

ENERGY AND POWER (PRE-ENGINEERING)

Farmington
Municipal
Schools

- *Farmington High School*
- *Piedra Vista High School*

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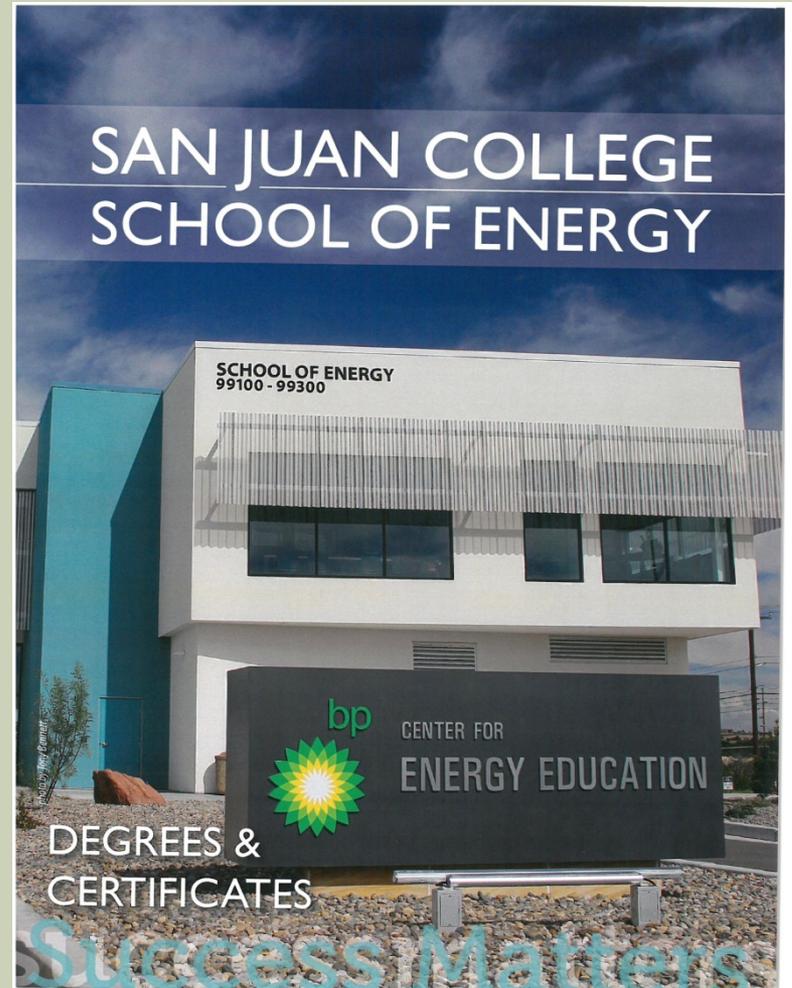
THE HISTORY

- Expanding High School Programs of Study
 - Student interest and job needs in the oil & gas and other industries
- SREB/HSTW
 - Participant with High Schools That Work
 - Advanced Careers Curriculum
 - Project based
 - Written by teachers & industry experts



THE HISTORY

- Local Industry
 - HS Principals meet with Four Corners Economic Development Council
- San Juan College School of Energy
 - Curriculum realignment
 - Opening of new facility



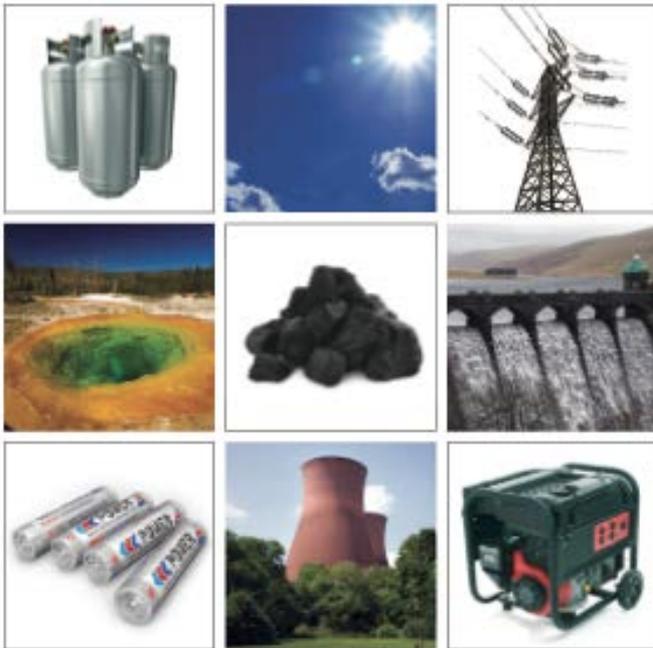
THE JOURNEY



- June 2014: Workplace Readiness grant submitted
- Aug 2015: Award letter received
- Oct 2014: Advisory Committee Meeting
- Nov 2014: Meetings with SJC, phone conferences with SREB
- Feb 2015: Site Visits to West Virginia schools
- Feb-Mar 2015: Student recruitment and purchasing
- June-July 2015: Teacher training in West Virginia
- Aug 2015: Course 1 started with 38 students enrolled

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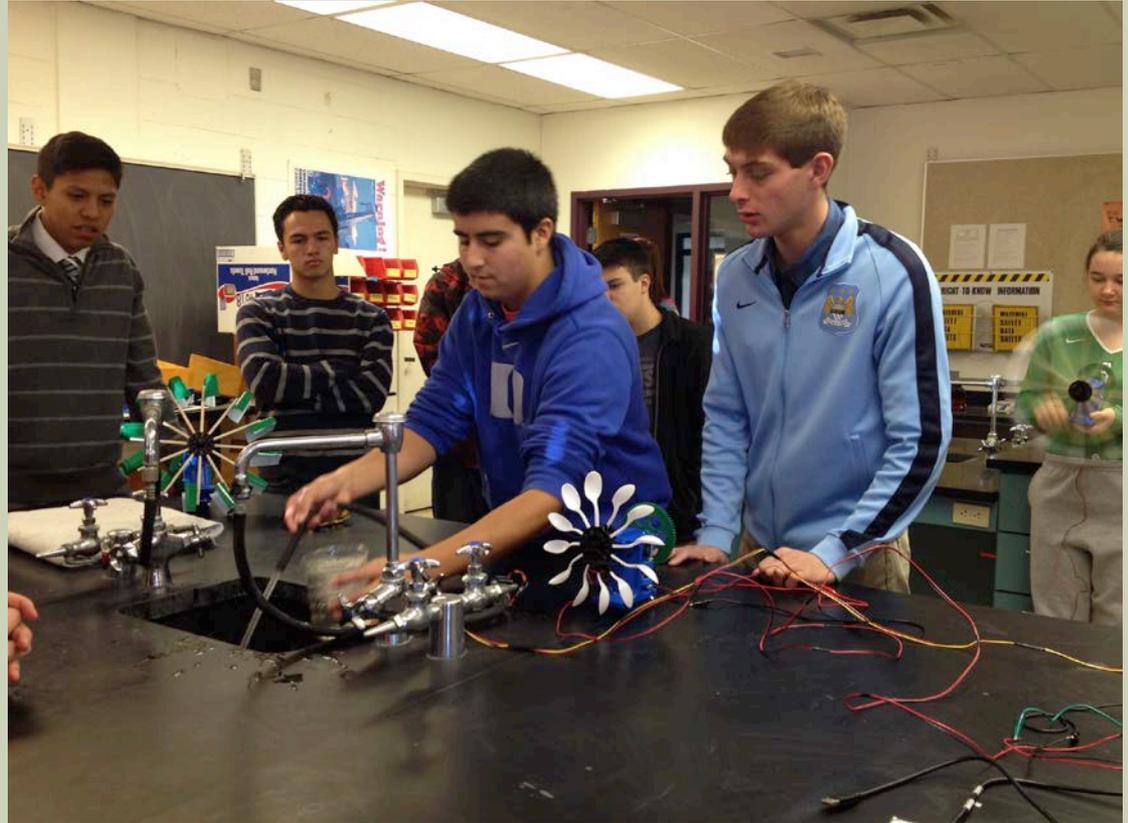
Energy and Power Curriculum



- AC Energy & Power Curriculum
 - 4 Courses
 - 6 hands-on projects each course
 - Integrates math, science, and ELA standards
- Course 1: Energy and Power Foundations
- Course 2: Energy Transmission and Distribution
- San Juan School of Energy courses for Dual Credit
 - Natural Gas Compression Technology (AAS or Certification)
 - Industrial Process Operator (AAS)
 - Petroleum Production Operations (AAS or Certification)

COURSE 1 PROJECTS

- DC Motors
- Hydroelectric Turbines
- Hydraulic Machines
- Heat Exchange
- Pumps
- Pipe Flow



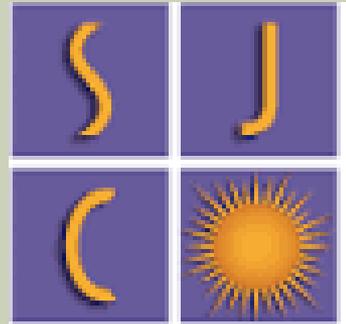
OUTSIDE EXPERIENCES

- Site visit to San Juan College School of Energy
- Site visit to New Mexico Tech School of Engineering
- Demonstrated their motor projects to groups of students at a booth at the Discovery Festival (a STEM based program of K-8 students)
- Presentations to a panel of adults including building and district level administrators. The next panel will also include an industry expert.

PARTNERSHIPS



- Farmington Municipal Schools
- San Juan College School of Energy
- Virtual Mentor Program SREB
- This list continues to expand as teachers make contact with local industry experts and is already supported by PESCO and Merrion Oil & Gas



ACCOUNTABILITY

- Increase academic performance
 - Grades in core content courses
 - PARCC scores in ELA and math
- Increase enrollment in Course 1 and retention of students in Course 2
 - Track number of students enrolled in
 - Course 1
 - Course 2
 - San Juan College School of Energy enrollment



WHAT THE TEACHERS SAY...

“I think it’s a good course. Anything that is hands on for students is good. They can see the principles in action. I think I’ve noticed that their quality of technical writing has improved, even after only two projects.”

~ Kris Hughes, Energy and Power Teacher,
Piedra Vista High School

WHAT THE TEACHERS SAY...

“The students have truly strived to understand the material in this course. They are invested in the educational process and see relevance to what they're being asked to do. By allowing students to explore the concepts in a project based learning environment, they are able to apply what they learn to their engagement scenario. During the first project, the students were reluctant to do the research and wanted to jump straight into building their motors. They realized after working on their motors the importance of having a foundation of prior knowledge. During project 2, the students were interested in learning the foundational material. It was truly amazing to see how students approach their education in a project based learning environment versus the traditional classroom setting. As a teacher, I was reluctant to change how I was teaching. Now that I have seen how a project based course promotes a strong interest in learning, I am trying to adopt similar approaches of self-discovery in all of my classes.”

~ Dave Rogers, Energy and Power Teacher,
Farmington High School

WHAT THE STUDENTS SAY...

- Students at both high schools were asked to answer the following questions:
 - Why are you taking this course?
 - What have you learned this semester?
 - Do you plan to take Course 2?
 - Any other information about this course that you would like to share.



WHAT THE STUDENTS SAY..

- Most students responded they took the course because of an interest in engineering and because they enjoy building things.
- Besides learning about motors and turbines, students have learned how to write engineering reports and to think creatively
- All students who are not currently seniors are planning on taking Course 2 next year
- Many students commented how much they enjoyed the hands-on projects and the independent learning. As one student said “This class is very fun and I learn a lot without really being preached to. I like to learn on my own and this class makes you do that.

CONTACT INFORMATION

- **FMS Energy and Power**
 - Curriculum & Instruction – Janet Hunter (jhunter@fms.k12.nm.us)
 - FHS – David Rogers (drogers@fms.k12.nm.us)
 - PVHS Teacher – Kris Hughes (khughes@fms.k12.nm.us)
- **San Juan College School of Energy:**
 - SJC School of Energy – Alice Trujillo (trujilloa@sanjuancollege.edu)
 - <https://www.sanjuancollege.edu/pages/1.asp>
- **SREB Advanced Career Curriculum:**
 - http://www.sreb.org/page/1609/the_pathways.html