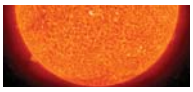
Clean Energy



SPACE FLORIDA

Florida ranks third among states in total energy consumption and the demand is increasing at an annual rate of 3.6%, which is well above the national average. Fossil fuels are used to generate 85% of the state's electricity, while nuclear and renewable generation account for only 12% and 3%, respectively. The state has virtually no known fossil fuel reserves. We import almost 100% of our fuel needs from domestic and international sources in the form of coal, oil, petroleum products and natural gas (including liquid NG). Further complicating the supply problem is the total absence of refinery capability in the state.

The state's heavy usage of fossil-fueled power generation (we are number one in the country) also means that we generate a disproportionate share of undesirable emissions. In 2007, our electric power industry alone generated 127 million metric tons of carbon dioxide, or about 6% of the nation's total. Our sulfur dioxide and nitrogen oxides were similarly of note.

The Market Horizon

Federal and state energy policies are evolving mostly around concepts such as "20% of our energy from clean renewable sources by 2020" and "reduce greenhouse emissions 40% by 2025."

A December 2008 study for the Florida Governor's Energy Office identifies solar (photovoltaic), offshore wind and biomass (solid) as having the most technical potential for the state. Florida already generates about 3.5% of its electricity from biomass, but equally important is the emergence of solar farms in the state and the keen interest in offshore wind turbines.

29,000 vehicles use alternative fuels today (not including millions of vehicles that make use of ethanol/gasoline blended fuels or diesel). Additionally, the state has been at the forefront of demonstrating hydrogen-powered vehicles and in the creation of hydrogen filling stations.

We must recognize that "Clean" energy is defined as highly efficient and/or renewable energy. Hence, technologies that make conventional power generation more efficient, or cleaner or less expensive are valuable in their own right just as is the development and deployment of power generation systems based on renewable resources.

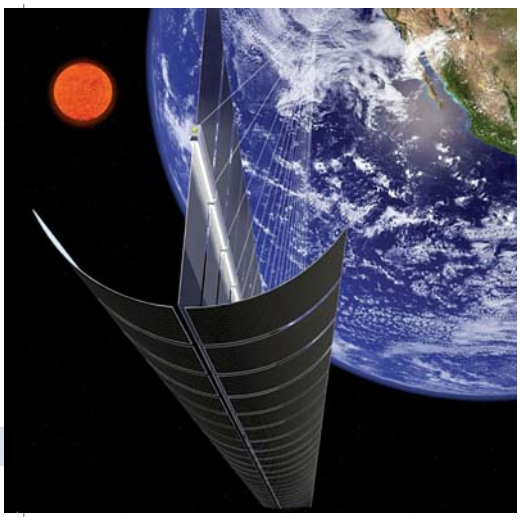
Recently Gainesville, FL, through a program initiated by Gainesville Regional Utilities, became the first city in the nation to have a solar feed-in tariff ordinance. This allows owners of new solar photovoltaic systems to sell energy to GRU at 32 cents per kilowatt hour of electricity produced by the system over the next 20 years. Image credit: Joe Raedle/Getty Images, NP

Timing

- Within 24 months have one or more entrepreneurial energy related companies resident in either Exploration Park or the CLZ
- Within 24 months have an alternative and clean energy source in field demonstrations coupled with an existing conventional power system
- Within 36 months have an alternative clean energy source in field demonstrations as an adjunct to a solar farm (to provide 24-hour power generation)
- Within 24 to 36 months have a program underway aimed at improving the efficiency of conventional, internal combustion engine power generation technologies (to include the use of diesel, hydrogen and biomass fuels such as ethanol and algae)

Florida's Edge

- *A dedicated Governor's Office for Energy, The Department of Environmental Protection, the Florida Public Service Commission, and the Florida Energy and Climate Control Commission*
- *An enthusiastic legislature*
- *The Florida Energy System Consortium (comprised of 11 colleges and universities)*
- *The Florida Solar Energy Center*
- *The Kennedy Space Center laboratories, facilities, and technical expertise*
- *An affordable, high technology work force*
- *The newly commissioned Exploration Park (including the Space Life Sciences Laboratory)*
- *World class agricultural and oceanic technologies*
- *A power generation industry committed to change*



A group of sixteen companies, led by the Japan Aerospace Exploration Agency, is spending three decades and $21 billion to develop a powerbeaming technology that harnesses solar energy in outer space and transmits it to Earth. Time of completion is set on 2020, during which the station is expected to power an average of 294,000 average homes in Tokyo. Image credit: JAXA

MARKET HORIZON

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

Targets for Florida

- Florida becomes a recognized hub for the development and implementation of alternative, clean, renewable energy technologies and systems
- Florida's energy imports are significantly reduced and the citizens and businesses of the state benefit from affordable, reliable energy with an emphasis on electricity and transportation devices
- Our energy user community reaps the benefits of affordable, reliable, non-polluting power generation whether it be for heating and air conditioning, transportation or industrial usage
- New jobs are created and capital investments accrue to the state from the introduction of clean energy technologies and systems

Algenol Biofuels, headquartered in Bonita Springs, FL, is using captured CO2 and algae to produce ethanol. This process is superior to corn-based construction because they can operate on smaller tracts of lower-quality land and the entire process is carbon negative. They are forecasting a capacity at their Mexican location of 1–2 billion gallons of ethanol per year. Image credit: Algenol Biofuels

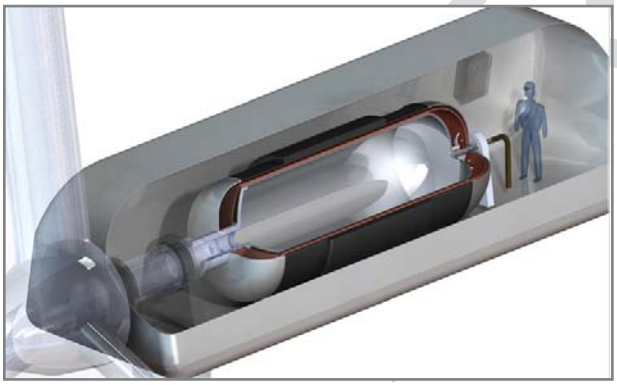
Tactical Development Strategies

Energy can neither be created nor destroyed but it can be converted (sunlight to electricity via photo voltaic materials), transported (electricity via a grid) and stored (batteries). These three functions of conversion, transport and storage are at the center of the technologies required to successfully implement clean energy strategies. The role of Space Florida is to act as a broker and match the needs of the energy community to the capabilities of the aerospace sector, and in so doing create an environment in which new jobs are realized.

To accomplish these objectives Space Florida will:

- Work with state and local government to create appropriate incentives
- Belong to those industry/government/academic consortiums that are energy centric
- Take advantage of the Special District monetary and tax provisions allowed by charter
- Investigate the establishment of a special energy zone along the lines of a Free Trade Zone with particular emphasis on Exploration Park, the Commercial Launch Zone and use of the Space Life Sciences Laboratory

Florida's next big community isn't for retirees — it's for solar energy buffs. Florida Power & Light and development firm Kitson & Partners are collaborating on Babcock Ranch, a 17,000 acre solar-powered city near Fort Myers. The community will run entirely on a 75 megawatt, $300 million solar-powered generator and will also use smart grid technology. Image credit: Kitson & Partners



Currently, generators used in wind turbines can't scale up efficiently due to size and weight issues. Because it is much lighter and smaller, AML Energy's All Superconducting Generator will allow wind turbines to produce more energy than currently possible. Image credit: AML Energy

Space Florida *was created to strengthen Florida's position as the global leader in aerospace research, investment, exploration and commerce. As Florida's aerospace development organization, Space Florida is dedicated to attracting and expanding the next generation of space industry businesses. Created by the State of Florida as a special district in May 2006, Space Florida serves space-related functions in all three aerospace sectors: civil, military and commercial. Florida's attributes include its superlative workforce, proven infrastructure and unparalleled record of achievement.*