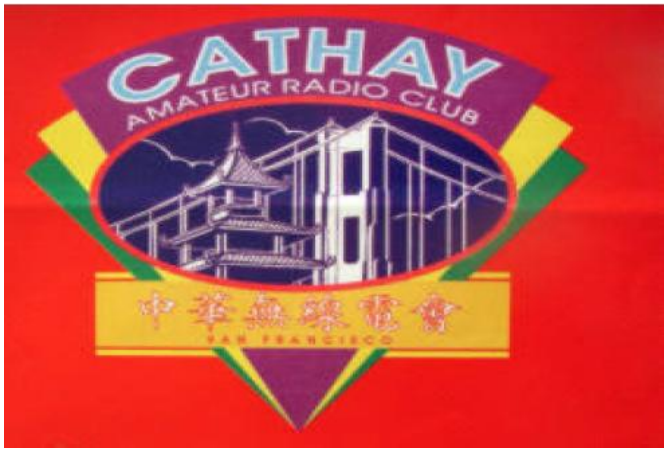


# Cathay April 2012

*www.cathayradio.org*

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**Web Master:** Edison Fong – *WB6IQN* - **email:** edison_fong@hotmail.com

**Mission:** The Cathay Amateur Radio Club is basically an active social club of Ham Radio Operators and their spouses. We support local community requests for HAM emergency communications. Several of us are trained in CPR/ First Aid and are involved with community disaster preparedness.

**Monday Night Net Time:** 9 PM PST, Frequencies: 146.67MHz -600KHz PL85.4 and 442.70 +5MHz PL 173.8. The repeaters are linked. The CARC Monday night net is the best way to find out the latest club news. All check-ins are welcome.

**Message from the President:** George Chong, *W6BUR*

I know you all had a choice of which HAM Bay Area Radio Club to join and I would like to thank you for deciding to join our Cathay Amateur Radio Club.

I also know that if I expect to keep you engaged with our Cathay Amateur Radio Club, we need to build a strong base of loyal and active members. I need your feedback to make sure you are completely satisfied with the direction that we have taken the Cathay Amateur Radio Club toward new initiatives and club activities.

I believe it is my job to acknowledge and welcome you in a friendly manner. I shall take the time to listen to you and take the extra effort to understand your requests. Our overall goal is to provide for each of you to have an enjoyable HAM radio experience and that your opinions and ideas are very much valued.

The opening page of our CARC newsletter states that we are an active social club of HAM Radio Operators and their spouses. In the March 2012 CARC newsletter, I requested your inputs on any social outings and ideas. I suggested a couple of ideas: the Hiller Air Museum at the San Carlos Airport and the other was (a computer start up) in San Jose. Your response was earth shaking and the numbers were equal, I won't ask you to vote again on which one of the two we will start out with. The decision will be to eventually visit to both locations within the time frame of how busy and available they are for us. I would like very much to see if it is feasible to schedule in such an outing between now and the June CARC Field Day Pot Luck.

In our current issue of the CARC newsletter as you travel though these pages and come upon page 7, you DX'ers will truly enjoy the spot light on our very own CARC unsung hero: Mingie, W6EE. My thanks go out to Bart Lee, K6VK for pointing out the extraordinary accomplishment that Mingie W6EE has performed on behalf of the HAM community.

For you technically minded folks, check out page 8, an exciting new revolutionary breakthrough on Lithium Ion batteries that offer a 160% increase in energy density over the current industry standard. The applications of this new Lithium Ion batteries spans across us HAMs and into many other industries. More details are just waiting for you to satisfy your curiosity, just read it. Your editor Rodney – KJ6DZI is responsible for helping to organize these nuggets of information for our CARC newsletter. Rod did it again! Thank you.

In the last issue of the newsletter I posed a trivial question for you to mull on. For your convenience, I have repeated the question below:

**About The Evolution of Building of Electronic Circuits:**

Are any of our members into constructions of simple circuits? For me it's been years since my last projects along that line. When I did it, I had to learn to drill holes and punch metal chassis for radio tubes. I had to run the wires between the sockets and components. I also bolted on

heavy transformers to power circuits. **Well, we don't do that anymore!**

After a while then came along solid state devices such as the transistors that utilize the printed circuit board (PCB). Now we had to learn to drill very tiny holes into the printed circuit board (PCB) to mount the solid state devices. **Well, we don't do that anymore!**

For us hobbyist HAMs, having to drill all those holes to mount our electronic components was a PITA (pain in the ass). **Well, we don't do that anymore!**

Now here comes the Surface Mount Component (SMC). Now you are all wondering what in the heck is that thing? SMCs do not need drilling as these are like the size of a grain of rice, only smaller. Now try to solder those tiny SMC onto a printed circuit board! The soldering iron tips are much smaller to work with SMCs. Although it can be done, it takes a whole lot more time and patience to work with SMCs. Do you love the smell of melting solder on your hot soldering iron? **Well pretty soon we won't be doing that anymore!**

I recently read a blog of a very clever idea of how we can soldering all those little grains of rice size SMCs without touching them with a soldering iron. Wow, what a great idea! I just absolutely love it! There is more to come about that in an upcoming newsletter now that I wetted your appetite.

As promised for this issue of the CARC Newsletter, I have provided you with the answer to working with SMCs in the explanation below.

My Fellow HAMs;

It is hard to believe that the technique of soldering SMCs have been in use for well over 10 years. When you think back, when was the last time you looked at the exposed circuit board on your hard drive?

As far as I can remember I do not ever recalling seeing the normal set of resistors and capacitors surfaced mounted with leads on them. It's probably due to the fact that I have not been into PC that long.

The quick and short answer to the March 2012 newsletter tease on soldering those SMD/C devices is called Reflow Soldering.

The technique is simple and the pros do it by using a modern solder paste that is a mixture of microscopic spheres of solder mixed in with a semi-liquid, viscous flux.

A small dab of soldering paste is placed on each pad of the PC board followed by placing the SMC component onto the pads.

When all the components are in place, the entire printed circuit board is placed into a special oven. The oven carefully heats the PC board and components to 188 °C / 217 °C (lead solder/non-lead solder), the solder paste mixture becomes a liquefied solder. Once the PC board cools down, every component gets solder together all in one shot and you're done! Now that was pretty quick and easy.

And I didn't even have to remember to plug in my pencil soldering iron.

With this new technique; it'll be a while before I can repeat the statement: **"We don't do that anymore".**

This tidbit of information was in last year's QST article by Jim Koehier, VE5FP

Item of trivia:

Item 1. "Linsanity" has spread to the Far East, China sez.....Taiwan sez he is Chinese. But only the folks in the USA correctly point out that Jeremy Lin is in fact: Chinese American!

Item #2. The Peltor Company has done it again: ORA TAC, a pair of PTT head sets for your HT that has no microphone, but that will allow you to communicate without picking up extraneous noise.

Does anybody have any comments about this new product?

For more information on this new product, please visit website: http://solutions.3m.com/wps/portal/3M/en_US/OHESD-Survey/ORATAC/

Thanks for paying attention. I did not mean for my message to be so long. It is just that I got carried away from being so darn pleased at being able to reconnect with the CARC membership via the revived newsletter.

Chat sub s'em to all you CARC members!

- George W6BUR.

## Public Service Announcements

**American Red Cross Bay Area Chapter: Offering FREE Save-A-Life Courses – April 14, 2012 at the following times: 9 am, 11am, and 2pm (depending upon location)**

American Red Cross is conducting free presentations on learning crucial lifesaving skills in disaster preparedness, basic first aid, and hand-only Citizen CPR.

The presentations are offered throughout the Bay Area (San Francisco, Oakland, North Vallejo, San Rafael, East San Mateo, East Palo Alto, and Richmond) non-certified, shortened version of Red Cross Training course, lasting approximately 1.5 hours. The presentation will be repeated multiple times throughout the day and at some locations be in languages other than English.

A Save-A-Life April 14, 2012 presentation will be conducted in the Cantonese language at 9am, 11am, and 2pm at the following location:

Salvation Army Chinatown
1450 Powell Street
San Francisco, CA 94133

For on-line signup and available seats for the San Francisco Chinatown presentation signup see link:
http://www.redcrossbayarea.org/class_view.asp?nroClass=3570&SN=4979&OP=5528&IDCapitulo=VA24T92924&languages=Chinese

To register for the presentation via phone please call (415) 427-9811.

To register via on-line (except for Chinese language, see above) please visit:
http://www.redcrossbayarea.org/savealife

**Tony – KR6EG**

The Auxiliary Communications Service holds General Meetings on the third Tuesday of each month at the San Francisco Emergency Operations Center, 1011 Turk Street (between Gough Street and Laguna Street), from 1900 hours to 2100 hours local time. All interested persons are welcome to attend.
**Upcoming meetings: Tuesday 7pm, April 17, 2012**

**SAN FRANCISCO NEIGHBORHOOD EMERGENCY RESPONSE TEAM (SF NERT) Announcement**

April 7th: Staging area drill

Put your ICS to practice. This is great preparation for the April drill on April 14th.
8:30am-1:00pm, SFFD DOT*
Register: http://nertstagingoperationsapril2012.eventbrite.com/

**April 14th: NERT Citywide drill**

8:30am-1:30pm, Everett Middle School, enter on 17th near Sanchez
limited parking available. RSVP with NAME, EMAIL, PHONE, &
NEIGHBORHOOD. Email: NERTAprildrill2012@hotmail.com

April 18th: Lotta's Fountain commemorating the Anniversary of the 1906 quake,
4:45am, 3rd and Market St

April 25th: NERT Coordinators and Leadership meeting, 6:30pm-8:30pm,
SFFD Division of Training (DOT*)

* SFFD DOT is the Division of Training @ 19th Street/Folsom. (enter through yard on 19th and park along back wall). Division of Training classroom is in the 1-story building directly next to the Fire Station on the corner.

**Gilbert – KJ6HKD**

## Oakland Chinatown Citizens on Patrol program is looking for a few good volunteers.

A volunteer staff is gearing up to make the Oakland Chinatown neighborhood safe for its citizens. The program called “Oakland Chinatown Citizens on Patrol” is endorsed by the City of Oakland.

The volunteer staff will work with the Oakland Chinatown Neighborhood and the Oakland Police Department to be the “eyes and ears” of the community. The volunteers will patrol the neighborhood and use radios to relay timely eye witness accounts of any criminal activity.

The program is looking to be up and running this late April / early May 2012 and is looking for HAMs to be among its ranks of volunteers.

To apply please obtain an application from the Oakland Police Department’s Chinatown Office (360-A 8th Street Oakland, CA 94607). For additional information email: OCCOPS@gmail.com

## HAMs In The News:

CARC member, Bart Lee (K6VK) has brought to my attention that **Vince Chinn – W6EE**, one our very own CARC member has done remarkable things for the HAM Community over these many years.

Among Vince Chinn's many accomplishments: He is one of the Founding Fathers of the organization known as the **Northern California DX Foundation** - NCDXF (http://ncdxf.org/index.html).
NCDXF is indebted to its very existence upon Vince Chinn a hand full of dedicated and extraordinary HAMs.

Taken directly from the Northern California DX Foundation website, please see below.

**Overview**

The Northern California DX Foundation (NCDXF) is a private foundation founded in 1972 to assist worthwhile amateur radio and scientific projects with funding and equipment.

**History**

It's 1972 in San Francisco. Four avid DXers met in the kitchen of **Vince Chinn**, then K6KQN and now W6EE, to discuss Vince's idea for a foundation that would qualify as a tax-exempt entity based upon its educational and technical contributions. Vince's idea was that a foundation could be established to encourage tax-deductible contributions from DXers that would be used to support DXpeditions to new and rare countries, help with the QSL chores, and perhaps help with radios and other equipment that would bring new ones on the air.

Vince thought that maybe 20-25 DXers would be interested in helping provide the funding. Jack Troster, W6ISQ, Lee Shaklee, W6BH, and Don Schliesser, K6RV, sitting around Vince's kitchen table, all thought it was a great idea and each contributed $100 as seed money to get the organization going. Shortly thereafter, Lee, W6BH, made a substantial contribution of shares in his company and NCDXF was off and running.

In the decades since its formation, NCDXF has become the premier DX foundation in the world. We are supported by amateurs from almost every country and approximately 1,000 newsletters are sent to contributors twice a year. Our ranks swell by 40-50 new contributors each year, making possible NCDXF's principal activities.

**DXpedition Support**

In keeping with the original goal of the founders, NCDXF has supported over 500 DXpeditions, large and small. For the expensive "mega" DXpeditions, NCDXF is often the "anchor" sponsor and its grant often makes the difference in whether the DXpedition goes forward.

**International Beacon Project**

In 1979 the NCDXF Board launched the NCDXF/IARU International Beacon Project to provide a mechanism for amateurs around the world to learn and understand more about radio propagation. The first beacon was designed by James Ouimet, K6OPO and Dave Leeson, W6NL. W6NL obtained the necessary licenses from the FCC. The first beacon went on the air signing WB6ZNL on 14.100 MHz.

The current beacon system has transmitters in 18 countries, transmitting for 10 seconds on each of five bands using Kenwood TS 50s radios. The beacon system is governed by a Beacon Committee of Peter Jennings, AB6WM/VE3SUN, Steve Lund, K6UM, and Charlie Mason, W4NJK. Steve Merchant, K6AW, is the Board liaison to the Beacon Committee. The entire Beacon Team is currently engaged in a project to upgrade the Beacon system over the next three years.

**Education**

In 1997, Don Doughty, W6EEN (SK), made a substantial contribution to NCDXF and designated the funds to establish an Educational Fund. Through 2010, NCDXF has awarded over 18 scholarships to college students in amounts ranging from $ 1,000 to $ 2,000.

**Financial Support**

In addition to his initial contribution, Lee Shaklee has made matching grants for various NCDXF activities. Our Beacon partners, the three IARU Regions, make annual grants to the Beacon project to help defray the ongoing expenses of maintaining the Beacon system, as well as providing invaluable counsel on matters relating to the location and operation of the Beacon project.

But our primary source of funds comes from our loyal group of contributors who contribute year after year. We could not do what we do without them.

The NCDXF Board is responsible for overseeing all of NCDXF's activities. The Board members, and the volunteer advisors who assist them, all hold or have held responsible positions in the business, legal and academic worlds and are all active DXers. NCDXF has no paid staff and no officer, director or advisor receives any form of compensation.

# Featured Tech Article:

## Startup Announces Big Breakthrough for Electric Vehicle Batteries

http://www.mercurynews.com/business/ci_20051131?IADID

By Dana Hull email: dhull@mercurynews.com

Posted: 02/27/2012 02:12:56 PM PST Updated: 02/28/2012 11:14:38 AM PST

For years, the electric vehicle industry has been eager to build a better electric car battery: one that extends range while having a longer overall life that is affordable, quick-charging and safe.

Now Envia Systems, a start-up based in the East Bay city of Newark, plans to announce Monday that it has achieved a critical milestone: a rechargeable lithium-ion battery with an "energy density" of 400 watt-hours per kilogram, the highest energy density known to be recorded.

When commercialized, Envia says the 400 wh/kg battery, with a range of 300 miles and a cost of about $25,000, will slash the price of electric vehicles and make them more affordable for mainstream consumers.

“My dream is to build an automotive supply-chain for the electric car in the United States and reduce our dependence on foreign oil," said Envia CEO Atul Kapadia in an e-mail Sunday.

Envia will make its announcement at the ARPA-E Innovation Summit in Washington, D.C. Monday. The start-up received a $4 million grant from ARPA-E in December 2009 to develop advanced lithium-ion batteries for electric cars. It went on to raise $17 million in venture capital from General Motors Ventures, Bay Partners, Redpoint and Pangaea Ventures.

"Envia's new battery technology represents exactly the kind of innovation and breakthroughs that ARPA-E is looking for from the American research and development community," said ARPA-E Director Arun Majumdar in a prepared statement "We hope that this low cost and high density battery technology enables widespread adoption of electric vehicles across the country and around the world."

Batteries are complex systems that convert stored chemical energy into electricity. Researchers say advances often involve trade-offs: improving range may result in skyrocketing costs, or a shorter battery life.

Measured as kilowatt hours per kilogram or liter, "energy density" determines range: The more watt hours, the more miles a car can travel on a single charge. Low-cost, high-energy density batteries are the Holy Grail.

Battery costs are expected to come down due to volume manufacturing, but energy density has been a much harder goal to achieve.

Kapadia said that Envia's hard-working team of engineers developed the technology from scratch. After testing the battery in-house, additional testing was performed by the Electrochemical Power Systems Department at the Naval Surface Warfare Center in Indiana.

The company is now in discussion with auto manufacturers.

"Rather than just a proof-of-concept of energy density, I am pleased that our team was successful in actually delivering 400 Whkg automotive grade 45 Amp-hour lithium-ion rechargeable cells," said Sujeet Kumar, Envia's co-founder and CTO, in a prepared statement.

The Tesla Roadster, Nissan Leaf and Chevrolet Volt all use some form of lithium-ion chemistry in their batteries. First commercialized by Sony in 1991, lithium-ion batteries are widely used in consumer electronics such as laptops and cell phones but are relatively new in cars

The Bay Area -- home to Palo Alto-based Tesla Motors (TSLA), the Lawrence Berkeley National Laboratory and at least two dozen battery startups -- has emerged as one of the nation's leading hubs of battery innovation.

The basic guts of a battery include a negatively charged anode, a positively charged cathode and the electrolyte. When a battery is fully charged, the lithium ions are concentrated in the anode. As the battery discharges, the ions flow to the cathode and current flows through the electric circuit, releasing energy.

Many battery startups are experimenting with battery chemistry; Envia started with the cathode, moved on to the electrolyte and then the anode.

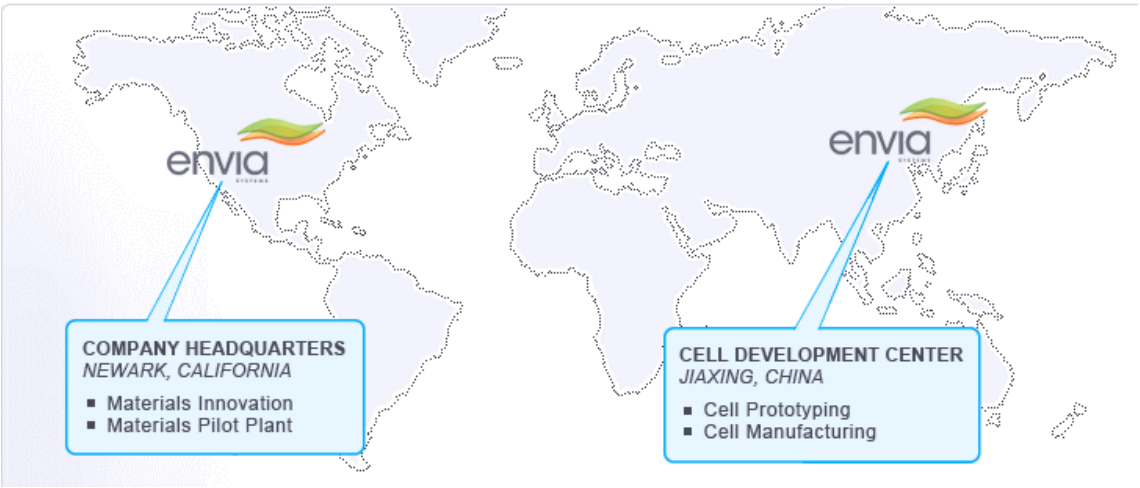
While there's been talk in the industry of moving "beyond lithium" and using new materials, many expect lithium-ion batteries to remain dominant in the coming decades.

"The rumors of the demise of Li-ion batteries were greatly exaggerated," said Kapadia.

For more information, go to: http://enviasystems.com/announcement

# About: Envia Systems

http://enviasystems.com

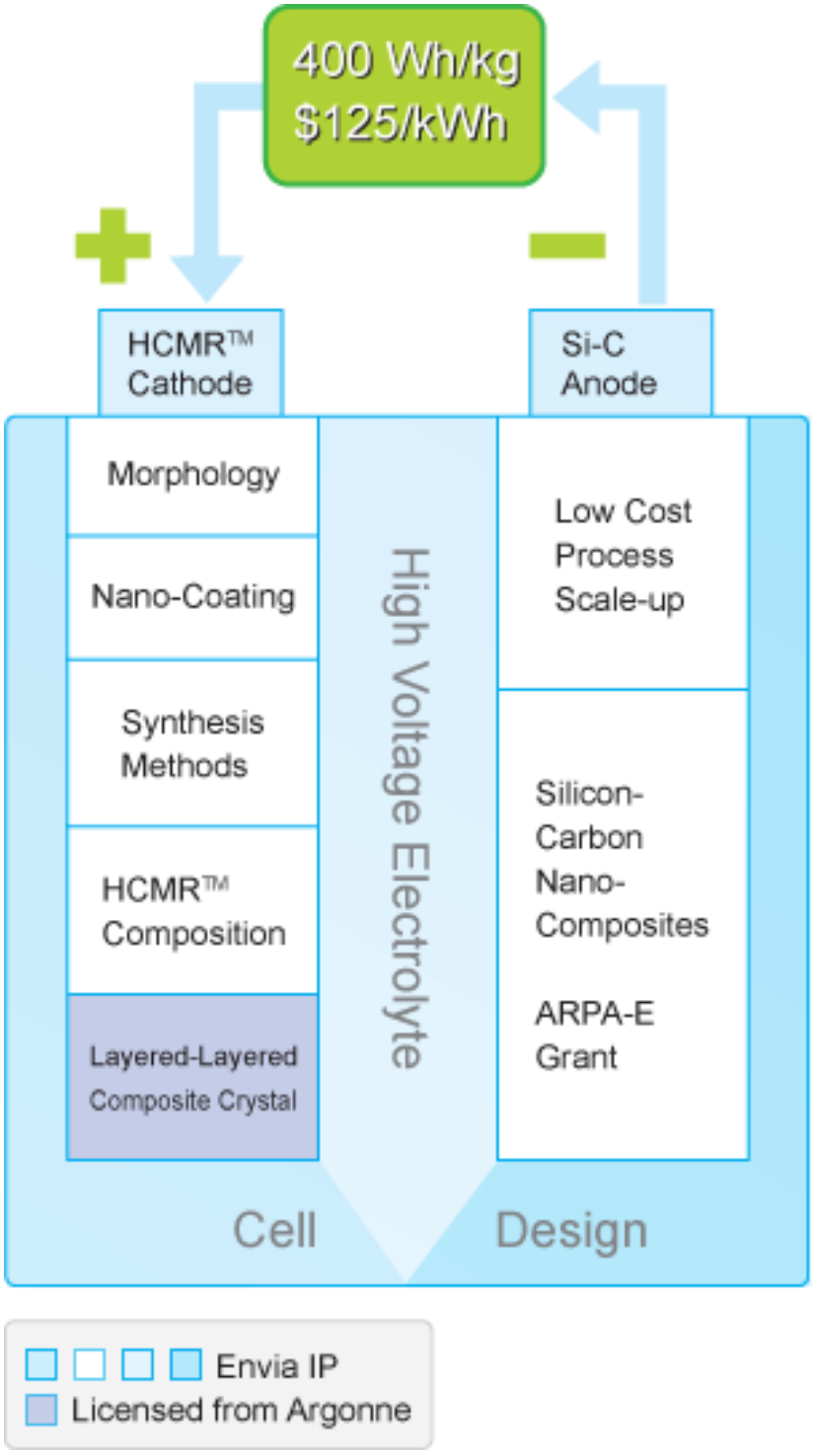



Envia Systems was founded in July 2007, and its headquarters are located in Newark, CA, which houses its materials innovation lab and a pilot production facility for fabrication of battery materials.

Its cell prototyping and manufacturing plant is located in Jiaxing, China. The company's management team has decades of experience in lithium battery development and manufacturing, which it has leveraged to develop its patented nanocomposite technology that enables its batteries to deliver previously unattainable levels of energy capacity, safety and life.

**Atul Kapadia, Envia Systems Chairman & CEO stated:** "In an industry where energy density tends to increase five percent a year, our achievement of more than doubling state-of-art energy density and lowering cost by half is a giant step towards realizing Envia's mission of mass market affordability of a 300-mile electric vehicle."

**Dr. Sujeet Kumar, Envia Systems Co-Founder, President & CTO stated:** "Since the inception of Envia, our product team has worked tirelessly and logged over 25 million test channel hours to optimally develop each of the active components of the battery: Envia's proprietary Si-C anode, HCMR cathode and EHV electrolyte. Rather than just a proof-of-concept of energy density, I am pleased that our team was successful in actually delivering 400 Wh/kg automotive grade 45 Ah lithium-ion rechargeable cells. "


400 Wh/kg
$125/kWh
HCMR™ Cathode
Si-C Anode
Morphology
Nano-Coating
Synthesis Methods
HCMR™ Composition
Layered-Layered Composite Crystal
High Voltage Electrolyte
Low Cost Process Scale-up
Silicon-Carbon Nano-Composites
ARPA-E Grant
Cell
Design
Envia IP
Licensed from Argonne

*Project Manager: Dr. Herman Lopez, Director of Materials Development*


The Envia Systems cells are prototype lithium pouch rechargeable cells. The cells have a capacity of 46 Ah and an energy density of 400Wh/Kg. The cell's dimensions are approximately 97 mm wide, 190 mm long and 10 mm thick. The cell's approximate weight is 365 grams. Cell serial numbers are 400WhK-07-005-111205 (designated as 005) and 400WhK-07-006-111205 (designated as 006).

1. One of the highest energy cells used in consumer applications is the NCR18650A manufactured by Panasonic, which can be used as a comparative asset to the Envia cells. The NCR18650A cell specification claims 3100 mAh capacity, 3.6 V average and weighs 45.5 grams. The calculated energy density of this comparative cell would be approximately 245 Wh/Kg.

2. The claims of 400 Wh/Kg were substantiated through the cycling tests performed at Crane. This is a 160% energy density increase over the industry standard indicated in the above paragraph.