

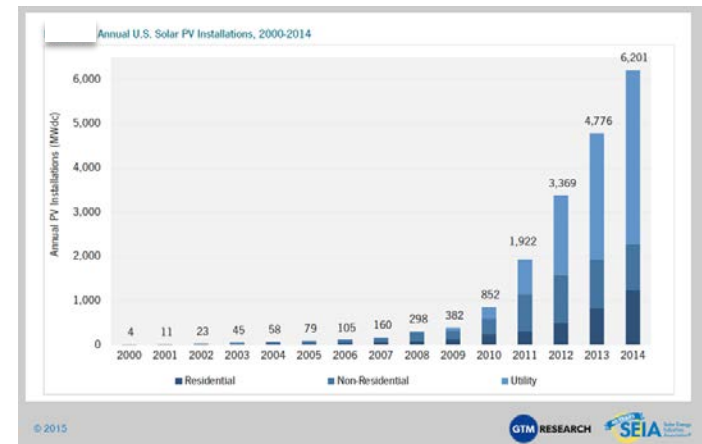
Solar Energy Technologies: Fundamentals and Applications in Buildings

-

Cheng-Xian (Charlie) Lin, Ph.D.
Department of Mechanical and Materials Engineering
Florida International University
Miami, Florida 33174

Motivations

- Great Solar Energy Growth Potential in Florida
 - No. 3 in solar potential
 - No. 19 in solar PV installation (2014)
 - No. 3 in SHC installation (2010)
- Large Energy Consumption in Building Sector
 - 40% (38.5 Quads) of primary energy consumption in the U.S. (2014)
 - Florida ranked No. 2 in retail electricity sales to the residential sector (2013)
- Need for a New Course Focused on Solar Technologies for Building Applications
- The New Course at Florida International University
 - Fully online primarily for undergraduate students
 - Complementary to existing courses, such as EEL 5285C Sustainable and Renewable Energy
 - Alternative to courses of the Energy and Sustainability Certificate Program



Course Outlines

Chapters	Topics
1	Introduction (Overview of solar energy technologies)
2	Solar Irradiation
3	Principles of Solar Energy Conversion (Solar-Thermal; Solar-Electricity)
4	Integration of Solar Systems in Buildings
5	Solar Thermal Systems: Water Collectors
6	Solar Thermal Systems: Air Collectors
7	Hybrid Solar Energy Systems (PV/T)
8	Solar Cooling Systems for Air Conditioning I
9	Solar Cooling Systems for Air Conditioning II

Total lectures: 28

Project Status

Tasks	Months																	
	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18
References gathering & evaluation	█	█	█															
Lectures preparation				█	█	█	█	█	█	█	█	█						
Course upload to Blackboard												█	█					
Course delivery (online)													█	█	█	█	█	
Biannual reports						█						█						
Final report																		█



- FIU contract/account set up: November 11, 2014.
- University Curriculum Committee approval: February 17, 2015.
- Progress reports submitted: 2.

Next Steps

- Complete lecture preparation
- Upload course to Blackboard Learn
- Deliver the course
 - Target: Fall 2015