

Welcome!

Good morning and welcome to the Wind Energy Webinar! The presentation will begin shortly.

- If you do not have a computer headset or speakers to listen to the webinar, please call the conference line at: (888) 886-3951 (passcode: 117857)

All guests will be on mute during the webinar but we do want to hear from our audience!

- Please send questions and comments to our presenters and guest speakers using the chat box.
- Direct your questions to the **Moderators** and we will do our best to answer them during **Q&A**.

Audience Poll

What is your interest in wind energy?

- A. My college currently has or is interested in developing a wind energy course and/or program.
- B. My economic & workforce development organization would like to learn more about the regional opportunities in wind energy.
- C. I am and/or I represent a wind energy employer and would like to learn more about workforce training options.
- D. General interest in wind energy.



Wind Energy Industry in California

**A Community College Perspective on
Wind Turbine Technicians**

September 22, 2009

Real-time Data to Advance Community Colleges



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The Centers of Excellence, in partnership with business and industry, deliver regional workforce research customized for community college decision making and resource development.



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- Greater Silicon Valley
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- Orange County
- Inland Empire
- San Diego & Imperial
- Central Valley
- South Central
- Far North & Greater Sacramento





Today's Presentation

**Research Objectives
& Methodology**

Industry Overview

Occupation Overview

College Response

Meet the Experts

Q&A

Research Objectives

- Collect data to qualify labor market opportunities in California wind industry
- Identify workforce needs and challenges of wind employers
- Identify possible gaps between demand and supply of skilled workforce

Research Methodology

- Secondary literature review and analysis
 - Wind 20/20 (US Department of Energy)
 - Wind of Change (The Economist)
 - Looking for Renewable Energy Workers (Community College Times)
- Executive interviews with industry experts



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Industry Overview

- Goal of 20% Wind by 2030
(US Department of Energy)
- Legislation and Policy
 - Federal Production Tax Credit
 - State Legislation
- Lack of Transmission Infrastructure
as a Barrier to Growth
- Future Trends

California Wind Resources

Wind farms in California are located in 5 distinct regions.



Wind Turbine Technicians: Traditional vs. New Skill Requirements

Traditional

- good physical condition for ladder climbing and occasional heavy lifting;
- ability to work comfortably at heights up to 350 feet; safety certification;
- experience using hand and power tools;
- meteorology and basic math;
- basic engineering skills;
- electrical; mechanical, hydraulic, and electrical maintenance repair and troubleshooting experience.

Wind Turbine Technicians: Traditional vs. New Skill Requirements

New

- understanding advances in technologies and turbine designs, computer software and computer diagnostic systems;
- testing equipment, and schematics;
- technicians should be knowledgeable in mechanics, hydraulics (these systems control the pitch of the blade);
- electricity (technicians need to understand control systems, and how power is generated and connected to the power grid.

Employment Projections

- Wind Turbine Technicians can be calculated per:
 - Megawatt: 10-20 Wind Technicians needed per 100 Megawatts
 - Turbine: 1 technician per 15 turbines
- California's wind industry requires anywhere between 265 – 832 technicians in total, depending upon a number of variables.*

*This figure represents a revised employment range; correction was made post-presentation.

Wind Technician Wages

- Entry level wind energy technicians earn wages from \$15 to \$25 per hour.
- Some firms indicate they advance workers quickly into supervisory/team leader positions paying more than \$60,000 per year for workers with only 3 years experience.
- Experienced technicians, those traveling with overtime, and most supervisors can earn as much as \$120,000 annually.

Workforce Needs & Challenges

- Employers offered many suggestions on how community colleges can assist in providing a skilled workforce for the wind industry:
 - Develop curriculum with high schools that teaches conservation and renewable energy;
 - Train more engineers and engineering technicians;
 - Offer job readiness and work maturity skill training to workers.



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College Programs

National Growth in Wind Turbine Technician Programs

- 2004:** 1 program nationally
(Iowa Lakes Community College (ILCC))
- 2005:** 2 programs nationally
(ILCC & Minnesota West Community College)
- 2006:** 4 programs nationally
- 2007:** 7 programs nationally
- 2008:** 12 programs nationally (only 10 with enrolled students)
- 2009:** 24+ programs nationally

Model Community College Programs

- Iowa Lakes Community College
- Columbia Gorge Community College
- Laramie County Community College
- Cape Cod Community College
- Cerro Coso Community College
 - Industrial Technology (Wind Technology)
A.S. Degree
 - Wind Boot Camp (Contract Education)

Potential Wind Turbine Technician Programs

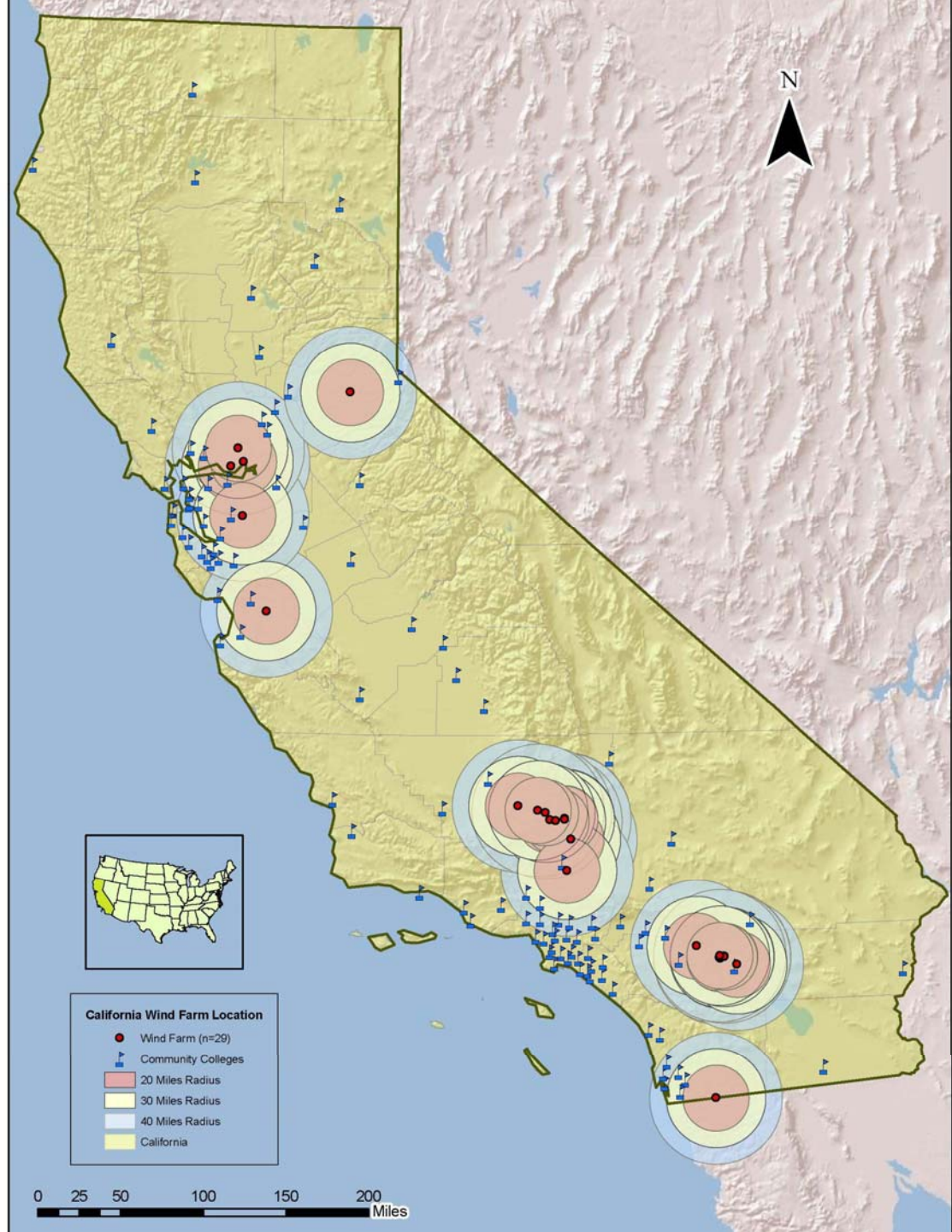
TOPS Code	Program Name
0934.20	Industrial Electronics
0934.40	Electrical Systems and Power Transmission
0945.00	Industrial Systems Technology and Maintenance
0952.20	Electrical
0956.00	Manufacturing and Industrial Technology
0956.30	Machining and Machine Tools
0934.00	Electronics and Electric Technology
0999.00	Other Engineering and Related Industrial Technologies

College Response

Barriers to program development may include:

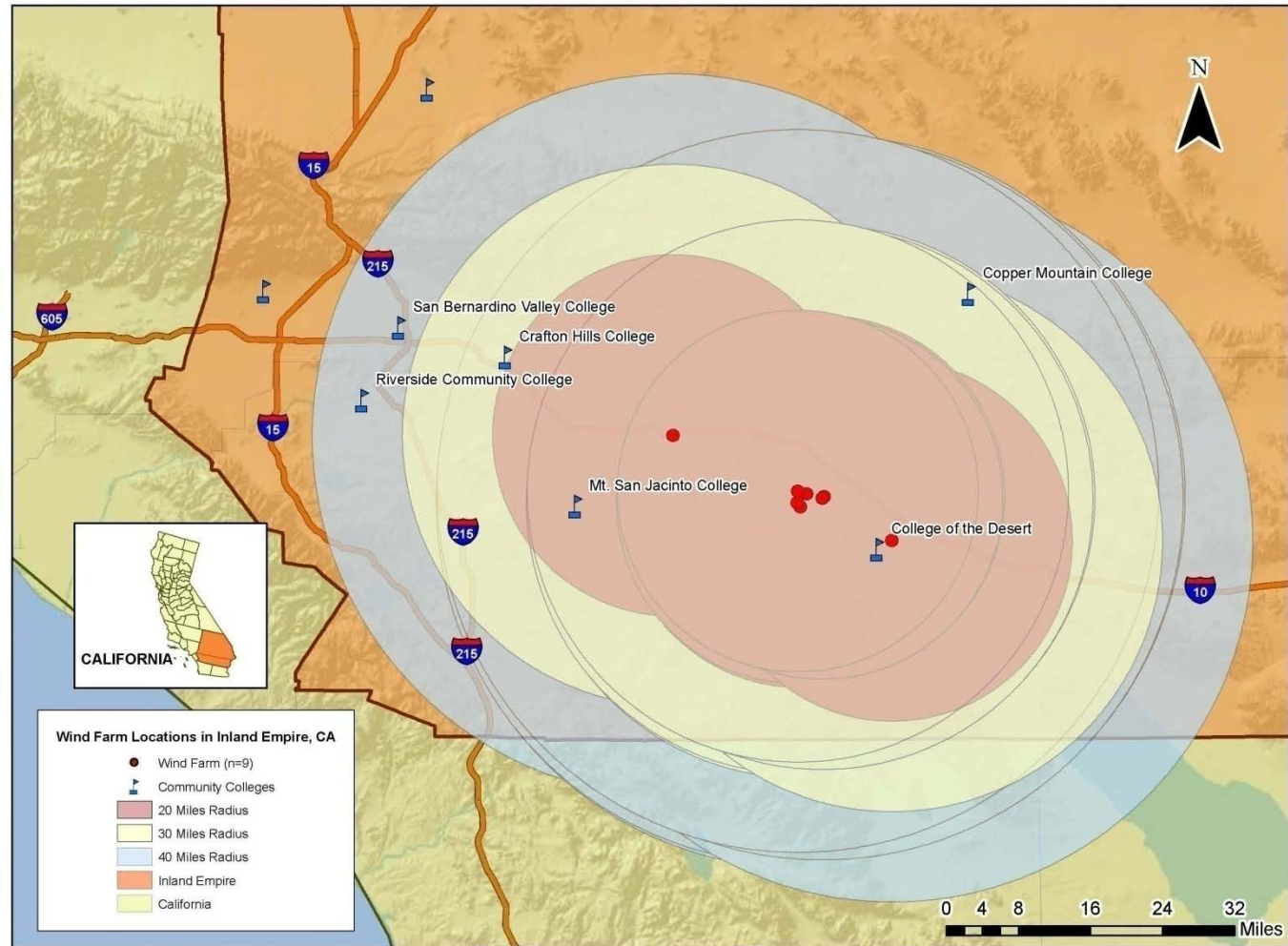
- Access to working turbines
- Support from Industry Partners
- Quality instructors with wind industry or related experience
- Financial requirements in purchasing, operating, and maintaining the necessary equipment

Community College Proximity to Wind Farms



Community College Proximity to Wind Farms

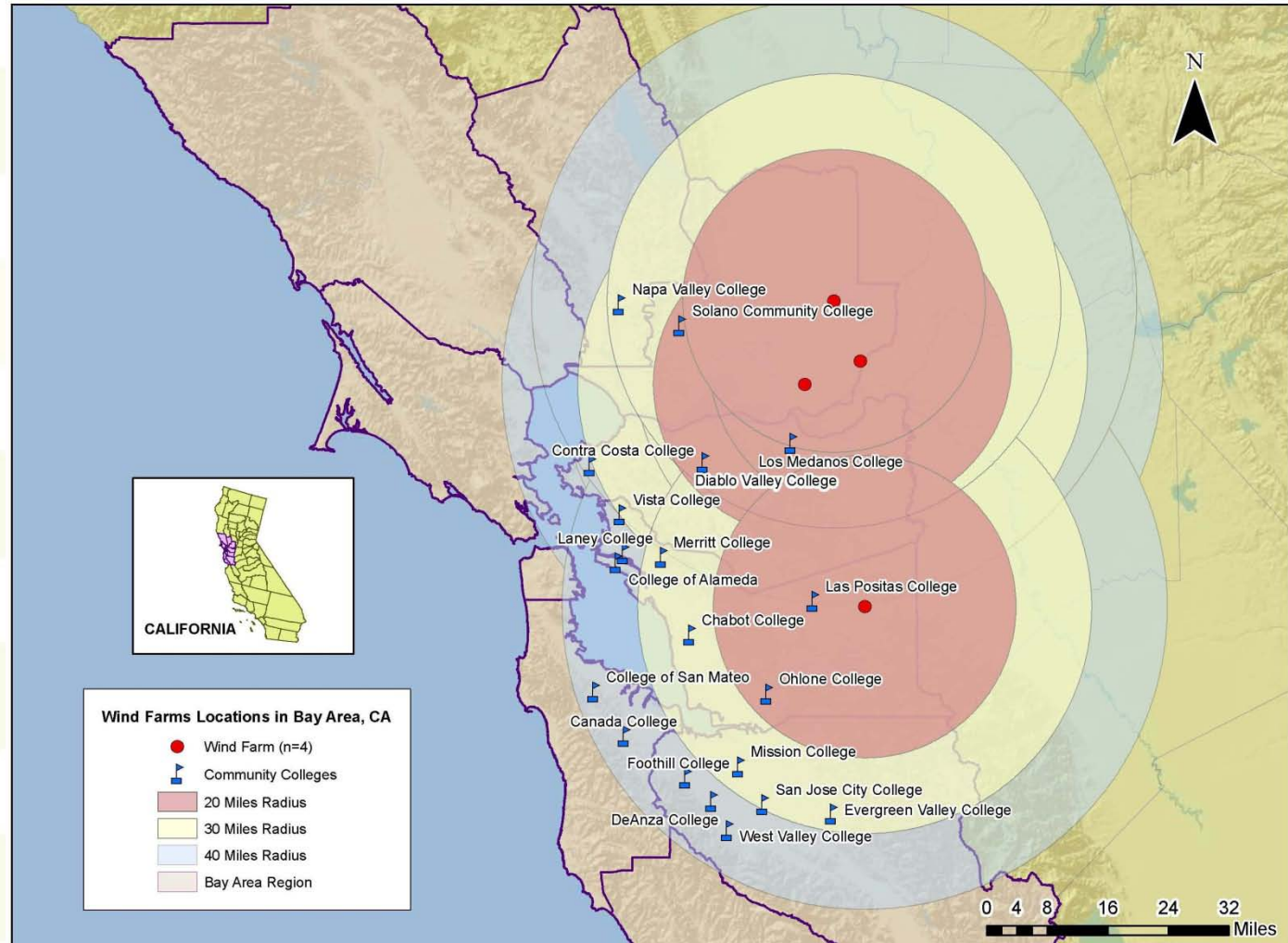
Inland Empire Wind Farms



Source: Center of Excellence, California Community College. Software and data provided by ESRI, Inc.

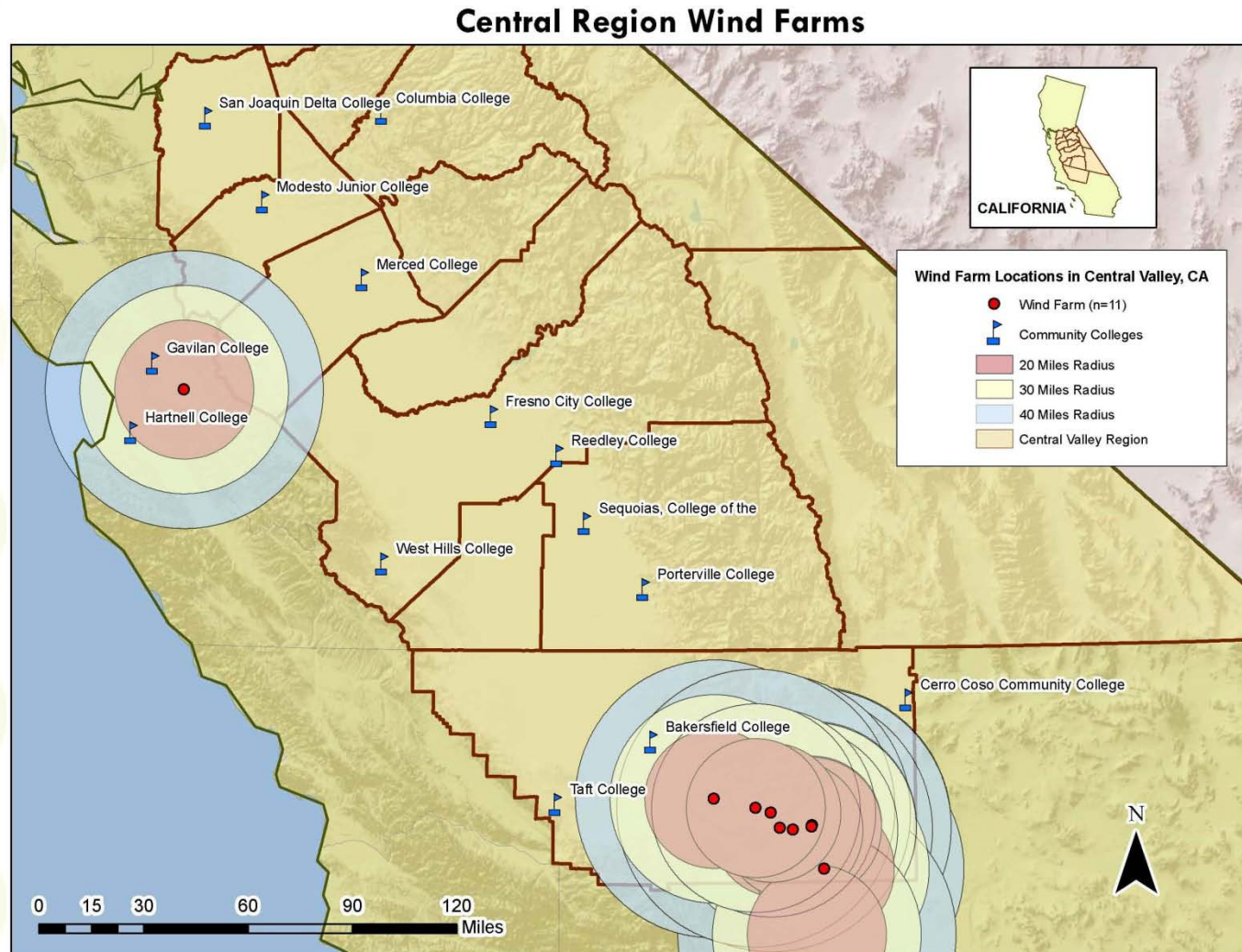
Community College Proximity to Wind Farms

Bay Area Wind Farms



Source: Center of Excellence, California Community College. Software and data provided by ESRI, Inc.

Community College Proximity to Wind Farms



Source: Center of Excellence, California Community College. Software and data provided by ESRI, Inc.

Conclusion

Which colleges in the California Community College system should offer wind courses or programs?

The three main criteria to consider are:

- 1) is the college close to where wind farms are located,
- 2) is there labor market demand for wind technicians within their service area, and
- 3) does the college have related programs to build upon for training wind technicians.

Recommendations

If a college determines that a wind turbine technician program is warranted, two options for responding should be considered:

- Deliver the 208 hour Advanced Transportation Technology and Energy (ATTE) wind technician curriculum in a Contract Education format.
- Build wind programs leveraged off of an industrial technology program such as mechatronics, mechanical engineering, hydraulics, electronics, electricity, automotive, and aviation.



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Conversation with Community Colleges

Greg Newhouse, Director

Advanced Transportation Technology
and Energy (ATTE) Initiative

Question

What challenges do colleges have to overcome when developing wind technician training programs?



Question

Can you describe the wind technician training course developed by the ATTE initiative?

How can a college use this course – who do they contact?



Question

Based on what you have learned, what advice would you give to colleges planning to develop wind programs at their colleges?



Continue the Conversation

For more information on wind turbine technician training, please contact:

Greg Newhouse, ATTE Director
San Diego Miramar College

gnewhous@sdccd.edu



A decorative background consisting of a grid of semi-transparent yellow and light green circles of varying sizes, arranged in a pattern that tapers off to the right.

Conversation with Industry

Nikki Cummings, President

World Wind Services

Question

Tell us about World Wind Services and your role in the industry?



Question

What are the workforce challenges facing Wind Turbine Operation & Maintenance firms today?



Question

You recently hired some Wind Technicians who have completed the Airstreams curriculum.

How qualified/prepared have you found them to be?



Question

Any other thoughts on how community colleges can help to address your future workforce needs?



A row of white wind turbines stretches from the foreground into the distance against a clear blue sky. The turbines are arranged in a perspective line, with the largest one in the immediate foreground on the left and smaller ones receding towards the right.

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Meet the Experts?

Q&A



Q & A

For More Information

Visit the Wind Energy page at www.coecc.net/wind to download the full environmental scan, *Wind Turbine Technicians in California*, the companion Research Brief, or a copy of this presentation.

Wind Turbine Technicians in California also includes:

- Industry & legislative overview
- Wind turbine technology information
- Inland Empire, Central Valley & San Francisco regional highlights
- Listing of wind farms in California
- Wind Turbine Technician course information

Wrap Up

Available now from the COE:

- Energy Efficiency (statewide and regional)
www.coecc.net/energy
- Renewable Energy (San Diego)
www.coecc.net/solar
- Green Economy Framework
www.coecc.net/green
- Water Efficiency Technology, Green Building and Construction, HVAC, and more!

Thank You!

John Carrese

Director, San Francisco Bay

jcarrese@ccsf.edu

Kevin Fleming

Director, Inland Empire Region

kfleming@sbccd.edu

Michelle Marquez

Director, Central Valley Region

marquezm@mjc.edu

Laura Coleman

Project Director, Northern California

colemal@losrios.edu



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