Welcome to Purdue Energy Camp!

June 10-16, 2012
West Lafayette, IN
Outline

• Objectives
• Leadership Team
• Schedule
• Teachers Projects
• Student Projects
• Rules and Guidelines
• Shreve Hall Guide Lines
• Questions and Answers
• Ice Breaker
Humanity’s Top Grand Challenges for Next 50 Years

Modified from Nobel Laureate Richard Smalley: 1943-2005

1. ENERGY
2. WATER
3. FOOD
4. ENVIRONMENT
5. POVERTY
6. TERRORISM & WAR
7. DISEASE
8. EDUCATION
9. DEMOCRACY
10. POPULATION

2004  6.5 Billion People
2050  ~ 10 Billion People
Millions of Barrels per Day (Oil Equivalent)

Source: Smalley, Pioneers in Energy Seminar, Purdue University
John F. Bookout (President of Shell USA), "Two Centuries of Fossil Fuel Energy”
Energy supply and use in the United States

Electrical Energy Storage

Smart Grid & Transmission

End Use Efficiency

Zero-\(\text{CO}_2\)Energy

Solar 0.09

Nuclear 8.15

Hydro 2.45

Wind 0.51

Geothermal 0.35

Natural Gas 23.84

Coal 22.42

Biomass 3.88

Petroleum 37.13 (2/3 of crude oil imported)

Net Electricity Imports

Wasted 57.07

Used 42.15

Res. 11.48

Comm. 8.58

Ind. 23.94

Trans. 27.86

http://www.purdue.edu/dp/energy
Nuclear and Renewable are ~15% of Energy Supply

Hydroelectric and wood still dominate the renewable energies

- Petroleum: 37%
- Natural Gas: 25%
- Coal: 21%
- Nuclear: 9%
- Renewables: 8%
Objectives

Application of STEM disciplines to the field of energy, the impact of changing environmental regulations, and logistical challenges associated with introducing new alternative sources of energy to the marketplace.

Students

• Spark interest in energy research, development and deployment

Teachers

• Provide an opportunity to "train-the-trainers."
• Gain knowledge of advances in energy research
Leadership Team

Maureen McCann  
Professor. Biological Sciences  
Director  
Energy Center and C3BIO  
Discovery Park  
PEC Director

Sally Bane  
Professor  
Aeronautical and Astronautical Engineering  
PEC Co-Director for Teacher Projects

Pankaj Sharma  
Managing Director  
Energy Center  
Discovery Park  
PEC Co-Director Operations

Chris Foster  
Director P-14  
Discovery Park  
PPEC Co-Director for Teacher Projects

Sally Bane  
Professor  
Aeronautical and Astronautical Engineering  
PPEC Co-Director for Student Projects
Leadership Team

Laura Warner
Administrative Assistant
Discovery Learning and Research Center
Discovery Park
PEC Administrative Asst.

Jill Wable
Administrative Assistant
Energy Center
Discovery Park
PEC Administrative Asst.

Kathryn Walter
Senior Conference Coordinator
Purdue University Conferences
PEC Conference Coordinator

Tolu Osomoto
Special Projects Assistant
Energy Center
Discovery Park
Graduate Student, Civil
PEC Counselor
Leadership Team

Counselors/Volunteers

Matt Massaro
Graduate Student
Mechanical Engineering
Zucrow Lab
PEC Counselor

Ben Kariya
Undergraduate
Chemical Engineering
Surf Student - Catalysis
PEC Counselor

Alaina Austin
Senior Undergraduate
Aeronautical and Astronautical Eng.
PEC Counselor

Meher Taleyarkhan
Sophomore Undergraduate
Mechanical Engineering Technology
PEC Counselor
Schedule

AM Speakers
Fossil Fuels, Electric Vehicles, Bioenergy, Efficient Vehicles

AM and PM Tours
Coal plant, Catalyst, Wind Farm, Technology Incubation, Smart Grid, Agriculture waste digester, Nuclear Energy, Nanotechnology

PM Speakers
Regulations, Wind Energy, Fermentation

Others
Bowling, Low Rope, Ross Ade and McKay Arena
Schedule: Closing Ceremony
June 16, 2012
Student Presentations
Key note speaker: Energy and Policy
Certificate presentation by Provost Sands
Group photo
Reception
Invite your parents!
Teachers Project
Chris Foster

• Achieve professional growth
• Gain knowledge to benefit classroom teaching
• Develop and outline of a lesson plan to include energy in curriculum
• Develop two page report
Feedback/Assessment
Chris Foster

• Initial

• Informal and in between/continuous

• Final

Important – Fill out forms and return
Student Projects
Sally Bane

Goals
• Learn sustainable energy science and engineering
• Gain experience to work in a group and to deliver a technical presentation

Purdue science and engineering graduate student assigned
Purdue computer labs are available for research
Camp Rules: General
Tolu Osomoto

• All participants must comply with all applicable federal, state, and local laws and all University statutes and regulations while on our campus.

• All participants must remain in groups at all times and participate in all scheduled activities.

• Visits to rooms of opposite sex colleagues are not permitted.

• Zero tolerance to use of drugs, consumption of alcohol, smoking, possession of firearms and weapons in the residence halls.
Camp Rules: Tours
Tolu Osomoto

- You are not allowed to touch anything during the tours.

- Comfortable closed toes shoes should be worn during facility tours.

- To be on the safer side, clothing exposing body parts to danger should be avoided.
**Camp Rules: Computer Policies**

Tolu Osomoto

- You have been assigned guest log-on usernames and passwords to enable you access the Purdue network.
- Purdue maintains a strict policy regarding computers on its networks.
  - Use responsibly
- Computer lab sessions should be used strictly for project purposes
  - No facebooking etc
- Food items are not allowed in the computer labs.
Use of mobile phones, ipods and associated electronics are not allowed during tours, speeches and laboratory sessions.
Shreve Hall Rules
We thank our sponsors!
Questions
Ice Breaker

Albert Einstein
Nobel Prize 1921
Theoretical Physics
Theory of Relativity
$E = MC^2$
Photoelectric Effect

Marie Curie
Nobel Prize Physics 1903
Nobel Prize Chemistry 1911
Radioactivity
Polonium and Radium

Niels Bohr
Nobel Prize 1922
Physics
Structure of Atoms

Richard Smalley
Nobel Prize 1996
Chemistry
Fullereness
Group Einstein

Students

• Jordan Parrott
• LaShawn Lee
• Ethan Steltz
• John O’Keefe
• Timothy Lui
• Samantha “Mandy” Christos-Hill

Teachers

• M. Merindy Carpenter
• David Collins
• Nancy Franke
• Peter Von Werder
Group Curie

Students
- Maya Sydnor
- James Porte
- David Poindexter
- Lowell Knight
- Vivien Lai

Teachers
- Lynne Barden
- John Weitlauf
- Melissa McCarthy
- Becky Stiller
Group Bohr

Students
- Jessica Tice
- William Mbongo
- Sean Martin
- Nicholas Birkhimer
- Braelin Stockton

Teachers
- Peidad Stella Corredor-Sanchez
- Lacy Walker
- Paul Norwine
Group Smalley

Students
• Matthew Von Werder
• Clayton Meranda
• Alexandrea (Sasha) Solochik
• Nathaniel Browne
• Joshua Alexander Campbell

Teachers
• Cynthia Hairston
• Lori Loucks
• Christine Chambers
• Walter Stephen (Steve) Riggle