

2009 North American Wireless Technologies Green Excellence of the Year Award**Aerius International, Inc.**

The 2009 Frost & Sullivan North American Green Excellence of the Year Award in the field of wireless technologies goes to Aerius International in recognition of its development of a breakthrough cell phone antenna design that increases cell phone battery life by 2 to 4 hours, increases handset range, and single cell coverage area significantly while reducing the frequency of dropped calls. By allowing cell sites to work efficiently by using up to 50% less power, this technology, when widely deployed, has the potential to reduce cell site CO₂ emissions by up to 1.2 million tons per year just in the United States. The increase in coverage area would also mean reduced infrastructure costs, thereby aiding governments and cell-site operators around the world looking to expand their rural wireless coverage.

Company Background

Aerius International is a cell phone engineering, product design, and marketing start-up with facilities in California and Nevada. The company has an accomplished team at the helm, having extensive experience in the design, production, and sale of wireless technologies for civilian and military applications. The company would soon introduce a range of Aerius green mobile phones equipped with its proprietary energy efficient communication technology for cellular handset and other mobile communication devices.

Key Industry Challenges

Throughout most of the world, cellular phone networks use the Ultra High Frequency (UHF) band at 800/900 MHz or 1800/1900 MHz frequencies while 4G services are proposed to operate at up to 2690 MHz. The path loss between a base station and handset increases as a function of frequency, with a signal operating at 1800/1900 MHz being 300% weaker than signals operating at the 800/900 MHz range given comparable transmit power and receiver sensitivity. This means carriers using the higher frequency band and 3G providers require a 6dB enhancement for comparable

signal parameters, achieved either by boosting transmit power and thereby cell-site power consumption or by increasing receiver sensitivity and bringing down battery life.

Current cell phone batteries have talk-time battery lives ranging from 2 to 10 hours which go down drastically with 3G capability and other advanced functionalities. These batteries can only survive 300-500 discharge/charge cycles, implying an enormous amount of battery discards entering the waste streams around the world. Even though governments recognize Lithium-ion batteries as non-hazardous to the environment, there is still the environmental impact of mining for metals such as nickel and cobalt used in these batteries and also the possibility of contamination of water systems by these metals. Therefore, any innovation that increases battery life would have a significant impact in reducing the environmental footprint of mobile phones. Another key challenge faced by the industry is the excess transmit power required due to the cell phone radio-frequency signal absorbed by the body, measured by the Specific Absorption Rate. FCC certification requires phones to have a Specific Absorption Rate of less than 1.6 W/kg.

Technology Fundamentals and Impact

The three types of antenna designs used in cell phone handsets manufactured today: coiled quarter-wave type, meander quarter-wave type, and conventional Planar inverted F Antenna (PIFA), all use two radiating elements, the resonator and the resonator ground plane. The three designs use components of its High-Density Interconnect (HDI) PCB as the resonator ground plane. The breakthrough innovation by Aerius uses antennas with built-in ground planes that do not need to use the HDI PCBs as ground planes. The antenna redirects almost 100% of cell phone signals at a 180° arc away from the user.

US FCC certified testing has shown that Aerius technology equipped phones reduce power loss into users as measured in SAR to 0.0093 W/kg on average, i.e. by 99.4% below the FCC maximum permissible standard of 1.6 W/kg. It improves upon the performance as measured in SAR of the currently best performing commercially

available cell phone by 95.2%. This extends battery life by 2 to 4 hours by allowing them to operate on lesser power. By extending battery life by up to 66%, this technology has the potential to bring about a 50% reduction in battery discards.

Compared to any handset available in the market today, Aerius technology adds between 3dB to 6dB (100% to 300%) more power into carrier link margins. Perhaps most significant, the tests indicate that the technology, by virtually eliminating handset power loss absorbed by the user, increases handset range by 168% and single cell tower coverage area by an average of 282%. In addition, the power saved also means a reduction in carrier cell site CO2 emissions by 5 Tons per cell site per annum, which amounts to a 1.2 million ton reduction in CO2 emissions per annum in the US alone.

The increase in coverage implies a reduction in cell sites required in new build-outs by 30%. This has enormous implications for governments and mobile phone operators looking to expand rural coverage and ensure better rural connectivity to drive growth in these regions as part of various national economic stimulus efforts. These advantages could also qualify Aerius for funding within the American Recovery and Reinvestment Act (2009) which provides \$50 million in grants for efforts to increase the energy efficiency of information and communications technologies.

Best Practices

The technical claims made by Aerius have been validated by the FCC and Cellular Telecommunications Industry Association certified labs around the world including CETECOM, ETS Lindgren, and the SGS Group by testing Aerius equipped phones. At SGS, a leading inspection, verification, testing and certification company with a network of more than 1,000 offices and laboratories around the world, an Aerius equipped Samsung X105 was compared to a Samsung X105 with its original antenna. ETS Lindgren, manufacturer of RF microwave absorbers, chambers, and high performance antennas used by engineers to design and test systems for communication, data transmission, and military and aerospace applications, tested Nokia phones retrofitted with Aerius' antenna technology in Austin, Texas.

Aerius intends to use a dual strategy to bring the technology to market where they have entered into an arrangement with E-Techo, a Chinese OEM that would manufacture Aerius phones and are also open to licensing the technology to the established mobile phone makers. They are currently negotiating with prospective partners in India, the Middle East, and the UK. There are two models currently in the pipeline, a 3G smartfone and a lower priced model targeting younger users.

Conclusion

Aerius International stands poised to introduce a technology to the market that can reduce the ecological footprint of cellular phone communication systems significantly while making it cost-effective to bring wireless coverage to the rural and less accessible regions of the world. In recognition of their achievements, Frost & Sullivan is pleased to present the 2009 North American Green Excellence of the Year Award to Aerius International.

Award Description

The Frost & Sullivan Green Excellence Award in Technology Innovation is presented to a company that has demonstrated superior technological advancement, which is aligned with a sustainable and environmentally conscious objective within its industry sector. This Award signifies the company's identification of a unique and revolutionary solution with significant environmental benefits, while presenting tremendous market potential simultaneously. Moreover, the Award also signifies that the company's overall business strategy is sound and poised for success.

Research Methodology

Technological excellence, focused on environmental priorities and long-term sustainability, is assessed regularly through continuous monitoring amongst market participants within specific industry sectors. Frost & Sullivan's analyst teams perform extensive interviews with companies within specific industries to evaluate their technologies, products and business strategies. In addition, research within that market space is performed to benchmark the Award recipient's technology against others. Also considered are elements such as strategic alliances, expected time to

market, environmental soundness, long-term green strategies, and management advocacy behind the success of the technology.

Measurement Criteria

Specific measurement criteria used to determine the final award recipient are as follows:

Technology Profile

- Technological platform characterized by long-term sustainability
- Ability to optimize resource usage
- Adaptability and responsiveness of the technology to address changing environmental needs and priorities

Business Commitment

- Entrepreneurial dexterity in incorporating conservation into the business concept
- Development of technological solutions to address concerns regarding climate change
- Industry's acknowledgement of the green initiative in question, by way of financial support, strategic support, and recognition as a pioneering venture

Environmental Accountability

- Demonstration of obligatory responsibility in reducing environmental burden as part of the solution (e.g. cradle to grave solution)
- Inherent features that enhances adoption/participation rate
- Creation of collective accountability towards reducing the impact of climate change, dependency on finite resources and ecological footprint.

About Frost & Sullivan Green Excellence Awards

Instituted as an integral part of the Environment & Building Technologies Practice of Frost & Sullivan, Green Excellence Awards are presented to companies that have excelled in green product and technology innovation, and service achievements. These Awards recognize groundbreaking ideation and innovation across a multitude of disciplines that originated from a firm sense of environmental responsibility. Recipient companies are committed to a continuous focus on reducing the dependency on finite resources, from concept to commercialization. Their efforts demonstrate a resolve to reduce the impact of climate change and overall ecological footprint.

Frost & Sullivan Best Practices Awards recognize companies in a variety of regional and global markets for demonstrating outstanding achievement and superior performance in areas such as leadership, technological innovation, customer service, and strategic product development. Industry analysts compare market participants and measure performance through in-depth interviews, analysis, and extensive secondary research in order to identify best practices in the industry.

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