

Project Coal to Electricity  
2015 Summer Energy Education Program

Barbara Altizer & Harry Childress  
Virginia Coal & Energy Alliance

Phil Meeks & Carl Zipper  
Powell River Project Research & Education Center

Project Summary

This week-long summer session offers teachers in grades 3-7 and earth science teachers a unique opportunity to learn about the coalfields in Virginia/central Appalachian region and the economic impact on the state/local/region economies. Designed to address the natural resource and earth science standards of learning, the sessions provides teachers first hand field experience with the extraction, preparation and utilization of coal. In addition, the regulatory requirements and global economy associated with coal are examined.

Project Coal to Electricity  
Summer Energy Education Program  
July 19 through 25, 2015  
UVA Wise Campus  
AGENDA

SUNDAY-19th

**2:00 p.m. to 5:30 p.m. Check-In: Martha Randolph Hall, UVA-Wise**  
**6:00 p.m. Dinner: Slemp Student Center – 5th Floor**  
**7:00 p.m. Guest Speakers: Dr. John Craynon, Appalachian Research Initiative for Environmental Science**  
**Dr. Susan Meacham, VCOM**

MONDAY-20th

**7:00 a.m. Breakfast: Hunter J. Smith Dining Commons**  
**7:45 a.m. TRANSPORTATION BUS Will Arrive In Front Of Martha Randolph Hall**  
**8:00 a.m. Depart for Field Trip (Bus provided Monday through Friday for all trips)**  
**8:00 a.m. City of Norton – Flag Rock -Tony Scales, Geologist**  
**Local geologic structure and its impact on history & coal mining**  
**11:00 a.m. Dr. Carl Zipper, Powell River Project Research & Education Center**  
**Post-mining land use opportunities for economic development**  
**Eddie Clapp, Red River Coal Co, coal surface mining operations**  
**12:00 Noon Lunch: PRP-R&EC**  
**1:30 p.m. Eddie Clapp, Red River Coal Co, coal surface mining operations**  
**5:30 p.m. Dinner: (cook out) hosted by Alpha Natural Resources at PRP-R&EC**  
**Guest Speaker: Phil Meeks, Virginia Tech's Powell River Project**

TUESDAY-21st

**7:00 a.m. Breakfast: Hunter J. Smith Dining Commons**  
**7:45 a.m. TRANSPORTATION BUS Will Arrive In Front Of Martha Randolph Hall**  
**8:00 a.m. Depart for Field Trip**  
**9:00 a.m. Underground Coal Mine – (Alpha's Deep Mine 41)**  
**12:00 Noon Lunch at Mine Site**  
**1:30 p.m. Preparation Plant Tour – McClure River**  
**3:00 p.m. Travel to Coal Yard**  
**3:45 p.m. Visit Norfolk Southern Coal Yard (Andover or Norton)**  
**6:15 p.m. Wine Tasting & Dinner, Mountain Rose Vineyard (Reclaimed Mine Site)**

**7:30 p.m. Guest Speaker: C.S. "Dutch" Tubman, Norfolk Southern Corporation**

**WEDNESDAY-22nd**

**8:00 a.m. Breakfast: Hunter J. Smith Dining Commons**  
**8:30 a.m. TRANSPORTATION BUS Will Arrive In Front Of Martha Randolph Hall**  
**9:00 a.m. Depart for Field Trip**  
**9:30 a.m. Dominion Energy Power Station**  
**Guest Speaker: Greg Edwards &**  
**11:30 p.m. Lunch**  
**Luncheon speakers:**  
**Nino Ripepi and Herbert Wheary**  
**Carbon Capture Utilization and Storage**  
**1:00 p.m. Virginia Department Mines Minerals & Energy**  
**Butch Lambert – Richard Davis - others**  
**4:00 p.m. Return to UVA Wise Campus**  
**6:00 p.m. Dinner: Slemp Student Center – 5th Floor**  
**7:00 p.m. Guest Speaker: Mike Miller, CARDNO / Marshall Miller & Associates**

**THURSDAY-23rd**

**6:30 a.m. Breakfast: Hunter J. Smith Dining Commons**  
**7:00 a.m. TRANSPORTATION BUS Will Arrive In Front Of Martha Randolph Hall**  
**7:15 a.m. Depart for Buchanan County**  
**8:20 a.m. Kevin Elkins - CNX Gas Tour (Coal-bed Methane/natural Gas), Claypool Hill, VA**  
**10:20 a.m. Brett Holbrook–Cathy St.Clair - Consol Energy Buchanan Mine (longwall operation)**  
**11:15 a.m. Underground tour**  
**1:30 p.m. Lunch: Buchanan Mine office**  
**2:30 p.m. Depart for SunCoke Energy**  
**3:00 p.m. Rob Feagins – Air Permit Manager, Virginia Department Environmental Quality –**  
**Air Quality Standards, Jewell Resources Training Center**  
**3:45 p.m. Bob Weaver - Suncoke Energy/Jewell Coke Ovens**  
**5:00 p.m. Depart for the Breaks Interstate Park**  
**7:00 p.m. Dinner: Breaks Interstate Park**  
**Guest Speaker: The Honorable Ben Chafin, Virginia Senate**

**FRIDAY-24th**

**7:00 a.m. Breakfast: Hunter J. Smith Dining Commons**  
**7:30 a.m. TRANSPORTATION BUS Will Arrive In Front Of Martha Randolph Hall**  
**7:45 a.m. Depart for Field Trip**  
**8:45 a.m. Wayne Thomas - JoyGlobal Facility, Duffield, VA**  
**10:30 a.m. Depart for Natural Tunnel**  
**11:00 a.m. Natural Tunnel Tour and Lunch – Tony Scales**  
**1:00 p.m. Depart for Eastman Chemical Co.**  
**2:00 p.m. Ray Ratheal - Eastman Chemical Company's**  
**Coal Gasification Plant**  
**3:30 p.m. Depart for UVA@Wise**  
**6:00 p.m. Dinner: John Fox Jr. Museum, Big Stone Gap, VA**  
**Outdoor Drama – Trail of the Lonesome Pine**

**SATURDAY-25th**

**8:00 a.m. Breakfast: Hunter J. Smith Dining Commons**  
**8:30 a.m. Discussion/evaluation of program with teachers - Certificates presented**  
**9:00 a.m. Depart for home**

Evaluation of Program  
**Evaluation Forms with data gathered from Teachers**

**Section 1 - Activity Questions**

1. How did you find out about this program?

**From teachers who had participated before. From VAST annual meeting, newsletter and VAST emails. From participating in the CEDAR Fair.**

2. Why did you decide to participate in this program? **Increase awareness of coal as an energy resource. Interested in mining, geology and the environmental issues. Interested in everything on the agenda. Desire to learn more about coal, the process of mining and energy so it can be passed on to students that they may have a better understanding of energy. Around coal entire life but knew very little about it – wanted to learn more about Virginia geology and gain new classroom activities. Relevant to my curriculum and needed the continuing education credits.**

**FIELD TRIPS - TEACHERS' RATING "VERY APPROPRIATE"**

- A. Flag Rock – geology & land use
- B. Powell River Project Research & Ed Center
- C. Red River's Surface Mine
- D. Alpha Natural Resources Underground Mine
- E. McClure Prep Plant
- F. Norfolk South Coal Yard
- F. CONSOL Gas
- G. CONSOL Longwall Mine
- H. SunCoke Energy/Jewell Coke Ovens
- I. Dominion Energy Power Plant
- J. Joy Mining manufacturing facility
- K. Eastman Chemical coal gasification

**EVENING PROGRAMS - TEACHERS' RATING "VERY APPROPRIATE"**

- A. Phil Meeks, Virginia Tech's Powell River
- B. Susanne and David Lawson, Mountain Rose Vineyard
- C. Dutch Tubman, Norfolk Southern
- D. Breaks Interstate Park
- E. The Honorable Ben Chafin
- E. John Fox House
- F. Trail of the Lonesome Pine

**Section 3 - Knowledge Change Questions**

5. As a result of this program, to what extent do you believe students will increase their understanding of the impact of coal on the Virginia economy?

( ) To A Great Extent      ( ) To Some Extent      ( ) Not Much      ( ) Not At All

**- TEACHERS' RATING  
15- "TO A GREAT EXTENT" and 3 – "TO SOME EXTENT"**

6. As a result of this program, to what extent do you believe students will increase their understanding of the coal industry's future impact on the Virginia economy?

( ) To A Great Extent      ( ) To Some Extent      ( ) Not Much      ( ) Not At All

**- TEACHERS' RATING  
16- "TO A GREAT EXTENT" and 2 – "TO SOME EXTENT"**

#### Section 4 - Practice Change Questions

7. To what extent will you incorporated the information gained during this program into lesson plans? TOTALS

Almost Never Seldom Often Almost Always

- TEACHERS' RATING

15- "ALMOST ALWAYS" and 3 – "OFTEN"

A. Adapt material to existing lesson plans ( ) ( ) ( ) ( )

- TEACHERS' RATING

16- "ALMOST ALWAYS" and 2 – "OFTEN"

B. Use material to create new lesson plans ( ) ( ) ( ) ( )

- TEACHERS' RATING

16- "ALMOST ALWAYS" and 2 – "OFTEN"

8. What will be done differently regarding teaching as a result of participating in the program?

**I will share actual samples of coal, coke and fossils with my students and other teachers. Will also share pictures. Be able to give personal experiences to heighten students' interest. Program allowed me to understand the coal process to energy by seeing first hand – from the coal being mined to generating electricity at the power plant. I will teach with more confidence and much more knowledge on energy subjects. Better informed and can explain in detail more about coal production, electricity and the many byproducts of coal. More prepared to speak knowledgeably about coal and to correct misconceptions being said about coal. Less theoretical and more personal experiences based on this program. Teach students to become better informed before making judgments on coal/energy. Stress importance of coal in electricity and its importance to the state's economy.**

#### Section 5 - End Result Change Questions

9. Has your ability to implement grade level Standards of Learning with the coalfield examples improved as a result of your participating in the program?

( ) Yes ( ) No

- TEACHERS' RATING

15- "YES – TO A GREAT EXTENT " AND 3 "TO SOME EXTENT"

If **Yes**, to what extent?

( ) To a Great Extent ( ) To Some Extent ( ) Not Much ( ) Not At All

10. Do you believe this will result in students gaining a better understanding of the world around them than would be the case if this program were not offered?

( ) Yes ( ) No

- TEACHERS' RATING

15- "YES – EXPLAIN

**Will share actual samples of coal, coke and fossils with students and fellow teachers. Will also share pictures and videos. Impressed with the progress on reclamation, the intense focus on safety, and the ingenious mining techniques. Virginia City Hybrid plant illustrates sustainable power well. Can teach a more balanced approach as the environmental science books often only highlight the negatives. This program allowed me to gain a better understanding of the importance of coal as an energy source in the world. Will share the importance of coal and its many uses with my students. Also learned about natural gas and the role it plays. So much of what people know about coal is made up. I can address the subject factually. I understand the growth and improvements and the technological advancements made in the coal industry. I also understand some of the education requirements that students would need to go into different coal or energy careers.**

11. Additional comments/impressions/thoughts (feel free to use back of page if need be):

**In 18 years of teaching and attending teacher training, I have never had an experience this rich and rewarding. I am inspired and energized to go home and work on lesson plans even though it's the middle of the summer. Discussions with Phil and Tony also enriched the learning experience. Would like to have visited with DMME folks first had that been possible. Since the program is Coal to Electricity more details on the electric generation process it might be good to help teachers know more about the design of turbines and generators. Since this program is an educational ongoing class, I believe a point for every hour should be given for teacher recertification points. Also, time traveling on the bus, etc. coal and coal related subjects (geology) were**

discussed. All of these times should be counted as educational points. Even the play showed how coal affects a community and its economy. This program should be offered for college credit, easily three credits. The program was amazing. People were well informed and very knowledgeable on all subject matters. Not one company shied away from any of our questions and all treated us like we were very important in our educational role. Although I am tired, I love that every possible moment was filled with learning experiences. Will teach my students what they are capable of doing. To do these things we have experienced this week and to see them be aware of their stewardship and that they are accountable to their communities around them.

## CONCLUSION

The 2015 Project: Coal to Electricity was an outstanding success. Participating teachers will return to their classrooms this fall with a wealth of newfound knowledge, informed understanding, and teaching resources.

## ACKNOWLEDGMENTS/SPONSORS

Teachers can stay abreast of important topics and remain informed about relevant topics they need to address in the classrooms through quality educational efforts.

The Project: Coal to Electricity Energy Education Program would not be possible without the continued partnerships and interest of many individuals and sponsors. We want to acknowledge the following:

Alpha Natural Resources

Appalachian Power Co.

CONSOL Energy

Dickenson Russell Coal

Dominion Energy

Eastman Chemical Company

Joy Global

Norfolk Southern Corporation

Paramont Coal Corp VA LLC

Red River Coal Company

SunCoke Energy/Jewell

Virginia Department of Mines, Minerals & Energy

Virginia Department of Environmental Quality

These industry partners have made it possible for educators to broaden their understanding of environmental issues related to coal, rail and power, to experience the coalfields with hands on opportunities, to appreciate the important role of coal in the Commonwealth of Virginia's economy, as well as the United States. The following industries have contributed financially to the support of this energy program:

Appalachian Power

Metinvest/United Coal Co

Old Dominion Electric Cooperatives

Oliver Coal Sales

Penn Virginia

RM Wilson Co.