Sunday, June 22

1:00-3:00 PM  Check in/Registration/Campus Boilermaker tour
               – Hillenbrand Dining Court

3:00-3:05 PM  Fill out and return ‘A Few Simple Questions – Dennis Schatz’

3:05-3:45 PM  Energy Icebreaker
               Hillenbrand Dining Court

3:45-4:30 PM  Teachers’ session by Jerry Krockover – Hillenbrand Conference Room C102A
               Professor Emeritus of Earth, Atmospheric, & Planetary Sciences Education, Purdue
               Nancy Franke, Teacher, St. Peter’s Lutheran School, Columbus, Indiana
               Margie Dobler, Project Lead the Way Teacher, South Adams Schools, Berne, Indiana
               Anne Dick, Science Department Head, Maconaquah High School, Bunker Hill, Indiana

3:45-4:30 PM  Students’ session – Hillenbrand Dining Court
               Kari Clase, Associate Professor, Technology Leadership & Innovation; Agriculture & Biological Engineering, Purdue

4:30 PM       Depart

4:50 PM       Group Photo - Academy Park (Clapping Circle)

5:15 PM       Reception
               North Ball Room, Purdue Memorial Union

5:40 PM       Welcome and introductory remarks
               Pankaj Sharma, Associate Professor of Technology Leadership and Innovation (Courtesy)
               Managing Director, Energy Academy & Energy Center
               Discovery Park

5:45 PM       Affordable, Reliable, and Clean Electricity
               Melody Birmingham-Byrd
               Duke Senior VP Midwest Delivery & Operations Services

6:00 PM       Dinner

7:00 PM       Energy: Challenges and Opportunities
               Rakesh Agrawal, Winthrop E. Stone Distinguished Professor of Chemical Engineering

7:30 PM       Depart for Hillenbrand Residence Hall

8:00 PM       Residence Hall Orientation
               Hillenbrand Dining Court
Monday, June 23

Notes for the day: (1) for afternoon tour to Benton County participants must wear closed-toe shoes and (2) laptop or mobile devices with calculator apps will be needed for calculations

7:00-8:00 AM Breakfast – Earhart Dining Court-Private room A, B, C, and D

8:00 AM Depart

8:30-8:40 AM Hall for Discovery Learning and Research - HDLR 131
Welcome
Mitch Daniels
Purdue President

8:40-9:30 AM Academy Orientation
Pankaj Sharma

9:30-10:30 AM Sustainability—Part I: LED Bulb – HDLR 131
Loring (Larry) Nies, Professor, Civil Engineering and Environmental & Ecological Engineering

10:30-10:45 AM Break

10:45-11:45 AM Sustainability—Part II: Photovoltaic Powered Electric Cars – HDLR 131
Loring (Larry) Nies, Professor, Civil Engineering and Environmental & Ecological Engineering

11:45 AM-12:00 PM Break

12:00 -1:00 PM Lunch – HDLR 134

Teachers meet with Jerry Krockover/Margie Dobler/Nancy Franke/Anne Dick
– HDLR 134
Students meet with Kari Clase and Soo Jung Ha, Graduate Student, Agricultural and Biological Engineering
– HDLR 131

1:00-1:15 PM Break

1:15 PM Renewable Energy: Solar - HDLR 131
Peter Bermel, Assistant Professor, Electrical and Computer Engineering

Renewable Energy: Wind – HDLR 131
Jun Chen, Assistant Professor, Mechanical Engineering
Zachary Adams, Graduate Student, Mechanical Engineering

2:00 PM Depart from Discovery Learning Research Center

2:45 PM Arrive at Benton County Wind Farm
410 S Adeway, Fowler, IN 47944
Contact: Kelly Kepner, Benton County Development Director
(765-376-3133 Cell; 765-884-2080 Office)

2:45-4:15 PM Tour

4:15 PM Depart

5:00 PM Arrive and Dinner Earhart Dining Court-Private room A, B, C, and D

6:30 –8:30 PM Background work on research projects
Computer Labs – Stanley Coulter Hall (SC) SC 246, 277, 283, and 289
Hillenbrand Conference Room C102A (private room for teachers)
Tuesday, June 24

Notes for the day: for hands-on activities participants must wear closed-toe shoes and must wear safety goggles and lab coats when instructed.

7:00-8:00 AM  Breakfast – Earhart Dining Court-Private room A, B, C, and D
8:00 AM  Depart
8:15-11:15 AM  Renewable Energy Challenge – Gerald D. and Edna E. Mann Hall (MANN), Mann Hall Atrium, 1st and 2nd Floor  
  John Zakelj, Wind Senator and Science Teacher &  
  High Ability Program Coordinator, Union City Jr/Sr. High School, Union City, Indiana
11:15-11:30 AM  Break and transfer to MRGN 121
11:30-12:30 PM  Overcoming Your Expert Blind Spot: or I Get It, Why Don’t They  
  Dennis Schatz, Senior Advisor, Pacific Science Center,  
  Seattle, Washington and National Science Foundation Program Director, Washington, DC
12:30-1:30 PM  Lunch – MRGN Café
1:30 PM  Break
1:45 PM  MRGN 121  
  Global Energy Business  
  Matthew Montgomery, Engineering, Gas Turbine Engineering, Siemens Energy, Jupiter, Florida
2:30 PM  Introduction to Snap Circuits – MRGN 121  
  Craig Locker, Graduate Researcher and Teaching Assistant Engineering/Technology Teacher Education, College of Technology
2:45 PM  Depart for Mann Hall
3:00 PM  Hands-on Activities: Power Transmission and Distribution – Mann Hall Atrium, 1st and 2nd Floor  
  Craig Locker, Graduate Researcher and Teaching Assistant Engineering/Technology Teacher Education College of Technology  
  Xiaojun Lin, Associate Professor, Electrical and Computer Engineering  
  Chris Foreman, Assistant Professor, School of Engineering Technology  
  Richard Fox, Computer Analyst, Youth Development and Agricultural Education
4:45 PM  Depart
5:00 PM  Dinner - Earhart Dining Court-Private room A, B, C, and D
6:15 PM  Depart to France Cordova Recreational Sports Center
6:30 PM  Tour of France Cordova Recreational Sports Center
7:00 – 8:30 PM  France Cordova Recreational Sports Center – Pool and Basketball court reserved
6:30 –10:00 PM  Hillenbrand Atrium and Conference Room C102A (private room for teachers)

Wednesday, June 25

Notes for the day: for hands-on activities participants must wear closed-toe shoes and must wear safety goggles and lab coats when instructed.

7:00-8:00 AM  Breakfast – Earhart Dining Court-Private room A, B, C, and D
8:00 AM  Depart
8:15-9:15 AM  MRGN 121
Smart-Grid/Power Systems
Christopher (Chris) Prince
Application Engineer, Grid IQ Experience Center
Digital Energy, General Electric, Atlanta, Georgia
Andrew Liu, Professor, Industrial Engineering
9:15-10:00 AM  Battery and Energy Storage
Vilas Pol, Professor, Chemical Engineering
10:00-10:15 AM  Break
10:15-11:00 AM  Biomass to Biofuels
Maureen McCann, Professor, Biological Sciences and Director,
Energy Center & Center for Direct Catalytic Conversion of Biomass to Biofuel
Nick Carpita, Professor of Plant Botany and Plant Pathology
11:00-12:00 PM  Energy Entrepreneurship and Innovation: Global Impact
Dan Bates
President and Chief Executive Officer, Wind Stream Technologies, North Vernon, Indiana
12:00 PM  Lunch with project faculty and graduate students – MRGN Café
1:00 PM  Introduction to ‘Energy Education Exercises’ by Craig Locker – Mann Hall Atrium
- Wind Farm Challenge
- LEGO Mindstorm Challenge
- Snap Circuit Smart Grid
- Solar Angle Session
1:15-4:45 PM  Hands-on activities: ‘Energy Education Exercises’
Craig Locker, Graduate Researcher and Teaching Assistant Engineering/Technology Teacher
Education, College of Technology
Xiaojun Lin, Associate Professor, Electrical and Computer Engineering
Chris Foreman, Assistant Professor, School of Engineering Technology
Richard Fox, Computer Analyst, Youth Development and Agricultural Education
Richard Simmons, Graduate Student, Aviation Technology and Executive Director, Air Transport
Institute for Environmental Sustainability, Purdue
4:45 PM  Depart
5:00 PM  Dinner – Earhart Dining Court-Private room A, B, C, and D
Technology Commercialization and Entrepreneurship at Purdue
Dan Hasler
President and Chief Entrepreneurial Officer of Purdue Research Foundation
6:30 –8:30 PM  Background work on projects
Computer Labs – Stanley Coulter Hall (SC) SC 246, 277, 283, and 289
Hillenbrand Conference Room C102A (private room for teachers), Hillenbrand Atrium
Thursday, June 26
Notes for the day: (1) participants must wear closed-toe shoes and wear long pants (no dresses/skirts allowed),
(2) taking photos is restricted and participants must follow directions, (3) hard hats will be provided as required,
(4) must wear safety goggles and lab coats when instructed, and (5) energy lessons by teachers are due by 9:00 pm on Thursday June 26.
7:00-8:00 AM  Breakfast – Earhart Dining Court-Private room A, B, C, and D
8:00 AM  Depart for Projects

8:30-11:30 PM  (Project #1) (Yellow) The Science of Photovoltaic Solar Cells: Fabrication and Characterization of Dye Sensitized Solar Cells from Berries
   Rakesh Agrawal, Winthrop E. Stone Distinguished Professor of Chemical Engineering
   Graduate Students: Mark Koeper, Robert Balow, Robert Boyne, Brian Graeser, Caleb Miskin, Xin Zhao (all from Chemical Engineering)
   Counselor: Plabita Talukdar, Graduate Student, Electrical Engineering
   Volunteer: Soo Jung Ha, Graduate Student, Agricultural and Biological Engineering
   Forney Hall, Room G124

   (Project #2) (Blue) Rechargeable Batteries with Advanced Electrode Materials
   Vilas Pol, Associate Professor, Chemical Engineering
   Graduate Students: Arthur Dysart, Sean Fronczak, Jimmy Tang, and Dr. Vinodkumar Etacheri, Postdoctoral Research Associate (all from Chemical Engineering)
   Counselor: Katie Greenan, Graduate Teaching Assistant, Communication
   Volunteer: Waterloo Tsutsui, Aeronautics and Aeronautical Engineering, Graduate Student
   Forney Hall, Room 2184

   (Project #3) (Green) Plant Biomass to Biofuel
   Nate Mosier, Professor of Agricultural and Biological Engineering
   Graduate students: Ximing Zhang and Barron Hewetson, Agricultural & Biological Eng.
   Counselor: Vivien Lai, Undergraduate Student, Biological Sciences
   Volunteer: Ana Carneiro, Undergraduate Student, Chemical Engineering
   ADM Agricultural Innovation Center, 698 Ahlers Drive

   (Project #4) (Orange) Hydrogen and Fuel Cell Renewable Energy
   Abel Chuang, Professor, Mechanical Engineering Technology
   Undergraduate student: Chulgi Nathan Hong, Chemical Engineering
   Timothy Pourpoint, Professor, Aeronautics and Astronautics Engineering
   Graduate student: Essene Waters, Aeronautics and Astronautics Engineering
   Counselors: Thora Mattais, Graduate Student, Chemistry
   Volunteer: Pooja Patel, Undergraduate Student, Mechanical Engineering
   Maurice J. Zucrow Lab, Building ZL1, Room #108/121B

   (Project #5) (Orange) Electricity Production from Renewable Thermal Energy Sources
   Eckhard Groll, Professor, Mechanical Engineering
   Jim Braun, Professor, Mechanical Engineering
   Graduate Students: Brandon Woodland and Nelson James, Mechanical Engineering
   Counselors: Sharon Snyder, Graduate Student, Mechanical Engineering and Andrew Tuholski, Graduate Student, Policy
   Volunteer: Prithviraja Basak, Graduate Student, Mechanical Engineering
   Helper: Justin Couetil, Student, West Lafayette High School
   New R.W. Herrick Laboratories, Room 1100

   (Project #6) (Purple) Vertical Axis Wind Turbines: An Introduction to Aerodynamics and Modeling
   Jun Chen, Professor, Mechanical Engineering
   Graduate Students: Zachary Adams, Graduate and Nina Zhou Mechanical Engineering
   Counselors: Ankita Rai, Graduate Student, Mechanical Engineering and Brian Hunter, Graduate Student, Consumer Science
   Helper: Lowell Knight, Undergraduate Student, Civil Engineering
   Mechanical Engineering Room #2054

   (Project #7) (Red) Understanding Nuclear Fuel and Radiation Decay Chains
   Robert Bean, Professor, Nuclear Engineering
   Matt Cameron, Engineer, Nuclear Fuel Supply, Duke Energy, Charlotte, North Carolina
   Counselors: Paul Branham, Graduate Student, Nuclear Engineering and Yushan Wei, Graduate Student, Curriculum Studies
   Electrical Engineering B76
Energy/policy discussion coordinators
Albert (Bert) Chapman, Professor of Library Science
Andrew Tuholski, Graduate Student, Environmental Policy

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<th>Departure at 8:00 AM</th>
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<td>Project#1 (Yellow) and Project #2 (Blue)</td>
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<td>Earhart Dining Court</td>
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<td>Project#6 (Purple) and Project #7 (Red)</td>
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<td>Project #3 (Green) and Project #5 (Orange)</td>
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<td>Project #4 (Orange)</td>
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<td>Earhart Dinning Court</td>
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<td>Physics Department/NW Av</td>
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<tr>
<td>Project #3 (Green) and Project #5 (Orange)</td>
<td>Bus #2</td>
<td>First Project #3 (Green) from ADM Center at 698 Ahlers Drive and then Project #5 (Orange) from Ray W. Herrick Lab at Russell Street (facing greenhouses)</td>
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<td>Project #4 (Orange)</td>
<td>PU Van</td>
<td>Maurice J. Zucrow Lab</td>
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11:30-12:00 PM Pick up your box lunch and depart

1:30 PM Tour Duke Energy Generation Plant, Cayuga, Indiana

Steve Immel, VP Midwest Regulated Operations, Duke Energy
Mike Wertz, Station Manager, Duke Energy

2499 Indiana 63, Cayuga, IN 47928
Contact: M. Wertz (812-249-0446 cell)

5:00 PM Dinner at Duke Energy Generation Facility

6:30 PM Depart

8:30 PM Arrive Hillenbrand Residence Hall

8:30 –8:30 PM Hillenbrand Atrium and Hillenbrand Conference Room C102A (private room for teachers)

Friday, June 27
Notes for the day: (1) participants must wear closed-toe shoes are required and (2) all adults must have their driver licenses to tour Purdue’s Nuclear Reactor. Participants will be divided into three sub groups in three separate buses and they will travel to three different destinations: Reactor, Herrick, Zucrow

7:00-8:00 AM Breakfast – Earhart Dining Court-Private room A, B, C, and D

8:00 AM Depart

8:15 AM Research Facility Tours

The Duke Energy Academy at Purdue 2014
Nuclear Power/Reactor - Electrical Engineering 117
Robert Bean, Professor, Nuclear Engineering
Matt Cameron, Engineer, Nuclear Fuel Supply, Duke Energy,
Charlotte, North Carolina
Counselor - Paul Branham (817-688-2895), Graduate Student, Nuclear Engineering

Energy Efficient Buildings and Combustion Engine Testing, Ray W. Herrick Lab – Arrive at High-Bay Area (East Entrance facing greenhouses)
Faculty Patricia Davies, Director, Ray W. Herrick Lab and Professor, Mechanical Engineering
Stuart Bolton, Professor, Mechanical Engineering
Jim Braun, Professor, Mechanical Engineering
Contact: Donna Cackley (494-2129 Office, 765-363-1598 cell)

Research: Rocket Combustion, Turbomachinery, and Gas Turbine Combustion - Maurice J. Zucrow Lab – Chaffee Hall
Stephen (Steve) Heister, Director and Raisbeck Distinguished Professor, Aeronautics and Astronautics Engineering
Scott Meyer, Managing Director
Contact: Larla Ritchie (765-918-7288), Student Service Lab Michelle Kidd, Research Account Specialist

Group 1 = Yellow/Plabita + Green/Vivien
Group 2 = Blue/Katie + Orange/Andrew
Group 3 = Purple/Brian + Red/Yushan

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<th>Group 2 (Bus #2)</th>
<th>Group 3 (Bus #3)</th>
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<td>8:00-8:15 am</td>
<td>Travel</td>
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<td>8:15-9:15 am</td>
<td>Nuclear Reactor – EE117/Northwestern Av.</td>
<td>Ray W. Herrick Lab at Russell Street (East side facing greenhouses)</td>
<td>Chaffee Hall/Maurice J. Zucrow Lab, 500 Allison Road, WL, IN 47907</td>
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<td>9:15-9:30 am</td>
<td>Travel</td>
<td>Travel</td>
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<tr>
<td>9:30-10:30 am</td>
<td>Chaffee Hall/Maurice J. Zucrow Lab, 500 Allison Road, WL, IN 47907</td>
<td>Nuclear Reactor – EE117/Northwestern Av.</td>
<td>Ray W. Herrick Lab at Russell Street (East side facing greenhouses)</td>
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<td>10:30-10:45 am</td>
<td>Travel</td>
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<td>10:45-11:45 am</td>
<td>Ray W. Herrick Lab at Russell Street (East side facing greenhouses)</td>
<td>Chaffee Hall/Maurice J. Zucrow Lab, 500 Allison Road, WL, IN 47907</td>
<td>Nuclear Reactor – EE117/Northwestern Av.</td>
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<td>11:45-noon</td>
<td>Travel to MRGN Building</td>
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12:00 PM       Lunch – MRGN Café
Lunch with Bowen Engineering Corporation staff

1:00-2:00 PM   MRGN-121
Inspiration and Careers in Engineering & Technology
Bob Bowen, Founder and Chairman of the Board
Teddy Deahl, Account Executive, Energy Engineering
Bowen Engineering Corporation, Indianapolis

2:00-2:30 PM   Break and move to computer labs to work on research project presentations

2:30-4:45 PM   Work on projects - Computer Labs – Stanley Coulter Hall (SC) SC 246, 277, 283, and 289

4:45 PM        Depart

The Duke Energy Academy at Purdue 2014
5:00 PM  Dinner – Earhart Dining Court-Private room A, B, C, and D

6:30-8:30 PM  Work on final project presentations
Labs – Stanley Coulter Hall (SC) SC 246, 277, 283, and 289
Hillenbrand Conference Room C102A (private room for teachers)

8:30-10:00 PM  Bowling (optional)

Saturday, June 28

Notes for the Day: two guests/Guardians per student invited to join closing ceremony

7:00-8:00 AM  Breakfast – Earhart Dining Court-Private room A, B, C, and D

8:00 AM  Check out and depart for Fowler Hall - Bus

8:30 AM  Stewart Center (STEW), Room 302/306
Welcome by Doug Esamann
President, Duke Energy Indiana

9:00-10:00 AM  Project Presentations (10 minutes each)
   1. Yellow/Photovoltaic Cells
   2. Blue/Batteries
   3. Green/Biofuel
   4. Orange/Hydrogen and Fuel Cells
   5. Orange/Electricity from Waste Heat
   6. Purple/ Vertical Axis Wind Turbines
   7. Red/Nuclear Fuel

10:10-10:30 AM  Break

10:30-10:45 AM  Reflection by teachers and/or teacher lesson (to be decided)

10:45-11:15 AM  Applying to Colleges
Mitch Warren
Director of Undergraduate Admission

11:15-11:20 AM  Stephen Beaudoin, Associate Vice Provost

11:20-11:50 AM  Certificate presentation by
Doug Esamann and Stephen Beaudoin

11:50-12 Noon  Break

12:00 PM  Group Photo

12:15 PM  Refreshment

1:30 PM  Goodbye

Sponsor
Duke Energy Foundation, Indiana

Co-sponsors
Bowen Engineering
Duke Energy
Energy Center, Discovery Park, Purdue
General Electric
Kidwind Project, Renewable Energy Education
Co-sponsors

Laboratory of Renewable Resource Engineering, Purdue
Maurice J. Zucrow Lab, Purdue
National Energy Education Development Project
Ray W. Herrick Laboratories, Purdue
Siemens Energy Inc.
Windstream Technologies Ltd.
Youth Development and Agricultural Education, College of Agriculture, Purdue