

**Micro Fuel Cell Market Opportunities, Strategies, and
Forecasts, 2005 to 2013**

Micro Fuel Cell



Picture by Susie Eustis

MOUNTAINS OF OPPORTUNITY

**WinterGreen Research, Inc.
Lexington, Massachusetts**

www.wintergreenresearch.com

CHECK OUT THESE KEY TOPICS

MICRO FUEL CELL MARKET SHARES

MICRO FUEL CELL MARKET FORECASTS

Micro Fuel Cell Delivery of Fuel

Market Driving Forces For Micro Fuel Cells

Fuel Cell Description

Micro Fuel Cell Target Markets

FUEL CELL FUEL DISTRIBUTION AND INFRASTRUCTURE

MICRO FUEL CELLS FOR CONSUMER ELECTRONICS

STORING HYDROGEN

PORTABLE APPLICATIONS

FUEL CELL ELECTROCHEMICAL REACTIONS

POLYMER ELECTROLYTE MEMBRANE

RV RECREATIONAL MICRO FUEL CELL MARKETS

DIGITAL DEVICE FORECASTS

MICRO FUEL CELL INDUSTRY SEGMENT ANALYSIS

ORGANIZATIONS WITH FUEL CELL INFORMATION

OPPORTUNITY ABOUND

WinterGreen Research, Inc.

Lexington, Massachusetts

www.wintergreenresearch.com

Micro Fuel Cell Market Opportunities, Strategies, and Forecasts, 2005 to 2013

The market driving force for micro fuel cells is the demand for better energy sources than batteries. Renewable energy is needed to be the base source. Batteries are a chemical process, but they do not last long enough. Fuel cells promise to provide more reliable, longer portable power than batteries.

Investment is needed to decrease the micro fuel cell component costs. Economies of scale are needed to make micro fuel cells competitive. Micro fuel cell systems are far less expensive than the alternative battery technologies in the long run.

Micro fuel cell products compete with power systems that utilize both direct and indirect energy conversion methods. Direct conversion may involve fuels such as methanol, ethanol and sodium borohydride that are converted into electrons through a direct fuel cell system.

During the war in Iraq, the military ran out of batteries. Supply managers took batteries out of every other location worldwide. Battery companies worked 24 x 7 and could not produce the needed batteries. Three days of batteries were on hand when the war ended. The military has to build a micro fuel cell substitute for batteries.

The market demand for these fuel cells is evolving. Mass-market acceptance is anticipated by 2008, with 145 million units in sales by 2010. The strong growth is anticipated to be starting in 2007 and 2008.

Markets are strongly impacted by the timing of the approval of letting unit be carried in the cabin of an airplane. Units are now approved for the baggage hold of an aircraft, leading one to believe that approval in 2007 is a reasonable expectation. The concern has been handling of explosive materials.

The market demand for micro fuel cells is building towards mass-market acceptance by 2008. Markets are anticipated to be \$510-million worldwide by 2008, with the strong growth occurring in 2007 and 2008 as technology becomes mature and products start to work.

By 2013, micro fuel cell markets reach \$11 billion. This represents a range of PC, handset, PDA, and digital device segments in a variety of industry, military, and health care segments.

Companies Profiled

Market Leader

Toshiba

Market Participants

Altair Nonomaterials

Ball Aerospace

Dow Chemical Company

Gore

Hoku Scientific

Johnson Matthey

Medis Technologies

Mechanical Technology Incorporated (MTI)

NEC Corporation

Smart Fuel Cell

Asahi Glass

Ballard

E-TEK

GrafTech International

ICM Pastics'

Manhattan Scientifics

Millenium

Motorola

SGL Technologies

Solvay

Micro Fuel Cell Equipment Strategies and Forecasts, 2005-2013

REPORT METHODOLOGY

THIS IS THE *TWO-HUNDRED AND FORTY FIRST* REPORT IN A SERIES OF MARKET RESEARCH REPORTS THAT PROVIDE FORECASTS IN COMMUNICATIONS, TELECOMMUNICATIONS, THE INTERNET, COMPUTER, SOFTWARE, TELEPHONE EQUIPMENT, HEALTH EQUIPMENT, AND ENERGY. THE PROJECT LEADERS TAKE DIRECT RESPONSIBILITY FOR WRITING AND PREPARING EACH REPORT. THEY HAVE SIGNIFICANT EXPERIENCE PREPARING INDUSTRY STUDIES. FORECASTS ARE BASED ON PRIMARY RESEARCH AND PROPRIETARY DATA BASES. FORECASTS REFLECT ANALYSIS OF THE MARKET TRENDS IN THE SEGMENT AND RELATED SEGMENTS. UNIT AND DOLLAR SHIPMENTS ARE ANALYZED THROUGH CONSIDERATION OF DOLLAR VOLUME OF EACH MARKET PARTICIPATION IN THE SEGMENT. INSTALLED BASE ANALYSIS AND UNIT ANALYSIS IS BASED ON INTERVIEWS AND AN INFORMATION SEARCH. MARKET SHARE ANALYSIS INCLUDES CONVERSATIONS WITH KEY CUSTOMERS OF PRODUCTS, INDUSTRY SEGMENT LEADERS, MARKETING DIRECTORS, DISTRIBUTORS, LEADING MARKET PARTICIPANTS, OPINION LEADERS, AND COMPANIES SEEKING TO DEVELOP MEASURABLE MARKET SHARE. OVER 200 IN DEPTH INTERVIEWS ARE CONDUCTED FOR EACH REPORT WITH A BROAD RANGE OF KEY PARTICIPANTS AND INDUSTRY LEADERS IN THE MARKET SEGMENT. WE ESTABLISH ACCURATE MARKET FORECASTS BASED ON ECONOMIC AND MARKET CONDITIONS AS A BASE. USE INPUT/OUTPUT RATIOS, FLOW CHARTS, AND OTHER ECONOMIC METHODS TO QUANTIFY DATA. USE IN-HOUSE ANALYSTS WHO MEET STRINGENT QUALITY STANDARDS. INTERVIEWING KEY INDUSTRY PARTICIPANTS, EXPERTS AND END-USERS. OUR RESEARCH INCLUDES ACCESS TO LARGE PROPRIETARY DATABASES. LITERATURE SEARCH INCLUDES ANALYSIS OF TRADE PUBLICATIONS, GOVERNMENT REPORTS, AND CORPORATE LITERATURE.

YOU MUST HAVE THIS STUDY

Micro Fuel Cell Market Opportunities, Strategies, and Forecasts, 2005 to 2013

Table of Contents

MICRO FUEL CELL EXECUTIVE SUMMARY

MICRO FUEL CELL EXECUTIVE SUMMARY	ES-1
Market Driving Force For Micro Fuel Cells	ES-1
Micro Fuel Cell Market Shares	ES-3
Micro Fuel Cell Market Forecasts	ES-4
Micro Fuel Cell Delivery Of Fuel	ES-6
Direct Methanol	ES-6
Sodium Borohydride Mixture	ES-7
Hydrogen	ES-8
Nano Particles	ES-9
Direct Borohydride	ES-9
Industry Maturing	ES-10

MICRO FUEL CELL MARKET DESCRIPTION AND MARKET DYNAMICS

1. MICRO FUEL CELL MARKET DESCRIPTION AND MARKET DYNAMICS	1-1
1.1 Fuel Cell Description	1-1
1.1.1 Micro Fuel Cell Description	1-3
1.1.2 Market Opportunity for Micro Fuel Cell Products	1-5
1.2 Micro Fuel Cell Target Markets	1-8
1.2.1 Military As A Micro Fuel Cell Target Market	1-8
1.2.2 Micro Fuel Cell Portable Medical Equipment	1-12
1.2.3 Micro Fuel Cell Laptop Computer Market	1-14
1.2.4 Micro Fuel Cell Consumer Electronics Portable Power Source	1-14
1.2.5 Micro Fuel Cell Laptop Computer Power Source	1-16
1.3 Fuel Cell Fuel Distribution and Infrastructure	1-17
1.4 Approvals From The United Nations And Related Regulatory Organizations	1-17
1.4.1 Fuel Cells Compared to Rechargeable Batteries	1-19
1.4.2 Fuel Cells Compared	1-20
1.5 RV Recreational Micro Fuel Cell Markets	1-22

MICRO FUEL CELL MARKET SHARES AND MARKET FORECASTS

2. MICRO FUEL CELL MARKET SHARES AND MARKET FORECASTS	2-1
2.1 Market Driving Force For Micro Fuel Cells	2-1
2.2 Micro Fuel Cell Market Shares	2-8
2.2.1 Micro Fuel Cell Companies	2-9
2.2.2 Toshiba Direct Methanol Micro Fuel Cell	2-12
2.2.3 Medis Battery-Recharging Fuel Cell	2-16
2.2.4 Japanese Micro Fuel Cell Commercialization	2-16
2.2.5 United States Micro Fuel Cell Commercialization	2-17
2.2.6 Motorola	2-17
2.2.7 Ballard	2-18

2.2.8	Smart Fuel Cell AG (SFC) Fuel Cell Cost Reduction	2-18
2.3	Micro Fuel Cell Market Forecasts	2-19
2.3.1	Micro Fuel Cell Market Unit Shipment Forecasts	2-19
2.3.2	Micro Fuel Cell Market Shipment Forecasts, Dollars	2-20
2.3.3	Micro Fuel Cells Replace Portable Batteries	2-22
2.3.4	Viable Commercial Micro Fuel Cell	2-23
2.4	Digital Device Forecasts	2-24
2.5	Micro Fuel Cell Industry Segment Analysis	2-25
2.5.1	Military Uses Of Micro Fuel Cells	2-31
2.5.2	Micro Fuel Cell Military Applications	2-31
2.5.3	Micro Fuel Cell Business Strategy Leverages Strength in Military Markets	2-33
2.5.4	Micro Fuel Cell Business Strategy Leverages Strength in Military Markets	2-34
2.5.5	Wireless Handset Uses Of Micro Fuel Cells	2-35
2.5.6	Portable PCs Uses Of Micro Fuel Cells	2-38
2.5.7	Rechargeable Batteries Vs Micro Fuel Cells	2-39
2.5.8	Micro Fuel Cell Health Care Applications	2-40
2.5.9	Micro Fuel Cell Digital Camera And Camcorder Applications	2-41
2.6	Micro Fuel Cell Prices	2-41
2.7	Research Budgets	2-42
2.8	Micro Fuel Cell Delivery Of Fuel	2-44
2.8.1	Direct Methanol	2-44
2.8.2	Sodium Borohydride Mixture	2-45
2.8.3	Hydrogen	2-46
2.8.4	Nano Particles	2-47
2.8.5	Direct Borohydride	2-47
2.8.6	Industry Maturing	2-48

MICRO FUEL CELL PRODUCT DESCRIPTION

3. MICRO FUEL CELL PRODUCT DESCRIPTION	3-1	
3.1	Digital Devices Provide Market for Fuel Cells	3-1
3.2	Toshiba Micro Fuel Cell	3-1
3.2.1	Toshiba Direct Methanol Fuel Cell	3-1
3.2.2	Toshiba Methanol Concentration	3-3
3.2.3	Toshiba Portege M200 Tablet PC Fuel Cells	3-3
3.2.4	NEC Fuel Cell Carbon Nanotubes Toshiba / CRDC Compact Fuel Cell For Notebook PCs	3-4
3.2.5	Toshiba Methanol Fuel Cell for Notebook PCs	3-5
3.3	Casio Laptop Fuel Cell	3-6
3.4	Millennium Cell Power Laptop	3-7
3.4.1	Millennium Cell Laptop Fuel Cells	3-8
3.4.2	Millennium Cell / Protonex Portable Power System	3-8
3.5	Smart Fuel Cell (SFC) Fuel Cell Systems	3-9
3.5.1	Smart Fuel Cell (SFC) Direct Methanol Fuel Cells	3-12
3.5.2	Smart Fuel Cell (SFC) Applications	3-13
3.5.3	Smart Fuel Cell (SFC) Electric Device Power	3-13
3.5.4	SFC DMFC prototype	3-14
3.5.5	SFC Market	3-15
3.5.6	SFC PowerBoy	3-16
3.6	MTI MicroFuel Cells	3-17
3.6.1	MTI MicroFuel Cells	3-17
3.7	Medis Technologies	3-18
3.7.1	Medis Technologies Micro Fuel Cell	3-18

WINTERGREEN RESEARCH, INC.

3.7.2	Medis Micro Fuel Cell	3-18
3.7.3	Medis Fuel Cell Products	3-18
3.7.4	Medis Fuel Cell Disposable Power Pack Products	3-19
3.7.5	Medis Fuel Cell Refuelable Power Pack	3-22
3.7.6	Medis Fuel Cell Technology	3-23
3.8	Samsung DMFC Prototype Fuel Cell	3-26
3.9	Ballard Micro Fuel Cells	3-26
3.10	NEC Fuel Cell Carbon Nanotubes	3-28
3.10.1	Fuel Cell Nanotechnology at NEC	3-29
3.10.2	NEC Laptop PC Powered By Micro-Fuel Cells	3-31
3.11	Materials and Energy Research Institute Tokyo (Merit) Direct Borohydride Technology Powers Fuel Cells	3-35
3.12	Wireless Handset Fuel Cell Products	3-38
3.13	Nokia Fuel-Cell Battery Plans	3-38
3.14	NTT Mobile-Phone Hydrogen Fuel Cell	3-39
3.15	Motorola Direct Methanol Fuel Cell	3-39
3.16	Manhattan Scientifics Delivers Fuel Cell Unit To U.S. Army	3-40
3.17	NEC DMFC Mobile-Phone Hydrogen Fuel Cell	3-41
3.18	Hitachi, Toshiba Show Portable Direct Methanol Fuel Cells	3-42
3.18.1	Hitachi And Toshiba Mobile Phone Fuel Cell Rechargers	3-44
3.19	NTT DoCoMo and Fujitsu Laboratories Mobile Phone Fuel Cell Rechargers	3-45
3.20	NEC DMFC Fuel Cell Launch	3-45

MICRO FUEL CELL SERVER TECHNOLOGY

4. MICRO FUEL CELL SERVER TECHNOLOGY	4-1	
4.1	Fuel cell Electrochemical Reaction	4-1
4.2	Organizations With Fuel Cell Information	4-2
4.3	Micro Fuel Cells For Consumer Electronics	4-2
4.3.1	Toshiba	4-3
4.3.2	Hitachi / Tokai	4-4
4.3.3	SFC Energetic Revolution powered by Smart Fuel Cell	4-4
4.4	Clean And Silent Micro Fuel Cell Power Generation By Methanol	4-7
4.5	Storing Hydrogen	4-7
4.5.1	Sodium Borohydride Storing of Hydrogen	4-7
4.5.2	Borohydride Hydrogen Generation	4-8
4.5.3	International Electrotechnical Commission Forms Working Group	4-8
4.6	PolymerElectrolyte Membrane	4-9
4.7	Sodium Borohydride Chemical Power	4-10
4.8	Bacterial Enzymes Replacement For The Platinum Catalysts	4-11
4.9	Portable Applications	4-12
4.9.1	Fuel Cell Power Packs	4-12
4.9.2	Casio Use Of Fuel Cell Technology In Mobile Devices	4-13
4.9.3	PolyFuel Honeycomb Membrane	4-14
4.9.4	Portable Electronic Fuel Cell Devices	4-14
4.9.5	Marketing Limitation Of Hydrogen Gas Or Methanol Powered Fuel Cells	4-15
4.9.6	Hitachi Compact DMFC	4-16
4.9.7	NEC Compact DMFC	4-16
4.9.8	Toshiba's DMFC	4-17
4.9.9	Toshiba Fuel Cell	4-17
4.9.10	PolyFuel Direct Methanol Fuel Cells	4-18
4.9.11	PolyFuel Direct Methanol Fuel Cell Membrane	4-18
4.9.12	NEC Product Plans	4-19

4.9.13	Toshiba Prototype Battery Charger Based On Direct Methanol Fuel Cell Technology	4-19
4.9.14	Hitachi Direct Methanol Fuel Cell	4-20
4.9.15	PolyFuel Direct Methanol Fuel Cell Membrane	4-20
4.9.16	MTI Micro	4-20
4.9.17	Manhattan Scientifics	4-21
4.9.18	Manhattan Scientifics / NovArs Mid-range Fuel Cell Technology	4-21
4.9.19	Millennium Cell / Samsung	4-23
4.10	Bacteria Micro Fuel Cell Products	4-26

FUEL CELL COMPONENT COMPANY PROFILES

5. MICRO FUEL CELL COMPANY PROFILES	5-1	
5.1	Altair Nanomaterials	5-2
5.2	Asahi Glass	5-3
5.3	Ball Aerospace	5-8
5.4	Ballard	5-11
5.4.1	Ballard AET	5-13
5.4.2	Ballard NGL Recovery Unit	5-13
5.4.3	Ballard Nitrogen Rejection	5-14
5.4.4	Ballard Monomer Recovery	5-15
5.4.5	Ballard Ammonia Purge Gas	5-16
5.4.6	Ballard Methanol Purge Gas	5-16
5.5	Dow Chemical Company	5-17
5.5.1	Energy Is Business Critical For Dow	5-18
5.6	E-TEK	5-20
5.7	Fuel Cell Components and Integrators	5-21
5.7.1	Fuel Cell Components and Integrators / TechnaPulse	5-23
5.7.2	Fuel Cell Components and Integrators (FCCI) Facilities	5-23
5.8	Gore	5-24
5.8.1	Gore Fuel-Cell Business Model	5-25
5.8.2	Gore MEA Recycling	5-26
5.8.3	Gore MEAs For High-Temperature / Direct Methanol Fuel Cells	5-26
5.8.4	Gore Sales And Customer Service Sites	5-26
5.9	GrafTech International	5-27
5.9.1	GrafTech Revenue	5-28
5.9.2	GrafTech International Patents	5-28
5.10	Hoku Scientific	5-28
5.10.1	Hoku Scientific / SANYO Electric	5-29
5.10.2	Team	5-31
5.11	ICM Plastics'	5-32
5.12	Johnson Matthey	5-34
5.12.1	Catalyzed Components For Fuel Cells	5-37
5.12.2	Johnson Matthey Global ECT auto catalyst	5-38
5.13	Manhattan Scientifics	5-39
5.14	Medis Technologies	5-39
5.14.1	Medis Partners	5-40
5.15	Millenium	5-41
5.15.1	Millennium Cell / Dow Chemical Military And Commercial Applications	5-41
5.15.2	Millennium Cell Fuel Cell Product Platforms	5-42
5.15.3	Millennium Cell Fourth Quarter Revenue 2004	5-43
5.15.4	Millennium Cell	5-44
5.15.5	Millennium Cell Hydrogen Energy Systems	5-45

5.15.6	Millennium Cell Technology Differentiation From Batteries And From Direct Methanol Fuel Cells (DMFC)	5-45
5.16	Mechanical Technology Incorporated (MTI)	5-46
5.16.1	MTI MicroFuel Cells	5-47
5.16.2	MTI MicroFuel / Intermec	5-48
5.17	Motorola	5-48
5.17.1	Motorola Positioning	5-49
5.17.2	Motorola Revenue	5-50
5.18	NEC Corporation	5-54
5.18.1	NEC Research And Development Labs	5-54
5.18.2	NEC IT And Networking Technologies	5-57
5.18.3	NEC Network Solutions Business	5-61
5.18.4	NEC Internet Broadband Network Positioning	5-62
5.18.5	PEMEAS Fuel Cell Technologies	5-62
5.18.6	PEMEAS Celtec® Membrane Electrode Assembly (MEA)	5-64
5.18.7	Celtec®- Heart Of The Fuel Cell	5-64
5.19	SGL Technologies	5-66
5.19.1	SGL Technologies Graphite Electrodes	5-67
5.20	Smart Fuel Cell	5-69
5.20.1	Smart Fuel Cell Designs	5-69
5.20.2	Smart Fuel Cell SFC Partners	5-69
5.20.3	SFC Development Directions	5-70
5.20.4	SFC Fuel cell stack	5-70
5.21	Solvay	5-71
5.22	Toshiba	5-73
5.22.1	Toshiba Organization	5-74

List of Tables and Figures**MICRO FUEL CELL EXECUTIVE SUMMARY**

Table ES-1	ES-1
Micro Fuel Cell Market Driving Forces	
Figure ES-2	ES-3
Worldwide Micro Fuel Cell Market Shares, Dollars, 2004	
Figure ES-3	ES-5
Worldwide Micro Fuel Cell Forecasts, Dollars, 2005-2013	

MICRO FUEL CELL MARKET DESCRIPTION AND MARKET DYNAMICS

Table 1-1	1-4
Portable Power Market Strategy	
Table 1-2	1-6
Micro Fuel Cell Product Benefits	
Table 1-3	1-9
Military Micro Fuel Cell Target Markets	
Table 1-4	1-11
Micro Fuel Cells Military Positioning	
Table 1-5	1-13
Micro Fuel Cell Portable Medical Equipment Demand Parameters	
Table 1-6	1-15
Micro Fuel Cell Consumer Electronics Portable Power Source Target Market	

MICRO FUEL CELL MARKET SHARES AND MARKET FORECASTS

Table 2-1	2-1
Micro Fuel Cell Market Driving Forces	
Table 2-2	2-5
Market Aspects For Micro Fuel Cells	
Table 2-3	2-6
Micro Fuel Cell Technology Issues	
Table 2-4	2-7
Micro Fuel Cell Market Issues	
Figure 2-5	2-8
Worldwide Micro Fuel Cell Market Shares, Dollars, 2004	
Table 2-6	2-15
Toshiba Handheld Fuel-Cell Technology Specifications	
Figure 2-7	2-20
Worldwide Micro Fuel Cell Forecasts, Units, 2005-2013	
Figure 2-8	2-21
Worldwide Micro Fuel Cell Forecasts, Dollars, 2005-2013	
Table 2-9	2-22
Worldwide Micro Fuel Cell Market Forecasts, Units and Dollars, 2005-2013	
Figure 2-10	2-27
Worldwide Micro Fuel Cell Market Segments, Dollars, 2004	
Figure 2-11	2-28
Worldwide Micro Fuel Cell Market Segments, Dollars, 2008	

Figure 2-12	2-29
Worldwide Micro Fuel Cell Market Segments, Dollars, 2013	
Table 2-13	2-30
Worldwide Micro Fuel Cell Market Segments Forecasts, Units and Dollars, 2005-2013 in Percent	
Table 2-14	2-30
Worldwide Micro Fuel Cell Market Segments Forecasts, Units and Dollars, 2005-2013 in Millions of Dollars	
Table 2-15	2-33
US Military Programs Calling for Fuel Cells	
Table 2-16	2-36
Worldwide Handheld Devices Market Forecasts, Units, 2005-2013	
Table 2-17	2-36
Worldwide Telecommunications Wireless Handsets Shipment Forecasts, Dollars, 2005-2013	
Table 2-18	2-37
Worldwide Micro Fuel Cell Penetration of Handheld Device Market Forecasts, Units, 2005-2013	
Table 2-19	2-40
Micro Fuel Cell Energy Systems Competitive Aspects	
Table 2-20	2-43
Worldwide Fuel Cell Membrane Electrode Assembly (MEA's), GDL, Bipolar Plates, and Other Components Research Spending Market Forecasts, Dollars, 2004	
Figure 2-21	2-49
Global Micro Fuel Cell Shipments by Region, Dollars, 2005	

MICRO FUEL CELL PRODUCT DESCRIPTION

Table 3-1	3-24
Medis Fuel Cell Technology Advances	
Table 3-2	3-25
Medis Fuel Cell Technology Advances	
Table 3-3	3-27
Ballard Micro Fuel Cells	
Figure 3-4	3-32
NEC Portable PC Powered by Fuel Cell	
Table 3-5	3-37
DBFC (Direct Borohydride Fuel Cell) Performance	

MICRO FUEL CELL SERVER TECHNOLOGY

Table 4-1	4-2
Organizations with Fuel Cell Information	
Table 4-2	4-6
SFC Fuel Cell Advantages	
Table 4-3	4-18
Direct Methanol Notebook Fuel Cell Target Markets	

MICRO FUEL CELL COMPANY PROFILES

Table 5-1	5-1
Selected Companies Involved In The Area Of Portable Fuel Cells	
Table 5-2	5-15
Ballard Gas Processing	
Table 5-3	5-22
Fuel Cell Components and Integrators Offerings	

Table 5-4	5-32
ICM Plastics Value Added Services	
Table 5-5	5-43
Millennium Cell Fuel Cell Product Platform Segments Targeted	
Table 5-6	5-72
Solvay Fuel Cell Products	

ABOUT THE COMPANY

WINTERGREEN RESEARCH, HAS A UNIQUE RESEARCH STRATEGY THAT RELATES TO IDENTIFYING MARKET TRENDS THROUGH READING AND INTERVIEWING OPINION LEADERS. BY READING THE ELECTRONIC EQUIVALENT OF 40 FEET OF PAPER, WINTERGREEN RESEARCH SENIOR ANALYSTS CAN LEARN A LOT MORE ABOUT MARKETS, A LOT FASTER THAN CAN BE LEARNED THROUGH EXPENSIVE SURVEYS AND FOCUS GROUPS. THINKING ABOUT MARKET TRENDS IS A HIGH PRIORITY AT WINTERGREEN RESEARCH. AS WITH ALL RESEARCH, THE VALUE PROPOSITION FOR COMPETITIVE ANALYSIS COMES FROM INTELLECTUAL INPUT.

IT IS A LUXURY REALLY, AVAILABLE TO ONLY A VERY FEW PEOPLE, TO BE ABLE TO GATHER INFORMATION, LOTS OF INFORMATION FROM READING MASSIVE AMOUNTS OF CONTENT, AND THEN TRYING TO MAKE SENSE OF THAT CONTENT. THE ABILITY TO THINK ABOUT MARKET TRENDS IS ENHANCED BY DOING IT OVER AND OVER FOR MANY DIFFERENT MARKETS. THAT IS WHAT WINTERGREEN RESEARCH IS ALL ABOUT: READING AND THINKING IS AN ESSENTIAL ASPECT OF COMPETITIVE ANALYSIS. TALKING TO OPINION LEADERS IS THE THIRD ESSENTIAL ASPECT OF PRODUCING GOOD, RELIABLE DATA.

WINTERGREEN RESEARCH, FOUNDED IN 1985, PROVIDES STRATEGIC MARKET ASSESSMENTS IN TELECOMMUNICATIONS, COMMUNICATIONS EQUIPMENT, HEALTH CARE, INTERNET AND ADVANCED COMPUTER TECHNOLOGY. INDUSTRY REPORTS FOCUS ON OPPORTUNITIES THAT EXPAND EXISTING MARKETS OR DEVELOP MAJOR NEW MARKETS. THE REPORTS ASSESS NEW PRODUCT AND SERVICE POSITIONING STRATEGIES, NEW AND EVOLVING TECHNOLOGIES, AND TECHNOLOGICAL IMPACT ON PRODUCTS, SERVICES, AND MARKETS. MARKET SHARES ARE PROVIDED. LEADING MARKET PARTICIPANTS ARE PROFILED, AND THEIR MARKETING STRATEGIES, ACQUISITIONS, AND STRATEGIC ALLIANCES ARE DISCUSSED. THE PRINCIPALS OF WINTERGREEN RESEARCH HAVE BEEN INVOLVED IN ANALYSIS AND FORECASTING OF INTERNATIONAL BUSINESS OPPORTUNITIES IN TELECOMMUNICATIONS AND ADVANCED COMPUTER TECHNOLOGY MARKETS FOR OVER 30 YEARS.

ABOUT THE PRINCIPAL AUTHORS

ELLEN T. CURTISS, TECHNICAL DIRECTOR, CO-FOUNDER OF WINTERGREEN RESEARCH, CONDUCTS STRATEGIC AND MARKET ASSESSMENTS IN TECHNOLOGY-BASED INDUSTRIES. PREVIOUSLY SHE WAS A MEMBER OF THE STAFF OF ARTHUR D. LITTLE, INC., FOR 23 YEARS, MOST RECENTLY AS VICE PRESIDENT OF ARTHUR D. LITTLE DECISION RESOURCES, SPECIALIZING IN STRATEGIC PLANNING AND MARKET DEVELOPMENT SERVICES. SHE IS A GRADUATE OF BOSTON UNIVERSITY AND THE PROGRAM FOR MANAGEMENT DEVELOPMENT AT HARVARD GRADUATE SCHOOL OF BUSINESS ADMINISTRATION. SHE IS THE AUTHOR OF RECENT STUDIES ON WORLDWIDE TELECOMMUNICATIONS MARKETS, THE TOP TEN INTERNET EQUIPMENT COMPANIES, THE TOP TEN CONTRACT MANUFACTURING COMPANIES, AND THE TOP TEN TELECOMMUNICATIONS MARKET ANALYSIS AND FORECASTS.

SUSAN EUSTIS, PRESIDENT, CO-FOUNDER OF WINTERGREEN RESEARCH, HAS DONE RESEARCH IN COMMUNICATIONS AND COMPUTER MARKETS AND APPLICATIONS. SHE HOLDS SEVERAL PATENTS IN MICROCOMPUTING AND PARALLEL PROCESSING. SHE HAS THE ORIGINAL PATENTS IN ELECTRONIC VOTING MACHINES. SHE HAS NEW PATENT APPLICATIONS IN FORMAT VARYING, MULTIPROCESSING, AND ELECTRONIC VOTING. SHE IS THE AUTHOR OF RECENT STUDIES OF THE REGIONAL BELL OPERATING COMPANIES' MARKETING STRATEGIES, INTERNET EQUIPMENT, BIOMETRICS, A STUDY OF INTERNET EQUIPMENT, WORLDWIDE TELECOMMUNICATIONS EQUIPMENT, TOP TEN TELECOMMUNICATIONS, DIGITAL LOOP CARRIER, WEB HOSTING, WEB SERVICES, AND APPLICATION INTEGRATION MARKETS. MS. EUSTIS IS A GRADUATE OF BARNARD COLLEGE.

ORDER FORM

Return To: WinterGreen Research, Inc.
6 Raymond Street
Lexington, MA 02421 USA
Phone: (781) 863-5078 --- Fax: (781) 863-1235 or (781) 860-0897

PLEASE ENTER MY ORDER FOR:

Micro Fuel Cell Market Opportunities,
Strategies, and Forecasts 2005-2013

-ALL REPORTS ARE AVAILABLE IN EITHER PRINT OR PDF-

_____ **PDF** _____ **PRINT**

_____ ENCLOSED IS MY CHECK FOR \$2,800 FOR SINGLE COPY, \$3,800 FOR WEB SITE POSTING

_____ PLEASE BILL MY COMPANY USING P.O. NUMBER _____

_____ PLEASE CHARGE MY MASTERCARD/VISA/AMERICAN EXPRESS _____

CARD NUMBER _____ EXP. DATE _____

If charging to a Credit card you may e-mail the order form, but not the card information
Fax or Call with credit card information - Do not send card number as e-mail - You may send the order as e-mail

_____ ADDITIONAL COPIES, @ \$375 (EXTRA COPY PRICE IN EFFECT ONLY WITH INITIAL ORDER)

NAME _____ TITLE _____

SIGNATURE _____

COMPANY _____ DIVISION _____

-

ADDRESS _____

CITY _____ STATE /

ZIP _____

TELEPHONE _____

FAX _____

EMAIL _____

PLEASE NOTE: RESIDENTS OF MASSACHUSETTS AND CONNECTICUT MUST INCLUDE APPROPRIATE SALES TAX

SUBSCRIBERS OUTSIDE THE UNITED STATES MUST PROVIDE PREPAYMENT IN U.S. FUNDS