

Frost & Sullivan Award for Technology Innovation

2005

FROST & SULLIVAN

Technology Innovation Award

AWARD DESCRIPTION

Frost & Sullivan's Technology Innovation Award is bestowed upon a company (or individual) that has carried out new research; which has resulted in innovation(s) that have or are expected to bring significant contributions to the industry in terms of adoption, change, and competitive posture. This award recognizes the quality and depth of a company's research and development program as well as the vision and risk-taking that enabled it to undertake such an endeavor.

RESEARCH METHODOLOGY

To choose the award recipient, Frost & Sullivan's analyst team tracks innovation in key hi-tech markets. The selection process includes primary participant interviews and extensive primary and secondary research via the bottom-up approach. The analyst team shortlists candidates on the basis of a set of qualitative and quantitative measurements. The analyst also considers the pace of research and technology innovation and the significance or potential relevance of the innovation to the overall industry. The ultimate award recipient is chosen after a thorough evaluation of this research.

MEASUREMENT CRITERIA

In addition of the methodology described above, there are specific criteria used to determine the final rankings. The recipient of this award has excelled based on one or more of the following criteria:

- Significance of the innovation(s) in the industry, and across industries (if applicable)
- Potential of the products of innovation(s) to become industry standard(s)
- Competitive advantage of innovation vis-à-vis other related ones
- Impact (or potential impact) of innovation(s) on company or industry mind share and/or company bottom line
- Breadth of intellectual property related to the innovation(s), i.e. patents, scientific publications, papers in peer reviewed journals.

AWARD RECIPIENT MICROCELL

Frost & Sullivan's 2005 Technology Innovation Award in the field of advanced energy sources, extrusion-based fuel cells, goes to Microcell Corporation in acknowledgement of its outstanding efforts in developing the microcell, an advanced extrusion-based PEM fuel cell technology. The company has made substantial contributions to the clean conversion of chemical energy to electrical energy that has brought fuel cells, previously available only for select military and space applications, within reach of today's end users. By bundling the microcells together, they can be used for applications ranging from portable electronics to automotive. These fuel cells are powered by either hydrogen or methanol.

Microcell Corp. is developing novel compact fuel cells using patented micro fibers. At the core of the company's technology is the 'microcell' design concept. Its high volumetric power density, extrusion-based scalable process for cost effective large-scale production, and versatility in size and shape distinguish this technology from other fuel cell technologies. It incorporates all the critical components of a planar Proton Exchange Membrane (PEM) fuel cell in a single fiber ('microcell'). The microcell is around 500 - 1000 micrometers in diameter and produced via an automated extrusion process. Extrusion can be used to tailor fuel cells of desired length and size using the same line. Further, these fibers, or microcells, can be fabricated into modular cores and customized for specific end use requirements.

The company's innovative portfolio comprises the Microcell - DG, the Microcell - EV and the Microcell - PE



which will be employed in distributed generation, electric vehicles and portable electronics applications and can be customized to meet required power output. For instance, Microcell - DG is targeted for 1 - 25 kW for the distributed generation market.

With its innovative approach Microcell Corp. has proverbially crossed the barriers of cost and process restraints along with adding the ease of repair and maintenance. In fact its approach has shifted the focus from fuel cells that were conventionally based on a planar (plate and frame) geometry to fuel cells of tubular geometry.

To further research & development and commercialize the technology for specific applications, Microcell Corp. has entered into partnerships with Washington D.C.-based Pepco Holdings Inc. and Raleigh-based Progress Energy. The company was initially funded by a US NIST (National Institute for Science and Technology) grant of \$2 million in October 2001 to pursue its research efforts. The company's intellectual property portfolio currently comprises 11 US patents. In addition, 10 US patent applications have been filed and 6 international applications are in various stages of development.

Because of its outstanding efforts in the development of an innovative extrusion-based fuel cell technology that has significant potential for use across a wide range of applications such as stand alone power systems for homes and businesses and portable power applications, Microcell Corporation has been recognized with Frost & Sullivan's Award for Technology Innovation.