Renewable Energy Education Program at USF's Patel College of Global Sustainability

George Philippidis, Ph.D.
Ali Yalcin, Ph.D., Yogi Goswami, Ph.D., Kala Vairavamoorthy, Ph.D.

Rationale

- Renewable energy drivers:
  - Energy security
  - Environmental quality
  - Climate change
- Production to increase 4x over next 40 years as US economy becomes more sustainable
- This growth will generate **employment**, investment, trade, and tax revenue

Florida's Role

- Rich in natural resources (biomass, solar, ocean)
- Becoming 3rd most populous state in the USA
- Strategic geopolitical location
- Can become leader in renewable energy
- Leadership position requires **well-educated** Floridians to run and manage green economy
- Need: Green workforce development

Status

- Only sustainability college
- MA program in Global Sustainability
  - Integrates principles, economics/finance, systems thinking, and communication of sustainability
  - Can complete in 12 months, fully in-class and on-line
  - Students with diverse backgrounds and work experience
- Concentration areas:
  - Water
  - Entrepreneurship
  - Eco-Tourism
  - **Renewable Energy**

Objectives

- Create new *Renewable Energy* concentration for the MA program
- Design, launch, and assess two new graduate courses:
  - Renewable Transportation Fuels (Fall '14)
  - Renewable Power Portfolio (Spring '15)
- Timeline: Jan. 2014 - Jul. 2015
- **In-class** and **on-line** for:
  - PCGS MA program students
  - USF students as electives
  - Florida SUS students and others
- Guest speakers from energy industry with emphasis on Florida
- Course assessment based on student feedback and energy experts
- Hands-on R&D in algae, biomass, solar, and energy storage at USF labs

Courses

Renewable Transportation Fuels

- Market status and prospects
- Conventional biofuels
  - Ethanol
  - Biodiesel
- Biomass resources
- Advanced biofuel technologies
  - Biochemical conversion of biomass
  - Thermochemical conversion of biomass
  - Algae technologies
- Biogas technologies
- Economics and finance
- Environmental and sustainability aspects
- Real-world integrative case study
- Research project

Renewable Power Portfolio

- Market status and prospects
- Technologies
  - Solar (PV, concentrating, thermal)
  - Wind
  - Biomass power
  - Geothermal
  - Hydro and ocean
  - Energy storage
  - Smart grid
- Economics of renewable power
- Project financing
- Integration into existing infrastructure
- Environmental and regulatory aspects
- Read-world case studies
- Research project

Acknowledgements

- The project is partially supported by a grant from FESC (subcontract UFOER00010008)
- Prof. Jennifer Curtis and Canan Balaban of FESC for their support

Contact Information

George Philippidis, Ph.D.
Associate Professor, Sustainable Energy
Patel College of Global Sustainability
University of South Florida (USF)
Tampa, Florida

(813) 974-9333
gphilippidis@usf.edu

psgs.usf.edu/patel-center/sustainable-energy/