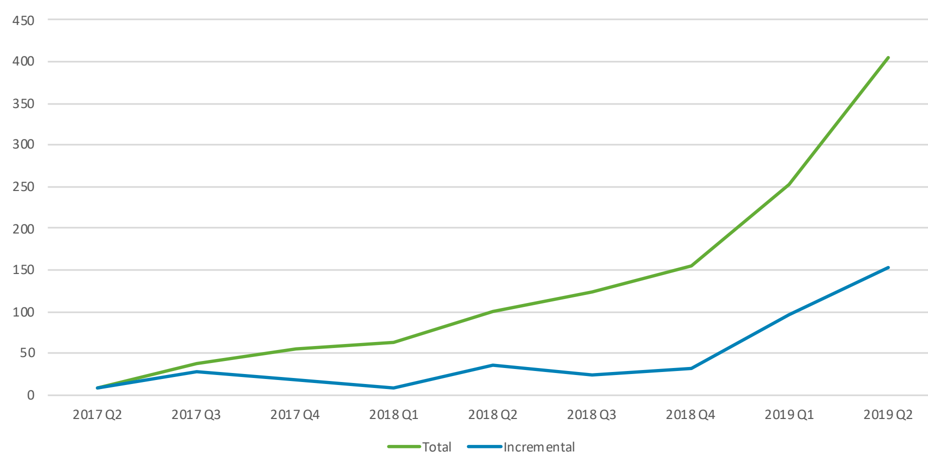
We make assumptions that are favorable to the company:

1. We benchmark shipments against annualized installations for the most recent quarter;
2. We apply a one-quarter lag to shipments versus installations to allow for time to install;
3. We assume a low proportion of U.S. sales, 60%, for the three quarters in which Enphase did not disclose the split with international.

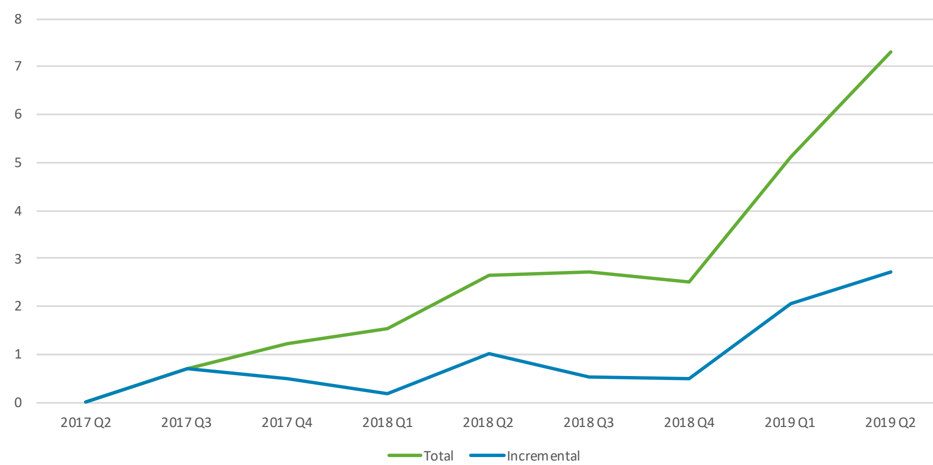
Applying these assumptions, we find that the company has pulled forward between seven and nine months of sales.

Chart 1. Shipped but not Installed Megawatts



Cumulative total MW shipped and not installed since Q2 2017 versus the installed-not-shipped amount incrementally each quarter. | Source: ENPH, Wood Mackenzie Solar Market Insight Report Q3 Executive Summary (available at https://www.seia.org/research-resources/solar-market-insight-report-2019-q3), J Capital

Chart 2. Implied Channel Inventory (Months)



Source: ENPH, SEDG, Wood Mackenzie Solar Market Insight Report Q3 Executive Summary (available at https://www.seia.org/research-resources/solar-market-insight-report-2019-q3), J Capital

We believe the evidence is clear: ENPH has improperly recognized seven months of sales.

The Numbers Just Don't Add Up

SolarEdge's market share has grown from 40% to approximately 60% In two years, and mathematically, this must be at the expense of ENPH's share. Tellingly, the CEO avoids any comment on market share other than to imply it is growing. From the last earnings call:

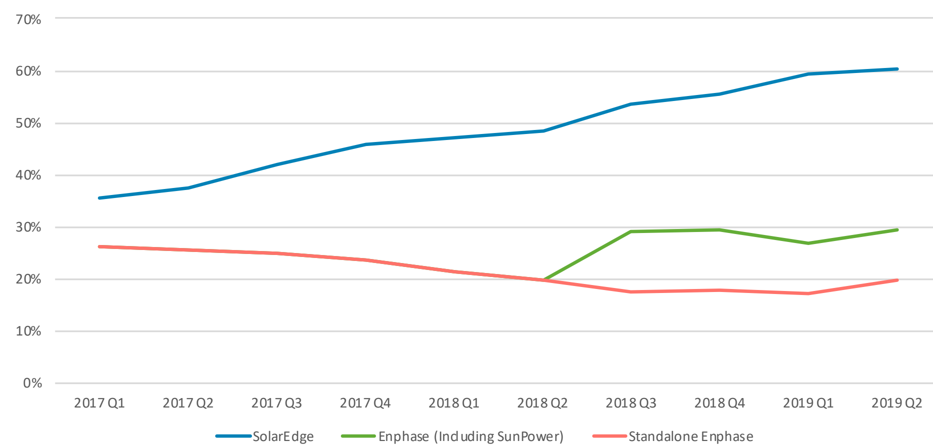
> We are not going to give out any numbers in market share, but the reasons why we are gaining market share, I believe, is basically along the lines of our core competence is essentially the focus on providing the highest quality, the highest customer experience and basically, products like Ensemble showed innovation in our product innovation capability. Badrinarayanan Kothandaraman, July 30, 2019

The 10-K on page 38 reads:

> "Our financial operating model sets gross margin, operating expense and operating income targets expressed as a percentage of net revenue. Our financial operating model explicitly focuses on profitability rather than market share."

It is sensible to avoid talking about share, because industry data show that share is declining.

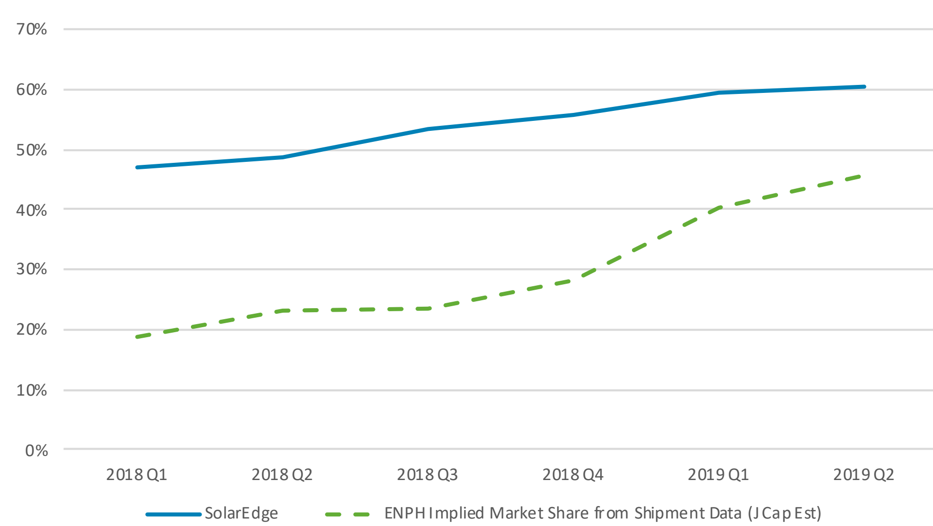
Chart 3. Inverter Market Share Based on Installations (MW)



Source: SEDG, J Capital, See Appendix for assumptions

Tracking current management's stated unit sales over time and translating them to ENPH market share puts the degree of managerial deception in even starker relief.

Chart 4. Inverter Market Share: Implied by ENPH Based on Shipments (MW)



Source: ENPH, SEDG, Solar Market Insight Report Q3 Executive Summary, https://www.seia.org/news/united-states-surpasses-2-million-solar-installations, J Capital

We start by establishing a historically accurate market share estimation methodology. ENPH states that a typical installation requires between 5 and 50 microinverters.[3] The company has also consistently reported total

3 SEDG May 2019: https://investors.solaredge.com/static-files/2d497b7a-c9c1-4d5e-b49f-48809d20f9aa

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quarterly microinverter shipments, as well as the annual geographic revenue breakdown. We then assume that a typical installation requires 25 microinverters and that ASPs are roughly the same ex-U.S. as they are in the U.S.[4] From the foregoing data points, we can estimate the number of ENPH installations in a given quarter.

Wood Mackenzie has tracked the total number of U.S. residential solar installations for over a decade via its acquisition of Greentech Media, so we use this information to give us ENPH's market share.[5] Previous management described ENPH's market share in 2016 as going from "approximately 20% in Q1 to over 30% in Q4", "based on third-party estimates as well as our own data."[6] Our methodology dovetails with this quite nicely, illustrating that management's microinverter sales figures used to comport with market-share estimates:

Table 1. Enphase Market Share Estimate Backtests Well

	Q1 2016	Q4 2016
Total Microinverters Sold	611,000	815,000
U.S. Revenue (%)	85.0%	80.0%
U.S. Microinverters Sold	**519,350**	**652,000**
Microinverters Per Installation	25	25
ENPH U.S. Household Installations	**20,774**	**26,080**
Total U.S. Household Installations	100,000	90,000
ENPH Market Share	**20.8%**	**29.0%**

Assumptions: Quarterly U.S. revenue from management commentary; ASPs equal globally

Source: ENPH, https://www.seia.org/news/united-states-surpasses-2-million-solar-installations, J Capital

However, digesting management's most recent disclosures tells a much more unexplainable story than the Wood Mackenzie data does. ENPH's market share has apparently eclipsed 45% as of Q2 2019, if the company's statements are to be believed:

4 Methodology follows based on conversations with solar experts.

5 https://www.seia.org/news/united-states-surpasses-2-million-solar-installations

6 ENPH Q4 2016 Earnings Call. Source: Bloomberg

Table 2. Newer Enphase Disclosures Defy Reality

	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019
Total Microinverters Shipped	611,000	675,000	665,000	820,000	976,410	1,283,680
U.S. Revenue (%)		61.6%	66.2%	70.4%	77.0%	75%
U.S. Microinverters Shipped	**376,614**	**446,982**	**467,875**	**631,400**	**757,398**	**1,026,944**
Microinverters Per Installation	25	25	25	25	25	25
ENPH U.S. Household Installations	**15,065**	**17,879**	**18,715**	**25,256**	**30,296**	**41,078**
Total U.S. Household Installations	80,000	77,500	80,000	85,000	80,000	82,500
ENPH Implied Market Share	**20.10%**	**23.20%**	**23.40%**	**29.70%**	**37.90%**	**49.80%**
SEDG Market Share per Wood Mackenzie, SEDG earnings call	59.50%		60%+			
Combined Market Share	**97.4%**		**>100%**			

Sources: ENPH 8-K filings; SEDG

The ENPH numbers do not survive even basic scrutiny. We calculate that at least 7 months of sales have been pre-recognized.

These numbers do not survive even basic scrutiny. ENPH would have had to be stealing U.S. market share from SolarEdge while squeezing out the cheaper, legacy competitors at the same time. Wood Mackenzie data, combined with strong results from SolarEdge, contradict the notion that SEDG ceded share. Therefore, it can only follow that ENPH's reported shipments diverge significantly from what installations would imply. The departure from Wood Mackenzie figures suggests that Kotharandaman and his team are pulling forward a significant amount of demand.

Even when using megawatts shipped instead of inverters, sensitivity analysis using a range of household power consumption shows that the assumption of 25 inverters per installation holds up reasonably well over time:

Table 3. ENPH Installations

	Q1 2018	Q2 2018	Q3 2018	Q4 2018	Q1 2019	Q2 2019
Megawatts Shipped	180	203	204	257	306	416
Kilowatts Shipped	180,000	203,000	204,000	257,000	306,000	416,000
U.S. Kilowatts Shipped	110,950	134,426	143,529	197,890	237,363	332,800
Kilowatts Per Installation	7	7	7	7	7	7
ENPH U.S. Household Installations	15,850	19,204	20,504	28,270	33,909	47,543
ENPH Implied Market Share	19.8%	24.8%	25.6%	31.4%	45.2%	52.8%
Microinverters per installation	23.8	23.3	22.8	22.3	22.3	21.6
Kilowatts Per Installation	7.5	7.5	7.5	7.5	7.5	7.5
ENPH U.S. Household Installations	14,793	17,923	19,137	26,385	31,648	44,373
ENPH Implied Market Share	18.5%	23.1%	23.9%	29.3%	42.2%	49.3%
Microinverters per installation	25.5	24.9	24.4	23.9	23.9	23.1
Kilowatts Per Installation	8	8	8	8	8	8
ENPH U.S. Household Installations	13,869	16,803	17,941	24,736	29,670	41,600
ENPH Implied Market Share	17.3%	21.7%	22.4%	27.5%	39.6%	46.2%
Microinverters per installation	27.2	26.6	26.1	25.5	25.5	24.7

Sources: ENPH, https://www.seia.org/news/united-states-surpasses-2-million-solar-installations, Solar Market Insight Report Q3 Executive Summary, J Capital

SolarEdge management, for its part, has openly addressed the numerical discrepancy, painting a stark contrast to ENPH's haughty silence. On the Q2 2019 SEDG call, after laying out recent Wood Mackenzie data in detail, the company said (emphasis added):

> "Lastly, to those who try to calculate market share from reported shipments, **the shipment number are not representing market share trends as these are affected by customer inventory.** I hope this will give you the motivation to get into the numbers of market share from Greentech Media rather from the shipment numbers that companies reported on themselves."[7]

7 SEDG Q2 2019 Earnings Conference Call. Source: Bloomberg

Though this commentary stops short of pointing the finger, we have laid out the history, characters, incentives, and computations that make it clear ENPH must be lying about how much product it is selling, and doing it in a big way.

How?

We cannot say how ENPH may be stuffing channels, but we suspect the company's shift to sales to distributors rather than installers. Distributors now account for about 80% of sales, according to a former finance executive, up from 65-75% two years ago. "Definitely moving more toward distributors." We believe this distributor channel could introduce a risk of excessive revenue recognition. Notably, installers may no longer buy directly from ENPH, according to our interviews, but are directed to buy from distributors, at a higher price.

ENPH Management Obfuscates

In the face of mounting evidence of market saturation, Enphase's CEO has resorted to stonewalling analysts. The content of his discussion regarding market share has dwindled to essentially nothing in the space of a year. As recently as last August, he gave concrete percentage estimates. At management's most recent public appearance in July of this year, Kothandaraman declined to discuss market share "because we don't look at the business like that":

Enphase Market Share Discussion Deteriorates Over Time

Date	Event	CEO Commentary
June 2018	SunPower Unit Acquisition	"We believe that SunPower's microinverter share in the U.S. in 2017 was roughly about 9% and Enphase is about 26% to 27%. So, on a pro forma basis, the 2017 market share if you combine both businesses would be roughly 30% to 36% and that is to provide you with the flavor of the market share."
August 2018	Analyst Day	"...if I were to do a pro forma market share, that would be 35% to 38% in the U.S."
April 2019	Q1 2019 Earnings Call	"I mean, look, I – we're not going to speculate about market share because that involves I know – I mean that means I know the total available market and I don't really know what will the total available market be for the latter half.

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Date	Event	CEO Commentary
July 2019	Q2 2019 Earnings Call	"Yeah, we are not going to give out any market share numbers because we don't look at the business like that."
July 2019	Q2 2019 Earnings Call	"We are not going to give out any numbers in market share. But the reasons why we are gaining market share I believe, is basically along the lines of our core competence is essentially the focus on providing the highest quality, the highest customer experience, and basically, products like Ensemble showed innovation in our product innovation capability."

Source: Bloomberg

Several industry experts we spoke to held up Greentech Media [now Wood Mackenzie] as the gold standard in fidelity for deducing share of installations. One former Enphase employee we spoke to stated not only that "Greentech Media's methodology on the whole has been very consistent" but that the data came straight from the horse's mouth: "That was real data we were giving back to GTM." As a result, it is confusing why Enphase would not want to report such an easily obtainable number as the Wood Mackenzie market share calculation. We encourage investors to contrast Enphase's evasiveness with SolarEdge's commentary, which is more helpful and nuanced by comparison, especially over time:

SolarEdge Market Share Discussion Is Consistently Numbers-Based or Appropriately Couched

Date	Event	CEO Commentary
January 2018	Needham Growth Conference	"...as of the third quarter, we were already 39.9% of the U.S. residential market."
November 2018	Q3 2018 Earnings Call	"On the competitive landscape, we believe that we continue to take market share."
May 2019	Q1 2019 Earnings Call	"Here, we think that our market share is growing, but that's very unindependent analysis that we do based on reviewing the many accounts of the Q1, Q2 and average long tail that we have. The right numbers or the most accurate numbers are coming as you know from GreenTech Media and those probably will be available by the end of May. So I would expect that we grow a bit in our market share, but I think it's hard to -- from our position, we have limited view. It's hard to come with a conclusive answer."

Date	Event	CEO Commentary
August 2019	Q2 2019 Earnings Call	"...you need to take into account that when we're shipping products, we're shipping them based on the demand that we see worldwide, based on seasonality that we see in markets and inventories that our customers are holding. So, I'm not sure that it is possible to derive based on one quarter what are the market share gains or losses? You can simply derive what we're shifting into the market itself but not what is really installed there."

Source: Bloomberg

Who is the New Management, Anyway?

With less than $20 million of cash in the bank as of year-end 2016, ENPH wrangled $10 million from Cypress Semiconductor founder T.J. Rodgers and venture capitalist John Doerr in January 2017.[8,9] Tellingly, much of this investment went into hiring consultants to advise ENPH on how to restructure the business.[10]

In April 2017, ENPH hired Badri Kothandaraman as its COO.[11] Kothandaraman was plucked from relative obscurity. After having spent more than 20 years at Cypress Semiconductor, rising to the level of executive vice president, Kothandaraman struck out on his own to make a crowdfunded charging adapter. Innocharge Solutions, LLC was incorporated in December 2016, with its headquarters listed as a residential property in Santa Clara, California.[12] A screenshot from Innocharge's website conveys relatively modest intentions for the product:[13]

8 ENPH 2016 10-K, p. 50

9 https://investor.enphase.com/news-releases/news-release-details/enphase-energy-announces-strategic-investment-tj-rodgers-and

10 https://investor.enphase.com/static-files/6166e871-80af-4fad-a796-2f977f1f3de8

11 https://investor.enphase.com/news-releases/news-release-details/enphase-energy-announces-new-chief-operating-officer-role/

12 https://www.bizapedia.com/ca/innocharge-solutions-llc.html

13 https://web.archive.org/web/20180822110747/http://www.innocharge-solns.com/

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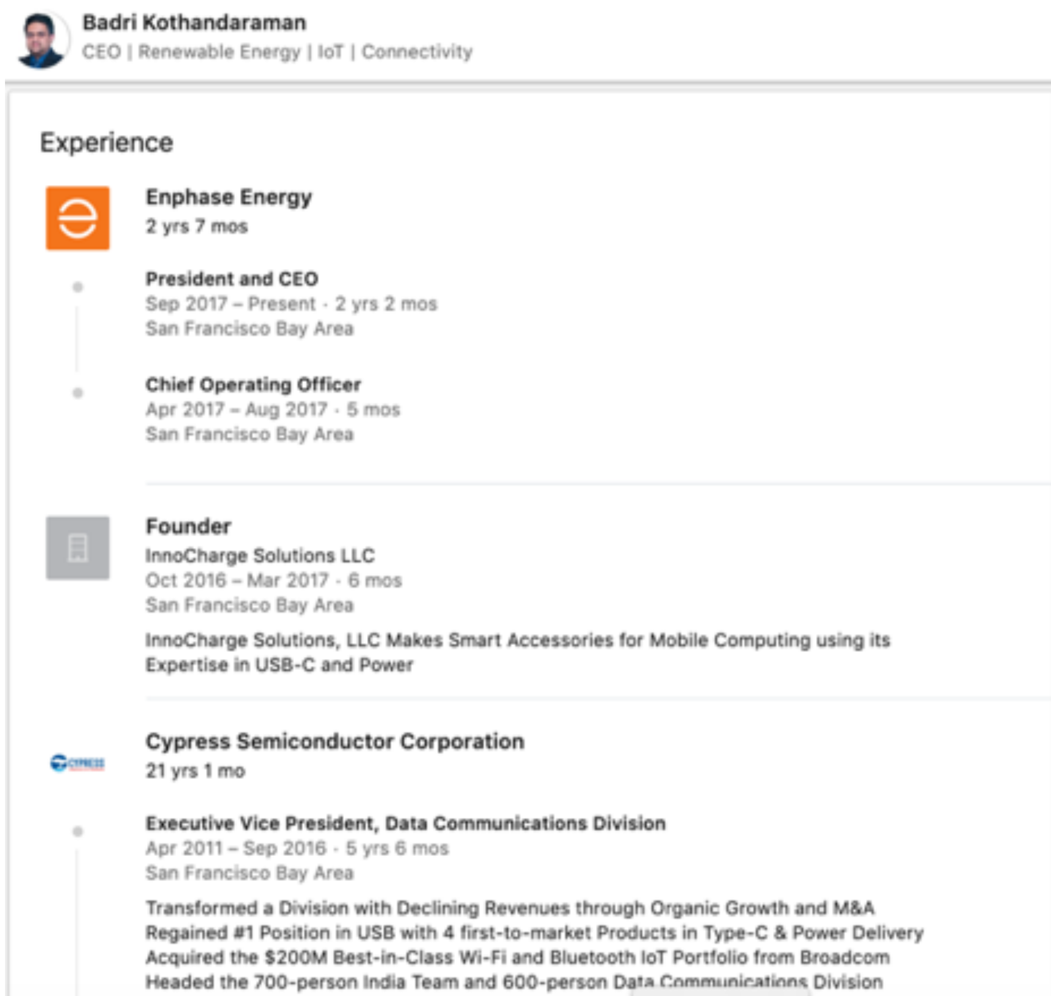
Source: Innocharge website

The accessory seems never to have made it to Kickstarter. Regardless of Kothandaraman's uninspired professional history, he was appointed CEO of ENPH in September 2017, less than a month after the previous CEO was pushed out and just five months after being appointed COO of the company, in April 2017.[14]

14 https://investor.enphase.com/news-releases/news-release-details/enphase-energy-appoints-badri-kothandaraman-president-and-ceo


Badri Kothandaraman
CEO | Renewable Energy | IoT | Connectivity

Experience

Enphase Energy
2 yrs 7 mos

President and CEO
Sep 2017 – Present · 2 yrs 2 mos
San Francisco Bay Area

Chief Operating Officer
Apr 2017 – Aug 2017 · 5 mos
San Francisco Bay Area

Founder
InnoCharge Solutions LLC
Oct 2016 – Mar 2017 · 6 mos
San Francisco Bay Area
InnoCharge Solutions, LLC Makes Smart Accessories for Mobile Computing using its Expertise in USB-C and Power

Cypress Semiconductor Corporation
21 yrs 1 mo

Executive Vice President, Data Communications Division
Apr 2011 – Sep 2016 · 5 yrs 6 mos
San Francisco Bay Area
Transformed a Division with Declining Revenues through Organic Growth and M&A
Regained #1 Position in USB with 4 first-to-market Products in Type-C & Power Delivery
Acquired the $200M Best-in-Class Wi-Fi and Bluetooth IoT Portfolio from Broadcom
Headed the 700-person India Team and 600-person Data Communications Division

Source: https://www.linkedin.com/in/badri-kothandaraman/

Based on our discussions with numerous former employees, Kothandaraman is anything but an inspired chief executive. Focused on wringing out costs and laying out headline numbers, Kothandaraman was described in tyrannical terms, as a manager not keen on learning details and prone to angry outbursts when he received unpleasant news. A former report described him as “very aggressive” in financial statements but never crossing the line into improper activity. Our interviews indicated that Kothandaraman often demands the impossible and tends to fire those who can’t deliver.

Given Kothandaraman’s middling experience level and predilection for bridge-burning, we learned in interviews that someone else was responsible for much of the strategic decision making in the new Enphase: none other than Ahmad Chatila, ex-CEO of SunEdison. Enphase has hidden Chatila’s involvement in the company, and he serves, nominally, as a consultant. However, he was described to us as a shadow CEO, attending most high-level meetings and often more active than the actual CEO. It is not hard to see why Enphase does not want to discuss why it employs the person who precipitated the largest US bankruptcy of 2016.[15]

Meanwhile, as the turnaround progressed, and management grew more ebullient, some more troubling signs emerged in ENPH's internal workings. The company's CFO resigned in May 2018, according to the company.[16] In June, ENPH replaced him with Tesla's former Chief Accounting Officer, Eric Branderiz.[17] Branderiz had joined Tesla through its acquisition of SolarCity and had been out of work since he left Tesla "for personal reasons" in March 2018 after 14 months on the job.[18,19]

Branderiz is a big fan of Kothandaraman, declaring him an #OutsidetheBoxThinker:[20]

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15 https://www.jonesday.com/en/insights/2017/01/top-10-bankruptcies-of-2016

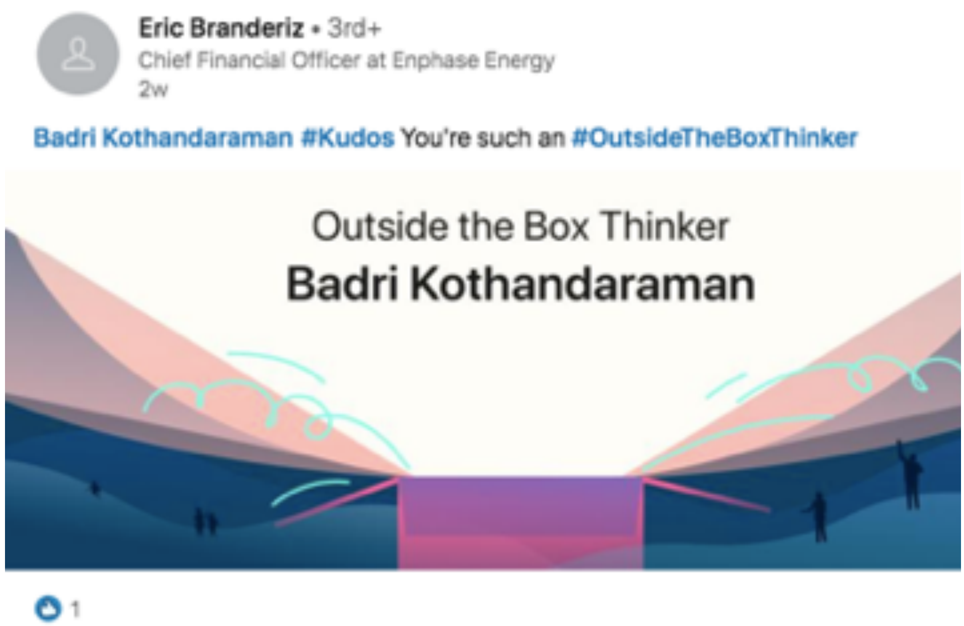
16 https://www.globenewswire.com/news-release/2018/05/01/1494386/0/en/Enphase-Energy-Announces-Chief-Financial-Officer-Resignation.html

17 https://newsroom.enphase.com/news-releases/news-release-details/enphase-energy-appoints-new-chief-financial-officer-0?ReleaseID=1069145

18 https://www.cnbc.com/2018/03/08/tesla-says-chief-accounting-officer-branderiz-left-for-personal-reasons.html

19 https://www.nytimes.com/2019/02/20/business/tesla-general-counsel.html

20 https://www.linkedin.com/feed/update/urn%3Ali%3Aactivity%3A6565566041395732480/



Source: Linked In

Meanwhile, in October 2018, with a year of new management, Enphase made another hire fresh from Tesla: Mandy Yang, who was Tesla's worldwide controller for over a year and a half.[21] During her tenure, Tesla engaged in particularly dubious revenue accounting, by, for example, using the sale of regulatory credits to bump up its net income, pushing out accounts payable, and reducing reported costs in a highly questionable manner.[22] Yang and Branderiz had previously worked together at flash memory maker Spansion Inc., which went bankrupt in 2009.[23]

In January 2018, ENPH had hired the former VP of Operations at Energous Corporation (WATT) Jeff McNeil to run its Quality and Customer Support division.[24] WATT is a blatant pump-and-dump, promising wireless charging, and its stock price has declined more than 80% since McNeil joined

21 https://www.linkedin.com/in/mandy-yang-8aa39b13/

22 See blog: "Tesla's Q3 GAAP "Net Income:" Manipulation If Not Outright Fraud," November 18, 2018, http://investmentresearchdynamics.com/teslas-q3-gaap-net-income-manipulation-if-not-outright-fraud/

23 https://www.nytimes.com/2009/03/02/business/worldbusiness/02iht-02chip.20521722.html

24 https://www.linkedin.com/in/jeff-mcneil-7240256/

ENPH.[25] As if his mere presence were not bad enough, in April 2019, ENPH promoted McNeil to COO.[26] Like Kotharandaman, McNeil was a long-time employee at Cypress.

Clubbiness and Layoffs

ENPH management's tendency to hire old colleagues and lay off outsiders has rocked Enphase to the core. Multiple ex-employees highlighted that as time rolled on and the ranks of middle managers—virtually all of them ex-Cypress or ex-SunEdison—swelled, there remained fewer and fewer employees who actually knew how to build and test Enphase technology. Those who stayed on described an atmosphere in which an increasing number of engineers with poorer technical skills took on core product design tasks. Others who left stated they did not even have a chance to properly transition their roles before being asked to leave.

Management's tendency to hire old colleagues and lay off outsiders has rocked Enphase to the core.

Emblematic of the disruption to the engineering organization, Enphase lost its VP of Engineering, Jan Klube, to home energy storage company Electriq Power in September 2019.[27] Klube had been at his current role at Enphase since late 2017.[28] This is one of numerous technical leaders who have moved on to other companies in California, taking their expertise with them.

Enphase is scrambling to hire additional engineers to plug skilled employee attrition. LinkedIn data shows engineering job openings have increased by more than a factor of 10 in the past year:[29]

25 Bloomberg data

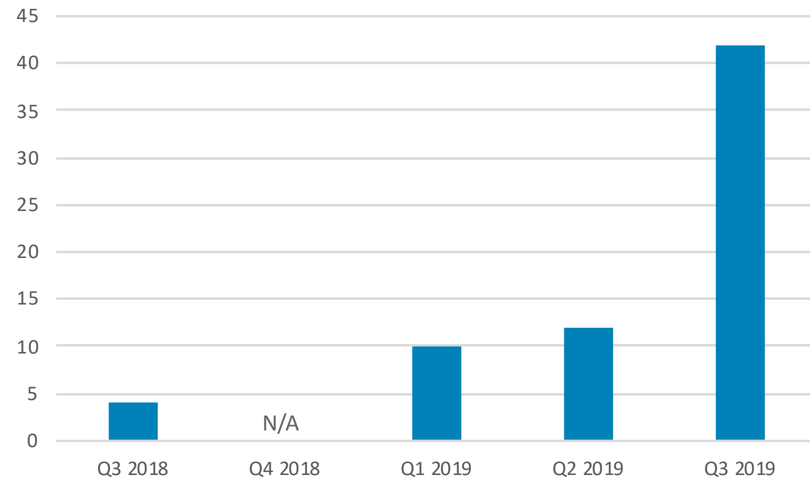
26 https://www.sec.gov/Archives/edgar/data/1463101/000146310119000092/form8-k20190303cooappointm.htm

27 https://www.globenewswire.com/news-release/2019/09/17/1916771/0/en/Electriq-Power-Welcomes-Google-Energy-Strategist-Neha-Palmer-as-Board-Member-and-Jan-Klube-as-Vice-President-of-Engineering.html

28 https://www.linkedin.com/in/janklube/

29 https://www.linkedin.com/company/enphase-energy/insights/

Chart 5. Engineering Job Openings on Linked In



Source: Linked In and J Capital

In an interview, we learned that Enphase is pursuing engineers whom it fired or alienated to resume doing work for the company, and many of the engineers had declined. This information leads us to believe that Enphase is scrambling for talent to stem the personnel bleed, rather than growing the depth of its engineering bench.

Given the forgoing, it should come as little surprise that Enphase's next-generation flagship microinverter, the IQ8, has been delayed multiple times, along with the much-touted Ensemble gridless power product. Enphase continues to push back the rollout date for Ensemble. At the Solar Power International conference, CTO Raghu Belur gave the product introduction date "to the end of Q4 2019 or Q1 2020."[30] When the company announced the product, in June 2017, the launch was projected for Q1 2018.[31] One executive at a major solar distributor whom we spoke to was put off by the fact that Enphase had no floor presence at this year's September Solar Power International conference, with nothing of Ensemble to show.

The company makes much of the secrecy involved in Ensemble's design and production, but this silence appears merely to mask poor engineering and slow progress with unfamiliar new product lines, such as energy storage, where Enphase is dwarfed by much bigger and better-capitalized competitors. One former Enphase employee we spoke to stated that management tried to take quality shortcuts on new equipment that would have

30 https://www.youtube.com/watch?v=glSXghzDZcs

31 Company presentation, Enphase Analyst Day, June 19, 2017

raised failure rates by an order of magnitude or more.

Enphase contract manufacturing facility operated by Flex in Guadalajara, Mexico Source: Google

The company's manufacturing transition from China to Mexico has also been more fraught than Enphase has let on. Three conversations with former executives described a well-run, automated manufacturing line Enphase built in China. Meanwhile, Mexico "manufacturing" was characterized to us as currently limited to assembly, with manual processes and less skilled staff. Yet, Enphase external commentary has remained disconnected from on-the-ground reality, with management instead characterizing the issues as "two process steps out of 230 process steps", while maintaining that "we have rapidly corrected the issues, we are now well underway."

We encourage investors to ask management more probing questions about the obstacles to IQ8 and Ensemble development as well as the readiness issues at the Mexico plant.

The Curious Case of Jithender Majjiga

Amid all of the subpar management hires, one egregious deal stands apart, where it appears the CEO acquired his old college friend's company. Jithender Majjiga, who became VP of cost planning at Enphase, had previously cofounded an energy storage startup named ActivStor. ActivStor, which was incorporated in 2017, gives a residential address as its headquarters.[32] According to Majjiga's LinkedIn, Enphase acquired this company a year later, in January 2018:[33] Regardless of Kothandaraman's uninspired professional history, he was appointed CEO of ENPH in September 2017, less than a month after the previous CEO was pushed out and just 5 months after being appointed COO of the company in April 2017. [34]

Co-Founder & CEO
ActivStor Inc.
Feb 2016 – Jun 2017 · 1 yr 5 mos
Cupertino CA

Co-founded ActivStor, is an early stage startup developing next generation Energy Storage Solutions to disrupt Residential energy storage solutions. Raised capital, hired a team and helped build prototype. Successfully exited in Jan 2018 by selling to Enphase Energy

Source: Linked In

32 https://opencorporates.com/companies/us_ca/C3984798

33 https://linkedin.com/in/jithender-majjiga-a9a5/

34 https://investor.enphase.com/news-releases/news-release-details/enphase-energy-appoints-badri-kothandaraman-president-and-ceo

Not only is the ActivStor acquisition not discussed in ENPH filings or transcripts, but Majjiga, as it so happens, graduated from the same university as Kothandaraman, just one year earlier:

Source: Linked In

"Show Me the Incentive..."

New management has tied themselves to ENPH's short-term share price for compensation while increasing the frequency of cash bonuses. In 2018, management began to cash bonus payouts quarterly.[35] Meanwhile, ENPH has begun making 60% of its restricted stock unit grants based on "specified corporate goals measured over a one-year period" and "achievement of stock price targets over a one-year period, which it laughably calls "Long-Term Incentive".[36,37] Quarterly cash bonus payouts are also non-GAAP and subject to numerous adjustments.[38] Interestingly, Enphase snuck these changes to performance-based compensation in after the 2018 proxy date, only noting the difference in compensation structures a year later, in April 2019.[39]

35 ENPH 2019 proxy statement, p. 24

36 Ibid.

37 ENPH 2019 proxy statement, p. 31

38 "In determining non-GAAP quarterly profit before taxes, the Company excludes, among others, the following items: stock-based compensation expense; restructuring charges; reserves for non-recurring legal matters; acquisition-related expenses; and non-cash interest expense." ENPH 2019 Proxy, p. 29

39 ENPH 2019 Proxy statement, p. 25

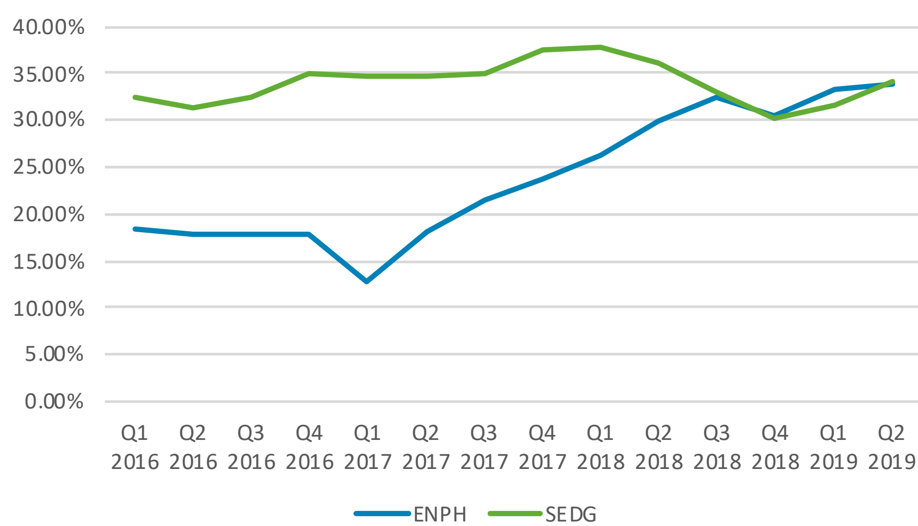
SEDG, by contrast, applies a four-year vesting period to all executive options and pays cash bonuses annually.

ENPH's pay packages, short-termist as they are, unequivocally encourage executives to manage to the quarter, while inviting management to juice ENPH's share price by hiding unfavorable information. Indeed, over the last six months, while shares have leapt from below $10 to above $20, insiders have sold shares worth $5.4 million.[40]

Gross Margins

Enphase has reported vaulting gross margin gains quarter after quarter since the management change in Q2 2017. Compare those with steady-Eddie gross margins reported by direct comparable SolarEdge.

Chart 6. Gross Margins by Quarter: SEDG and ENPH



Source: Bloomberg

We have asked about 15 former executives and competitors how ENPH managed to achieve this improvement. The only plausible explanation offered was that, when ENPH received an injection of capital in late 2016, the market gained confidence that Enphase would be able to honor its warranty commitments and was more willing to purchase.

We believe that explanation is insufficient. ASPs declined in 2017.[41] In

40 Bloomberg data.

41 Earnings call transcript Q4 2017

Anne Stevenson-Yang anne@jcapitalresearch.com +1 860 391 6094

2018, the company obfuscated.

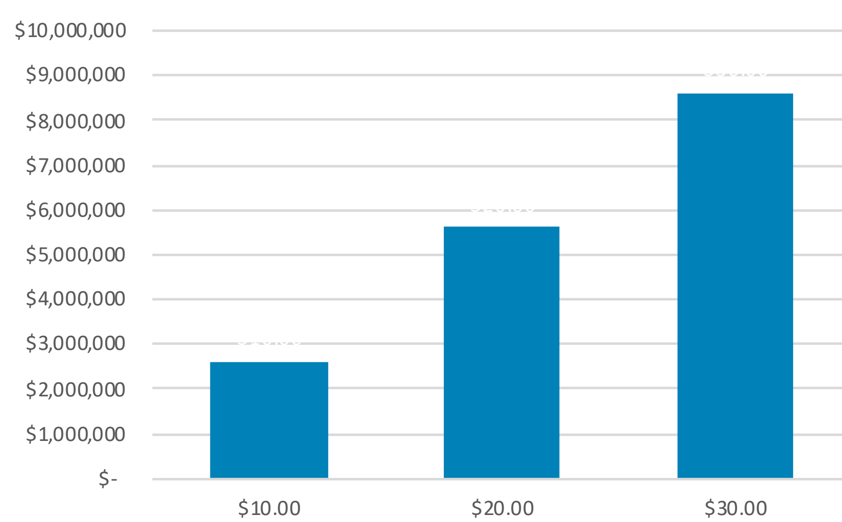
> Pricing is complicated. Some customers are large, Tier 1 customers, some are long-tail customers. The number of long-tail customers is a lot. And, therefore, each transaction needs to be optimized there. And very often, we were not able to service some valued customers because our costs on IQ 6 were not good enough. Kothandaraman August 16, 2018 earnings call

Over and over, Kothandaraman attributed the margin performance to cost-cutting:

> In general, we're making a lot of progress on gross margin. We are working on costs day and night. We are working on this architectural innovation. We are working on accessories, dropping our overhead. In addition, as we transition to higher power, higher performance products, our gross margin is naturally better. . . . So obviously we're cautious. But we really feel good about gross margins. Q3 2018 earnings call

The company awards Restricted Stock Units (RSUs) quarterly to top management, based on various performance criteria, including the price of ENPH's publicly traded shares. To give an idea, here is a chart showing how much the CEO stands to make from his share options in 2019 and 2020 at different values for the publicly traded shares:

Chart 7. Value of CEO's Options with ENPH at $10, $20, and $30 per Share



Source: ENPH, J Capital

Not coincidentally, in 2018, Enphase brought forward the vesting date of the stock awards that had been given to Chief Commercial Officer David Ranhoff in 2017. Had the company not changed the vesting date, Ranhoff's total compensation would have been 70.8% lower than the $2.0 million in total compensation he brought in in 2018.

Stock Awards

	2017 Proxy statement	2018 Proxy statement
No of stock awards outstanding as at the year end	1,000,000	750,000
Vesting date	15-Feb-19	4-Dec-18
Impact on the 2018 remuneration*		1,398,142
as a % of total compensation		70.8%

Source: ENPH

Overall, top executives' salaries at Enphase have ballooned as compensation targets have grown more short-term. Kothandaraman has enjoyed particular prosperity, with his compensation eclipsing $8 million in 1H 2019:

Total Compensation Paid

USD	2017	2018	1H19
Total reported compensation			
Paul B. Nahi	1,843,403	-	
Badrinarayanan Kothandaraman	1,954,111	2,721,724	
Eric Branderiz	-	2,699,584	
Humberto Garcia	860,367	206,745	
David Ranhoff	2,933,842	577,304	
Kris Sennesael	-	-	
Total calculated compensation			
Paul B. Nahi	1,821,848	-	-
Badrinarayanan Kothandaraman	292,011	3,165,222	8,161,344
Eric Branderiz	-	383,585	2,242,765
Humberto Garcia	415,347	687,641	-
David Ranhoff	33,842	1,975,446	200,000
Kris Sennesael	-	-	-

USD	2017	2018	1H19
Compensation includes;			
Base salary*			
Paul B. Nahi	294,168	-	-
Badrinarayanan Kothandaraman	287,596	450,000	225,000
Eric Branderiz	-	232,051	200,000
Humberto Garcia	312,500	175,000	-
David Ranhoff	33,333	400,000	200,000
Kris Sennesael	-	-	-
Cash performance bonuses**			
Paul B. Nahi	-	-	
Badrinarayanan Kothandaraman	-	211,168	
Eric Branderiz	-	148,088	
Humberto Garcia	-	-	
David Ranhoff	-	172,468	
Kris Sennesael	-	-	
Stock awards - time based***			
Paul B. Nahi	206,248	-	-
Badrinarayanan Kothandaraman	-	-	830,700
Eric Branderiz	-	-	1,299,750
Humberto Garcia	97,665	261,776	-
David Ranhoff	-	1,398,142	-
Kris Sennesael	-	-	-
Stock awards – performance***			
Paul B. Nahi	-	-	-
Badrinarayanan Kothandaraman	-	-	2,006,141
Eric Branderiz	-	-	743,015
Humberto Garcia	-	-	-
David Ranhoff	-	-	-
Kris Sennesael	-	-	-

iz -	2,699	,584	Humb
Stock options****			
Paul B. Nahi	5,597	-	-
Badrinarayanan Kothandaraman	-	2,499,998	5,099,503
Eric Branderiz	-	-	-
Humberto Garcia	1,600	207,774	-
David Ranhoff	-	-	-
Kris Sennesael	-	-	-
Bonus and other*			
Paul B. Nahi	1,315,835	-	
Badrinarayanan Kothandaraman	4,415	4,056	
Eric Branderiz	-	3,446	
Humberto Garcia	3,582	43,091	
David Ranhoff	509	4,836	
Kris Sennesael	-	-	

*Base salary and bonus and other are taken as disclosed in the proxy statements for each year. For 1H19 we have pro-rated.

**Cash performance bonuses are taken as disclosed in the proxy statements. We cannot estimate the value for 1H19.

***The value of the stock awards is taken as at the date it is vested using the share price at the vesting date.

****The value of all the vested but unexercised options are taken based on the difference between the share price and the exercise price at period end.

Source: ENPH

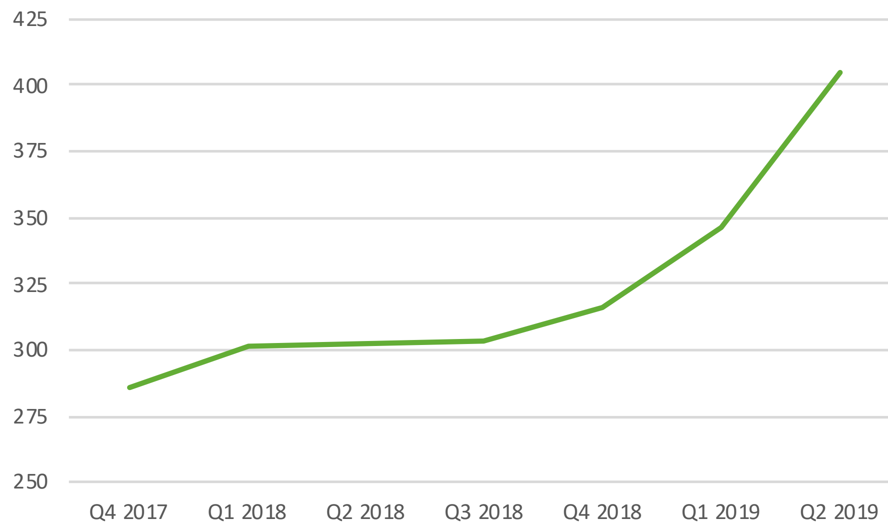
Rosy Revenue Growth Reliant on a Suspect Deal

Enphase has grown sales well above the rate of industry growth, with a CAGR of 26% since Kotharandaman was named CEO.[42] In the past half year, ENPH's TTM revenue acceleration has intensified, reaching a blistering 64% CAGR. ENPH estimates that the worldwide solar market has

42 Source: ENPH quarterly and annual reports

grown at only +10%, by contrast.[43]

Chart 8. Enphase TTM Revenue (mln)



Source: ENPH disclosures

In August 2018, ENPH increased its market share by a third by acquiring struggling solar panel maker SunPower's microinverter business.[44] ENPH had no use for SunPower's technology and immediately discontinued the inverters. The rationale of the deal was a contract to supply SunPower for five years.

Kothandaraman was rewarded with nearly 1 mln RSUs[45] for making this purchase, stock that has soared in value since the deal was made. But the deal looks foolish in hindsight. In 11 months since acquisition, the Sun-Power agreement produced $33.6 million in revenues.[46] This is despite the company's announcement that the acquisition would bring in $60-70 mln in annualized revenues in the second half of 2019.[47] At the time of pur-

43 ENPH 2018 annual report, p. 5

44 "We believe that SunPower's microinverter share in the U.S. in 2017 was roughly about 9% and Enphase is about 26% to 27%." ENPH Acquisition Call, June 2018. Source: Bloomberg

45 ENPH Proxy Statement April 4, 2019

46 ENPH 2018 10-K, p. 93; ENPH Q2 2019 10-Q, p. 24

47 ENPH presentation June 12, 2018

chase, the purchase consideration was $25 million in cash and 7.5 million shares, or $57.3 million altogether.[48] This amounts to an annualized sales multiple of about 1.6x, which is itself hard to justify for a barely profit-making book of business. At current share prices (SunPower still holds its ENPH shares), SunPower is making over $270 million.[49]

Amid this lackluster return profile, it is important to note that SunPower is not even a timely payer. As of Q2 2019, SunPower owed ENPH $14.3 mln in receivables, or approximately 140 days' sales.[50] From a working capital perspective, too, this seems like a rotten acquisition. This reinforces the perception that management is working to bolster revenue growth however it can.

Not coincidentally, ENPH's CFO, Eric Branderiz, was formerly senior vice president, corporate controller, and chief accounting officer at SunPower. Mandy Yang, chief accounting officer at ENPH, was also at SunPower at the same time reporting to Branderiz.

We have detailed a business that differs wildly from analyst and investor perception. Enphase employs obfuscation to mask eroding market share. The company is a refuge for cast-offs from Tesla, PlugPower, SunEdison, and Cypress Semiconductor. Meanwhile, ENPH ranks have been stripped bare of engineering talent thanks to mismanagement and a short-term fixation. The same aggressive practices that led to 200% of Q2 sales being pulled forward have delayed and impaired the company's product pipeline. Amid these repeated fumbles, a tight-knit squad of executives continues to deceive investors while enriching themselves and those loyal to them. Market participants holding Enphase shares do not know what they own.

48 ENPH 2018 10-K, p. 93

49 It may be worth noting that ENPH angel T.J. Rodgers was one of SunPower's original backers.

50 ENPH Q2 2019 10-Q, p. 24; assumes $33.6 million constitutes 11 months' sales

Appendix

Methodology – Market Share

Based on multiple subject-matter expert calls, we determined Enphase's installed market share to fluctuate around 45% of the non-Solar Edge US residential inverter market, while SunPower constituted about 25% of the non-SolarEdge US residential market.

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