

# **Leveraging Deployment Through Workforce Development**

**NASEO Annual Meeting  
Savannah, Georgia  
September 8-11, 2014**

**Paritosh Kasotia  
Iowa Energy Office  
Iowa Economic Development Authority**

**IOWA**<sup>TM</sup>  
economic development

# Iowa Economic and Workforce Landscape

Iowa is known for its energy sector industries-wind, renewable fuels, and biosciences.

Iowa maintains strong supply chain especially for wind and biofuels industries.

Iowa's manufacturing sector employs 14% of the state's workforce; 36% higher than the nation's average.

## Top 5 States

Indiana	16.3%
Wisconsin	16.3%
Iowa	14.0%
Michigan	13.5%
Alabama	13.1%

Top 5 States with the Highest Share of Manufacturing Employment (*National Association of Manufacturers*)

**All of this requires a skilled workforce!**

# Workforce Development Efforts

Trade  
Groups

Pre K-12  
Initiative

Higher  
Education  
Institutions

Community  
Colleges

GREATNESS  
STEMS  
FROM IOWANS

I.B.E.W. J.A.T.C. N.E.C.A.



IOWA ELECTRICAL APPRENTICESHIP



Kirkwood Community College



**DMACC**  
DES MOINES AREA  
COMMUNITY COLLEGE

# Governor's STEM Advisory Council

**Created by Governor Branstad in 2011**

**Partnership of businesses, policy and educational leaders**

**Strengthen innovation in Iowa and better position the state's economy**

**Chaired by Lt. Governor Reynolds and Vermeer Corp. CEO Mary Andringa**



# Governor's STEM Advisory Council

## Priorities

Student Interest and Achievement

Technology enhanced Instruction for Global Learning

STEM Teacher Recruitment and Preparation

STEM Learner Readiness for Post-Secondary Education and Career

STEM for ALL - High potential, Under-represented, and Non-traditional

**Public/Private Partnerships and Mapping STEM Education to Economic Development**

STEM Education Policy

Public Awareness of the Importance of STEM Education for the Economy and Society

# Governor's STEM Advisory Council

## Public-Private Partnerships and Mapping STEM to Economic Development

Map public, non-profit, and private sector resources to expand STEM educational programs

Develop an action plan to leverage financial resources to enhance STEM preparedness

Clearly define and communicate the important link between enhanced STEM preparedness and Iowa's vision for an innovation driven economy

**Increase the pipeline of students who select STEM fields.**

# Higher Education Institutions-Iowa

## EPSCoR

### Experimental Program to Stimulate Competitive Research (EPSCoR)

\$20 million, 5 year NSF grant with \$2 million of state match

Research areas: Wind energy, Bio-energy, Energy utilization, Energy policy

Build research capacity and increase competitiveness for the State of Iowa

Build workforce capabilities in the STEM pipeline

#### Additional goals:

- Increase participation of women and under-represented minorities in STEM.
- Grant funds to allow junior faculty and graduate/undergraduate students to conduct research projects.

# Higher Education Institutions-Iowa EPSCoR

## **Results:**

- Publications, presentations, and citations of research papers
- Additional students undertaking Doctoral and Masters program
- Additional external funding
- Increased mentoring opportunities to students
- Targeted programs to increase number of minority and women students in STEM fields



# Higher Education Institutions- IAWIND

- Iowa Alliance for Wind Innovation and Novel Development (IAWIND)
- \$3 million financial support



Teaming together to catalyze the growth of wind energy



## R&D Related to Wind Power Equipment

- *Reliability based manufacturing process and increased optimization of turbine castings.*
- *Exploration of carbon fibers from lignin to be used for wind turbines.*
- Common theme among most of the projects: Partner with the private sector

## Training and Education

- Expansion of Wind Technician Training Program at North Iowa Area Community College
- Summer internship program - 17 employers, 33 students

# Higher Education Institutions- Enhancing Energy Education in Iowa

**Partnered with Iowa State University to develop a sustainable education program for all levels through a \$.5 million grant.**

Masters of  
Engineering in  
Energy Systems

Minor in Energy  
Systems at the  
undergraduate  
level

Graduate  
Certificate in  
Energy Systems

Energy related  
curriculum for K-  
12 teachers

**Over 500+ students enrolled each year since 2012!**

# Higher Education Institutions- Enhancing Energy Education in Iowa

## Required Courses

**EE 351. Analysis of Energy Systems.**  
(3-0) Cr. 3. *Prereq: MATH 165*

Energy-scientific, engineering and economic foundations. Energy utilization-global and national. Sectoral analysis of energy consumption. Relationship of energy consumption and production to economic growth and environment. Technology for energy production. Economic evaluation of energy utilization and production. Scientific basis for global warming. Environmental impact of energy production and utilization. Renewable energy.

**Econ 380. Energy, Environmental and Resource Economics.**  
(Cross-listed with ENV S) (3-0) Cr. 3. F *Prereq: ECON 101*  
Natural resource availability, use, conservation, and government policy, with emphasis on energy issues. Environmental quality and pollution control policies.

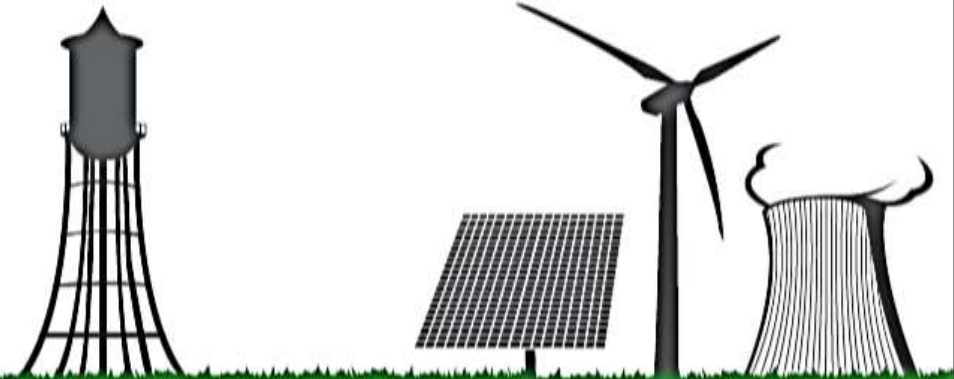
## Elective Courses

Aerospace Engineering (AER E)	381, 481
Agricultural Engineering (A E)	325, 363, 413, 423X, 472
Biorenewable Resources and Technology (BRT)	501, 535, 515X, 545X
Biological Systems Engineering (BSE)	380, 415, 480
Chemical Engineering (CH E)	356, 357, 358, 381, 382, 415
Civil Engineering (C E)	411, 430X
Construction Engineering (CON E)	352, 353, 354X, 454X
Electrical Engineering (E E)	303, 448, 452, 455, 456, 457, 458, 4XX, 459, 552, 554, 555, 556
Engineering (ENGR)	340
Industrial Engineering (I E)	443
Mechanical Engineering (M E)	332, 433, 436, 437X, 441, 442, 444, 446, 449, 479X, 4XX, 530, 536, 540, 542, 545
Materials Engineering (MAT E)	311, 363, 4XX
Materials Science and Engineering (M S E)	520
Nuclear Engineering (NUC E)	401, 441, 461

To view all elective courses and their descriptions, visit

[www.me.iastate.edu/energy-systems-minor](http://www.me.iastate.edu/energy-systems-minor)

IOWA STATE UNIVERSITY™  
Department of Mechanical Engineering



## Energy Systems

- MINOR -

[www.me.iastate.edu](http://www.me.iastate.edu)

Department of Mechanical Engineering  
Iowa State University  
2025 Black Engineering  
Ames, IA 50011

[energyminor@iastate.edu](mailto:energyminor@iastate.edu)

(515) 204-1423




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# Higher Education Institutions- Enhancing Energy Education in Iowa

Introduction to Wind Energy

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## Introduction to Wind Energy



### Course Description

In this course, you will learn:

- History and types of wind turbines
- Aerodynamics of wind turbines
- Wind energy potential, wind resources and capacity factor
- Resource Modeling and Meteorology related to wind turbines
- Structural loads on blades, towers and foundation
- Control Systems and Kinematics of wind turbines.

**APPLY NOW**  
BE > YOU IMAGINED

**GRADUATE DEGREES**

**GRADUATE CERTIFICATES**

**LAS GRADUATE PROGRAMS**

# Community Colleges- Wind Training Programs

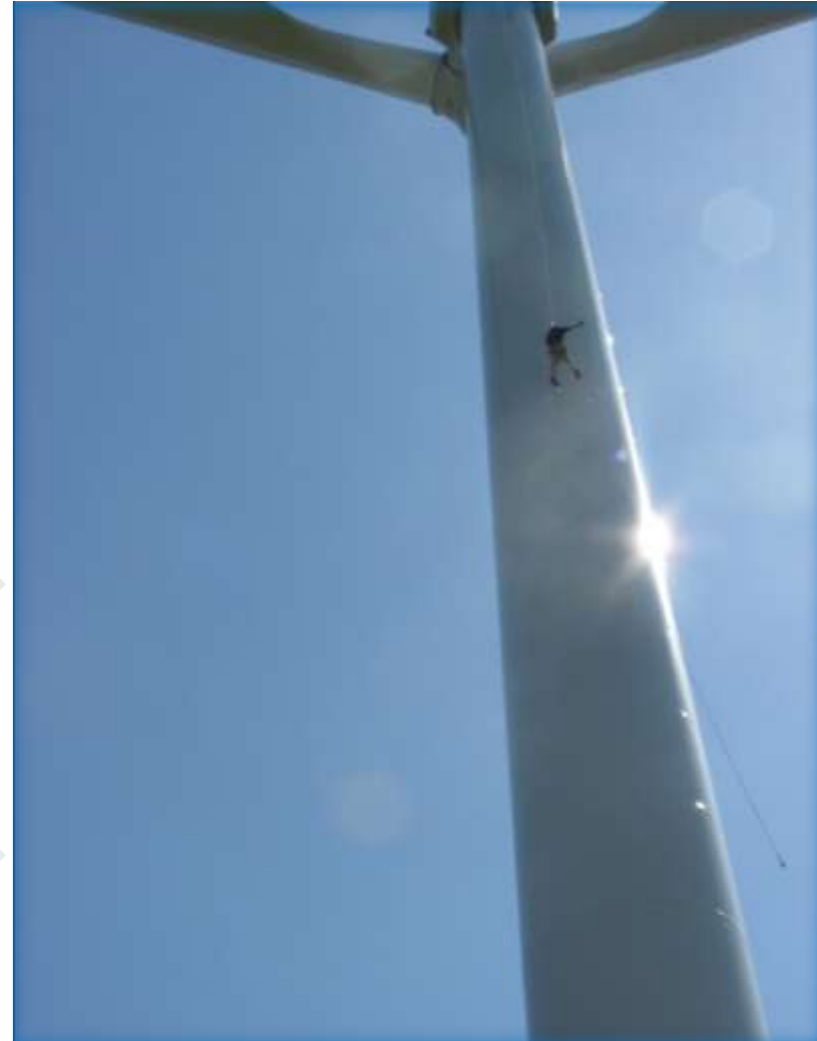
**Provided financial assistance to various community colleges to install wind turbine systems to be used for training purposes**

**Kirkwood  
Community  
College**

- Installed a 2.5 MW wind turbine
- Utilized to train the wind turbine technicians

**Des Moines Area  
Community  
College**

- Installed a 108 kW wind turbine
- Utilized for DMACC's Wind Turbine Technician Program



# Trade Groups and Workforce Development

Funded multiple fixed and portable solar PV systems and wind turbines at the Cedar Rapids Electrical Journeymen and Apprenticeship Training Program

Installed systems are used for hands-on training related to the basic theory of the systems, operation and installation methods, national and local electrical code requirements, utility requirements and maintenance care and prevention



# Other Training Opportunities-Iowa Energy Center

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## **Upcoming Workshops:**

*Pressurization and Ventilation: Achieving Energy Efficiency and IAQ Compliance*

*Blower and Blaster Basics: Diagnostic Energy Tester Certification*



# Other Training Opportunities-IEDA Workforce Training Programs

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## **Job Training Programs**

Job training coordinated through the Iowa Community College network.  
Forgivable loans to Iowa businesses to train existing workers

## **Iowa's Accelerated Career Education Program**

Assists Iowa's community colleges to either establish or expand programs that train individuals in the occupations most needed by Iowa.

## **Iowa Student Internship Program**

Targeted industries: Biosciences, Advanced Manufacturing, Information Technology  
Interns must be involved in a substantive experience in one or more of the following areas: research and development, engineering, process management and production, product experimentation and analysis, product development, market research, business planning or administration.

# Contact Information

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**Thank You!**

**Paritosh Kasotia**

Team Lead, Iowa Energy Office  
Iowa Economic Development Authority

[paritosh.kasotia@iowa.gov](mailto:paritosh.kasotia@iowa.gov)

515-725-0434