

Clean Technology & Sustainable Energy

"There is an aggressive and enabling atmosphere in the Metro Orlando area for high-tech companies and new research, which make it an ideal locale for the energy and alternative fuels industry."

— Dr. Robert Stonerock, Jr., Clean Power Engineering Company

Metro Orlando has firmly established a traditional energy sector with the presence of such worldwide industry leaders as Siemens Energy, Inc. and Mitsubishi Power Systems, as well as leading utility companies and a host of related service and equipment companies. With this foundation in place, the sector is beginning to shift more focus on alternative fuel sources.

The region is steadily becoming a hotbed for renewable energy and alternative fuel endeavors as businesses and non-profit entities engage in a variety of research and development projects aimed at deploying more cost-efficient, environmentally-friendly power. With federal government urgency to reduce reliance on foreign oil, hydrogen technologies are a key area of research being conducted in Metro Orlando. NASA, the world's chief end user of liquid hydrogen, and the federal Department of Energy have awarded millions of dollars in grant money toward hydrogen research in the region.

State and local government are committed to creating a diversified economy, which ensures ample supporting resources and incentives are available for high-tech industry sectors in the region, including energy and alternative fuels. As a result, there is great potential in Metro Orlando for start-up and existing businesses alike to flourish.

Overview and History

The clean technology and sustainable energy sector in Metro Orlando is evolving as the push is on to reduce the country's dependence on foreign oil and make use of environmentally-friendly alternatives to fossil fuels.

Metro Orlando's traditional energy industry is bolstered by major utility providers Progress Energy Florida and the Orlando Utilities Commission, as well as world-renowned power generation companies, including Mitsubishi Power Systems, Inc. (MPS) and Siemens Energy, Inc. -- both of which are headquartered in the region.

A number of fuel distributors and wholesalers are also based in Metro Orlando, along with engineering, consulting, construction and equipment firms that support energy providers. Firms providing energy conservation products such as photovoltaic systems also augment the sector.

In addition to research projects, businesses are involved in other renewable energy endeavors, including conversion of methane gas from landfills and waste oil from restaurants into fuel to generate power.

Metro Orlando's venture into renewable energy began in response to the 1973 oil embargo. In 1975, the state of Florida founded the Florida Solar Energy Center (FSEC) to pursue research and development of alternative energy sources. Today, FSEC forms the backbone of the emerging renewable energy sector in the region, with an emphasis on solar power and building efficiency.

Hydrogen power for space exploration and transportation systems is another significant area of research conducted at FSEC. The center performs contracted research for government agencies like the U.S. Department of Energy (DOE) and NASA. FSEC has shared in grant funding awarded to state universities by NASA, which uses hydrogen for space launches. FSEC has been studying development of future space propellants and more efficient space launch activities. In 1997, the Department of Energy (DOE) designated FSEC a Center for Excellence for hydrogen research and education for its efforts toward developing hydrogen as a clean, abundant and locally-produced fuel.

The clean technology and sustainable energy sector is supported by a number of organizations dedicated to advancing the use of alternative energy sources. In addition to serving as information resources and government advisors, some of these organizations are instrumental in helping businesses obtain funding for energy research and development. Metro Orlando is a strong area of opportunity for continued activity in both traditional energy and alternative fuel initiatives.

Marketplace

"The EDC did a great job of pulling people together to attract a hydrogen fuel powered vehicle demonstration to Metro Orlando. This demonstration of hydrogen internal combustion and fuel-cell powered vehicles is a wonderful opportunity to show the people of Florida that there is an alternative to petroleum fuels."

— David E. Bruderly, PE , Candidate for Congress, District 6 Florida
president, Clean Power Engineering Company

Metro Orlando comprises nearly 300 companies engaged in various aspects of the traditional clean technology and sustainable energy sector. From petroleum distribution and building efficiency consulting to installation of solar panels for home power generation and creating diesel fuel from organic materials, local businesses are carving a niche in the energy/alternative fuels industry.

The commercial sector in Metro Orlando is basically segmented into three categories:

- **Commodity** - companies such as electric utilities, power generation, fuel distributors and wholesalers that deal mainly with the sale of energy sources.
- **Service** - companies that support commodity businesses, such as engineering firms and energy efficient construction/facilities management.
- **Equipment** - companies creating and/or providing machinery and infrastructure to the industry.

Orlando Utilities Commission (OUC) and Progress Energy are the primary utility companies serving the region. OUC is the second largest municipally-owned public utility in Florida, providing water and electric service to 190,000 customers in the city of Orlando and adjoining portions of Orange County. OUC owns the Curtis H. Stanton Energy Center and portions of other power plants in Florida, as well as eight water plants.

Progress Energy is a Fortune 250 diversified company with more than 23,000 megawatts of generation capacity. The company's holdings include two electric utilities serving more than 2.8 million customers in Florida, North Carolina and South Carolina.

The headquarters for two major power generation companies—Mitsubishi Power Systems, Inc. (MPS) and Siemens Energy, Inc.—are also based in the region. MPS manufactures, repairs and refurbishes parts for large turbines at its Orlando service center. In addition to standard corporate functions, engineering design is performed at the Siemens headquarters.

Home to the Florida Solar Energy Center (FSEC), the country's leading renewable energy research center, Metro Orlando is well-positioned to become a hub for this emerging field. Located on a 20-acre complex site, FSEC performs renewable energy and energy efficiency research in partnership with industry, nonprofit organizations, private sponsors and national laboratories. An internationally-recognized institute of the University of Central Florida, FSEC focuses on solar thermal and photovoltaic (PV) systems, as well as hydrogen technologies. The center's research is based on field monitoring, computer simulations and controlled experiments in highly-instrumented laboratories.

As nearly half of Florida's energy is used in buildings—with the demand driven mostly by air conditioning—FSEC is heavily involved in energy efficiency and building science. The center also does contracted research for in- and out-of-state utilities on end-use load patterns in various customer segments.

Both OUC and Florida Progress Energy are aggressively pursuing alternative energy and energy efficiency solutions. Progress Energy is a partner in a hydrogen fuel powered vehicle demonstration project to showcase hydrogen internal combustion and fuel-cell powered vehicles in Orlando. Ford Motors and BP Amoco are other partners in the venture, which the Metro Orlando EDC actively pursued.

Progress Energy has also teamed with Palm Harbor, a leading manufactured home builder, and FSEC to study the operation of PV systems in manufactured homes.

OUC uses methane gas from a local landfill as fuel to provide enough electricity for 10,000 homes, while reducing methane emissions from the landfill. OUC is currently soliciting customer feedback on Green Power, an expanded renewable energy program the utility plans to launch soon. OUC also provides financial incentives for residential and commercial solar power installations.

Solar collection for pool and water heating makes up a substantial portion of the commercial side of the sector. Two major solar panel manufacturers are based in the state, and sales and installation offices are located in Metro Orlando.

Companies in Metro Orlando are exploring different ways to create fuel from green sources. HUGR Systems, Inc. provides small engine-based equipment that burns environmentally-friendly biodiesel made from waste oil collected from local restaurants. The company serves carpet cleaning, lawn care and landscape businesses. Another local company specializes in environment-friendly packaging derived from plant material harvested during waterway restoration programs.

Renewable energy efforts are expected to increasingly turn to hydrogen technologies in Metro Orlando. With space launch facilities at Kennedy Space Center, there is much potential to leverage the expertise of NASA in the safe handling of hydrogen to expand the use of this fuel for general transportation. Both state Governor Jeb Bush and President George Bush have recently expressed great interest in hydrogen and other alternative fuels for powering vehicles and generating electricity and have pledged funding for research throughout the U.S.

Workforce

Situated in the center of Florida's high-tech corridor, Metro Orlando is able to draw on a pool of well-educated workers trained in fields pertinent to the clean technology and sustainable energy sector, such as electrical engineering and environmental science. The region is home to the University of Central Florida, one of the nation's leading metropolitan research institutions, which works closely with local industries to develop curricula that meet employment needs. The region's community colleges augment the workforce by offering courses to also provide a well-rounded education to supplement the employee pool.

Education

Academia in Metro Orlando has long shared a partnership with local industry to prepare students from the elementary to graduate levels for careers in a range of fields. The region features a wealth of well-regarded educational and vocational technical institutions that work with the business community to develop curricula aimed at improving workforce quality.

Education in Metro Orlando is anchored by the University of Central Florida (UCF), one of the nation's leading metropolitan research institutions. In addition to offering fields of study related to energy/alternative fuels, such as environmental engineering, UCF administers the Florida Solar Energy Center. One of the country's leading energy and energy efficiency research centers, FSEC also offers a range of continuing education courses covering renewable energy and building energy efficiency. Most courses include both classroom instruction and hands-on field experience. In many cases, students can receive continuing education units, and some courses are approved for Florida professional license renewals.

Rollins College, considered among the top regional colleges in the South, offers an interdisciplinary environmental studies major in which students study the uses and protection of resources essential for economic development and public well-being. The curriculum provides a foundation of knowledge that enables students to analyze and recommend actions on environmental issues, problems and opportunities. Courses involve students in real environmental issues through field experiences and guest lectures.

The region's community colleges and elementary and secondary school magnet programs add to the strong educational base helping to train local students for high-tech careers.

Industry Organizations & Involvement

Metro Orlando features trade associations that are focused on advancing the clean technology and sustainable energy sector through information sharing, networking opportunities, funding and educational resources. Following are brief overviews of a sampling of these organizations:

Florida Hydrogen Energy Partnership

The Florida Hydrogen Energy Partnership was formed in 2003 and comprises a statewide group of community leaders, university researchers, industry representatives, and government officials. The goal of the Partnership is to begin the process of making Florida the nation's leader in development of, and transition to, a hydrogen economy.

Florida Solar Energy Industries Association (FlaSEIA)

Founded in 1977, the FlaSEIA is a nonprofit professional association of companies involved in the solar energy industry. Members include manufacturers, distributors, contractors, retailers and consultants who provide solar water heating, pool heating and solar electric systems.

Technological Research and Development Authority (TRDA)

The TRDA, established by the Florida Legislature in 1987, administers the Florida Energy Investment Initiatives, Venture Smart Florida and Investment Initiative for Energy Technologies. These entrepreneurial initiatives are designed to assist Florida companies secure private capital in their effort to develop and commercialize promising and innovative energy-related technologies, products and services. Both Venture Smart and Investment Initiative aim to transform promising, yet borderline investable, companies into attractive investment opportunities, by helping them overcome investor concerns.

The TRDA has provided grant funding to several companies engaged in energy-related ventures in Metro Orlando. Specific activities funded have included efforts to convert biomass to ethanol; production of micro turbines; development of energy efficient lighting; and design of cooling systems for lasers.

In addition to the numerous professional events attended and hosted by the Metro Orlando EDC, various trade organizations hold local and nationally attended events here such as:

DistribuTECH

For 13 years, DistribuTECH has been the leading automation and information technology conference and exhibition in the utility industry. Now, in its 14th year, DistribuTECH is expanding its base to cover not only electric utility automation, control and IT, but also a broader power T&D and water market. Now encompassing automation and control systems, IT, T&D engineering, power delivery equipment and water utility technology, this event provides resources, tools and networking opportunities to succeed in today's utility industry.

EMACS 2003—The Energy Marketing and Customer Service Conference & EXPO

EMACS is the premier industry conference for idea exchange and thought leadership in the energy delivery business. EMACS provides a forum for networking with key decision makers who represent the leading utility and retail energy companies in North America and abroad.

ISES Solar World Congress

Sponsored by the International Solar Energy Society, this event will be held in Orlando in August 2005. The world's leading researchers, scientists, engineers and other renewable energy professionals will attend this 50th anniversary of the ISES. The conference will feature special sessions and presentations on solar science over the past 50 years, as well as several solar tracks looking at the technology, issues and application of solar energy in the coming years. Indoor/outdoor exhibits showcasing the latest products, technology and services in solar, wind, biomass, sustainable technology and water applications are other highlights of the event. A trip to the Florida Solar Energy Center will also be offered.

POWER-GEN International

POWER-GEN is one of the world's largest conferences for the power industry. The annual conference is intended to increase attendees' competitive advantage in today's market by empowering them with the critical knowledge needed to succeed. Experts within this industry will present enlightening perspectives and valuable information for success in this dynamic market.

Incentives

Metro Orlando offers attractive incentives to qualified relocating and expanding companies. This assistance is provided based on each organization's particular needs, including, but not limited to:

- Job creation
- Wage levels
- Capital investments

For more information, please visit the "Relocate & Expand/Incentives" section of the Metro Orlando EDC's website at OrlandoEDC.com, which provides a general overview of incentives offered to companies within Metro Orlando.

Company Profiles

Local businesses are involved in varying aspects of traditional energy/alternative fuels from power generation and solar pool heating to biodiesel and energy efficiency. Following are overviews of a sampling of companies within the sector that are operating in the region:

Allsolar

Allsolar is one of the region's oldest solar energy companies, providing installation and service of solar hot water heating, solar pool heating and solar electric systems. The company is among the only full service solar companies in the state to deliver energy rating and analysis for buildings.

Clean Power Engineering Company Clean Power Engineering offers comprehensive consulting, engineering and professional support services with strong capabilities in all phases of energy and water-related project development across the U.S. Clean Power's primary interest is the widespread demonstration and deployment of hydrogen fuels—production, distribution and end-use—and integrated, high-efficiency power system technologies.

HUGR Systems

HUGR provides small engine based equipment that burns clean biodiesel created from waste vegetable oil. The company's partners offer professional carpet cleaning, lawn care and landscape services to residential and commercial clients.

K.O. POWER

K.O. Power has provided power purification, interruptible power supplies, surge protection products and service contracts to telephone and power companies, hospitals, banks, emergency facilities and other national databases since 1991. K.O. POWER provides a range of power services, including conditioning power for sensitive laboratory equipment, lighting protection for computer and phone lines and battery backups for outages. The company also offers site surveys to assess power needs.

Mitsubishi Power Systems, Inc.

Headquartered in Metro Orlando, Mitsubishi Power Systems, Inc. provides a broad range of products and services, including power systems, air-conditioners, machinery for industrial and general use, aerospace systems and more. In addition to the corporate headquarters, Mitsubishi Power Systems also operates a power systems service and manufacturing center in the region.

Mitsubishi's Remote Monitoring facility at the Orlando Service Center features redundant communications lines, uninterruptible power supplies and emergency power to ensure continuous connection to customer sites.

Orlando Utilities Commission (OUC)

OUC is the second largest municipally-owned public utility in Florida, providing water and electric service to 190,000 customers in the city of Orlando and adjoining portions of Orange County. OUC owns the Curtis H. Stanton Energy Center and portions of other power plants in Florida, as well as eight water plants.

OUC is currently soliciting customer feedback on Green Power, an expanded renewable energy program the utility plans to launch soon. OUC already uses methane gas from a local landfill as fuel to generate power, which provides enough electricity for 10,000 homes while reducing methane emissions from the landfill. The utility also provides financial incentives for residential and commercial solar-power installations.

Progress Energy

Progress Energy is a Fortune 250 diversified company with more than 23,000 megawatts of generation capacity. The company's holdings include two electric utilities serving more than 2.8 million customers in Florida, North Carolina and South Carolina.

Progress Energy has partnered with Palm Harbor, a manufactured home builder, and the Florida Solar Energy Center to study the operation of solar photovoltaic (PV) systems in six homes. Upon installation of the PV systems, Progress Energy will monitor each home for a year or longer to determine the impact.

Siemens Energy, Inc.

Headquartered in Metro Orlando, Siemens Energy, Inc. is the regional entity in the Americas for the global fossil power generation business, which has an installed fleet of more than 697,000 megawatts worldwide. Siemens offers a full spectrum of innovative, environmentally friendly, and cost-effective products. The company offers an unparalleled level of service and support for the power generation market – including gas and steam turbine-generator technology, world-class process control and power management systems operations and maintenance support, power plant modernization and upgrades, wind power and air pollution control technology.

Solis Energy

Solis Energy is a privately held global provider of reliable outdoor off-grid solar and battery backup solutions for all low-voltage applications. Solis Energy's products offer the most reliable, flexible and cost-effective outdoor powering solutions available on the market today. Established in 2005, the company's "smart" solutions allow customers to continuously power critical, low-wattage applications and electronic devices – such as security/surveillance cameras, WiFi hotspots, WiMax radios, telemetry equipment, power conditioning, SCADA and traffic monitoring systems – anytime and anywhere grid-supplied electricity is either unavailable or unreliable.