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Technology Analysis for Business & Investment

Silver Spring Networks Private Company Report

Benjamin Stein – May 5, 2010

Silver Spring Networks has been regarded as one of the best cleantech companies of the past decade and has been closely followed by every major media outlet. They have also been backed by the biggest names in venture capital, such as Kleiner, Perkins, Caufield, and Byers and Google Ventures.

To date, Silver Spring has attracted $255 million in venture capital and most recently closed on a $105 million Series E financing in December 2009. Silver Spring has selected Morgan Stanley and Jefferies & Co. as the lead underwriters for a planned mid-year IPO.

In this report we intend to shed light on an emerging IT company that leverages wireless network technology in what is now called the "Smart Grid". Silver Spring falls into our Digital Power ecosystem by transforming our old analog electrical grid into a smart gird with two-way communication of energy consumption and distribution data between the utility and the consumer. Silver Spring's "Smart Energy Platform" enables better monitoring, management, and distribution of energy usage by utilities and empowers consumers to save on their energy bills.

INTRODUCTION

Traditionally, the utility industry has not been very exciting with respect to either the service it provides or as an investment vehicle. The utility business has been a seemingly predictable one because their customers will always need power no matter what happens to the economy, and many utilities have proven they can provide a steady dividend over many years. But today is the day of reckoning for this aging electrical grid and we are seeing incredible innovation around the "smart grid". Technology companies in the digital power ecosystem are creating new ways to generate, deliver, manage, and monitor electrical power. Silver Spring Networks provides hard and soft networking solutions that allow utilities to connect with consumers while improving energy efficiency and reliability.

Silver Spring Networks (SSN) has not yet submitted their S1 filing to the SEC, but their IPO appears to be imminent. SSN has already chosen Morgan Stanley and Jefferies as the lead underwriters, and there are rumors of a $3 billion valuation. This report will provide a look into the market opportunity for smart grid implementers like SSN, what solutions they're offering utilities, and a fair valuation of the company.

MARKET OPPORTUNITY

Although the U.S. electric metering business is limited to the number of homes, businesses, and industrial sites in existence, the good news is that the smart metering business is relatively untapped. In the U.S. 3300[1] electric utilities serve 143 million customers[2]. The breakdown is as follows:

Segment	Customers
Residential	125,937,469
Commercial	17,562,726
Industrial	774,713
Transportation	727

Estimates for the cost of a smart meter range from $250-$500. If we assume SSN can capture 20% of the market at a top of the market price of $500, then their gross revenue opportunity is $14 billion. If we assume all customers with electric also have water connections and 6 million Americans have gas[3] connections this doubles SSN revenue opportunity to $30 billion.

According to SSN competitor Itron[4], there are over 1 billion electric and another 1 billion gas and water meters needing to be upgraded worldwide. If SSN can take 20% of the global market, the most they stand to gain is another $200 billion. In addition to their $230 million global meter opportunity, they will be able to monetize other components along the smart grid like relays, access points, and services associated with their "Smart Energy Platform".

From a sales perspective, SSN is in a good position. Even with the massive cost of upgrading, utilities are willing to make the investment in the smart grid because they aren't paying for it. Utilities are passing the cost on to the consumer by adding a few extra dollars to their bills every month ($4.5 billion worth of stimulus funds from the American Recovery and Reinvestment Act also helps make a few payments). Electricity, water, and gas are inelastic services and consumers will be forced to pay for an upgrade they may not want. There are some utilities that are deploying smart meters under test programs to their customers on a volunteer basis. Eventually consumers won't have a choice on whether or not they want a smart meter.

There are many skeptics in the market who believe smart meters aren't the answer. Consumers could just as easily lower their energy bills by shutting off more lights and lowering their air conditioners. Utilities currently offer consumers air-conditioner cycling programs that allow the utility to better manage their base load. These programs have been successful, but without smart meters the utility doesn't know what price to charge based on the time of usage.

[1] Electric Power Industry Overview 2007.
[2] Electric Power Annual 2008.
[3] US Energy Information Administration.
[4] Itron investor Presentation 2010.

The smart grid is spurring on an entirely new industry and revitalizing old infrastructure. Not only will we see massive deployments of smart meters, but also upgrades to sub-stations and transmission lines. Our electrical grid is aging and utilities are making the upgrades. Even Microsoft and Google are in the smart grid space with their Hohm and PowerMeter products. Their software will help users manage the electrical usage inside their home for appliances, electronics, and their electric vehicles.

COMPANY INFORMATION

SSN is headquartered in Redwood City, California and employs 385 people. SSN is positioned as a "Smart Energy Platform" and offers a full suite of smart grid hardware and software solutions which support advanced metering, distribution automation, demand response, the smart home, and electric vehicles. Their technology works on an IP-based network infrastructure, which is part of the reason for their success. An IP-based platform allows utilities current back office systems to easily network and interface with SSN software.

SSN claims to serve 20% of U.S. customers and currently has 9 major utility customers, two of which are located in Australia. At this point it is difficult to say what the financial health of the company is, because until SSN files their S1 with the SEC the public won't have access to their financial statements. But going purely from the gut, SSN seems to be a fairly mature company in comparison other pending cleantech deals, i.e. Tesla Motors.

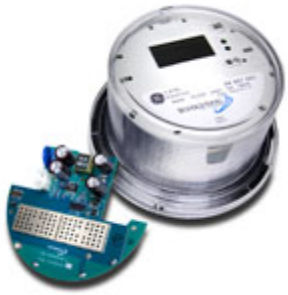
History: SSN was founded in Milwaukee, Wisconsin in 2002 and named after the road which led to the company headquarters. In 2003, Foundation Capital made the original investment of $8 million which later led to multiple follow-on rounds from funds such as Google Ventures, North Gate Capital, and KPCB that have totaled $255 million in invested capital.

The company ran out of money in 2005 but Foundation Capital stood behind their investment and issued loans for 15 months to keep them in business[5]. SSN received an investment from Duquesne Capital in 2007 at approximately the same time they landed their first deal with Florida Power and Light. That contract led to other deals with Pacific Gas & Electric and Pepco Holdings.

SSN's original selling point was to detect outages before customers called in and to enable home owners to control of their energy usage. Today SSN has become the "Cisco of the Smart Grid". They have leveraged existing IT — specifically networking, IP, and wireless technology — to achieve upstream and downstream power management efficiencies. As a start-up, they were laughed at by VCs because at the time the biggest investments being made were in renewable energy like bio-fuels and solar. SSN is on their way to proving that the best investments of the time were the ones that used IT to increase efficiencies, which essentially was the lowest hanging fruit.

Products & Services: SSN has a number of offerings that are built on top of the "Smart Energy Platform". The components of the platform are IP networks, security, advanced metering, distribution automation, demand response, smart home, and electric vehicles. The offerings that enable the platform are outlined below:

Intelligent Endpoints



SSN doesn't make the smart meters themselves but simply instruments them with NIC (network interface cards). NIC allow the meter to communicate with the utility and the consumer's home area network. This allows the utility to better manage service and informs the consumer of their energy consumption.

[5] Efficient Power Use Attracts Investors From the Green Side. NYT.

The eBridge, pictured above, allows utilities to monitor and manage electricity loads on their DA (distribution automation) system in near real-time. The device is equipped with serial and Ethernet ports that support other devices such as reclosers, sectionalizers, feeder switches, capacitor banks, controllers, transformers, and voltage regulators. Utilities can poll these devices through the eBridge to aid in fault detection and equipment failure and remotely control critical equipment.

Network Infrastructure

Access Points, shown above, serve as a link between network endpoints (smart meters, thermostats, demand response load switches) and the utilities systems. Access points create a two-way wireless communication with endpoints that can send firmware updates to endpoints and also receive usage data from those same endpoints. Relays are also a critical part of the network infrastructure. Relays communicate with access points and allow the utility to extend the reach of its network.

UtilityIQ Applications

UIQ is a web portal that allows the utility to manage incoming meter data, outage detection and restoration, and remotely connect/disconnect service to customer accounts. In addition, there is a system administration side of the application that allows the utility to upgrade software remotely and monitor the health of system endpoints. This software is woven together with the utilities existing systems by the SSN integration team.

CustomerIQ Applications by Greenbox Technology

This is a customer-facing web portal that shows consumers how much energy they are using and at what price (demand response). The idea is to empower consumers to take control of their energy consumption which in turn helps the utilities manage peak loads. SSN acquired the company Greenbox in 2009 to create this application that helps consumers make conscious decisions about their energy usage. Eventually CIQ will help homeowners manage and measure appliance usage as well as electric vehicle charging and discharging in the home area network (HAN).

Services

Services include business system integration, customer support, hosting choices, installation support, mesh design, monitoring and maintenance, and training. These comprise the customer service SSN provides for utilities which helps them get their smart grid running smoothly.

Business Model: SSN makes its money from the sale of products and services around their "Smart Energy Platform". They sell the NIC that is wired to an old-style analog meter which transforms the meter to digital. They integrate with gas, water, and electric meters and also assemble access points and relays which are part of the network infrastructure. On the services side, SSN can either license their CIQ software for a one-time fee or host the CIQ platform as a SaaS. In addition, SSN offers employee training and ongoing grid monitoring and support for a fee.

A typical deal for SSN is contracted for approximately 1 million meters at a cost upwards of $200 million. Those were the terms of their first deal with Florida Power and Light. It was estimated that if FPL wanted to outfight the rest of its 3.5 million customers, that deal would have fetched $500 million. SSN has also been working with Pacific Gas & Electric to network their 9 million meters, which is worth an estimated $2 billion. Through analyzing their deal sizes and customers, we can see SSN is targeting and closing major U.S. and international utilities, which is good news for investors. Deals may be few and far between but when they happen it means major revenue for SSN. Closing deals with major utilities like FPL and PG&E will only make the other majors more comfortable with SSN and attract more business.

Management & Culture: The company's CEO, Scott Lang, has been with SSN since 2004. He brings several years of experience to SSN from his time at Perot Systems. Lang spent a better part of his career in Europe building their business, which should be beneficial to SSN when they expand internationally. The rest of the team has significant experience in emerging technologies from both the private and public spaces within the IT business. The executive team clearly has an edge when it comes to IT, but more direct experience working from inside the utility industry would be a plus. This obviously hasn't stopped them from succeeding; they have been able

to successfully implement their innovative energy management technology in the grid with major utilities. We should consider their current customers the early adopters with the early majority standing in line. In 2008, this team earned the World Economic Forum Technology Pioneer award. However, from an anecdotal, former employee point of view (for whatever it's worth) the management team did not receive high marks. Testimonials from past employees said the management was highly focused on an IPO and top heavy. In terms of operational priorities you would like to hear a focus on the customer and not the IPO. However, an IPO should provide the capital to expand in what is basically a wide open playing field for the smart grid which would be strategically important.

Partners, Suppliers & Alliances: SSN has a number of partners that have enabled them to break into the utility business. They don't actually manufacture the meter but integrate a NIC and software to communicate with the utilities back office system. SSN would be playing a different ballgame if they tried to manufacture hardware themselves. They work with the best in the business in terms of suppliers of hardware and software solutions to the utility industry. Partners for metering, demand response, distribution automation and networking include: GE, Itron, Landis + Gyr, Comverge, EnerNOC, ABB, Cisco, and Oracle — just to name a few. They have a total of 30 listed technology partners on their website.

Competition: The competitive landscape of the smart grid business is interesting because many of the companies that compete with each other also work together. The reason for this is that the industry is coming to a general understanding that shifting to an IP-based network will ultimately benefit the utilities, vendors, service providers, and consumers. Properly building an interoperable smart grid is an enormous undertaking but normalizing standards to IP, a technology we are familiar with, will increase the ease and speed at which we modernize our grid.

A company like Cisco is in direct competition with SSN because they have their own smart grid platform, but these companies have found a way to work together in mutually beneficial way. As Cisco sells its networking hardware to SSN they are able to refine the technology that SSN is integrating with their customers, which creates a better product for Cisco and happy customers for SSN. This level of collaboration is indicative of early-stage technologies. In the early stages, all the players are providing similar solutions and it's a land grab. As this industry matures, companies may start to withdraw from each other and work internally on products and solutions that differentiate themselves for each other. As infrastructure is built out, the greatest differentiation and competition will be at the consumer level in the home area network.

The list of established IT and infrastructure companies in the smart grid space is substantial; Oracle, Cisco, IBM, GE, Siemens, ABB, and Itron are all there because they have to be. The electrical grid is one industry, like healthcare and education, where the biggest improvements in IT and infrastructure will be made over the next 10 years.

Some recent news will give you an idea of where the players stand:

Itron – Has deployed of 50% of AMI in the U.S.

IBM – 9 planned projects in China; $400 million over 4 years

Cisco – Appliance management pilot program in Germany

Echelon – Shipped 2 million smart meters to date

GE – Smart grid deployment for 1.5 million people in Yangzhou, China

Siemens – $1 billion in smart grid revenue in 2009

OPPORTUNITIES & THREATS

The smart grid will save utilities billions of dollars. It enables better service by managing peak loads and reduces truck rolls by detecting and initiating service remotely. This is not a tough sell especially when upgrades to the grid are financed by taxpayers via the government.

+ Companies are just beginning to roll out end-to-end smart grid solutions, but SSN has been implementing smart grids since 2007. SSN should be able to grow its business with limited competition.
+ Reasonably priced plug-in hybrid electric vehicles and pure electric vehicles like the Prius, Volt, and Leaf will go on sale at the end of 2010. SSN will have the chance to generate some excitement around the home area network by demonstrating the V2G (vehicle to grid) capability of their Greenbox solution.

+ Grid infrastructure is old and "dumb", not smart. The smart grid is a mega trend in the power business and is becoming a "have to have it" solution. Just like Google has to be in social networking, utilities like Con Edison and IT companies like IBM have to be in the smart grid. The benefits to utilities are clear and if SSN executes correctly they should have no problem with generating business.

By and large, smart grid solutions are brand new. A Harris poll showed more than half of Americans had never even heard of the smart grid. Smart Grids are being installed but they are far from perfect. Some of the potential downsides we see are:

- PG&E is one of SSN's major customers. PG&E is being sued by its customers on claims of faulty smart meters. Although SSN is not being held under suit, this could be damaging to their brand.
- It is unclear what the variable price structure will be for consumers. Peak rates may not change, which may have no material effect on your energy bill.
- There is a possibility that consumers will reject the cost of smart meters or their invasive attributes. Instrumented meters and appliances will allow not only the consumer but the power company to monitor times and types of energy usage. Consumers in the Netherlands had their smart meters removed because they felt like big brother was invading their privacy.

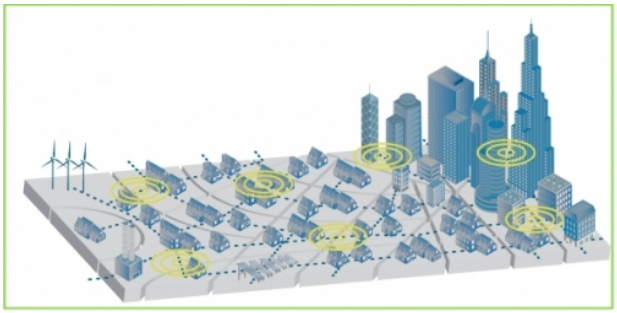
VALUATION

There hasn't been much financial data released from SSN, so we have performed our back of the envelope analysis based on what information *is* available. The WSJ[6] reported an anecdotal valuation around $3 billion with an $800 million sales backlog. A valuation at nearly 4x revenue is not unusual relative to other successful cleantech IPOs like A123 Systems. A123 managed to raise almost $400 million dollars on $86 million in revenue and a $1 billion valuation. Unlike many early cleantech investments, SSN has real customers and real products with useful applications. Meeting these criteria will help SSN achieve a substantial valuation.

In order to verify the whisper valuation, we backed out an estimate of revenue and used SSN's deal with Florida Power and Light as a proxy for valuing other deals with other utilities. SSN is being paid $200 million for instrumenting 1 million meters. We arrive at $200 per home/meter and then look at the customer bases of the utilities SSN serves. As a rough estimate, it is likely SSN has generated over $1 billion in revenue to date, so we would put a figure of $4B in valuation on the company as our estimate for 2010. Once the company files their S-1 we will be able to complete our Intrinsic Value model and have a firmer number that includes price per share estimates.

CONCLUSION

Instrumenting, managing, monitoring, and interconnecting the world's electrical grid is an enormous undertaking. At this point there is plenty of work to go around and there are many parties involved in tackling this initiative. SSN has been building a name for itself as a complete, utility to the consumer smart grid solution and has a nice head start on the competition. Barring any uprising from consumers, we are starting to see increased adoption of smart grid devices such as smart meters. Demand response and distribution automation are next in line in terms of infrastructure upgrades. As the industry matures, consumers will have much greater control and information around energy usage in the home area network, which will include electric vehicles and smart appliances.



The SSN IPO seems likely this year if current market conditions continue. A few companies have pulled their IPOs off the table this year citing market conditions, and this may be what has been holding SSN back. No official numbers have been released but a $4 billion valuation may be attractive for buyers and possibly help SSN raise a substantial amount of equity capital. to solidify their leading position.

[6] SSN Selects Bankers for Planned IPO. WSJ.

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Our main office is located at 1313 Washington St., #326, Boston MA 02118 U.S.A. and we have staff in New York, Connecticut and Paris, France. Our main telephone number is +1-617-848-9651.

Our Team

Kris Tuttle, Founder & CEO, kris@research2zero.com

Stephen Waite, Partner and Director of Strategy, steve@research2zero.com

Leigh Deacon, Administrative Manager, leigh@research2zero.com

Benjamin Stein, Associate Analyst, ben@research2zero.com

Heidi Manwaring, Research Assistant, heidi@research2zero.com

Vish Kalburgi, Associate Analyst, vish@research2zero.com

Lin Yuan, Associate Analyst, lin@research2zero.com

Ruckmani Ramachandran, Intern, ruckmani@research2zero.com

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Attachment A - SSN Mini Ecosystem

Silver Spring Networks Mini Ecosystem
3-May-10

COMPANY	Ticker	Price	1 year change	3 month change	TEV	LTM Rev	LTM Growth	Gross Margin	Oper Margin	TEV / Revenue	Emps	Rev / Emp	Tags
Itron, Inc.	ITRI	$80.20	71%	28%	3,874	1,798	-1.2%	31.9%	2.5%	2.2	9,000	199,801	Networked Meters
Echelon Corporation	ELON	$9.51	20%	6%	334	103	-22.9%	42.7%	-31.0%	3.2	326	316,988	Building and Home Networking
EnerNOC, Inc.	ENOC	$29.60	72%	-9%	594	191	79.7%	46.0%	-3.6%	3.1	418	456,160	Energy Efficiency Services
Comverge, Inc.	COMV	$11.55	49%	8%	247	99	28.0%	33.6%	-32.0%	2.5	440	224,645	Energy Efficiency Services
A123 Systems, Inc.	AONE	$12.34	NA	-31%	864	91	32.9%	-3.0%	-94.2%	9.5	1,627	55,961	Power Storage Systems
EnerSys	ENS	$26.48	42%	28%	1,414	1,522	-29.6%	21.0%	3.3%	0.9	7,500	202,935	Power Storage Systems
Lime Energy Co.	LIME	$4.12	13%	-18%	77	71	28.8%	19.2%	-22.9%	1.1	310	228,394	Energy Consulting
Ametek Inc.	AME	$43.72	37%	17%	5,381	2,102	-15.0%	31.6%	9.7%	2.6	10,100	208,134	Engineered Energy Products
ESCO Technologies Inc.	ESE	$30.75	-27%	-5%	951	584	-6.6%	39.9%	7.5%	1.6	2,140	273,090	Engineered Energy Products
Atheros Communications Inc.	ATHR	$39.33	125%	18%	2,272	669	50.1%	48.6%	11.0%	3.4	1,302	514,015	Wireless and Power N/W Chips
Cisco Systems, Inc.	CSCO	$27.30	39%	19%	133,203	35,533	-10.2%	63.9%	17.1%	3.7	65,550	542,075	Networking Equipment
Calix Inc.	CALX	$12.13	NA	NA	867	233	-7.0%	35.2%	-9.6%	3.7	407	572,351	Specialty Networks
Occam Networks Inc.	OCNW	$6.60	135%	27%	97	84	-15.3%	40.5%	-10.6%	1.2	189	444,688	Specialty Networks
Motorola Inc.	MOT	$7.08	28%	8%	12,000	22,044	-22.6%	32.4%	-0.5%	0.5	53,000	415,925	Specialty and Home Networks
ADTRAN Inc.	ADTN	$27.12	29%	26%	1,539	501	2.0%	59.3%	15.4%	3.1	1,624	308,404	Networking Equipment
Average			***48.8%***	***8.7%***			***6.1%***	***36.2%***		***2.8***		***330,904***	

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Lin Yuan, Associate Analyst, lin@research2zero.com

Ruckmani Ramachandran, Intern, ruckmani@research2zero.com

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