CLIMATE
ENTREPRENEURS

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Great Egret. Photo: Clyde Comstock/Audubon Photography Awards

Businesses Building Florida's Future

Because Florida is ground zero for climate change, it also serves as an innovation lab for entrepreneurs at the cutting edge of climate solutions. Across the state, Florida businesses are forging a new climate economy—one which strengthens both our physical and financial resilience.

Entrepreneurs are helping us meet the threats of a changing climate while pioneering new business models and creating new jobs. Florida's oldest industries are finding their footholds in climate mitigation and adaptation, and small business owners are discovering fresh opportunity to grow their impact.

From transportation to energy efficiency, sustainable land use to mitigation banking, we need enterprising minds to spearhead new initiatives that reduce carbon emissions, boost coastal resilience, and safeguard our communities and natural resources. **Wherever you are in this economy, you have a place in the state's response to climate change.**

Rising to those challenges requires a business community that works creatively with Floridians and government agencies to make the Sunshine State strong now and into the future. In this brand-new series, Audubon Florida sits down with a suite of entrepreneurs who are building that future.

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Husein Cumber

FLORIDA EAST COAST INDUSTRIES (FECI) | CHIEF STRATEGY OFFICER | JACKSONVILLE

The Future of High-Speed Rail in Florida, Creating Jobs While Reducing Emissions

Innovation and entrepreneurship are helping us meet the challenges of climate change and in the process, are creating economic opportunity. Florida East Coast Industries is finding opportunity in mass transit, creating jobs while writing a new, greener chapter in Florida's transportation patterns.

Established in 1892 by Henry Flagler whose railway opened up Florida, the Florida East Coast Industries of the 21st century is pioneering high-speed rail from Miami to Orlando. This business is finding opportunity and creating jobs with an eye to delivering emissions savings and getting more than five million people off Florida roads when the route is at capacity ridership.

As FECI's Chief Strategy Officer, Husein Cumber recognizes that mass transit has always been desirable for its convenience; now, he sees that there is also increased demand from Floridians because of transit's role in addressing climate change. "It's been an evolution. We launched Brightline (FECI's high-speed rail enterprise in Florida) in 2012, and if you think back over the last ten years, a lot of the debate was centered on whether or not climate change exists. Today, the discussion has shifted from not whether it exists, but to what are the different mitigation measures that we need to put in place to address climate change," Cumber explains. "People need mobility options, and being able to move people through mass transportation is critical."

The growing demand to address climate change is driving a renaissance of technology and business plans. To innovators and entrepreneurs, Cumber has sober advice on the emerging climate economy: "This is that once in a lifetime opportunity where you're on the front end of an industry that's about to explode. And you don't want to look back and say I had the opportunity to be part of something special but I just went for something safe."

> "We are changing the way people move; the way they live.

Private sector solutions are key to blunting the worst effects of climate change. Decisionmakers who see the win-win of enlisting entrepreneurs in the fight against climate change have an important role to play. "Florida has the ability and will continue to attract people that are willing to come here and help solve the issues," Cumber said. "And so, where we can actually encourage them and incentivize them, I think Florida is going to be in a great position to attract companies, talent, and technologies we need to succeed."

While the marketplace's role in meeting the challenge of climate change is grounded in economics, the work has other rewards that are profound. "When you are able to do something that actually has a lasting effect—whether it's clean hydrogen, carbon capture, or building high-speed rail and fueling it with biodiesel, there's something very self-satisfying about that. You're building new technology, you're hiring people and training them with new skill sets and opening up new businesses that couldn't have existed but for these new technologies entering the market," said Cumber.

"We are changing the way people move; the way they live."

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Edwin Perkins

MOSS SOLAR | PRESIDENT | FT. LAUDERDALE

Florida Native Proving Sun is State's Greatest Resource

> Florida *is* my backyard, and I am proud to have the opportunity to build renewable energy here.

Florida has long been synonymous with sunshine, from beach scenes to breakfast juice. But Edwin Perkins, President of Moss Solar, is well on his way to giving new meaning to Florida's sunny reputation. Chief among these is solar energy, which diversifies our energy resources, can lower costs over time, and reduces carbon pollution—creating a better future for ecosystems, wildlife, and people. In his role with Ft. Lauderdale-based Moss, Perkins is building the infrastructure, workforce and opportunities to drive solar expansion throughout North America and the Caribbean.

From his vantage point, Florida has immense advantages in solar energy: "We are the Sunshine State, and we have the most amazing natural resources here. Not every state has the source of the sun year-round. Our land is also a great resource, and it's optimal—we don't have to do a lot of grading and changing the terrain. We don't have to cause environmental impacts to get solar built—we are light on the land."

Moss is a national construction and engineering leader based in Ft. Lauderdale that expanded into solar in 2012, recognizing the business opportunity it presents. In 2012, when solar was in its infancy, Perkins jumped at the opportunity to enter the solar market and build Moss' solar division. Now, demand is booming, and the company is growing in response. In the last two years, Moss Solar has expanded from thirty-five salary employees in 2018 to over three hundred and fifty today. A native Floridian, he is enthusiastic about the increase in solar projects not only across the hemisphere but also within the state. "I was born and raised in Florida. When I first got into solar, it was disappointing that all of the projects were outside of the state, and it wasn't until about three years ago that we started building solar in our backyard," says Perkins. "Florida *is* my backyard, and I am proud to have the opportunity to build renewable energy here."

Perkins is also proud of Moss' employees, and the company's entrepreneurial culture. "When people join Moss, they never want to leave."

Although this past year has been difficult for many industries, solar shows no signs of a long-term slow-down. "The demand for solar is phenomenal," Perkins explains. "No other construction industry has the ten-year outlook as we see with solar. It's doubling every year through 2030."

"We must find a way to support demand," Perkins adds. Moss Solar is committed to doing exactly that: "Four years ago, no one wanted to build solar, but now when we recruit, everyone wants to work for renewable energy. We are moving forward in the right direction."

Larry Beggs

REEF INNOVATIONS | PRESIDENT | SARASOTA

Fifth Generation Floridian Champions Reef to Land Protection

With climate change driving sea level rise and storms, erosion and flooding are more concerning for Florida's coasts than ever before. Instead responding to this threat with harmful seawalls, innovators are helping Florida employ nature-based solutions like well-sited artificial reefs and mangrove restorations, to dissipate wave energy and provide habitat for fish and other wildlife. These features can create calm-water shorelines to halt erosion and attenuate storm surge, enable seagrass and marshes to reestablish, and provide a substrate for invertebrates like oysters that clean the water and drive the food web. Larry Beggs has been innovating with artificial reef technology for more than 20 years, creating jobs, habitat, and community resilience from his Tampa-based business, Reef Innovations.

Beggs is a fifth-generation Floridian who began his career on the land, specifically in his family business with horses and cattle. At nineteen years old, a friend talked him into trying scuba diving, leading him to develop a passion for the sport. As Chairman of a volunteer-led reef restoration project off the coast of Cape Canaveral, he researched ways to build artificial reefs. The research led him to an article about reef ball prototypes in a YMCA publication, and the rest is history.

Today, Beggs is the President of Reef Innovations, a Sarasota-based company and a worldwide contractor for reef balls. With over 23 years of experience, Beggs and his crew build projects of all sizes utilizing local labor and material, providing economic stimulus and community ownership. With the singular goal of reef restoration in mind, project locations vary from remote islands to metropolitan areas, and Beggs' team designs reef modules of all sizes and shapes to fit into unique ecosystems.

> **"Nature-based solutions to erosion create habitat, community resilience and jobs.**

Beggs sees the direct connection between reef preservation and land conservation. When high levels of nutrients from runoff and agriculture end up in our waterways, the resulting algal blooms have a devastating impact on Florida's reefs and marine life. "Everyone needs to understand that what you do on land, on your street, and in your cul-de-sac drains out of your home or into the stream behind their house and ends up in the bay, the ocean, and ultimately the reefs," he explains. "Our reefs and our land are not two separate resources, they benefit each other and when one becomes damaged, the others do too."

The future of his work is focused on educating residents and decision-makers on the importance of reef restoration and protection. As a natural climate solution, artificial reefs and reef balls are a critical tool in a community's toolbox, and Beggs advocates for more streamlined permitting as the need for coastal protection becomes increasingly urgent.

To learn more about Reef Innovations, Eternal Reefs, and the Reef Ball Foundation visit www.reefball.org

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Alex Preisser

MITIGATION MARKETING | PRESIDENT | WINTER PARK

Native Floridian Combines Expert Mitigation Skills and Environmental Passion

Under state and federal environmental laws, people who propose development impacting natural resources have to avoid and minimize some of those impacts, and when they can't they are required to mitigate them. That means paying for natural resources elsewhere to be protected or restored — and that's where Alex Preisser, President of Mitigation Marketing, comes in. Born and raised in Central Florida, Preisser combines her background in biology with an expert knowledge of the permitting processes of state, federal, and local environmental regulatory agencies to deliver meaningful conservation results. In her role, she oversees on-site restoration activities and manages federal and state permitting compliance at the company's banks located throughout the state, while also managing the marketing and sale of mitigation credits.

Mitigation Marketing, founded in 1998, was the first company of its kind in Florida. Today, the company remains the largest firm specializing in marketing support for mitigation banks. Preisser notes that success in this line of work comes from savvy risk assessment, a good eye for investment, and thoughtful project management: "We identify problems early on in the process," she explains. "We have never had a project fail because we invest in our education. If we have a bank that's successful, we will make money—it's a green investment."

> **What we do is valuable to the environment so we must meet our milestones to have our projects make a big difference in the long run.**

Beyond ensuring the company's own success, she keeps her eye on the larger environmental goals. "What we do is valuable to the environment so we must meet our milestones to have our projects make a big difference in the long run." Mitigation Marketing is instrumental in helping achieve no net loss of wetlands—an ongoing environmental quest to increase the wildlife corridor, decrease water pollution, and create additional open outdoor space.

While Preisser's university education was in Utah, she grew up in Winter Park, FL, and had always planned to return home after college. "I just love everything about Florida. It's so diverse and I truly love being out in parts of Florida that most people do not get to see." In her role, she is able to enjoy Florida's special places; the 900-acre Hilochee Mitigation Bank within the Withlacoochee River Basin in Polk County is one of Preisser's favorite projects. The restoration and enhancement plan creates wetlands, enhances both the wetlands and the upland forests, and establishes native marsh vegetation. "The wildlife out there is amazing, and we get to see eagles, Sandhill Cranes, gopher tortoises, coyotes, and bears on our wildlife cameras."

Mitigation banking continues to evolve and Preisser enjoys maximizing its benefits for Florida's natural resources, and sharing her perspective as a "woman in this industry, coming home to my three kids in snake boots and a shovel."

> **In mitigation banking, the negative impacts to one ecosystem are offset by restoration, protection, or enhancement of another ecosystem.**

In addition to their beauty, wetlands and other natural spaces can function as natural climate solutions. While improving air and water quality and enhancing habitats for birds, fish, and other wildlife, they also offer flood and erosion control, recharge groundwater, offer storm protection, and sequester carbon pollution.

"I will continue to put my skills and knowledge to good use," she said. "Florida is THE place to do [mitigation] banking; everything is on the cutting edge."

Syd Kitson

KITSON & PARTNERS | CHAIRMAN & CEO | PUNTA GORDA

The Hometown of Tomorrow, Today in Florida

> When people move to our community, solar goes from being a curiosity to a way of life.

In 2005, Syd Kitson had a crazy idea: To build a new community—a town—that would be mainstream sustainable, and at its heart, it would be powered by solar energy. This was before solar was fashionable or even economical, and he had some big hurdles to overcome. Pitching the CEO of Florida Power & Light Company opportunistically in an elevator in the Capitol, Kitson made a compelling argument. "He listened as I explained we were building a new city of just under 20,000 homes and six million square feet; we wanted it to be the most sustainable and environmentally responsible new town," Kitson described. The following week, Kitson received a call from a group of individuals working for Florida Power & Light Company, and collaboration began.

Whether it's solar, or the major conservation acquisition Kitson brokered in the creation of the town, or its emphasis on native plants and restored wetlands to attenuate flooding, protect from fire in droughts, and reduce and absorb algae bloom-fueling fertilizer use, Babcock Ranch's sustainable design choices didn't just make environmental sense, they made economic sense. An investment that has paid returns, these features distinguish Babcock from a field of communities competing for new residents. "From an economic perspective, Babcock Ranch is already ranked in the top 30 in the country in home sales, and we are breaking all of our records. I have other developers calling me—my peers—and asking 'Do you mind if we take your playbook?' and I say, it'd be the greatest compliment you could ever give me."

Babcock Ranch is not a subdivision or a gated community, but a unique town that inspires a very special feeling for many people. "If you see the before and after pictures [of wetland restoration projects included in Babcock's community design], it's stunning. And what amazes me is how fast nature heals itself," Kitson said. "That's why I am so optimistic about the future — because I truly believe that it's not too late for us to get this right."

In addition to being a successful businessman, Kitson has been a thought leader in Florida for years, serving as Chairman of both the Board of Governors of Florida's State University System as well as the Florida Council of 100. Kitson believes "people come here because of our incredible environment. But if we destroy that, we've taken away one of the greatest economic engines we have in the state. This is a point in time where people want to take action, and you're going to see a lot of that from companies large and small." In demonstrating sustainability's economic viability, Kitson has set the stage for entrepreneurship to help Florida meet the challenge of climate change head on.

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Rick Meeker

NHU ENERGY | PRESIDENT | TALLAHASSEE

Startup Founder Leads Transformation to a Cleaner Power and Energy System

> You can be profitable and do the right thing for the environment.

Our current energy grid was designed and organized for our fossil fuel-driven past. However, our future relies on clean, renewable energy, in the form of solar, wind, and hydropower. To accelerate this energy transition, we need a more connected and intelligent energy system. Rick Meeker and Nhu Energy are designing those systems and that future.

Meeker has over 35 years of experience leading in the engineering and energy industry, from research and development to manufacturing. That experience shapes his current role as President of Nhu Energy, a company working to optimize and innovate new energy technologies that can integrate with our current energy grid while also transforming it. "The electric power grid has been called the largest and most powerful machine man ever built," Meeker says. "It is a big complex machine, and we are getting ready for an even bigger and more complex future." Meeker and Nhu Energy work daily on the future of energy.

Nhu Energy specializes in distributed energy resources—smaller scale energy production and storage resources, like solar panels, battery storage, or EV charging stations, as well as microgrids, small energy grids made up of those distributed energy resources that provide energy for specific locations, like a university or a hospital. Meeker has a background in control systems, so he understands both the complexity of the grid and the critical need for intelligent systems that allow everything to work together. Nhu Energy's expertise is paving the way forward for both businesses and governments; they developed the first renewable energy microgrid in a California hospital and have partnered with the Department of Energy through Florida State University.

Continuing research in this area is essential. In 2019, the group participated in a natural accelerator called the Clean Team Open and leads the Florida Alliance for Accelerating Solar and Storage Technology Readiness (FASSTeR) to "assist in developing pathways for the successful expansion of grid-integrated solar, energy storage, and other distributed energy resources in Florida in a way that maximizes value and reduces risk," he explains. Forging a partnership of Florida's world-class academic talent, Meeker and his team created the first Florida statewide university energy consortium, the Florida Energy Systems Consortium (FESC). FESC "promotes collaboration among the energy experts at Florida's 12 supported universities to share energy-related expertise and assists the state in the development and implementation of an environmentally compatible, sustainable, and efficient energy strategic plan."

Where there is need, entrepreneurship has an opportunity to be the solution. With its strong industry leadership, it is easy to forget that Nhu Energy is a startup. Establishing a startup is demanding; establishing a startup bent on transforming the energy grid can seem like an even more daunting prospect. "The hill to climb to transform the power and energy systems is challenging," Meeker says. "It's this massive infrastructure that is worth nearly five trillion dollars—it is bigger than aerospace, and it is bigger than pharmaceuticals, so trying to play a role in this space is giant." However, Nhu Energy is more than equipped for that challenge, and Meeker recognizes the tremendous opportunities in this sector. Establishing a network of cleaner and more efficient energy resources protects bottom lines, makes our systems and institutions more secure, and gives us cleaner air and water. "We buy into the philosophy that you can be profitable and do the right thing for the environment and the community around you. You can be more profitable if you do these things right," he adds.

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Sastry Pamidi

FAMU-FSU | CHAIR & PROFESSOR | TALLAHASSEE

FAMU-FSU Engineering Superconductor Tech Drives Energy Storage and Efficiency

> Strong research centers with cutting edge science attract renewable tech companies to Florida.

The frontier of renewable energy is in energy storage, saving solar energy generated in the day for use at night, or powering electric vehicles over longer distances with greater capacity for passengers or cargo. Battery innovators are working to reduce the size of batteries, making them more portable and reducing the amount of energy they waste in the form of heat. One of the most promising tech frontiers for batteries? Superconductor applications, like those investigated by Dr. Sastri Pamidi and his team at the Florida A&M University-Florida State University College of Engineering and the Center for Advance Power Systems.

Superconducting materials are much more efficient than traditional conductors for electricity storage and transmission. Traditionally, superconductors need to be operated at very cold temperatures; however, Dr. Pamidi and his colleagues' innovative technologies allow the 'new superconductors' to be used at much higher temperatures, making them much more practical while maintaining the inherent efficiency of superconductors. This significantly higher efficiency means that cables, and other storage devices can be smaller and emit little to no wasted heat.

"Superconducting technologies not only make the devices smaller and more efficient, they can change the whole architecture of electric power distribution," Dr. Pamidi says. "The grid can be completely rethought to dramatically eliminate emissions and pollution while making the system safer and more sustainable." Reducing size and increasing efficiency offers tremendous opportunities for city infrastructure, transportation, and renewable energy generation.

For example, building infrastructure for electric vehicles requires cities and counties to lay more transmission cables, "But the ground beneath cities is already full," he explains. Superconducting tech enables smaller cables to conduct more energy—reducing the underground transmission footprint while increasing capacity. The transportation sector contributes almost a third of United States' carbon emissions. While smaller vehicles, like cars or light trucks, are transitioning to all-electric, it is much harder for larger vehicles, watercraft, and aircraft to do the same. Superconducting technology helps bridge this gap.

The aerospace industry—a notorious carbon polluter—is working hard to develop superconducting devices on aircraft, which would make each plane lighter, saving on fuel and reducing the carbon footprint of each flight. Excitingly, Dr. Pamidi's Florida State University's Center for Advanced Power Systems and Advanced Conductor Technologies, LLC—a small business—have already tested a superconducting cable that could lead to all-electric ships.

Superconducting technology also offers more efficient renewable energy production. In wind turbines, for example, it can make the generator and cables smaller, so the windmills can be lighter—this allows them to generate more power with a smaller physical footprint. These windmills have been successfully tested in Europe, and researchers hope for a full roll-out across the world.

Already, Dr. Pamidi's research at the Florida State University Center for Advanced Power Systems is partnering with Florida businesses to develop technologies and bring jobs to the Sunshine State. "Strong research centers with cutting edge science attract renewable tech companies to Florida. We have the expertise and technologies, as well as a highly skilled workforce trained at our universities."

Dr. Pamidi and his team's work on superconductor tech are not just building the future of renewable technology, but driving the growth this sector and its jobs for Floridians.

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Thomas J. Brown

LIVING SHORELINE SOLUTIONS INC. | CEO | DADE CITY

Finding Natural Engineering Solutions That Can Help Bridge the Gap

> Climate change is a big issue especially if the land itself is disappearing into the water.

What makes a financial advisor, used to walking the halls of Fortune 500 companies, leave it all behind to start a Living Shorelines business? A lucrative market, of course, but also the chance to make a lasting difference in vulnerable coastal communities.

After Thomas J. Brown flew from New York to Florida to learn about an emerging technology for a client, he knew instantly that it would change the tide of both his career and environmental conservation. Enter: WADs, short for "Wave Attenuation Devices," and the foundation of Brown's company, Living Shoreline Solutions. WADs are innovative structures that, when placed in the water along shorelines, reduce the amount of wave energy reaching the coast.

As sea levels rise and storms have become more intense and frequent, coastal erosion has worsened. Reducing the intensity and height of waves that hit the coast offers myriad benefits: erosion mitigation and prevention, increased protection for important shoreline habitats, and the opportunity to build back lost land by allowing sand to accrete. The advantages of WADs extend underwater as well; within the calmer waters between WADs and the shore, seagrass beds flourish, creating key fish habitat. WADs are an ecologically-minded alternative to dredging and other types of wave-refracting infrastructure that disrupt existing habitat or don't offer the same habitat benefits. The ultimate result is a living shoreline that supports healthier, more productive coastal ecosystems that can better adapt to climate change impacts.

Living shorelines are composed of materials, like plants, sand, and rock, that help stabilize coasts and marine systems. The benefits of living shorelines include reduced erosion, protection from storm surge, and habitat for wildlife. Living shorelines also increase natural carbon storage, pulling carbon that contributes to climate change and global warming out of the atmosphere.

Brown recognizes that ecosystems need time to adapt to a rapidly changing climate and that the pace of sea level rise and other climate impacts outstrips some ecosystems' adaptation potential.

"Climate change is a big issue especially if the land itself is disappearing into the water," he says. However, he also recognizes the enormous potential for natural engineering solutions that can help bridge this gap. The demand for innovative climate technologies that protect communities, wildlife, and natural spaces make WADs both desirable and profitable. "I went into the business because one, I understood the technology and how it worked, and two, I saw unlimited worldwide demand," Brown explains.

Brown's first project with Living Shoreline Solutions was with Audubon Florida at Tampa Bay's Alafia Bank Sanctuary. The sanctuary hosts up to 18,000 nesting pairs of birds and is one of the largest colonies in Florida. Reduced shoreline erosion has already protected vulnerable nesting islands through two storm seasons.

Since partnering with Audubon Florida, Brown has worked in Florida and across the United States to protect shores. By partnering with local governments, various organizations, and the Army Corps of Engineers, Living Shoreline Solutions has burgeoned, and Brown is excited for the projects on the horizon, both in the United States and beyond.

When asked about the legacy he would like to leave, Brown says "if my little role is that I have introduced to the US, and the world, technology that allows them to stop erosion and counteract some of the climate change issues that we are going to face in the next 50 years, then I have done my job".