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# SILVER NEWS

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FOURTH QUARTER 2009

## 24,000 Silver Mirrors Generate 5 Million Watts

By Samuel Etris, Senior Technical  
Consultant to The Silver Institute

“Today, we unveil a new blueprint for solar energy,” said Bill Gross, [eSolar's](#) Chief Executive Officer at the late summer opening ceremony of the company's first solar-to-electricity plant near Lancaster, California. “Sierra SunTower solar power is just the beginning. Soon, eSolar technology will be deployed worldwide to provide clean, affordable energy to hundreds of thousands of homes.”

Sierra SunTower's plant has 24,000 one-square-meter mirrors and a computer program individually turns each mirror to perfectly reflect the sun's energy onto a heat-collecting SunTower from dawn to dusk. The silver-coated mirrors reflect the heat from the sun, raising the water temperature in the tower to superheated steam. The steam spins a turbine whose generator at peak power provides some 5 million watts, enough to power 4,000 homes.

Silver, being the most reflective metal - over 97 percent of the solar energy is reflected - makes a major contribution to the efficiency of the solar-heat collecting system. The plant saves some 650,000 gallons of oil and reduces carbon emissions by about 7,000 tons per year. About five million ounces of silver are used for all mirrors in the United States each year.

The output of eSolar is delivered to the California electric power grid through a power purchase agreement with Southern California Edison, one of the nation's largest utilities.

eSolar has completed a licensing and development agreement with NRG Energy, Inc., and together the two companies plan to build three additional power plants in California and New Mexico to generate up to 465 million watts of electricity, enough to power nearly 375,000 homes.



ESOLAR

Silver-coated mirrors improve the efficiency of eSolar's Sierra SunTower facility.

## Silver Price Expected to Bump Above \$20: GFMS

The silver price is expected to rise above \$20 in the short term because of continued investment interest. However, even if investment were to wane in 2010, the price will still be supported by an expected recovery in fabrication demand as global economies grow, according to a presentation made by GFMS Ltd. in November.

Overall fabrication demand may fall by almost 11 percent due to poor global financial conditions but 'fair recovery' is expected in 2010.

GFMS also noted that:

- Fabrication, on a combined basis, is forecast to rise by nearly 2 percent in 2009. Silver has benefited in several important jewelry markets from substitution at gold's expense. Some of the rise in fabrication reflects an increase in trade stocks in India, where surging local prices have constrained final demand from consumers.
- Coinage has risen strongly this year, with a full year gain forecast for 2009 of about 19 percent. (See the related story in this issue: *American Silver Eagle Bullion Coins Set Record Sales.*)

- Total supply to the market is forecast to be virtually unchanged year-on-year in 2009. Marginal growth in mine production is being offset by lower supply from scrap and government sales.
- Mine production is forecast to rise moderately by some 12 million ounces or almost 2 percent this year.

[GFMS Ltd.](#) is a London-based consultancy that specializes in research into the global precious metals, base metals and steel markets.



## Silver Adds Anti-Bacterial Power to Charcoal Filters

Taiwan-based Lin Horn Technology Co., Ltd. has launched a process that can place nanosilver particles in bamboo charcoal's tiny orifices, allowing them to be used in products such as masks, protective clothes, medical gauze, gas masks, humidifiers and air conditioner filters.

Silver prevents the buildup of dangerous microbes in these products while maintaining charcoal's deodorizing and dust filtration abilities. The company has patented the material in many countries including the United States, Germany, Japan and China. Officials say they are talking with a European company to supply them with anti-bacteria filters.

The product is certified by the Industrial Technology Research Institute (ITRI) in Taiwan, a national research organization that promotes the country's technological competitiveness.

## American Silver Eagle Bullion Coins Set Record Sales

With one month left to count in 2009, one-ounce, American Silver Eagle coins have already sold a record 26 million units, and they could be on track to break 30 million if recent increases in sales are any indication. Already, this year's sales eclipsed 2008's record of 19.6 million coins..

The rise in demand is coming mainly from consumers who value silver as a storehouse of wealth especially in these economically uncertain times.

Silver's 2009 price has risen to the November Comex average of \$17.86 from the January average of \$11.39 an ounce, a 57 percent gain. Historically, silver's price also tracks gold, which has been on a tear during 2009, but has only risen 36% in the same period.

Because of blockbuster demand, the US Mint announced in October that it would suspend issuance of 2009 Proof Silver Eagles and 2009-W Uncirculated Silver Eagle coins. In a notice to authorized dealers, Mint officials stated: "Because of unprecedented demand for American Eagle Gold and Silver Bullion Coins, the United States Mint suspended production of 2009 proof and uncirculated versions of these coins. All available 22-karat gold and silver bullion blanks are being allocated to the American Eagle Gold and American Eagle Silver Bullion Coin Programs..." The Mint last year briefly suspended Eagle coinage last year in because it was having difficulty keeping up with the unprecedented demand.

Silver American Eagle Bullion Coins were authorized by Congress in 1985 with the first production run beginning in 1986.



U S M I N T

## Micro-Cubes Produced by Silver Molds Hold Promise for Precise Drug Delivery

Micro-sized 'smart capsules' that can be implanted under the skin and opened and closed – when laser beams are pointed at them – releasing just the right amount of medicine at an exact location have been the subject of research and development for almost ten years. Now, scientists at Washington University in St. Louis have their own method for producing these capsules that uses the unique characteristics of silver.

Writing in the November online issue of *Nature Materials*, Younan Xia and his colleagues note that the first step in making a smart capsule is to mix silver nitrate with other chemicals that precipitate out solid silver and produces sharp-edged nanocubes. Next, the silver nanocubes are heated in chloroauric acid which dissolves the silver nanocubes leaving a gold skin on the cubes which have since become hollow. The cube's edges are now cut off.

Medicine can be placed inside these cubes and when hit and heated by infrared laser light – which often can penetrate the human body several inches deep – its corner pores, covered by a thinner gold skin, open allowing the medicine to leach out in precise amounts. When the light stops, the holes close.

In one experiment, the laboratory team filled capsules with doxorubicin, a chemotherapy drug, and triggered its release with a laser beam. In another test, a bacteria-killing enzyme was unleashed to destroy common bacteria found in human mouths and throats.

One hope is that the nanocubes can be made to bind with tumors. By injecting the micro-cubes filled with chemotherapy drugs, they will find the tumor, stick to it, and release their drugs upon command. The dosage can be adjusted by changing the intensity and duration of the light beam.

## Adding Nanosilver to Solar Cells Produces More Electricity at Lower Costs

Adding small pieces of silver to the semiconductors in solar cells boosts the material's electric current generation, according to researchers at Ohio State University.

The researchers, led by Professor Paul Berger, noted that without silver the material produced 6.2 milliamperes (6.2 thousands of an ampere) per square centimeter, but when nanosilver particles were added the current rose to 7.0, about a 12 percent increase.

Berger said that silver particles help the semiconductor polymer capture a wider range of light wavelengths than normal which then increases the electrical output. "The light absorption of polymer solar cells is inadequate today," he told *Research News*, a publication of Ohio State. "The top-performing materials have an overall efficiency of about 5 percent. Even with the relatively low production cost of polymers compared to other solar cell materials, you'd still have to boost that efficiency to at least 10 percent to turn a profit. One way to do that would be to expand the range of wavelengths that they absorb. Current polymers only absorb a small portion of the incident sunlight."

Berger suggests that encasing silver particles in an ultra-thin polymer layer before depositing them under the light-absorbing polymer in the solar cell prevents the silver particles from clumping, but also allows them to form a pattern that enhances light absorption. He is studying different patterns to see which ones offer the best increase in electrical production.

Because the technique can be done at room temperature and with relatively simple equipment, it holds promise for producing more efficient solar cells at lower cost.

## Scottish Government to Test Silver-Based Treatment for Incoming Hospital Patients; Goal is to Stop MRSA Before it Enters Health Care Facilities

Ayr-UK based Giltech, Ltd. is working with Scottish health authorities to develop silver-based products to beat Methicillin-resistant *Staphylococcus aureus* or MRSA, the bacterial infection endemic in many hospitals. It causes serious illness and death, is increasingly difficult to treat and has a significant impact on healthcare costs.

In the UK, it is estimated that 300,000 patients will develop a hospital acquired infection annually, and it will be the leading cause of death for over 5,000 patients. Because of the difficulty in treating MRSA, the Scottish government has mandated a 'MRSA decolonization program' across Scotland designed to screen patients for the disease before they enter a healthcare facility. Dr. Masterton, Executive Medical Director – NHS Ayrshire & Arran, said of the program: "Staphylococcus aureus is a common germ that around one in three people have in their nose or on their skin, and MRSA is just a variant that is resistant to particular antibiotics. Normally, neither sort does us any harm – but they can cause infections in people who are already unwell. Because MRSA is resistant to some commonly used antibiotics it is harder to manage – but it can be treated."

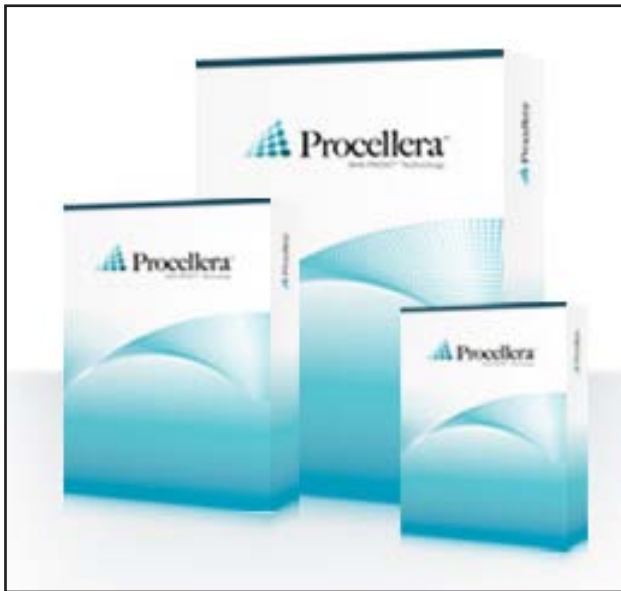
Currently, if a patient receives a positive result during screening (seven percent of patients admitted to hospitals may have the MRSA bacteria on the surface of their body, says Masterton), then the patient is prescribed an antibiotic nasal ointment and an antiseptic body wash to use over a three-day period in an attempt to kill the MRSA microbes carried naturally in certain parts of the body.

Unfortunately, these washes can produce adverse skin reactions and repeated use can render them ineffective as the MRSA microbe continuously is growing resistant to antibiotics.

Giltech officials believe that by creating a nasal cream and body/hair shampoo containing pure silver ions they can offer a more effective MRSA treatment with few or no side effects. Most important, because of the way in which silver ions kill microbes – by destroying the cell's structure – germs can not grow resistant no matter how often silver is employed.

Trials are expected to begin in summer 2010.

## Bandage Uses Silver to Produce its Own Healing Electricity



PROCELLERA

The Procellera bandage uses silver and zinc particles to produce small amounts of electricity to hasten healing.

When you receive a wound, the body generates small electrical currents around the area to help attract healing cells to the area. In addition, artificially induced, low-level electrical currents can further hasten healing by attracting even more cells to the area.

Now, a company has produced a bandage containing silver and zinc that produces its own electricity when moistened with the body's fluids, including saline. When the bandage is activated, positive and negative-charged cells produce electrical current at the injury site. This current is necessary for the initiation of wound healing and the transport of cells to the wound site.

In addition, microbes are attracted to the positive pole because gram negative and positive microbes carry a negative charge. All microbes, therefore, are attracted to the positive pole containing silver where they are destroyed. Silver also kills viruses and fungi.

The [Procellera](#) bioelectric dressing with Prosit technology has been cleared by the US Food and Drug Administration for health professional use for acute and chronic wounds such as pressure ulcers, burns, surgical incisions and graft sites.

### For Future Reference Silver Prices 1980-2009

2009	High	Low	Average
Nov	18.77	16.43	17.86
Oct	17.89	16.17	17.17
Sept	17.41	15.04	16.50
Aug	14.98	13.87	14.40
July	13.99	12.64	13.38
June	15.95	13.57	14.62
May	15.60	12.48	14.11
Apr	13.02	11.79	12.50
Mar	13.86	11.95	13.09
Feb	14.49	12.30	13.41
Jan	12.56	10.42	11.39

2008	High	Low	Average
Dec	11.39	9.35	10.32
Nov	10.46	8.80	9.78
Oct	12.72	8.79	10.39
Sep	13.46	10.46	12.22
Aug	17.48	12.80	14.48
July	19.18	17.25	18.07
June	17.62	16.46	17.01
May	18.24	16.12	17.01
Apr	18.31	16.50	17.48
Mar	20.69	16.81	19.16
Feb	19.81	16.30	17.66
Jan	16.95	15.17	16.05

Year	High	Low	Average
2008	20.69	8.79	14.97
2007	15.50	11.47	13.38
2006	14.85	8.82	11.62
2005	9.00	6.43	7.32
2004	8.21	5.51	6.67
2003	5.98	4.35	4.89
2002	5.11	4.22	4.60
2001	4.81	4.03	4.36
2000	5.55	4.56	4.97
1999	5.76	4.87	5.22
1998	7.26	4.62	5.51
1997	6.34	4.16	4.88
1996	5.82	4.68	5.18
1995	6.10	4.38	5.19
1994	5.78	4.57	5.28
1993	5.44	3.52	4.30
1992	4.32	3.63	3.94
1991	4.55	3.51	4.03
1990	5.35	3.94	4.82
1989	6.20	5.02	5.47
1988	8.06	6.01	6.53
1987	11.25	5.35	6.99
1986	6.32	4.85	5.49
1985	6.89	5.48	6.14
1984	10.17	6.25	8.15
1983	14.74	8.38	11.46
1982	11.30	4.81	7.93
1981	16.53	7.97	10.53
1980	50.35	10.20	20.66

(COMEX settle)

#### The Silver Institute El Instituto de la Plata

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