

Spara Tech -Inventor

Tony Corrado

- Senior manager of advanced technology and system development at VP level with Fortune 100 firms
 - Raytheon, Robert Bosch, Gencorp, US Army
- Holder of multiple patents (16) issued in various fields with several pending applications

J LYONS MARKETING

- A technology marketing firm that gets new technology beta tested to prove out the merits can perform as claim
- The technology does the selling not JLM
- JLM has the “inside track” globally with OEM’s on new technology roadmaps
- A natural fit as external marketing partner
- JLM has 25 + years experience and relationships this includes M Flex
- JLM works mostly with European companies with high revenue that want to enter the US market. The ideal business model is to license the technology

Solar and wind power reinvented: latest news

Virtually all of the new grid capacity being added in the world is renewable or nuclear nowadays. Solar and wind met 10% of electricity demand in March 2017 in the USA. Hydro electricity from a wet spring season on the West Coast, which alone provided more than 10% of the nation's electricity, as well as biomass and geothermal power, all renewable energy sources combined met 24% of electric demand in March and if we add in the 20% we get from nuclear power, 44% of electricity demand in the USA was met with non-fossil fuel electrons. Norway and New Zealand have been almost entirely on renewable for some time.

Excitingly, both solar and wind are being reinvented and the new forms are typically pitched as replacements by unimaginative developers but they actually expand the market. They are complementary so existing proponents should not fear them - they should grab them.

Spara Tech

Spara Tech is offering to develop a unique thermoelectric solar design and manufacturing process compatible with Mflex in-house capabilities. Solar thermoelectric energy converts solar energy into electricity directly from the thermal spectrum. This design systems' primary advantage, compared to photovoltaics, is the low manufacturing cost. Solar thermoelectric energy converters can be used in many applications ranging from remote off-grid power generation to waste heat harvesting. The high efficiency solar panel offers lower cost than photovoltaics. The design has no expensive semi-conductive material and manufacturing is done with lasers and printed electronics as currently used to manufacture thermal electronic devices

Design Offers Lowest Manufacturing Cost

The thermal electric design requires limited capital investment as it requires modified existing processes that most contract manufacturers or solar modular firms currently have in-house

- **Sputtering equipment available from the two market leaders**
- **VON ARDENNE GmbH and Meyer Burger Global AG both from Germany**
- **Alternatively, the system can use printed electronics techniques as the three required metals are available in powder form and can be converted to conductive ink. The three metals are constantan, silver & copper.**
- **The lasers ideally work at room temperature for the etching, metal bonding and fabricating fluid cooling channels**

SOLAR ENERGY COLLECTOR EFFICIENCIES

Science Magazine for 15 April 2016 has an article on page 307 titled, “Photovoltaic materials: Present efficiencies and future challenges.” It first notes that the “Shockley-Queisser” model shows that the peak efficiency of any photovoltaic solar collector is 33.7%. The actual highest efficiency currently is about 21% for the best materials such as crystalline silicon and gallium arsenate. The article goes on to discuss future possible improvements of these and other materials.

The primary advantage of a copper-constantan thermocouple is that it is proven and has a lower manufacturing cost. The voltage output of each couple increases with the temperature difference between the contact between the three metals and room temperature. The voltage output has been shown to be 30 to 40 microvolts from each thermocouple. In addition, the hot water generated by cooling may be used to heat a home or other structure.

The net result can be an overall efficiency of the use of the incoming solar energy significantly higher than the S-Q limit of 33.7%. The main point is that **ALL** of the available solar energy is being used by the thermocouple effect system.

Richard S. Greeley, Ph. D. (Solar Consultant)

Thermoelectric energy generators have been shown to function in a myriad of patents.

- These patent all serve to prove the technology works as predicted.
- Institute Of Technology has a patent issue 2008 on solar thermoelectric conversion patent on the invention and a number of other companies have claims on generating electricity from thermal electric device .
- Spara -Tech, working with Mflex, would generate unique patents based on manufacturing patents pending focus it 's unique design as based on the manufacturing processes as well as several unique design elements.
- Spara- Tech can guide the licensee based on their in-house capabilities to get patents approval

Spara Tech Cost comparison

	Thermoelectric	Photovoltaic
Size:	24" x 24"	24" x 48"
Output:	160 watts	160 watts
Cost:		\$250 (sell price)
Costs:		
Glass:	\$4.50	
Metals:	\$3.50	
Deposition Processing:	\$24.00	
Glass Processing:	\$6.00	
Assembly Costs:	\$12.00	
Total:	\$50.00	\$125.00

Solar electricity cost, not solar module cost, is key

Module prices now make up less than half of the price of complete solar deployments at the utility scale. The bulk of the price of solar is so-called “soft costs” – the DC->AC inverter, the labor to install the panels, the glass and aluminum used to cover and prop them up, the interconnection to the grid, etc. Solar module costs are now just one component in a more important question: What’s the trend in cost reduction of solar electricity? And what does that predict for the future? Electricity cost is now coupled to the ever-decreasing price of technology. That is profoundly deflationary. It’s profoundly disruptive to other electricity-generating technologies and businesses. And it’s good news for both people and the planet.

Contract Manufacturing For Solar Panels

Flex's success may prompt other contract manufacturers to increase their efforts in energy. It also sets up an interesting dichotomy between the companies like Canadian Solar and First Solar that are more vertically organized and those that will be willing to deeply integrate contractors into their operations.

Why has Flex seemingly prevailed while so many other tech companies have stumbled in solar? Applied Materials invested billions in amorphous silicon, only to give up a few years later. TSMC closed its LED lighting and solar units this year. Samsung entered solar but the industry never felt the full brunt of its manufacturing might. Intel spun out, and wound down, a solar company. Part of the answer has to do with the nature of its business. It's a contract manufacturer, working behind the scenes to shave costs and ship in volume. Most of the other companies were trying to establish brands under their own name.

Flextronics (or Flex as it likes to be called.) Over the past few years the company has been steadily, and deliberately without a ton of fanfare, growing its solar business. The company produces solar panels for SunEdison and SunPower, among others. It has a collective manufacturing capacity of 1.7 GW, which, by its own estimation, makes it the largest solar panel maker outside of China with over 10 million panels shipped. By sheer manufacturing capacity, it probably ranks around number 7 in the world. Overall, the industrial and energy group generates about \$4.5 billion in revenue for Flex, or 17%

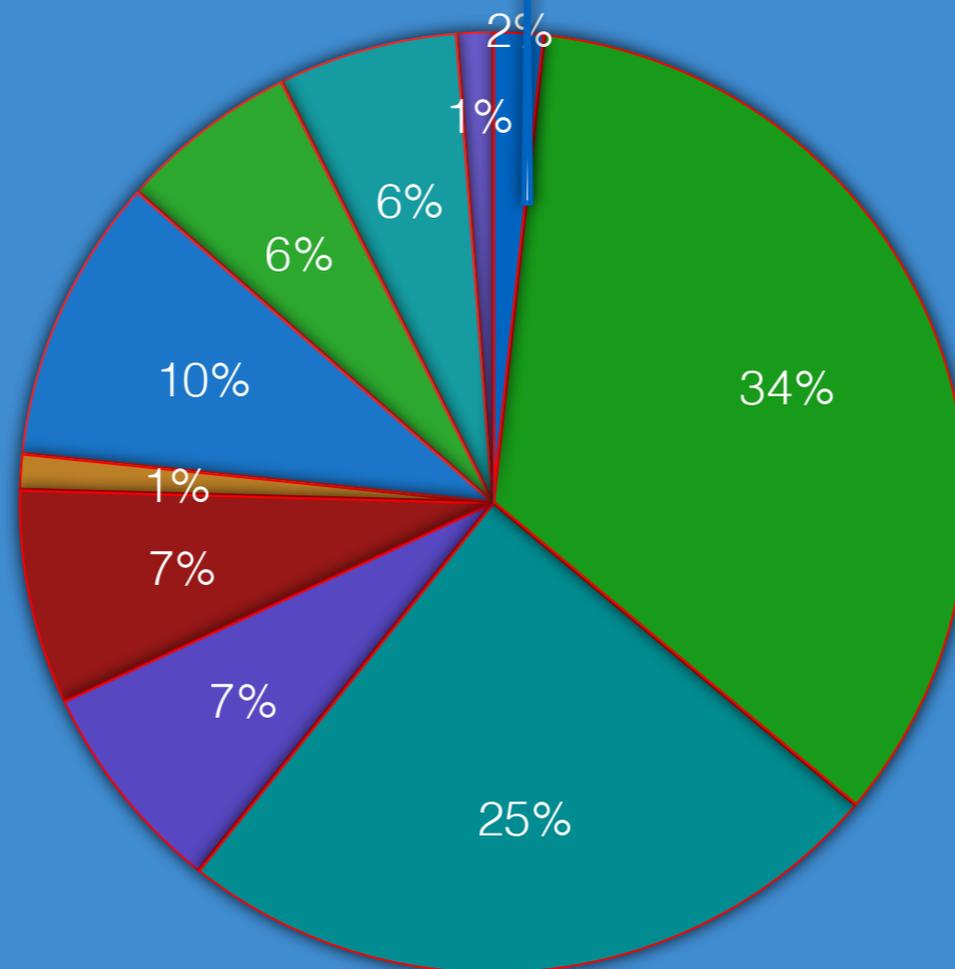
- Note MFlex can be the global licensee and even brand MFlex Solar

Top Ten Solar Modular Firms

- Telsa-Solar City did acquire Silevo (Tesla Gigafactory) request to see demo
- First Solar (under NDA)
- Canada Solar
- Hanwha Q Cells
- Solar Frontier (under NDA)
- Sharp
- Solarfun
- SolarWorld (under NDA)
- SunEdison (requested to see a demo)
- SunPower own by Total (under NDA)
- Trina Solar
- Yingli

Solar Modules Sales Revenue

First Solar	Canadian Solar	Hanwha Q Cells	Trina Solar	Sharp Electronics	Solarfun	Solar World	SunEdison	SunPower	Suntech
\$3B	\$2.8B	\$709M	\$2.4B	\$1.1B	\$1.8B	\$869M	\$2.5B	\$2.5B	\$631M



Summary

Strategically an MFlex license has a high upside potential for both parties.

- Spara Tech design manufactured by MFlex would validate the technology immediately
- The trend with solar modular OEM's is to outsource manufacturing
- With exclusive global marketing rights sub licensing would provide global presence
- A new technology approach must employ lower cost manufacturing and better performance.
- The Spare Tech prototype will provide “proof of principle”
- A working, manufacturing demo could be accomplished if directed by the inventor within several months
- We would require a letter of intent from MFlex, and based on the performance, it would be coupled to a license agreement