Zacks Small-Cap Research

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ForceField Energy, Inc. (FNRG-OTC)

FNRG: Rating remains Neutral until a revenue recovery is evident.

Current Recommendation	**Neutral**
Prior Recommendation	Underperform
Date of Last Change	02/12/2012
Current Price (03/01/13)	$5.40
Six- Month Target Price	**$6.60**

OUTLOOK

ForceField Energy has expanded into two new "green technology" segments: LED lighting and ORC (Organic Rankin Cycle) technology. The strategic positioning into two other alternative energy industries transforms ForceField into a broader-based company, which should benefit from the secular trend towards more efficient energy generation and consumption. Multiple new relationships and trials have been announced over the last few months. In the legacy TCS market, polysilicon prices have rebounded from the December lows, and a recovery appears to be underway. We maintain our Neutral rating.

SUMMARY DATA

52-Week High	**$5.60**
52-Week Low	**$2.42**
One-Year Return (%)	**33.66**
Beta	**-0.19**
Average Daily Volume (shrs.)	**3,217**
Shares Outstanding (million)	**15.6**
Market Capitalization ($ mil.)	**$84**
Short Interest Ratio (days)	**N/A**
Institutional Ownership (%)	**14.7**
Insider Ownership (%)	**35.0**
Annual Cash Dividend	**$0.00**
Dividend Yield (%)	**0.00**
5-Yr. Historical Growth Rates	
Sales (%)	**N/A**
Earnings Per Share (%)	**N/A**
Dividend (%)	**N/A**
P/E using TTM EPS	**N/M**
P/E using 2013 Estimate	**N/M**
P/E using 2014 Estimate	**N/M**
Zacks Rank	**3**

Risk Level	**Above Average**
Type of Stock	**Small - Growth**
Industry	**Energy – Alt.**
Zacks Rank in Industry	**9 of 43**

ZACKS ESTIMATES

Revenue
(in millions of $)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2011	7.75 A	10.16 A	7.47 A	2.96 A	28.34 A
2012	0.51 A	0.53 A	0.23 A	0.27 E	1.53 E
2013	0.82 E	1.43 E	2.50 E	3.83 E	8.59 E
2014					21.00 E

Earnings per Share
(EPS is operating earnings before non recurring items)

	Q1 (Mar)	Q2 (Jun)	Q3 (Sep)	Q4 (Dec)	Year (Dec)
2011	-$0.02 A	$0.00 A	-$0.00 A	-$0.14 A	-$0.17 A
2012	-$0.03 A	-$0.04 A	-$0.04 A	-$0.04 E	-$0.14 E
2013	-$0.02 E	-$0.01 E	$0.01 E	$0.02 E	-$0.00 E
2014					$0.10 E

Zacks Projected EPS Growth Rate - Next 5 Years % **N/A**

ForceField converted to a calendar year on 12/31/2011. Prior results adjusted.

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KEY POINTS

- In 2012, ForceField entered another two industries in the alternative energy segment through the acquisition of a controlling interest of TransPacific Energy and an exclusive distribution agreement with Shanghai Lightsky, both in August 2012. ForceField's **two new business** segments are **LED lighting** and **Organic Rankin Cycle (ORC) systems**.
- ForceField's management team seeks out the favorable investment opportunities in the emerging and fast-growing "green energy" and alternative energy markets. The company now operates in the LED lighting, ORC systems and solar energy markets.
- In **LED lighting**, ForceField, through its exclusive distribution agreement with Shanghai Lightsky, offers commercial LED lighting systems and products through four sub-distributors and by bidding on large commercial projects. In addition, four commercial trials are underway.
- Through a controlling interest in and non-exclusive distribution agreement with TransPacific Energy, ForceField is **installing two ORC units** at Zibo Qilin Fushan Iron & Steel Company in China. ForceField will own the ORC units and sell the electricity generated to Zibo Qilin at a discount to the local utility's price at an anticipated annual revenue run rate of $600,000.
- With majority ownership positions in two Chinese companies (90% the Zibo **Baokai** trichlorosilane distribution company and 60% of the **Wendeng** trichlorosilane production facility), ForceField is positioned to benefit from a recovery of the solar-grade polysilicon market. Spot prices for polysilicon have been steadily increasing since December 2012. Baokai and Wendeng are low-cost producers in China and should be able to take advantage of the Chinese government's $454 billion commitment to renewable energy projects in China's five-year plan.
- The price target for ForceField's stock is $6.60.

OVERVIEW

A Nevada corporation with administrative offices in New York City, ForceField Energy (FNRG: OTC), formerly SunSi Energies, is a manufacturer, distributor and licensee of green energy products and systems. ForceField operates in the solar energy, LED lighting and Organic Rankin Cycle technology industries through the manufacture of trichlorosilane in China, the exclusive distribution of LED lighting products in North America and distribution TransPacific Energy's ORC units .

In August 2012, ForceField entered into a five-year, exclusive North American distribution agreement with Shanghai Lightsky Optoelectronics Technology Co., Ltd. (Lightsky), a manufacturer and marketer of **LED lighting products** and systems located in Shanghai, China. In the United States, the LED lighting market is growing at a 32% compound growth rate due to the lower electrical power consumption and longer lives of LED lamps, along with government regulation designed to phase out inefficient incandescent light bulbs. Management is targeting the **commercial lighting market**, which also includes the industrial, institutional and governmental segments, where the additional advantages of LED lighting are also important selling points, specifically reduced maintenance costs (lower frequency of bulb replacements) and lower heat generation (reduced air conditioning costs). ForceField has announced four sub-distribution deals and four commercial trials in the last five months, along with a multimillion dollar bid proposal to retrofit LED streetlights.

ForceField owns a 51% controlling interest of **TransPacific Energy** (TPE) and holds a distribution agreement to provide TPE's modular **Organic Rankine Cycle (ORC) units**. Utilizing blends of proprietary refrigerants, TPE's ORC units capture heat energy from heat sources (such as industrial flue gas, geothermal sources and biomass processes) and convert the waste heat into electrical energy. TPE's competitive advantage lies in the broad range of temperatures (from 75° F to 1000° F) at which the units can operate and the benign attributes of the refrigerants (non-toxic and non-flammable). ForceField has already negotiated the installation of two ORC units at Zibo Qilin Fushan Iron & Steel Company in

China. ForceField will own the ORC units and sell the electricity generated to Qilin at a discount to the local utility's price at an anticipated revenue run rate of $600,000 annually

In the **solar industry**, ForceField produces and distributes **trichlorosilane (TCS)**, the basic chemical ingredient used in the production of purified polysilicon[1], an essential raw material in the production of solar cells for photovoltaic (PV) panels. Between December 2010 and March 2011, the company acquired majority ownership positions in two Chinese companies (90% the Zibo **Baokai**[2] trichlorosilane distribution company and 60% of the **Wendeng**[3] trichlorosilane production facility), which together control TCS production of approximately 55,000 MT. With the acquisition of 90% of the Zibo Baokai distribution company, ForceField began to report revenue in the beginning of 2011. The following quarter, ForceField reported the company's first profitable quarter. However, subsequently, a glut reduced the pricing for all products in the photovoltaic (PV) supply chain (from solar cells to polysilicon), and ForceField Energy has reported losses in the ensuing quarters. Management prudently shut down TCS operations in December 2011 to minimize the financial impact of the industry's downturn.

In October 2012, the stock of ForceField Energy underwent a one-for-two reverse stock split with the aim of qualifying for an up-listing to NASDAQ by meeting the $4.00 per share bid price requirement.

On February 27, 2013, the company's name was official changed to ForceField Energy in order to better reflect the broader scope of operations within the alternative energy industries.

NEWS SINCE OUR LAST REPORT

Company Changed Name to ForceField Energy

To better reflect the company's business operations, especially the acquisitions of a controlling interest in TransPacific Energy (ORC technology) and of the exclusive North American rights to distribute LED lighting products manufactured by Shanghai Lightsky (LED technology), the company's name was changed to ForceField Energy from SunSi Energies.

Organic Rankine Cycle Segment (TransPacific Energy)

On June 15, 2012, ForceField Energy announced that its Wendeng subsidiary entered into a non-exclusive distribution agreement with TransPacific Energy (TPE) to distribute TPE's Organic Rankine Cycle (ORC) systems in China. TransPacific Energy is a renewable energy company focused on the generation of electricity through the use of Organic Rankine Cycles (ORC) to recover energy from heat sources.

On August 21, 2012, ForceField announced the acquisition of a 51% controlling interest in TransPacific Energy, which expands ForceField's footprint in green energy as well as adds another revenue stream. Synergistically, ForceField can broaden TPE's geographical reach, specifically into China where the government is overtly supporting renewable energy projects where ForceField has established important customer relationships. For a description of TransPacific's core competencies and products, see the TransPacific Energy section below.

On January 18, 2013, ForceField announced the signing of a definitive agreement for up to four modular Organic Rankine Cycle (ORC) system units to be installed at **Zibo Qilin Fushan Iron & Steel Company** located in the Shandong Province, China. The project's first phase is comprised of the installation of two ORC units that are expected to generate approximately 650 kilowatts of electricity. ForceField will own

[1] Polysilicon is properly known as polycrystalline silicon.
[2] On December 8, 2010, SunSi HK acquired a 90% equity interest in Zibo Baokai Commerce and Trade Co., Ltd.
[3] On March 18, 2011, SunSi HK acquired a 60% equity interest in Wendeng He Xie Silicon Industry Co., Ltd.

the ORC units and sell the electricity generated to Qilin at a discount to the local utility's price. ForceField expects to receive at least $600,000 annually over twenty-year period. In the second phase, ForceField (at its discretion) may install an additional two ORC units.

Exclusive Rights to Distribute Lightsky LED Products

On August 27, 2012, ForceField acquired the exclusive North American rights to sell and distribute LED lighting products manufactured by **Shanghai Lightsky Optoelectronics Technology Co., Ltd**. The five-year distribution agreement automatically renews when ForceField achieves certain performance milestones. ForceField issued 150,000 shares of restricted common stock (valued at $780,000) to acquire the distribution rights for the United States, Canada and Mexico. ForceField Energy plans to build a network of sub-distributors to sell Lightsky LED products to commercial, institutional and governmental users throughout North America.

Sub-Distribution Agreements

On October 23, 2012, ForceField Energy announced that the company entered into a **strategic alliance** with **Commonwealth Energy Group, LLC**, an energy consulting firm focused on providing significant improvements in energy efficiency through green energy technology solutions. Through the strategic alliance, Commonwealth is expected to offer to its customers turnkey LED lighting solutions utilizing Lightsky products. In addition, ForceField expects to employ Commonwealth's service platform, especially the ability to provide energy audits and facilitate the paperwork required to secure tax savings, rebates and grants.

On January 29, 2013, ForceField entered into a **distribution agreement** with **Gonneville, Inc**., a Service-Disabled, Veteran-Owned, Small Business Enterprise (SDVOB) and a Small Business Enterprise (SBE) which specializes in the distribution of MultiQuip (MQ) power generation and lighting equipment. Gonneville's customers include California and federal government agencies, which generally require multiple bids. The economic advantages of LED lighting and ORC waste heat conversion systems, along with Gonneville's SDVOB/SBE status, should lead to the awarding of contracts. As stated by Don Gonneville, President of Gonneville, Inc., "Lightsky and ORC waste heat conversion system products … integrate seamlessly into our business model …."

On February 22, 2013, ForceField announced that a 5-year distribution agreement for both LED and ORC products was signed with **DEK International**, a global supplier of gaming tables, slots and bingo products to the gaming industry. Initially, ForceField's LED products will be marketed by DEK on its website and marketing materials. Headquartered in Panamá, DEK operates through a network of offices in more than 25 countries with a core presence in Latin America.

Commercial Trials with Lightsky LED Products

In an effort to create interest in and demonstrate the efficacy of Lightsky's LED products, ForceField is conducting **three separate trials** in the United States. In **Massachusetts**, the energy savings and other benefits of Lightsky's lighting products are being measured and analyzed by **On-Site Analysis Inc.**, an automated fluids analysis company based in Palm Beach Gardens, Florida. The three-month test is being conducted at On-Site's 15,000 square-foot warehouse, manufacturing and R&D facility in Marlborough, MA. It is expected that On-Site Analysis will enter into a sub-distribution agreement with ForceField once the test results confirm and quantify the cost benefits of adopting LED lighting products. On-Site's customer base is composed of companies, militaries, municipalities and other fleet service providers, all of whom are targeting effective solutions to reduce the operating costs of maintaining their fleets. Given On-Site's relationship and credibility with its clients, the selling cycle for the implementation of LED lighting projects should be short. On-Site lists over 100 high profile customers on its webpage, including Chevron, ExxonMobil, Joy Mining, Phelps Dodge, John Deere, Navistar, Volvo Trucking, Ford, General Motors, Toyota, Honeywell, Pratt Whitney, the US Navy and the cities of Los Angeles, Dallas and Charlotte.

In the **Midwest**, a private **hospital group** with over 300 hospital and clinic locations is evaluating the electrical consumption savings during a trial of installing ForceField's Lightsky LED lighting products at one of its facilities. The results should demonstrate the potential energy savings of deploying LED products in the hospital industry. The trial was negotiated by Global Resource Group, Inc., a sub-distributor of ForceField's Lightsky products.

In Collin County, **Texas**, **Gold Rush Gaming Room, LLC** is conducting a trial with Lightsky LED lighting products at its 15,000 square-foot facility. After assessing the savings of reduced energy consumption during the trial, Gold Rush Gaming's management will determine the level of deployment of Lightsky's LED products at three new facilities expected to open in 2013. This trial was also negotiated by Global Resource Group.

Lightsky LED Display Products

On December 4, 2012, ForceField Energy announced the launch of a marketing campaign targeting the **outdoor LED display market**. Lightsky has designed and installed several large, customized, high-resolution, outdoor LED displays in China, and ForceField is actively pursuing the outdoor LED display market not only in its exclusive Lightsky territories of the U.S., Canada and Mexico, also in Latin America, the Caribbean and France where the company has received approval to sell Lightsky LED display products. Initially, ForceField is approaching signage companies.

LED Streetlight Bid

On February 13, 2013, ForceField announced the submission of a **multi-million dollar bid** proposal **to retrofit LED streetlights in Costa Rica**. Lightsky's LED streetlights already are being tested by the utility company in Costa Rica ForceField's subsidiary, ForceField Energy S.A., is now registered as an approved vendor for 14 Costa Rican government institutions including Grupo ICE, the Costa Rican state-owned holding company that controls Instituto Costarricense de Electricidad, the provider of electrical power for Costa Rica.

Polysilicon Pricing

Polysilicon pricing update: In Greater China, polysilicon prices appear to have stabilized in the last few months and have been steadily rising from the $15.35/kg bottom in December to $16.80/kg currently. At some point, we would expect the operations at Wendeng and Baokai to resume in earnest.

1-for-2 reverse stock split

Effective October 9, 2012, the stock of ForceField Energy underwent a one-for-two reverse stock split, which had been approved by the Board of Directors for the purpose of qualifying for an up-listing to NASDAQ by meeting the $4.00 per share bid price requirement.

Transition from May Fiscal Year to December Calendar Year

On December 8, 2011, ForceField filed a Form 8-K stating that the company elected to **change** its **fiscal year** end from May 31 **to December 31**.

TRANSPACIFIC ENERGY INC.

In August 2012, ForceField Energy acquired a controlling 51% interest in TransPacific Energy Inc., a renewable energy company based in Carlsbad California and focused on the generation of electricity through the use of **Organic Rankine Cycles** (ORC) to recover energy from various heat sources.

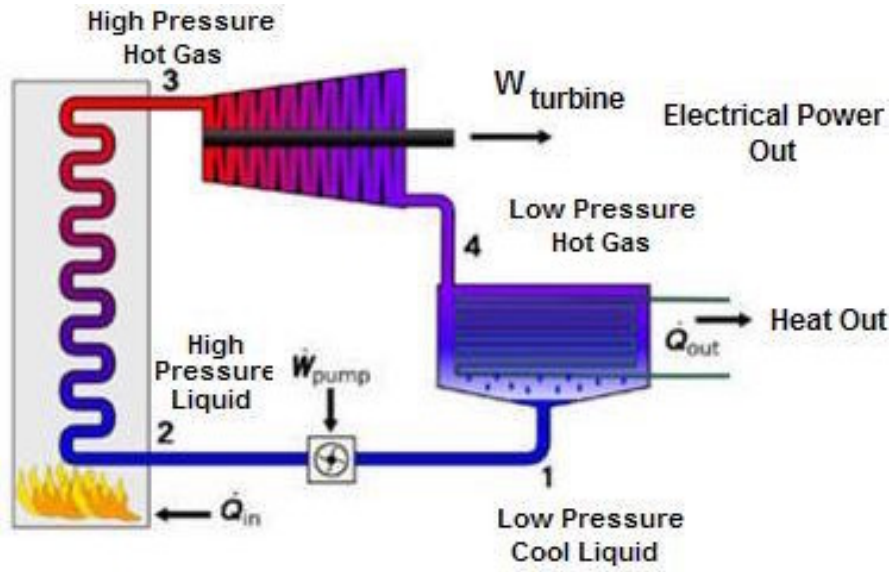
TransPacific is well-positioned to benefit from the deployment of green energy projects based on renewable sources and waste heat worldwide, but especially in the US and China. With offices in Henderson Nevada and Carlsbad California, TransPacific Energy has become a **new business segment for ForceField** and will add another revenue stream**.**

While ForceField held a minority interest in TransPacific Energy (in June 2012)**,** ForceField's Wendeng subsidiary entered into a non-exclusive distribution agreement with TransPacific Energy (TPE) to distribute TPE's Organic Rankine Cycle (ORC) systems in China. Within three months, on September 17, 2012, ForceField announced the signing of a letter of intent to install a modular Organic Rankine Cycle system at **Zibo Qilin Fushan Iron & Steel Company** located in the Shandong Province, China. Within a month, on October 9th, 2012, ForceField announced that the project size has been expanded based TransPacific Energy's technical evaluation, which determined that the plant has the capacity for four ORC units. The definitive agreement for up to four modular ORC system units was signed on January 18, 2013. The project's **first phase** is comprised of the **installation of two ORC units** that are expected to generate approximately 650 kilowatts of electricity. ForceField will own the ORC units and sell the electricity generated to Zibo Qilin at a discount to the local utility's price. ForceField expects to receive at least $600,000 annually over twenty-year period. In the second phase, ForceField (at its discretion) may install an additional two ORC units. The Qilin project will showcase the economic and environmental advantages of installing ORC systems in order to harvest heat energy from industrial exhaust systems.

TransPacific Energy offers ORC systems under multiple terms depending on the customer's needs and preferences. Under one option, the customer purchases the equipment and refrigerants and benefits from any green energy credits and the electricity generated. Under another option, ForceField and/or TransPacific Energy (through an LLC) owns the equipment and would enter into a long-term power agreement, under which the customer would purchase some or all of the electricity generated from the waste heat. Under the second scenario, ForceField would benefit from a reoccurring revenue stream.

Organic Rankine Cycle Technology

The **Rankine Cycle** is thermodynamic process by which heat is converted into mechanical power. The most well-known example is the steam power plant in which heat is applied to a working fluid (water) in a boiler. The steam generated flows through a closed loop and powers either pistons or a turbine, after which the water is re-condensed and returned to the boiler. The Rankine cycle is the fundamental thermodynamic underpinning of all coal and nuclear power plants, which utilize the Rankine Cycle mechanical power to generate about 90% of the electricity produced globally.



The fundamental working principle of the Rankine Cycle applies to the **Organic Rankine Cycle** except that the working fluid is an organic liquid that has a relatively low liquid-vapor phase change temperature (boiling point) compared to water. As a result, lower temperature heat sources (such as biomass combustion, industrial waste heat, geothermal energy, solar thermal ponds, etc.) can be utilized to recover energy through the thermodynamic cycle. The use of the Organic Rankine Cycle presents both challenges and advantages. With the working fluid operating at lower temperatures, heat transfer inefficiencies from operating conditions, fluid friction, etc. can dramatically reduce the optimal thermodynamic characteristics of heat transfer process. In addition, many fluids with high ozone depletion potential, especially chlorofluorocarbons (CFCs)[4], have been phased out through the Montréal Protocol of 1996. On the other hand, organic working fluids that are non-corrosive, non-toxic, non-flammable and chemically stable, not only extend the operational life of the components within the power plant (such as valves, tubing and turbine blades), but also can alleviate environmental concerns. Energy systems based on ORC technology also benefit from government mandates and worldwide initiatives focused on the development of renewable energy.[5]

TransPacific Energy

TransPacific Energy designs, builds, sells and installs heat recovery and energy conversion systems based on Organic Rankine Cycle (ORC) technology. TPE's systems are custom-designed utilizing a mixture of non-toxic and non-flammable working fluids specifically formulated to maximize heat recovery from specific sources of waste or untapped heat within particular temperature ranges. In addition to using mixtures composed of multiple refrigerants, TransPacific Energy's patent-pending technology employs improved heat transfer techniques that help overcome the inherent thermodynamic inefficiencies when operating at lower temperatures. Also, TPE's process can efficiently recover heat not only in the 200º F and 350º F temperature range in which most other competitors function, but also within specific narrow temperature ranges from 75º F up to 1,000º F.

The heat recovery and energy conversion processes of TransPacific Energy address the needs of energy projects based on both renewable sources and waste heat. TPE's Organic Rankine Cycle technology produces electricity from renewable heat sources (such as concentrated thermal solar power, biomass, geothermal and warm ocean waters), as well as from waste heat created by industrial processes (such as flue gases from smokestacks, hot gray water and exhaust gases from engines and turbines).

The acquisition of a controlling interest in TransPacific Energy expands ForceField's footprint in green energy as well as add another revenue stream. Synergistically, ForceField can broaden TPE's geographical reach, specifically into China where the government is overtly supporting renewable energy projects and Wendeng (ForceField's subsidiary) has established important customer relationships.

In June 2012, the Research Institute for Solar Energy and New Energies (a Moroccan governmental agency) announced that SNC-Lavalin (an international engineering and construction firm), MITHRAS Energies Maroc and TransPacific Energy were selected as members of a three-company consortium to design, develop and install a 1MW Thermal Solar ORC project in Morocco. As of September 2012, one customer accounted for 100% of TransPacific Energy's revenue

Ownership

In May 2012, ForceField Energy entered into share exchange agreements with shareholders of TransPacific Energy in order to purchase a controlling equity interest in TPE. Through a series of transactions, ForceField purchased 11,667,101 shares (37% of the 31,543,336 outstanding shares of TPE) from TPE (8,333,333 shares) and the remainder from three shareholders (ABH Holdings, LLC, Acme Energy, Inc., and Apela Holdings LLC). The TPE shares were acquired from the three shareholders at a fixed price of $0.06 per share with shares of ForceField common stock while shares

[4] CFCs were manufactured and sold under the trade name Freon.
[5] Renewable energy is energy generated from resources that are naturally replenished or renewable, which include ORC projects exploiting biomass, thermal solar and geothermal energy sources.

acquired from directly from TPE were made with $500,000 in cash. In addition, ForceField acquired 4,420,000 shares (14% of the shares outstanding) from Soffimat Holdings SA with shares of ForceField common stock.

By mid-August 2012, ForceField acquired an additional $350,000 worth of TPE common stock from TransPacific and further shares from the three shareholders such that **a 51% controlling interest in TransPacific Energy** is held by ForceField Energy.

DISTRIBUTION OF LIGHTSKY LED PRODUCTS

In August 2012, ForceField Energy entered into a **five-year distribution agreement** acquiring the exclusive North American rights to sell and distribute LED lighting products manufactured by **Shanghai Lightsky Optoelectronics Technology Co., Ltd.** (aka Lightsky). Within two months of securing the exclusive distribution agreement with Lightsky, ForceField announced that three trials in separate industries (hospital, fleet management and gaming) were arranged to evaluate the efficacy of converting to LED lighting for the purpose of evaluating broader deployment of LED lighting products. The interest level and progress achieved by ForceField in a relatively short period of time exceeded management's expectations.

ForceField's LED strategy is primarily focused on targeting multi-location commercial companies where **retro-fitting existing facilities** with the installation of LED lighting products is able to reduce the level of electrical energy consumption and future maintenance costs. Prime targets for the rapid adoption of LED lighting are warehouses, casinos, corporate campuses, parking structures, airports and 24/7 lighting applications. In addition, ForceField has expanded its marketing efforts to the **outdoor LED display** marketplace where Lightsky has a proven record of designing and installing large outdoor LED display screens. The Lightsky has also produced indoor LED display signs, a market segment which includes information resources at airports, stock markets, banks, malls and exhibitions.

The installation of LED lighting offers significantly lower ongoing energy consumption, reduced maintenance costs and attractive payback periods. Currently, many building owners are concerned about the maintenance costs associated with building operations (specifically energy consumption), along with the desire to implement cost-effective green projects. ForceField's management is seeking opportunities to deploy and demonstrate the energy saving capabilities of LED lighting utilizing Lightsky LED lighting products.

LED Technology

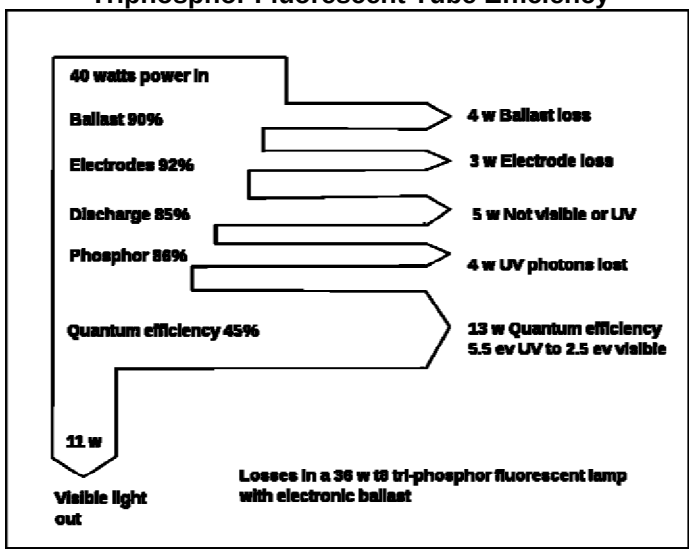
A **light emitting diode** (or **LED**) is a semiconductor (or solid-state) electronic device that efficiently converts electricity into light. Since LED chips consume less electricity than both incandescent and compact fluorescent (CFL) lights (and also do not utilize mercury), they are considered a **"green" source of light energy**. Over the next decade, it is expected that there will be an extensive transition from incandescent to LED lighting technology in warehouses, offices, homes and on the streets.

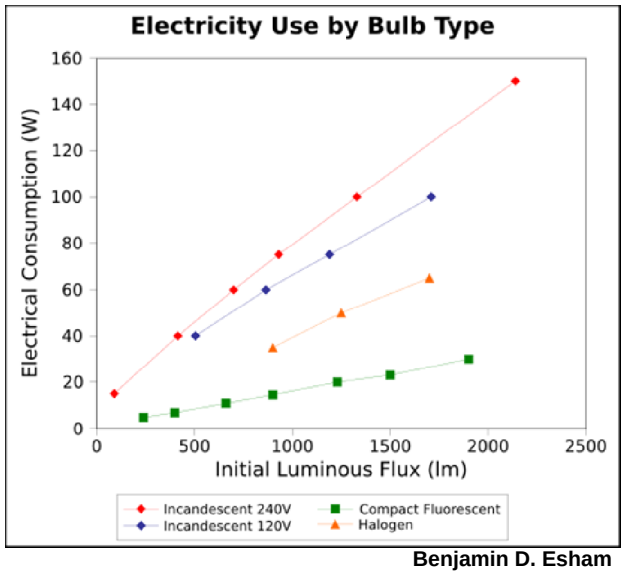
Incandescent lamps (or conventional light bulbs and sometimes known as Edison bulbs) generate a glowing light when an electric current passes through a resistive filament. A "warm" yellow light is produced as the glowing filament emits a broad range of visible light frequencies and significant amount of heat energy. Incandescent lamps are inefficient with at least 90% of the electrical energy input being converted to heat as the tungsten filament glows. However, having been mass produced for over a century, the production costs of incandescent lamps are low, making the bulbs **relatively inexpensive**. A typical AC incandescent light bulb has a **life span between 750 and 1,000 hours**. The luminous efficacy

of a representative 120-volt 100-watt bulb is **11.8 lumens per watt**[6]. Most light fixtures are designed to accept the standard the size and shape of traditional incandescent bulbs.

Fluorescent lamps produce visible light by converting ultraviolet light (which is created by passing electricity through low pressure mercury vapor) through a process known as fluorescence, whereby a coating of fluorescent material (called a phosphor) transforms shorter wave length UV light into longer wavelength visible light, though traditional fluorescent lamps emit an uneven spectrum of light causing certain colors to appear differently than when illuminated by incandescent light bulbs or daylight. The life expectancy of a fluorescent lamp is dependent on the number of on/off cycles, with frequent cycling lowering the bulb's life; however, based on 3 hours per cycle, the average **life span** of a fluorescent lamp is **between 18,000 and 20,000 hours**. The life expectancy of fluorescent lamps can be increased improving the efficiency of the UV-conversion by utilizing coatings that are composed of rare earth triphosphor blends. The average efficacy of representative fluorescent lamps is between **50 and 70 lumens per watt**. Approximately **22%** of the electrical energy input[7] into a fluorescent lamp is converted to useful visible light. Since fluorescent lamps contain hazardous substances (mercury and phosphor), accidental breakage and disposal present health and environmental risks. Also, the color rendering properties of fluorescent lamps are inferior to incandescent lamps with the misperception colors and the light often described as drab.

Triphosphor Fluorescent Tube Efficiency





Benjamin D. Esham

Fluorescent lamps are commonly available in two forms, fluorescent tubes and compact fluorescent lamps (CFLs). **Fluorescent tubes** require ballasts in order to regulate the flow of current through the lamp; therefore, specialized overhead fixtures that house the connectors, ballasts and wires must be installed. Initial installation costs are recouped through more efficient energy usage; however, all fluorescent tubes flicker (even if not detected by the human eye) and the ballast can cause a humming or buzzing noise. **CFLs** are miniature, curled versions of full-sized fluorescent bulbs, which screw into standard light bulb fixtures. The average life span and efficiency of CFLs are less than fluorescent tubes (approximately between 6,000 and 15,000 hours and 17% to 21%, respectively). When first introduced, CFLs were very expensive, but over the last 10 years, prices have dropped significantly.

[6] Lumens are the units of measure concerning the power of light as perceived by the human eye. Luminous efficacy is the number of lumens produced for each watt of electrical energy used. A 120-volt incandescent bulb emits approximately 1,180 lumens while a typical 230-volt bulb generates about 1,340 lumens or 13.4 lumens per watt.

[7] Perez, Marcelino, Efficient of the Bulbs, May 2012.



Incandescent bulb



Compact fluorescent lamp (CFL)



LED lighting

LED lamps are efficient, low-voltage, solid-state lighting devices that **consume at least 75% less electricity** and **last 35-to-50 times longer than incandescent bulbs**.[8] LED lamps also last **about two-to-five times longer than fluorescent lighting**, further reducing life-cycle costs with lower required maintenance, especially in commercial and industrial applications where bulb replacement entails the use of ladders (or other special equipment) and an environmental-compliant disposal program.

Operating on direct current (DC) electrical power, LED lamps contain internal or external rectifier circuits that convert standard AC power to low voltage DC. Theoretically, **a LED lamp has an expected life of approximately 50,000 hours** of continuous use under normal conditions; however, the power supply (voltage rectifier) is less robust resulting in a LED lamp being rated for 25,000 hours. In contrast to incandescent bulbs (which fails when the tungsten filament breaks), the brightness of a LED lamp fades over time, and its lifetime ends when light output falls to 70% of initial brightness. Poorly designed LEDs may not achieve the average projected lifetime by fading prematurely, shifting in color, emitting uneven light and even flickering.

LEDs are extremely durable. Most LEDs do not contain glass components and the internal parts are rigidly supported. Therefore, they are more mechanically robust and less vulnerable to vibration and breakage than incandescent and fluorescents. Unlike fluorescent tubes and CFLs, LEDs do not contain mercury and are not prone to flickering. In addition, LEDs turn on almost instantly and have a lifetime that is unaffected by cycling between on and off.

Though **LEDs perform well outdoors, especially in cold temperatures**, their expected lifetimes are reduced if operated at high temperatures. In addition, human eyes seem to prefer full-spectrum analog light that is emitted from an incandescent light bulb, a fire or the sun. LEDs emit light in a very small band of wavelengths, and white light is produced by using phosphor coatings to convert the single color from the LED into multiple colors that mimic the full-spectrum for white light and also other colors for illumination, backlighting and display screens.

During the transition from Edison bulbs to CFLs, fluorescent tubes and LEDs, commercial and industrial purchasing decisions will be based on the **payback period**, **lumen output** and **color attributes**. On the consumer side, the traditional frame of reference of watt rating will give place to lumen output, color attributes and the initial sticker shock of higher unit pricing. For the consumer, the initial capital cost to replace an incandescent bulb with a LED lamp is over 10 times greater than using another conventional incandescent bulb. On the commercial side, the initial cost of a lighting system is approximately three times greater than a traditional mix of incandescent and fluorescent lamps. However, the electricity savings offset the additional cost within a short payback period and the lamps should not need replacing for 20 years. The **payback period for LED replacements** of commercial lighting is usually **in the range of 18-to-36-months** and less than a year for highly-used lighting. With the anticipation of lower pricing, the **payback period may soon be between 6-to-24-months**.

An attribute of fluorescent and LED lamps is the selective emission of visible light wavelengths, which impacts the perceived color of objects. Fluorescent and LED bulbs are manufactured to produce a range of color temperatures allowing the lighting to be customized for specific applications. The quality and tone of the color are designated in shades and measured by the **Kelvin color temperature scale** (not to be

[8] According to Energy Star, energystar.gov.

confused with the Kelvin thermodynamic temperature scale). Low Kelvin temperatures (2,700 K to 3,000 K) are denoted as Warm colors (aka warm white or WW), which produce a yellowish relaxing light, generally appropriate for ambient light in most residential rooms. Neutral colors (aka enhanced white or EW) have a color temperature around 3,500 K and are most suitable for offices. Cool white (or CW) is in the 4,100 K range and produces a bright, clean light preferable for tasks in work environments like warehouses, garages and basements. Higher Kelvin temperatures produce cooler, bluer shades with 5,000 K known as is Natural light (NL) and 6,500 known as Daylight white (DW). For reference, a typical 60-watt incandescent bulb emits 750-800 lumens at a color temperature of 2,700 Kelvin, replaceable by a 750 lumen warm white LED lamp.



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Colour temperature	Kelvin
'Warm white' or 'Soft white'	≤ 3,000 K
'White' or 'Bright White'	3,500 K
'Cool white'	4,000 K
'Daylight'	≥ 5,000 K

Color Appearance	Kelvin Temperature	Description and Uses
Warm	• 3,000 K	• Produces an inviting, relaxing light • For use in any room • Perfect for kitchens and bathrooms
Neutral	• 3,500 K	• Produces a pleasant light • For use in any room • Perfect for offices
Cool White	• 4,100 K	• Produces a bright, clean light • For use in garages, basements and work environments
Natural Light	• 5,000 K	• Simulates natural light • For use in any room
Daylight	• 6,500 K	• Produces a crisp, refreshing light • For use in any room

Most LED lamps, especially those targeting the consumer replacement market, are constructed in standard light bulb shapes with an Edison medium E26 base in order to be directly **interchangeable with screw-in incandescent bulbs**. Many commercial applications (such as recessed lighting, accent lighting, retail lighting, museum lighting, hospitality lighting and architectural lighting) also utilize E26 fixtures. In addition, LED lamps are available in a variety of bases, including E27 screw-in, MR16 bi-pin, GU5.3 bi-pin cap and GU10 double-contact bayonet mount.



LEDs have directional light characteristics. Today, most LED light bulbs emit light in one direction, which is ideal for illuminating flat, defined work areas. Not only is it a more efficient application of lumens, but also optimal for task lighting, recessed lighting fixtures, floodlights and reading lights. However, for

general-purpose lighting that illuminates in all directions as incandescent and fluorescent bulbs do, LED lamps must be designed and manufactured with a light diffuser and/or with many individual light emitting diodes assembled in multiple directions. Also, since multiple diodes are assembled for general-purpose lighting and LEDs can be damaged by operating at high temperatures, heat dissipation elements, such as heat sinks and/or cooling fins are necessary.

Though the era of the modern LED light was ushered in by Nick Holonyak at General Electric in October 1962 with the invention of the first practical visible-spectrum LED, recent advances in performance[9] have made LED lamps commercially feasible as an economical alternative to conventional lighting options. Today, the efficiency of commercially available LEDs is approximately 16% versus a theoretical efficiency of 30%. In addition to economies of scale as demand accelerates, improvements in the design, configuration and engineering of LED lamps (composed of light emitting diodes, a power supply, circuitry, controllers, phosphors and a protective housing) are contributing to **the decline in the cost of manufacturing**. For example, at Purdue University, researchers have developed a method to create LEDs with inexpensive, metal-coated silicon wafers instead of expensive sapphire substrates used today. If commercially feasible, LED lamp manufacturing costs could potentially decline to competitive levels to fluorescent tubes. In addition, the future improvements in the process of deposition of active semiconductor layers of the light emitting diodes are expected to improve yields, especially advancing from today's 2- to 4-inch wafers to 12-inch wafers. Manufacturing throughput could be further increased by integrating production steps, particularly evolving to micro modules (aka chips on board technology). . As the manufacturing process of LEDs matures, economies of scale become robust and government legislation incites demand climb the S-curve of adoption, **both manufacturing costs and pricing are expected to decline significantly**.

With the secular trend in the conversion to LED lighting being apparent, many competitors have ramped up to participate in the transformation of the lighting industry, including OSRAM (Opto Semiconductors, a subsidiary of Siemens), Philips, Toshiba, Samsung, Sharpe, GE, Panasonic, MK Electric (Honeywell), CREE, Nichia, Shanghai Lightsky (ForceField), Acuity Brands (which acquired Renaissance Lighting in July 2010), Albeo Technologies, LED Dynamics, Wissen Lux S.p.A., among others. As these competitors attempt to garner market share during the accelerating sales growth phase, profit margins may suffer due to overcapacity. However, the adoption of LED lighting in the residential marketplace is expected to be more affected by price competition, overcapacity and pressured margins than in the commercial and industrial lighting system segment.

Trends in and the Estimated Growth Rate of LED Lighting

The United States Congress has mandated efficiency standards that are intended to gradually phase out the incandescent bulb, which was invented by Thomas Edison 132 years ago. Designed to move the U.S. towards greater energy independence and security, the Energy Independence and Security Act of 2007 requires that light bulbs consume 28% less energy than incandescent bulbs.[10] The new efficiency standards are being implemented in phases. As a result, 100-watt incandescent bulbs cannot be manufactured in or imported into the United States after Jan. 1 2012, though a subsequent Congressional bill delayed enforcement to September 2012. According to the legislation, restrictions on the 75-watt incandescent bulb began in January 2013, and the 40-watt and 60-watt versions will be affected in January 2014. Therefore, **over the next few years, it is expected that there will be an extensive transition from incandescent to LED lighting technology** in warehouses, offices, homes and on the streets.

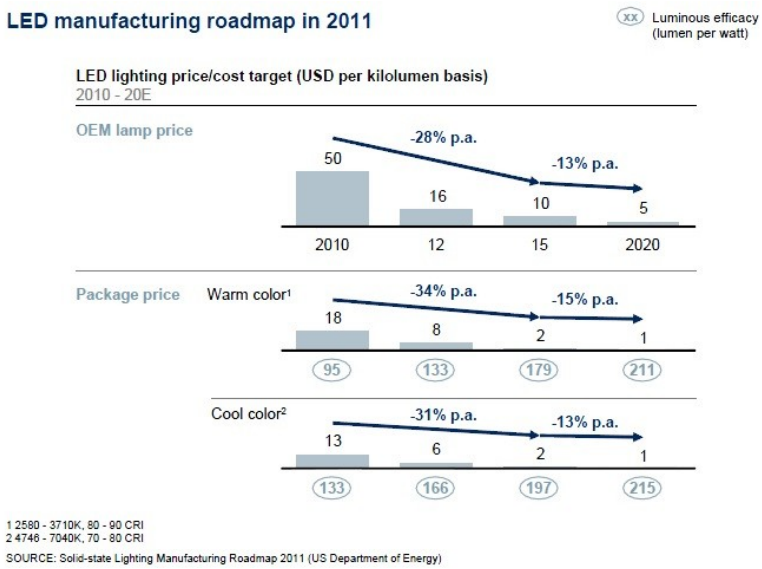
[9] Specifically, LED performance has improved from 55 lumens per watt (lpw) to over 140 lpw commercially and over 230 lpw in the laboratory (CREE in May 2011).

[10] Specifically, the brightness of a standard 100-watt incandescent light bulb (on average 1,260 lumens) must be produced with a maximum of 72 watts, and the 1,170 lumens emitted by a standard 75-watt incandescent light bulb is required to be produce using 53 watts or less.

ElectroniCast Consultants, a specialty forecasting firm specializing in market trends in electronics, forecasts that U.S. consumption of LED lighting will reach $2.4 billion in the year 2016 from the $592 million recorded in 2011, representing a **32% compound growth rate** (CAGR). The market forecast are based on four expected trends: 1) advanced LED performance, 2) price competition, 3) additional utility incentive programs and 4) increased adoption of LED by corporate customers. The quality of the estimate is reinforced by ElectroniCast not only segmenting the market into the application categories of Government, Commercial/Industrial and Residential, but also breaking out the forecast into six lamp types: Parabolic Aluminized Reflector (PAR), General Service (Type A), Decorative, Multifaceted Reflector (MR) Compatible, Linear/Tube and Streetlights/Exterior lighting.

Commissioned by OSRAM, **McKinsey & Company** published a comprehensive analysis of the lighting industry entitled Lighting the Way: Perspectives on the Global Lighting Market in 2011. A second edition was produced in 2012 to addresses the fast-paced lighting market environment, especially the faster-than-expected erosion of LED prices. In the residential segment, LED market share is expected reach almost 50% in 2016, and rise above 70% in 2020. Lower LED prices pulls forward the payback time of LED lighting, stimulating commercial, office and industrial conversion to LED lighting. The study concludes that "**The significant differences in LED technology vs other lighting technologies will lead to a fundamental disruption of the lighting industry along the entire value chain**."

The **U.S. Department of Energy** (DOE) estimates that the rapid adoption of LED lighting in the United States will reduce lighting electricity demand by 33% in 2027, which will reduce electrical energy demand by approximately $265 billion avoiding the need to construct 40 new power plants. The DOE predicts that the prices of LED OEM lamps and LED packages to decline by about 30% annually through 2015 and by 10%-to-15% annually between 2016 and 2020.



The conversion from traditional lighting to energy-saving LED lighting is expected to accelerate dramatically in the near future. It is possible that LED technology could dominate the lighting market by 2016 as the North American marketplace adopts energy-efficient LED lighting.

Relationship

On August 27, 2012, ForceField Energy acquired the **exclusive North American rights** to sell and distribute LED lighting products manufactured by **Shanghai Lightsky Optoelectronics Technology Co., Ltd.** (aka Lightsky). The five-year distribution agreement automatically renews when ForceField achieves certain performance milestones. ForceField issued 150,000 shares of restricted common stock (valued at $780,000) to acquire the distribution rights for the United States, Canada and Mexico.

Shanghai Lightsky Optoelectronics Technology Co., Ltd.

Shanghai Lightsky was established by Shanghai Academy of Science and Technology (SAST) and Shanghai Zhongbo Capital Co., Ltd. in 2007. Lightsky continues to work closely with SAST. Lightsky's 2,000 square-meter **R&D center** is located in Shanghai's Zhangjiang Hi-Tech Park, which is situated in the Pudong New Area District (a Special Economic Zone or SEZ) in east Shanghai. The **5,000 square-meter factory** is in central Shanghai in Pujiang Town (Minhang District).

Lightsky manufactures LED lighting products for commercial, institutional and residential applications, primarily in the categories of **illumination lighting**, **architectural lighting** and **video display systems**. Lightsky produces over 140 LED commercial and residential lighting products, including spotlights, down lights, desk lights, display lights, ceiling lights, panel lights, tube lights, candle lights, street lights, traffic lights and light bars. Lightsky offers LED lights in three color temperature ranges: warm white (3000K ± 150K), neutral white (4000K ± 250K) and cool white (5700K ± 300K).

Shanghai Lightsky not only provides LED lamps and lighting fixtures, but also designs and operates integrated **LED lighting and display projects**,. Noteworthy projects include six Pavilions at the Expo 2010 in Shanghai (UAE, the Philippines, Tibet, China State Shipbuilding Corporation, Algeria and Turkmenistan Pavilions) and extra-large outdoor LED displays at the Kunshan World Trade Center (138 square meters), Jinlin (255 square meters) and Shanghai (285 square meters). In addition, Lightsky supplies RL06 LED down lights to the Shanghai Pudong International Airport, Hong Kong University and the Shanghai Jingan Science Museum and also SL 40w solar LED solar street lights for a project in Mexico.

ForceField's LED Strategy and its Execution

ForceField's strategic LED business plan involves aggressively introducing Lightsky's LED products in the North American market by rapidly building a **network of sub-distributors** that can target large-scale customers (commercial, industrial, institutional and governmental) that would benefit from upgrading to LED lighting. An ideal client is a multi-location entity where economic evaluations strongly influence the decision-making process. The rationale to transition to LED lighting products is compelling considering the relatively short payback period (under two years) and long-term cost benefits. In addition, ForceField is **pursuing specific opportunities** for large contracts related to the conversion to LED lighting, specifically a multi-million dollar bid to retrofit streetlights in Costa Rica. **ForceField is actively pursuing distributing prospects** not only in its exclusive Lightsky territories of the U.S., Canada and Mexico, also in Latin America, the Caribbean and France where the company has received approval to sell Lightsky LED products.

ForceField is expanding the presence in the LED through multiple sub-distribution agreements. In early September 2012, ForceField retained the services of **Global Resource Group**, Inc. to help generate immediate interest in Lightsky's LED product line. Thus far, Global Resource Group has negotiated LED trials with a private hospital group in the Midwest and the Gold Rush Gaming Room, LLC, in Texas. In October 2012, ForceField entered into a strategic alliance with **Commonwealth Energy Group, LLC**, an energy consulting firm that can offer to its customers not only the turnkey LED lighting solutions that utilize Lightsky products, but also the energy audits required to secure tax savings, rebates and/or grants. In January 2013, ForceField entered into a distribution agreement with **Gonneville, Inc.** for both Lightsky's LED products and TransPacific Energy's ORC systems. And in February, a 5-year distribution agreement for both LED and ORC technology products was signed with **DEK International**, a global supplier of to the gaming industry with a core market presence in Latin America.

Optimally, the upgrade to LED lighting would entail a multi-year roll-out of installing and/or retrofitting of Lightsky's LED lighting products and fixtures. Hence, ForceField is targeting large-scale commercial deployments, including corporations, hospitals, institutions and governments (federal, state and local).

ForceField is conducting four separate trials in the United States:

1) By On-Site Analysis at a 15,000 square-foot warehouse in Marlborough, Massachusetts
2) By a private hospital group in the Midwest
3) By Texas, Gold Rush Gaming Room, LLC at a 15,000 square-foot gaming facility in Collin County, Texas and
4) At a national tire center location

In December, 2012, ForceField expanded the scope of its LED effort by announcing the launch of a marketing campaign targeting the **outdoor LED display market**. Shanghai Lightsky has designed and installed several large, customized, high-resolution, outdoor LED displays in China as cited above. LED Display Screen Competitors include Shenzhen EASTAR Electronic Co., Ltd (CreateLED Electronics) in ShenZhen, China, Shenzhen Chip Optech Co., Ltd. in Shenzhen China, Mitsubishi Electric (Diamond Vision LED displays), Impact Video (ProStar and Smartvision LED displays) and Panasonic (Astrovision LED displays).

Commercial LED Lighting Market

ForceField is targeting the widespread opportunities in the commercial lighting market, which also includes the industrial, institutional and governmental segments. The rapid adoption of LED lighting by commercial enterprises is a favorable tailwind for ForceField and other providers of commercial energy solutions. Most large-scale commercial customers are rationale consumers who make informed decisions, especially when related to cost centers.

LED lighting is an energy-efficient alternative to both incandescent and florescent lighting. LED products usually consume over 80% less energy than conventional incandescent bulbs and can last 20 times longer. The comparison versus florescent lighting is also positive with comparable LEDs costing at least 20% less to operate and lasting five times longer. The stimulus of immediate and significantly lower energy costs, along with longer useful lives, facilitates the transition to LED lighting.

Decisions by commercial customers are driven also by other factors, including the total cost of purchasing, operating and maintaining a lighting system, such as the initial capital cost of lamps and fixtures; the cost of installation; the frequency of bulb replacement and the attendant labor costs; the heat effect of lamp operation on HVAC (heating ventilation and air conditioning) systems, etc. The cost benefits of LED lighting can be clearly demonstrated by calculating the expected payback period, which for most LED systems is between 18 and 24 months.

Another important driver in the commercial marketplace is also the ability to provide turnkey LED lighting solutions. As the manufacturers of LED product attempt to gain market share in the rapidly growing LED marketplace, dramatically higher LED sales allows for more efficient utilization of fixed cost resources, which results in price competition. Two respected market analysis firms, Groom Energy and Greentech Media (GTM Research), have noted that LED fixture prices declined 24% in the past two years and that prices should continue to fall. However, the commercial and industrial lighting systems category (especially the application-ready or turn-key system sub-segment) is less vulnerable to the pricing pressure.

As a distributor of Shanghai Lightsky LDE lighting products and systems, ForceField offers a selection of LED products for commercial interior & exterior lighting, warehouses, light factories, multiple franchise locations, schools & universities, retail & grocery stores, museums, casinos, government buildings, parking garages & lots, pedestrian walkways, street lighting, tunnel lighting, construction zones and indoor & outdoor displays.

VALUATION

Our valuation methodology is based on price-to-sales due the character of ForceField's enterprise. Price-to-sales valuation incorporates a company's ability to generate cash flow and increase revenues. Management's stated business plan is to focus on the alternative energy sector and to increase the sales base by concentrating on large commercial contracts for the installation and/or operation of LED and ORC projects, and by participating in the recovery of the polysilicon-trichlorosilane market.

We expect ForceField's stock to continue trading within our estimated valuation range of 1.1 and 3.2 times normalized sales. The process of determining ForceField's normalized sales level is challenging due to the unevenness of the contracts awarded in the nascent LED and ORC markets and the contraction evidenced in the polysilicon market over the last year. In such cases, especially when a company's stock has remained relatively stable during the period of uncertainty (like ForceField's), one can attempt to ascertain the quartiles of P/S valuation by calibrating the stock's price (as determined by an efficient market) to the median valuation, namely 2.15 times sales. Utilizing this methodology, the valuation range of the top quartile is between $6.00 and $7.20. Our mid-point price target is $6.60.

PROJECTED INCOME STATEMENT & BALANCE SHEET

ForceField Energy, Inc.

Consolidated Statements of Operations and Retained Earnings

Annual Earnings Analysis (in $ US)	**2008** (May 31)	**2009** (May 31)	**2010** (May 31)	**2011** (May 31)	Change to Calendar Year	**2010** (Dec 31)	**2011** (Dec 31)	**2012 E** (Dec 31)	**2013 E** (Dec 31)
Revenue: Baokai	-	-	-	9,755,030		1,165,239	14,546,790	819,261	1,232,000
Revenue: Wendeng	-	-	-	5,327,758		0	13,791,599	586,725	3,070,000
Revenue: LED	-	-	-	-		-	-	-	3,835,000
Revenue: ORC	-	-	-	-		-	-	124,609	450,000
Total Revenues	**0**	**0**	**0**	**15,082,788**		**1,165,239**	**28,338,389**	**1,530,595**	**8,587,000**
Cost of sales: Baokai	-	-	-	9,538,061		1,141,605	14,234,315	802,870	1,207,360
Cost of sales: Wendeng	-	-	-	3,506,938		0	9,881,216	538,840	2,753,950
Cost of sales: LED	-	-	-	-		-	-	-	2,876,250
Cost of sales: ORC	-	-	-	-		-	-	124,609	450,000
Cost of sales	0	0	0	13,044,999		1,141,605	24,115,531	1,466,319	7,287,560
Gross Profit	**0**	**0**	**0**	**2,037,789**		**23,634**	**4,222,858**	**64,276**	**1,299,440**
Professional fees		124,435	545,049	618,992		478,518	772,868	598,281	690,045
General & administrative	24,937	45,420	76,586	1,315,137		186,288	3,795,974	2,782,041	2,962,357
Total Operating Expenses	**24,937**	**169,855**	**621,635**	**1,934,129**		**664,806**	**4,568,842**	**3,380,322**	**3,652,403**
Equity earnings (loss) from TransPacific Energy	-	-	-	-		-	-	(10,800)	(8,543)
Interest income (expense)	9,440	-	-	-		-	-	(13,255)	(1,000)
Goodwill impairment charge	-	-	-	-		-	(2,800,000)	-	0
Total Expenses	**34,377**	**169,855**	**621,635**	**1,934,129**		**664,806**	**7,368,842**	**3,404,377**	**3,642,860**
Pre-tax profit from operations	**(34,377)**	**(169,855)**	**(621,635)**	**103,660**		**(641,172)**	**(3,145,984)**	**(3,340,100)**	**(2,343,420)**
Income (loss) before income taxes	(34,377)	(169,855)	(621,635)	103,660		(641,172)	(3,145,984)	(3,340,100)	(2,362,505)
Future income taxes	0	0	0	256,227		5,909	168,746	(504,851)	(357,089)
Net income (loss)	(34,377)	(169,855)	(621,635)	(152,567)		(647,081)	(3,314,730)	(2,835,249)	(2,005,416)
Net income attributable to noncontrolling	-	-	-	266,979		1,773	(876,697)	(554,689)	(2,003,146)
Net income (loss) attributable to SunSi	**(34,377)**	**(169,855)**	**(621,635)**	**(419,546)**		**(648,854)**	**(2,438,033)**	**(2,280,560)**	**(2,270)**
Net income per common share (diluted)	**(0.00)**	**(0.01)**	**(0.05)**	**(0.03)**		**(0.05)**	**(0.17)**	**(0.15)**	**(0.00)**
Weighted average common shares outstanding - diluted	13,380,000	13,380,000	13,486,243	13,837,626		13,660,577	14,635,641	15,572,388	16,072,388
Gross Margin	N/M	N/M	N/M	13.5%		2.0%	14.9%	4.2%	15.1%
Gross margin: Baokai	N/M	N/M	N/M	2.2%		2.0%	2.1%	2.0%	2.0%
Gross margin: Wendeng	N/M	N/M	N/M	34.2%		N/M	28.4%	8.2%	10.3%

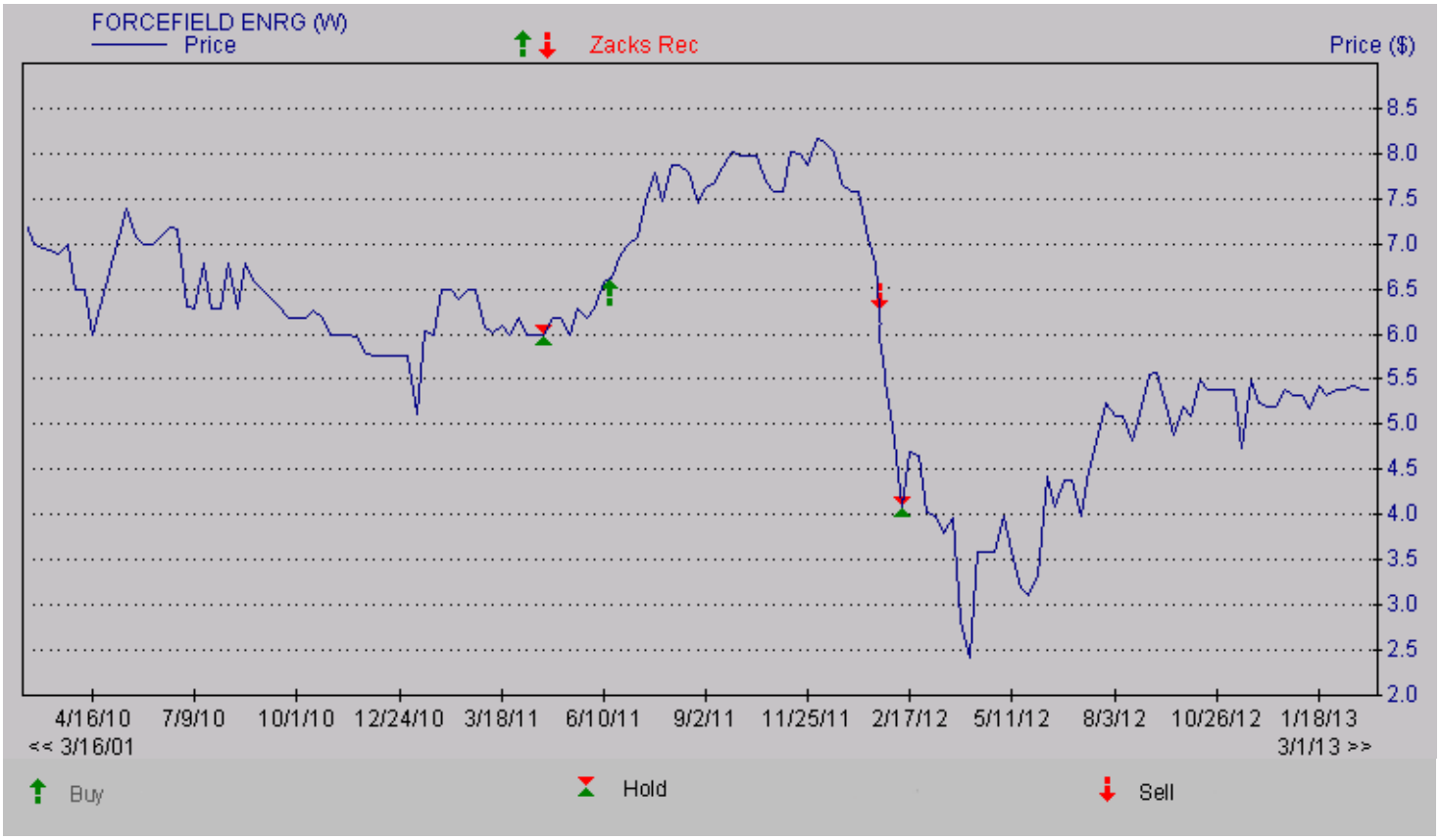
Quarterly Earnings Analysis	Partial Year (Jun-Dec) 2011	1Q (March) 2012	2Q (June) 2012	3Q (Sept) 2012	4Q E (Dec) 2012	Year E (Dec) **2012**	1Q E (March) 2013	2Q E (June) 2013	3Q E (Sept) 2013	4Q E (Dec) 2013	Year E (Dec) **2013**
Revenue: Baokai	5,956,999	234,959	527,052	32,250	25,000	**819,261**	32,000	150,000	350,000	700,000	**1,232,000**
Revenue: Wendeng	8,463,841	272,668	(462)	133,838	180,681	**586,725**	220,000	450,000	900,000	1,500,000	**3,070,000**
Revenue: LED	-	-	-	-	-	-	500,000	750,000	1,100,000	1,485,000	**3,835,000**
Revenue: ORC	-	-	-	59,609	65,000	**124,609**	70,000	80,000	150,000	150,000	**450,000**
Total Revenues	**14,420,840**	**507,627**	**526,590**	**225,697**	**270,681**	**1,530,595**	**822,000**	**1,430,000**	**2,500,000**	**3,835,000**	**8,587,000**
Cost of sales: Baokai	5,837,859	230,260	516,511	31,599	24,500	**802,870**	31,360	147,000	343,000	686,000	**1,207,360**
Cost of sales: Wendeng	6,374,278	245,065	(3,292)	126,323	170,744	**538,840**	206,800	416,250	810,900	1,320,000	**2,753,950**
Cost of sales: LED	-	-	-	-	-	-	375,000	562,500	825,000	1,113,750	**2,876,250**
Cost of sales: ORC	-	-	-	59,609	65,000	**124,609**	70,000	80,000	150,000	150,000	**450,000**
Cost of sales	12,212,137	475,325	513,219	217,531	260,244	**1,466,319**	683,160	1,205,750	2,128,900	3,269,750	**7,287,560**
Gross Profit	**2,208,703**	**32,302**	**13,371**	**8,166**	**10,437**	**64,276**	**138,840**	**224,250**	**371,100**	**565,250**	**1,299,440**
Professional fees	473,794	141,710	148,014	151,424	157,133	**598,281**	163,057	169,204	175,583	182,202	**690,045**
General & administrative	2,606,566	605,119	823,282	703,640	650,000	**2,782,041**	700,000	726,390	753,775	782,192	**2,962,357**
Total Operating Expenses	**3,080,360**	**746,829**	**971,296**	**855,064**	**807,133**	**3,380,322**	**863,057**	**895,594**	**929,358**	**964,394**	**3,652,403**
Equity earnings (loss) from TransPacific Energy	-	-	(1,211)	(4,587)	(5,002)	**(10,800)**	(5,387)	(6,156)	500	2,500	**(8,543)**
Interest income (expense)	-	(2,250)	(2,518)	(4,487)	(4,000)	**(13,255)**	(5,000)	4,500	2,000	(2,500)	**(1,000)**
Goodwill impairment charge	2,800,000	-	-	-	-	**0**	-	-	-	-	**0**
Total Expenses	**5,880,360**	**749,079**	**975,025**	**864,138**	**816,135**	**3,404,377**	**873,443**	**897,250**	**926,858**	**964,394**	**3,661,945**
Pre-tax profit	**(3,671,657)**	**(716,777)**	**(961,654)**	**(855,972)**	**(805,697)**	**(3,340,100)**	**(734,603)**	**(673,000)**	**(555,758)**	**(399,144)**	**(2,362,505)**
Income (loss) before income taxes	(3,671,657)	(716,777)	(961,654)	(855,972)	(805,697)	**(3,340,100)**	(734,603)	(673,000)	(555,758)	(399,144)	**(2,362,505)**
Future income taxes (benefit)	(81,572)	(114,176)	(167,342)	(101,553)	(121,780)	**(504,851)**	(111,034)	(101,723)	(84,002)	(60,330)	**(357,089)**
Net income (loss)	(3,590,085)	(602,601)	(794,312)	(754,419)	(683,917)	**(2,835,249)**	(623,569)	(571,277)	(471,756)	(338,814)	**(2,005,416)**
Net income attributable to noncontrolling	(1,141,903)	(138,068)	(178,244)	(114,032)	(124,345)	**(554,689)**	(311,601)	(356,115)	(667,715)	(667,715)	**(2,003,146)**
Net income (loss) attributable to ForceField	**(2,448,182)**	**(464,533)**	**(616,068)**	**(640,387)**	**(559,572)**	**(2,280,560)**	**(311,969)**	**(215,162)**	**195,960**	**328,901**	**(2,270)**
Net income per common share (diluted)	**(0.16)**	**(0.03)**	**(0.04)**	**(0.04)**	**(0.04)**	**(0.14)**	**(0.02)**	**(0.01)**	**0.01**	**0.02**	**(0.00)**
Weighted average common shares outstanding - diluted	14,921,856	15,010,314	15,057,587	15,572,388	15,672,388	15,800,000	15,950,000	16,500,000	17,500,000	17,650,000	17,000,000

ForceField Energy, Inc.

Consolidated Balance Sheets

(in $ US) For the years ending May 31	2008 (May 31)	2009 (May 31)	2010 (May 31)	2011 (May 31)	2011 (Dec 31)	2012 (Sept 30)
ASSETS						
Cash and cash equivalents	705	4,190	598,468	640,880	674,291	698,117
Accounts receivable (net)	-	-	-	4,669,490	3,773,556	3,458,205
Note receivable	-	-	-	941,314	559,325	79,550
Inventory	-	-	-	563,579	657,287	414,972
Prepaid expense & other current assets	-	-	-	399,086	207,837	306,807
Current Assets	705	4,190	598,468	7,214,349	5,872,296	4,957,651
Fixed assets	-	-	-	7,559,369	7,890,132	7,610,479
Goodwill	-	-	-	3,357,277	608,953	2,093,878
Intangible assets (net)	-	-	-	3,025,489	3,142,997	3,479,190
Accounts receivable (net) - non-current	-	-	-	-	-	296,046
Related party receivables - trade	-	-	-	1,177,204	489,595	469,113
Other assets	-	-	-	248,879	21,737	21,764
Total Assets	**705**	**4,190**	**598,468**	**22,582,567**	**18,025,710**	**18,928,121**
LIABILITIES						
Accounts payable	4,813	143,741	149,538	5,320,381	3,333,500	3,130,953
Accrued liabilities	-	-	-	256,444	373,802	749,730
Advances payable	-	-	230,981	0	0	0
Advances from related party	-	20,836	0	0	0	0
Loans payable	-	-	-	-	-	18,100
Related party payables	-	-	5,671	5,535,149	5,665,245	5,654,726
Income tax payable	-	-	-	1,561,112	886,050	424,214
Current Liabilities	4,813	164,577	386,190	12,673,086	10,258,597	9,977,723
Long term debt	-	-	-	-	100,000	100,000
Redeemable common stock and capital	-	-	-	2,707,488	0	0
Share capital	26,760	26,760	27,312	29,437	30,006	15,850
Additional paid in capital	11,240	24,816	1,018,764	5,057,252	8,855,271	12,188,153
Retained earnings (deficit)	(42,108)	(211,963)	(833,798)	(1,253,344)	(3,701,526)	(5,422,514)
Accumulated other comprehensive income	-	-	-	100,896	280,024	300,585
FORCEFIELD'S SHAREHOLDERS' EQUITY	(4,108)	(160,387)	212,278	3,934,241	5,463,775	7,082,074
Noncontrolling interests - Equity	-	-	-	3,267,752	2,203,338	1,768,324
Total Liabilities and Equity	**705**	**4,190**	**598,468**	**22,582,567**	**18,025,710**	**18,928,121**
Common shares outstanding	26,760,000	26,760,000	27,312,500	29,436,928	30,005,628	15,849,737

HISTORICAL ZACKS RECOMMENDATIONS



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