



Company: ESS Tech, Inc.
Industry: Energy Storage Systems
Price (10/21/21 close): US\$ 15.94/share

NYSE: GWH
URL: <https://essinc.com/>
Market Cap: US\$ 2.3 billion

Table of Contents:

1. FAILED PRODUCT INSTALLATIONS – DISSATISFIED CUSTOMERS	... p. 2
a. Stone Edge Farm Estate Vineyards & Winery	... p. 4
b. University of California, San Diego	... p. 6
c. US Army Corps of Engineers	... p. 7
d. Camp Pendleton - Cleanspark	... p. 8
e. San Diego Gas & Electric	... p. 8
f. BASF & Pacto Energia S.A.	... p. 9
g. InoBat & Naturgy	... p. 10
2. TEETERING ON BANKRUPTCY IN CY'20 – SAVED BY A SPAC IN '21	... p. 11

Ess Tech, Inc. (“ESS”) (NYSE: GWH) was recently acquired by the SPAC ACON S2 Acquisition Corp. (“STWO”) to commercialize ESS’ low-carbon emission long-duration iron redox flow battery.

ESS’ May 2021 PPT Investor Presentation (“May’21 PPT”) disclosed that its iron flow batteries were “*validated by a blue-chip customer base... field proven and shipping now.*”

ESS highlighted six (6) different ESS battery installations deployed from 2015 to 2020 to customers such as the US government, a private commercial winery, and a university in San Diego.

We found five (5) ESS’ projects abandoned and its purported CY’20 project generated zero revenues.

To us, the evidence revealed that ESS lied to investors about its historical customer base and project deployments.

Competition in the battery sector is fierce, especially when your primary product inputs are iron, salt and water. In 2012 and 2015, ESS was awarded two separate grants for a total of ~US\$ 3 million from the US Department of Energy (“DOE”). On September 23, 2021, the DOE [announced](#) US\$18 million in grants awarded to four ESS flow battery competitors and did not include ESS.

ESS’ did not generated any revenues from January 2019 through June 2021 despite its purported “*blue-chip customer base.*”

With increased expenses and a depleting cash balance between US\$ 256 million to 399 million (between ~US\$ 1.89 to 2.70 cash/share dependent on warrant exercise amount), we are short GWH and believe that its stock is going significantly lower (~85%).

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FAILED PRODUCT INSTALLATIONS – DISSATISFIED CUSTOMERS

Customer websites and local media coverage revealed that ESS’ historical product deployments were abandoned and, in some cases, replaced by alternative low-emission long duration energy storage solutions.

ESS’ May’21 PPT disclosed that its iron flow batteries were “*validated by a blue-chip customer base... field proven and shipping now.*”

ESS’ May’21 PPT included a slide highlighting six (6) different ESS battery installations deployed from 2015 to 2020 to customers such as the US government, a public utility, a private commercial winery, and a university in San Diego.¹

We found that five projects were abandoned and that San Diego Gas & Electric Company (“SDG&E”) opted for Sumitomo Electric Industries, Ltd.’s (TYO:5802) vanadium battery.²

Product Deployments

 <p>Stone Edge Farms 10 kW/60 kWh; 2015</p>	 <p>USACE 60 kW/225 kWh; 2016</p>	 <p>UCSD (CA) 50 kW /400 kWh; 2017</p>
 <p>DNV-GL (TX) 50 kW /400 kWh ; 2017</p>	 <p>Camp Pendleton 50 kW /400 kWh; 2018</p>	 <p>US Utility 50 kW /400 kWh; 2020</p>

Validated by a Blue-Chip Customer Base ESS^{INC}

	Utilities EW ● ● EC	IPPs/Developers EW ○ ● EC
Demand Drivers	<ul style="list-style-type: none"> ▪ Peaker replacements ▪ T&D upgrade deferrals ▪ Wildfire resiliency ▪ Distributed energy services products 	<ul style="list-style-type: none"> ▪ Peaker replacements ▪ Resource adequacy & grid reliability ▪ 24/7 power supply ▪ Microgrids
Select Customers / Use Cases	<div style="background-color: #eee; border-radius: 10px; padding: 5px; text-align: center; margin-bottom: 5px;">Engie</div> <div style="background-color: #eee; border-radius: 10px; padding: 5px; text-align: center;">San Diego Gas & Electric</div>	<div style="background-color: #eee; border-radius: 10px; padding: 5px; text-align: center; margin-bottom: 5px;">  <small>SoftBank Group</small> </div> <div style="background-color: #eee; border-radius: 10px; padding: 5px; text-align: center;">  </div>
	Commercial & Industrial EW ● ○ EC	
	<ul style="list-style-type: none"> ▪ Energy cost savings ▪ Operational resiliency ▪ RE integration ▪ Carbon footprint reduction/ESG goals 	<div style="background-color: #eee; border-radius: 10px; padding: 5px; text-align: center; margin-bottom: 5px;">Applied Medical</div> <div style="background-color: #eee; border-radius: 10px; padding: 5px; text-align: center;">Pacto Energia</div>

Source: ESS May’21 PPT – p.26, 45
https://s28.g4cdn.com/365128779/files/doc_presentations/2021/ACONS2-ESS-Merger-Investor-Presentation-02.pdf

¹ Source: ESS May’21 PPT – p.10, 21

² Source: <https://www.sdgenews.com/article/groundbreaking-flow-battery-project-helping-advance-clean-energy-microgrids>

Piper Sandler & Co. (“Piper”)’s October 2021 initiation report included some alleged existing & potential customers.



Source: ESS Investor Presentation, Piper Sandler

Source: Piper Sandler Initiation Report dated October 21, 2021 – p. 19

ESS management contradicted itself about ESS’ historical installation customer base.

ESS’ December 2018 Investor Presentation (“Dec’18 PPT”) touted multiple “*projects under construction*” to be delivered in 2019.³

On June 9, 2021 at the Cowen Conference, ESS claimed that its batteries had been deployed, yet according to its Prospectus, ESS “*currently do not have any products deployed*” and had not generated revenues in 2019, 2020 or 1H’21.

So people are deploying it. They want to deploy storage as a way to buffer the economics. Store during the day, discharge at night. How does that change over time? We actually do have some utilities to date. We’re buying Energy Warehouses, That lets them get started and they can do very select, kind of drop in. And then, for lack of a better term, they graduate to an Energy Center or something with much larger scale.

Source: Cowen Sustainability & Energy Transition Summit dated June 9, 2021

<https://www.sec.gov/Archives/edgar/data/0001819438/000119312521188900/d129808d425.htm>

are developing two products, each of which is able to provide reliable, safe, long duration energy storage. **We currently do not have any products deployed** and expect to begin shipping our second generation of Energy Warehouses in the second half of 2021. With each additional battery deployed,

Source: ESS 424B3 dated September 14, 2021 – p.174

Early-stage ESS investors, such as BASF and InoBat, made similar comments about large future orders in 2018 that never came to fruition.

ESS’ SEC filings are vague about past recalls and the tech specs needed to satisfy product deliveries to BASF, InoBat, or SB Energy.⁴

Competition in the battery sector is fierce, especially when your primary product inputs are iron, salt and water.

In 2012 and 2015, ESS was awarded two separate grants for a total of ~US\$ 3 million from the US Department of Energy (“DOE”).⁵

On September 23, 2021, the DOE announced US\$18 million in grants awarded to four ESS flow battery competitors and did not include ESS.⁶

ESS’ did not generated any revenues from January 2019 through June 2021 despite its purported purported “*blue-chip customer base.*”

To us, the evidence suggests that ESS lied to investors about its installation base and failed to build a commercially viable battery.

³ Source: ESS Dec’18 PPT <https://worldcongress.energyandmines.com/files/Hugh-McDermott-Senior-Vice-President-Sales-Business-Development-ESS-Inc.pdf>

⁴ Source: ESS 424B3 dated September 14, 2021 – p.174

⁵ Source: <https://www.sbir.gov/sbc/energy-storage-systems-inc-2>

⁶ Source: <https://www.energy.gov/eere/articles/department-energy-invests-179-million-long-duration-energy-storage-technologies>

a. Stone Edge Farm

ESS' May'21 PPT disclosed a 10kW /60 kWh ESS battery deployed at Stone Edge Farm Estate Vineyards & Winery ("Stone Edge Farm") in Sonoma, California in 2015.

ESS' installation at Stone Edge Farm appeared short-lived.

Stone Edge Farm is famous for operating a microgrid.⁷

In May 2016, ESS promoted that its battery was operational at Stone Edge Farms.

ESS' All-Iron Flow Battery Operational at Stone Edge Farms Microgrid

May 11, 2016

System to provide a variety of value streams at California Winery in net-zero micro-grid.

PORTLAND, OR – May 11, 2016 – ESS Inc., the leading manufacturer of a safe, low cost and long cycle-life battery for renewable energy storage, today announces that it is operating a customized **All-Iron Flow Battery** (IFB) system at Stone Edge Farm winery in Sonoma, California to demonstrate how energy storage can enable net zero, with intermittent renewables, in an advanced microgrid application. The iron, salt, and water electrolyte was hydrated on-site as part of a simple two day installation and commissioning. The 60 kWh IFB system provides multiple services that will maximize the microgrid's use of renewables.



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Sonoma Microgrid Proves Ideal Fit for Long-Duration, All-Iron Flow Battery

by Bill Sproull

An IFB is operating as part of an advanced microgrid at Stone Edge Farm, Sonoma, CA. The system was easily sited in an environmentally sensitive area, given its small footprint and non-toxic, non-flammable chemistry.

The owner of Stone Edge Farm (SEF), a premier boutique winery in Sonoma, California, wanted to develop a microgrid with assets that could not only bring its carbon footprint down to zero, but go beyond that to become a net generator of zero-footprint energy to its neighbors. Their goal was to demonstrate what was possible.

Source: <https://essinc.com/ess-all-iron-flow-battery-operational-at-stone-edge-farms-microgrid/>

Source: <https://essinc.com/wp-content/uploads/2021/05/ESS-Vol10-Issue5.pdf>

⁷ Source: <https://sefmicrogrid.com>

November 2017 media coverage disclosed Stone Edge Farm’s energy storage system did not include ESS, rather batteries from Tesla, Sony, Simpliphi and Redflow.

Stone Edge Farms Microgrid			
Energy Storage	Total Capacity	Units	Individual Capacity
Tesla Lithium Cobalt	250kW 475 kWh	5	50kW 95kWh
Sony LiFePo	2.4kW 9.6 kWh	8	300W 1.2 kWh
SimpliPhi Power LiFePo	23.8kW 45 kWh	7	3.4kW 6.4 kWh
Redflow Zinc Bromide	10kW 20 kWh	2	5kW 10 kWh
PlugPower ReliOn Hydrogen fuel cells	28kW		2.3kW

Source: <https://cleantechnica.com/2017/11/24/stone-edge-farm-sandbox-microgrid-development/>

Stone Edge Farm’s website includes its current microgrid components list which does not include ESS.⁸

Stone Edge Farms continues to use batteries from Tesla, Sony, Simpliphi, but seems to have abandoned both ESS and Redflow, opting for another battery competitor, Aquion Energy (<https://www.aquionenergy.com/>).

Batteries/Inverters

Aqueous Hybrid Ion Battery

The Aquion Energy sodium ion (“saltwater”) battery consists of eight 48V battery modules connected in series and combined in one string by an Ideal Power grid-resilient 30kW AC/DC power conversion system. The battery’s unique chemistry combines abundant non-toxic materials; it is non-flammable, non-explosive, and truly sustainable.

Lithium Ion (Nickel Manganese Cobalt Oxide, or NMC) Batteries

LG Chem’s RESU lithium ion battery is a 10kWh 240V “peaker” battery that, like the Tesla Powerpack, delivers substantial power quickly for short intervals of time to accommodate peak loads. It is paired with a Solaredge SE 7600 Inverter. ([Visit site](#))

Our Tesla Powerpack was the first one made at Tesla’s Nevada Gigafactory. This utility-scale battery consists of five 50kW/95kWh cabinet-and-rack units, each containing 16 pods of lithium ion batteries identical to those that power Tesla cars. With its 250kW/475kWh rate and capacity, the largest on the farm, the battery can discharge considerable power in a short period of time through a 250kW Dynapower inverter. When the MicroGrid operates in island mode, the Powerpack can generate its own 60 Hz cycles to serve in a master or grid-forming role. ([Visit site](#))

Lithium Ferro (Iron) Phosphate (LFP) Batteries

SimpliPhi Power protects the Critical Grid at Node 3 with a stack of three 3.5kWh 48V AccESS lithium ferro phosphate batteries that produce 5.7kW/10.5kWh output and capacity and are paired with a 6.8kW Schneider inverter with charge controller. SimpliPhi batteries are completely recyclable, non-toxic, hyper-inert, and have no flammable components, no thermal runaway, no need for heat mitigation, and 98% round-trip efficiencies. ([Visit site](#))

Four SimpliPhi Power PHI 3.5kWh 48V LFP batteries provide a voltage “buffer” for the H2 park fuel cells. The hives feed a 30kW Siemens Sinamics DC/DC converter that boosts voltage to 380V for the Ideal Power 30kW inverter to output 480VAC/3P. ([Visit site](#))

SimpliPhi Power’s PHI High Voltage 120kW/256kWh 480V LFP battery in the DER plant comprises eight cabinets, each containing a rack of ten 3.6kWh 24V modules wired in series with a second rack to form a string of 20. Each string has a Battery Management System (BMS). In island mode, this battery can function as a master, using the same 250kW Dynapower inverter as the Tesla Powerpack. ([Visit site](#))

Seven SimpliPhi Power Smart-Tech 3.4kW units make up a back-up battery pack that displaces power at a rate of 23.8kW with 45kWh capacity matched with a 208V/3P SMA Sunny Island inverter at Node 1. ([Visit site](#))

Eight Sony lithium iron phosphate batteries in a stack with a combined rate and capacity of 2.4kW/9.6 kWh are paired with a 6kW Outback Inverter to protect Critical Grid servers at Node 2.

Source: <https://sefmicrogrid.com/overview/components/>

⁸ Source: <https://sefmicrogrid.com/overview/components/>

b. University of California San Diego

ESS' May'21 PPT disclosed a 50kW /400 kWh product deployed at the University of California San Diego ("UCSD") in 2017.

ESS confirmed that its UCSD project was operational in 2Q'17.⁹

However, evidence revealed that ESS' battery system is no longer in use at UCSD.

UCSD maintains a list of its current energy storage systems, which includes Maxwell Technologies, Inc., BYD Co. Ltd (NYSE: BYD) and Cummins Inc. (NYSE: CMI).

ESS is not included as a partner on UCSD's current energy storage project list.

Energy Storage

Energy storage is the key to balancing the supply and demand equation. It serves as a method to advance the relationship between energy consumption and production in order to increase efficiency and reduce production costs.

Solar Energy Storage

UC San Diego partners with technology leaders to implement solar energy projects.

- The California Energy Commission is funding testing of ultracapacitors –devices that charge quickly and store energy from an electric source and discharge it on demand. Through this program, Maxwell Technologies has been able to integrate its ultracapacitors with the Mandell Weiss Forum's 30 kilowatt solar array and the campus microgrid, providing a real world opportunity for demonstrating the feasibility of using ultracapacitors for solar smoothing.
- UC San Diego's Trade St. Receiving & Distribution Center has a 250 kilowatt/500 kilowatt-hour energy storage system integrated with its rooftop 266 kilowatt solar array.

In addition to these systems, a standalone 2.5 Megawatt/5 megawatt-hour battery energy storage system is interconnected with the campus microgrid.

Source: <http://rmp.ucsd.edu/strategic-energy/storage.html>

The 2.5 MW, 5 MWh energy storage system at UC San Diego was purchased from BYD, the world's largest supplier of rechargeable batteries. BYD's energy storage system uses high performance lithium-ion iron-phosphate batteries that are known for being highly reliable and environmentally-friendly. The company's rechargeable batteries contain no heavy metals or toxic electrolytes and, during the manufacturing process, all caustic or harmful materials are avoided. The batteries are also considered non-explosive and fire-safe, even in direct flames. The company has supplied more than 100 MWh of fixed energy storage stations around the world.

Source: <https://en.byd.com/news/one-of-the-nations-largest-most-environmentally-friendly-battery-energy-storage-systems-to-be-installed-at-uc-san-diego/>

Stationary Energy Storage System (ESS) Testing Program

A Cummins / UC San Diego Partnership

[Cummins Inc.](#) is expanding their product offering into electrified mobility and energy storage sectors. With a ramping up and production of full electric trucks and stationary energy storage systems, Cummins is seeking viable business and technical approaches to effectively reuse and repurpose electric vehicle batteries.

Source: <https://cer.ucsd.edu/research/energy-storage/stationary-ess.html>

⁹ Source: http://www.iee.usp.br/sites/default/files/anexoseventos/4-IEE_USP%20The%20Case%20for%20Flexible%20Energy%20Storage_March%2019%202018.pdf
Source: <https://www.windpowerengineering.com/ess-inc-installs-50kw-400kwh-power-storage-uc-san-diego/>

c. US Army Corps of Engineers

ESS' May'21 PPT disclosed a 60kW /225 kWh product deployed at the US Army Corps of Engineers (“USACE”) in 2016.

A search of the government contractor database revealed one (1) contract awarded to ESS by the USACE between 2010 and 2019.

The contract was signed in 2017 with the Construction Engineering Research Laboratory of the USACE.

However, the total contract amount was US\$ 0.

We believe that the USACE tried out ESS' battery system at zero cost and decided that the product was simply not good enough to be awarded a paying contract.

Date range correspond to the Date Signed on Procurement Awards

From			To		
Month	Day	Year	Month	Day	Year
1	1	2010	12	31	2019

Legal Business Name

Organization

Contracting Office Region

Tips for selecting organizations:
 Only choose organizations that are at the same level in the hierarchy (e.g. department, sub-tier, major command, office).

Execute **Save** **Clear** **PDF Export**

Contracting Agency Name	Contracting Office ID	Contracting Office Name	Contracting Office Region	PIID	Modification Number	Transaction Number	Referenced IDV PIID	Date Signed	Period of Performance Start Date
DEPT OF THE ARMY	W9132T	W2R2 CONST ENGRG LAB	NO REGION IDENTIFIED	W913	P00001	0		01/26/2017	01/26/2017

Source: <https://sam.gov/reports/awards/standard>

Number of Actions	Action Obligation	Base and Exercised Options Value	Base and All Options Value (Total Contract Value)
1	\$0.00	\$0.00	\$0.00

Source: <https://sam.gov/reports/awards/standard>

d. Camp Pendleton - Cleanspark

ESS' May'21 PPT disclosed a 50kW /400 kWh product deployed at Camp Pendleton US Military Base ("Camp Pendleton") in 2018.

A search of the government contractor database revealed no additional contracts were awarded to ESS besides the USACE between 2010 and 2019, which suggested that ESS' Camp Pendleton project was sub-contracted.

We found that ESS was selected as a supplier by a subcontractor CleanSpark, Inc. (Nasdaq: CLSK, "CleanSpark").

CleanSpark's SEC filings disclosed its FY'18 material expenses were US\$ 0.3 million and that ESS received 19.29%, equal to US\$ 53,000 in revenues to ESS.

CleanSpark has not purchased from ESS since FY'18.

Contracts and awards

The Company was awarded a \$900,000 contract from Bethel-Webcor JV. Under the contract terms we will install a turn-key advanced microgrid system at the U.S. Marine Corps Base Camp Pendleton. The contract is in direct support of the United States Department of Navy's communication information system (CIS) operations complex at the U.S. Marine Corps Base Camp Pendleton that was recently awarded to the Joint-Venture. The Company begin on-site work for this project in February of 2018 and expects to complete its scope of work in early 2019.

16. MAJOR CUSTOMERS AND VENDORS

For the years ended September 30, 2018 and 2017, the Company had the following customers that represented more than 10% of sales.

	September 30, 2018	September 30, 2017
Bethel-Webcor JV-1	70.42%	10.8%
Daoust	11.82%	—
Jacobs/ HDR a joint venture	—	13.0%
Macerich	—	24.4%
Firenze	—	20.0%

For the years ended September 30, 2018 and 2017, the Company had the following suppliers that represented more than 10% of direct material costs.

	September 30, 2018	September 30, 2017
CED Greentech	13.57%	54.9%
Rexel USA, Inc.	27.47%	—
ESS, Inc.	19.29%	—
Ideal Power, Inc.	14.72%	—
Integrated power systems	—	11.5%
Simpliphi Power	1.8%	27.6%

Source: CleanSpark FY'18 10-K – p.F-24

https://www.sec.gov/Archives/edgar/data/0000827876/000166357719000036/mainbody2.htm#a_013

e. San Diego Gas & Electric Company

ESS' May'21 PPT stated that it was "*Validated by a Blue-Chip Customer Base*" which included a United States Utility, San Diego Gas & Electric Company ("SDG&E").

In January 2021, SDG&E disclosed that it chose Sumitomo Electric Industries, Ltd.'s vanadium redox flow battery, not ESS' iron redox flow battery.¹⁰

¹⁰ Source: <https://www.sdgnews.com/article/groundbreaking-flow-battery-project-helping-advance-clean-energy-microgrids>

f. BASF & Pacto Energia S.A.

BASF has been an investor in ESS since 2017 through its subsidiary BASF Venture Capital GmbH (“BASF”).¹¹

Despite being an investor since 2017, BASF has yet to pay ESS any revenues for its product.

On March 13, 2018, ESS reported that it was to ship two (2) ESS battery systems to BASF’s German facility.¹²

ESS’ Dec’18 PPT claimed that the BASF project would be commissioned in 1Q’19.



BASF Global Headquarters

System:	400kWh, 8 Hours
Storage:	
Use Case:	R&D Pilot
Commission:	Q1 2019
Location:	BASF Headquarters, Germany

Project Overview
BASF, the lead investor in ESS’s Series B funding round, purchased the Energy Warehouse 50kW/400kWh for R&D testing at their global headquarter in Germany. The unit will be used to test a multitude of use cases, both behind and in front of the meter. Additionally, BASF and ESS recently entered into a JDA for global sales and technological improvements to the iron flow battery. The future testing conducted on unit will help further improve the power density of the electrolyte, round trip efficiency, and energy capacity of future ESS product offerings.

ESS PROJECTS UNDER CONSTRUCTION



We create chemistry

BASF is the global chemical industry leader, ranked 126 on the Fortune Global 500. They specialize in five segments: chemicals, performance products, functional materials and solutions, agricultural solutions and oil & gas. BASF employees more than 115,000 employees worldwide and generated \$64.5 billion in revenue 2017.

Source: ESS Dec’18 PPT

<https://worldcongress.energyandmines.com/files/Hugh-McDermott-Senior-Vice-President-Sales-Business-Development-ESS-Inc.pdf>

BASF decided to forego both Series-C rounds which indicates to us that BASF’s lack of confidence despite a US\$ 1.5 million PIPE investment coinciding with the SPAC merger.

Similarly, on May 22, 2018, ESS announced that it was awarded a contract with Pacto GD, a subsidiary of Pacto Energia S.A.¹³

ESS’ Dec’18 PPT claimed the project would be commissioned in 3Q’19.

Pacto GD Brazil

System:	400kWh, 8 Hour
Storage:	
Use Case:	PV + Storage
Commission:	Q3 2019
Location:	Goiás, Brazil

Project Overview
ESS has been awarded a \$1.3M grant from the USTDA to design and install the first Energy Warehouse 50kW/400kWh unit in Latin America for Pacto GD, a Brazilian solar developer. The Energy Warehouse will be utilized with a 100kW PV array for bulk energy-shifting. In addition, the project will enable the local end customer, to shed their reliance on the use of diesel generators during peak hours. The system will provide health, safety and noise reduction benefits, financial savings in fuel and maintenance, and reduce energy costs during peak demand.



Pacto Energia is a wholly owned subsidiary of 3F Capital, specializing in the development of commercial hydro, solar, and wind power generation. In its 17+ years in operation, Pacto Energia has built a renewable portfolio of more than 4 gigawatts in the Latin America market. Pacto Energia presents solutions to reduce consumption and costs with electricity for its customers.

Source: ESS Dec’18 PPT

<https://worldcongress.energyandmines.com/files/Hugh-McDermott-Senior-Vice-President-Sales-Business-Development-ESS-Inc.pdf>

ESS has not recorded any revenue from January 2019 through June 2021.

¹¹ Source: https://www.basf.com/global/en/who-we-are/organization/group-companies/BASF_Venture-Capital/portfolio/ESS-inc.html

¹² Source: <https://essinc.com/ess-inc-to-deliver-two-energy-warehouse-systems-in-germany/>

¹³ Source: <https://essinc.com/ess-inc-enters-latin-american-market-signs-contract-with-pacto-gd-to-deploy-long-duration-energy-storage-solar-pv-system/>

g. InoBat & Naturgy

We found certain ESS' potential customers chose alternatives to ESS for their energy storage solutions.

On May 6, 2019, ESS announced its partnership with InoBat, a company under IPM Group, another long-time investor of ESS, "to deploy flow batteries in European Market".¹⁴

This deal was also announced by InoBat.

However, InoBat has been rebranded as InoBat Auto and as of today only sells lithium-ion batteries.

2019 PARTNERSHIP ANNOUNCEMENT

**INOBAT SIGNS STRATEGIC
PARTNERSHIP AGREEMENT WITH
ESS INC. TO DEPLOY FLOW BATTERIES
IN EUROPEAN MARKET**

BRATISLAVA, SLOVAKIA/ PORTLAND, OREGON (6/5/2019) – INOBAT AND ESS INC. TODAY ANNOUNCE THE SIGNING OF A STRATEGIC PARTNERSHIP AGREEMENT TO DEVELOP ENERGY STORAGE APPLICATIONS AND OPPORTUNITIES IN CENTRAL AND EASTERN EUROPE.

Source: <https://web.archive.org/web/20190718104049/https://www.inobat.eu/>

CURRENT INOBOT WEBSITE

InoBat Auto provides unparalleled R&D capability, enabling customers to leverage unique collaborative partnerships to rapidly design and engineer bespoke, mission-specific, high-margin EV battery solutions, which exceed current industry standards for energy density, efficiency range and time-to-market.

All cells are lithium-ion and based on nickel-rich chemistry. Both chemistry and form factor are fully variable and can be rapidly adapted and configured to meet precise customer needs. InoBat Auto battery cell

Source: <https://inobatauto.eu/our-batteries.html>

Piper's Initiation Report purported Naturgy Energy Group S.A. ("Naturgy") (Madrid: NTGY) as an existing or potential ESS customer.

Rather, evidence revealed Naturgy opted for vanadium redox flow batteries from E22, a unit of Spanish solar developer GRS (Gransolar Group).¹⁵

¹⁴ Source: <https://essinc.com/ess-inc-signs-strategic-partnership-agreement-with-inobat-to-deploy-flow-batteries-in-european-market/>

¹⁵ Source: <https://energystoragesolutions.com/e22-installs-its-vanadium-flow-battery-in-a-pioneering-project-with-naturgy/>

TEETERING ON BANKRUPTCY IN CY'20 – SAVED BY A SPAC IN '21

Despite previous rounds of financing, ESS disclosed that it teetered on bankruptcy.

The idea of a low-carbon emission long duration battery is attractive which is why the largest chemical producer in the world, BASF invested in both ESS' December 2017 Series-B round and ESS' 2018 Convertible Notes.

It is also why investors such as Bill Gates' Breakthrough Energy Ventures, LLC ("BreakthroughEV") and Japanese conglomerate Softbank Group Corp. via SB Energy Global Holdings One Ltd. ("SB Energy") participated in ESS' 2019 Series-C Round.

In October 2019, ESS raised US\$ 30 million in a Series C-1, which BreakthroughEV invested US\$ 10 million.¹⁶

In March 2020, ESS defaulted on its note payable agreement with Silicon Valley Bank ("SVB").

The note was amended and SVB lent an additional US\$ 4 million to ESS.

“As management believes there is substantial doubt about our ability to continue as a going concern, this is an event of default under the notes payable agreement.”

We have a note payable with Silicon Valley Bank that is secured by significantly all of our property, except for our intellectual property. The note principal is due in monthly installments of \$28 thousand beginning in March 2019 with an original maturity date of July 1, 2021 but the maturity date was modified and extended to January 1, 2022. In March 2020, we amended the note payable and borrowed an additional \$4.0 million. The \$4.0 million note payable's original maturity date was on January 1, 2023, but the maturity date was modified and extended to July 1, 2023. The notes payable bear interest at 0.50% below the bank's prime rate (4.25% rate at June 30, 2021). **As management believes there is substantial doubt about our ability to continue as a going concern, this is an event of default under the note payable agreement. As such, the notes payable have been classified as a current liability as of June 30, 2021 and December 31, 2020.** In July 2021, we entered into a Mezzanine Loan and Security Agreement with Silicon Valley Bank providing for a \$20.0 million term loan. The term loan has been fully drawn as of the date of this proxy statement/prospectus/information statement, and the principal balance of \$20.0 million remains outstanding. The term loan bears interest at 9.0% per annum and matures on the earlier of January 13, 2022 or the consummation of the merger with STWO.

Source: ESS 424B3 dated September 14, 2021 – p.203

We believe ESS' business was unsustainable prior to the SPAC because its battery was not commercially viable.

ESS' story and iron redox flow batteries are not new.

Founded in 2011, ESS used iron flow redox battery technology from the 1970's.

At the 2015 Ocean Exchange Conference, ESS presented its technology to investors seeking US\$ 140,000 to use towards automating tooling for lead plates and plastic containers.¹⁷

ESS' June 2018 promo video highlighted ESS' low technology and basic material assemblies.

“Sometimes when we are missing a part or a certain part did not come in, the engineer would just go to Home Depot and pick out the different parts and make it happen... the battery is composed of some of the most common elements on earth, you can find the parts to build it at almost any hardware store.”¹⁸ – Dr. Julia Song (Founder & CTO)

¹⁶ Source: CB Insights

¹⁷ <https://www.youtube.com/watch?v=ovZXBxIG9nc>

¹⁸ <https://www.youtube.com/watch?v=xCzKQbukLIE> – 6min20sec



Source: <https://www.youtube.com/watch?v=xCzKObukLIE>

To us, the evidence shows that ESS misrepresented its customer installation base to investors.

BreakthroughEV management is comprised of very intelligent and very well-connected investors who have made 91 investments and written larger and more frequent checks to ESS' direct competitor for iron-based long-duration energy storage systems (invested in Form Energy's Series A-D from February 2018 through July 2021).¹⁹

While recent announcements of large future customer orders from companies such as SB Energy generated significant investor interest, SB Energy is heavily incentivised to promote ESS given its sizable investment in ESS stock.

ESS' has not generated any revenues from January 2019 through June 2021 despite its supposed customer base.

With increased expenses and a depleting cash balance between US\$ 256 million to 399 million (between ~US\$ 1.89 to 2.70 cash/share dependent on warrant exercise amount), we are short GWH and believe that its stock is going significantly lower (~85%).

Old ESS Stockholders	99,562,793
STWO Public Shareholders	25,000,000
STWO Initial Shareholders	6,250,000
PIPE Investors	25,000,000
Redemption	(20,754,719)
Total shares outstanding	135,058,074
Share price (as of Oct 21, 2021)	\$ 15.94
Market capitalization (US\$ million)	2,153
ESS Warrants (US\$ 11.50 per share)	12,416,621
Fully diluted shares outstanding	147,474,695
Fully diluted market capitalization (US\$ million)	2,351
Pro forma combined cash and cash equivalents as of June 30, 2021 (US\$ million)	256
Cash from exercise of ESS Warrants (US\$ million)	143
Total cash and cash equivalents (US\$ million)	399
Cash per share without exercise of ESS Warrants	\$ 1.89
Downside without exercise of ESS Warrants	88%
Cash per share with exercise of ESS Warrants	\$ 2.70
Downside with exercise of ESS Warrants	83%

Source: ESS Filings

¹⁹ Source: CB Insights; Form Energy (<https://formenergy.com/>) is an iron-air battery maker that boasts 6 days of storage at 1/10th the price of lithium-ion batteries.

DISCLAIMER

We are short sellers. We are biased. So are long investors. So is ESS Tech, Inc. (GWH). So are the banks that raised money for ESS Tech, Inc. (GWH). If you are invested (either long or short) in GWH, so are you. Just because we are biased does not mean that we are wrong. We, like everyone else, are entitled to our opinions and to the right to express such opinions in a public forum. We believe that the publication of our opinions about the public companies we research is in the public interest.

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