

# Clean Energy Partnership Advisory Group



**September 2023**

# Agenda

**Introductions & Announcements**

**Governor's Energy Office 2040 Energy Plan**

**Clean Energy Workforce Development Updates**

**Feedback & Discussion**





# Announcements

1. RFP for Clean Energy Incubators, Accelerators, and Business Support Services closes Friday, September 22
2. GEO selects Blaze Partners for Workforce, Innovation, and Clean Energy Communications and Clearinghouse Development
3. GEO to commission update to 2021 Clean Energy Industry Report



# 2040 Energy Pathways

# New Technical Study to Contribute to Maine Energy Plan

The GEO is the state's designated energy office charged with carrying out responsibilities of the state relating to energy resources, planning and development.

- Under Maine law, the GEO updates the State Energy Plan for delivery to the Governor and Legislature.
- The "Pathway to 2040" study will build off previous studies and bring together multiple components to supplement Maine's Energy Plan.

**The process will build upon existing work to provide a comprehensive basis to inform Maine's best pathway to 100% clean electricity and enable greenhouse gas emissions reductions.**



# Maine Energy Policy Requirements

## • Renewable Portfolio Standard



- 80% of electricity delivered in Maine to be renewable by 2030
- Supports hydroelectric, biomass, tidal, waste-to-energy, wind, and solar
- Targeted support for new and existing resources including solar, wind, biomass, hydro, and wood-fired CHP

## • Offshore Wind



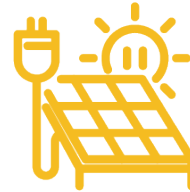
- Goal of 3,000 megawatts from the Gulf of Maine by 2040
- GEO to establish procurement schedule and process with stakeholder input

## • Energy Storage



- Goal of 400 megawatts by 2030
- GEO to develop procurement program for up to 200 megawatts

## • Solar



- Goal of 750 megawatts of distributed generation
- GEO to implement distributed solar and storage program
- Targeted procurement for solar on contaminated lands

## • Electrification

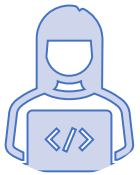


- Oil dependence reduction
- Electrification of heating and transportation to achieve emissions reduction requirements

# "Pathway to 2040" Study Outcomes



3-5 modeling scenarios, informed by public input and ongoing aligned processes



Concise, accessible digital summary of findings and comparison of different scenarios



Policy considerations based on the scenario comparison and interpretation



Incorporation into Maine Energy Plan

*The "Pathway to 2040" study will be included as a technical volume within Maine's Energy Plan, delivered to the Governor and the Legislature in early 2024.*

## Energy Decarbonization Pathways – Study Goals and Overview

---

This study will develop and compare alternative pathways to decarbonize Maine's economy, to provide support for future policy decisions and guidance for implementation

**Technologies: EVs, heat pumps, efficiency, onshore/offshore wind, solar, biofuels, etc.**

- A Pathway specifies how much of each, when and how, to meet decarbonization requirements
  - Using detailed modeling of energy supply and demand interrelationships, across all sectors of the economy
- Modeled in regional context – not just Maine

## Limitations – What This Study Cannot Do

### **Cannot predict the future:**

- Technologies and fuels – uses reasonable assumptions for progress on technology cost and performance

**Cannot identify/evaluate specific generation or transmission projects or their costs**

### **Cannot address detailed and granular implementation issues**

- Though can identify some types of issues that will likely be encountered, and perhaps approaches to address them

# Public Engagement Timeline



**Multiple opportunities for public engagement and input over the coming months.**

**We welcome your input on how this analysis and work would be helpful to you!**

For more information and to sign up for email notifications, see:

<https://www.maine.gov/energy/studies-reports-working-groups/current-studies-working-groups/energyplan2040>

# **Clean Energy Workforce Development**



# Clean Energy Workforce Development

Via the Clean Energy Partnership, the **Governor's Energy Office** has awarded \$2.5 million in grants to nine entities to advance clean energy workforce development programming in the state:

- Attracting new workers to the clean energy and energy efficiency workforce
- Providing career training and upskilling opportunities to existing workers
- Increasing diversity and representation in the clean energy workforce
- Facilitating entry into rewarding and high-paying jobs in clean energy through new and expanded internship, Registered Apprenticeship, and pre-apprenticeship models



Northeast Energy Efficiency Partnerships



# Clean Energy Workforce Development

With funding from the Maine Jobs & Recovery Plan and other federal sources, the **Maine Department of Labor** is investing in apprenticeship and pre-apprenticeship programs to strengthen clean energy career pathways:

- Increasing exposure to clean energy careers through pre-apprenticeship programs
- Creating new pre-apprenticeship programs focused on multi-craft core curriculum for construction & trades
- Expanding apprenticeship pathways by creating new clean energy sales & customer service apprenticeships



# Clean Energy Workforce Development

## Activities performed:

- Apprenticeship & pre-apprenticeship
- Education & outreach
- Train-the-trainer
- Industry engagement
- Training & credentialing

## Target populations reached:

- K-12 youth
- BIPOC jobseekers
- Justice-involved individuals

## Program impact (CEP):

- 2,032 participants served:
  - 319 training, credentialing, and job placement
  - 1,713 education and outreach
- 30 businesses or community organizations receiving economic assistance
- 18 new career development or job training programs offered



# Clean Energy Workforce Development

- 3:40-3:50: *AGC Maine*
- 3:50-4:00: *AFL-CIO*
- 4:00-4:10: *ReVision Energy*
- 4:10-4:20: *passivhausMAINE*
- 4:20-4:30: *University of Maine*





ASSOCIATED GENERAL  
CONTRACTORS OF MAINE

---



CONSTRUCTION IMMERSION PROGRAM  
2023

---







***DESIGNED TO BUILD  
RELATIONSHIPS AND  
SPARK INTEREST***

---





# ***THE SPECIFICS***



## **PARTNERSHIP BETWEEN AGC AND SCHOOL SYSTEM OR CTE**

EACH PROGRAM IS A PARTNERSHIP BETWEEN AGC, THE LOCAL SCHOOL OR CTE & LOCAL WIOA SERVICE PROVIDER



## **TWO PROGRAM OPTIONS 3 WEEKS OR 6 WEEKS**

PROGRAM PROVIDES WORK READY CERTIFICATIONS AND MEANINGFUL HANDS ON INSTRUCTION



## **WHO IS IT FOR**

OFFERED TO STUDENTS AND RECENT GRADS BETWEEN 16 AND 20 YEARS OF AGE







---

# ***CHANGING LIVES AND BUILDING THE FUTURE***

“

I HAVE SEEN MORE GROWTH IN THESE STUDENTS OVER THIS 6 WEEKS THAN IN THE ENTIRE 4 YEARS PRIOR. THEY ARE BEING RECOGNIZED, AND GIVEN AN OPPORTUNITY THAT THEY HAVE NEVER SEEN BEFORE. THEY ARE GROWING AS PEOPLE.

---





# ***THE RESULTS***

104 applicants  
50 selected

99%  
completion  
rate

213  
Certificates  
Issued

13 different  
crafts



# ***STUDENT EXPERIENCES***

---

## ***HVAC, PLUMBING & ELECTRICAL***



---

## ***HYDROELECTRIC FACILITY MAINTENANCE***



---

## ***CONCRETE FOUNDATIONS***



# ***EQUIPMENT OPERATION***





# ***STUDENT EXPERIENCES***

---



## ***CRANE OPERATION***







---

**COMING SOON!**

---

**SIMULATED CRANE OPERATION**

**PROGRESSIVE LEARNING IN SAFE ENVIRONMENT**

**REDUCTION OF FUEL USE FOR TRAINING**

**TRAIN ANYTIME IN ANY WEATHER**

**ADDITIONAL  
EDUCATION**

## **FINANCIAL LITERACY**

STUDENTS HAD A 2 HOUR FINANCIAL LITERACY COURSE WITH BANGOR SAVINGS

**HOW TO MANAGE YOUR MONEY**

**BASICS OF MANAGING CREDIT**







# WORK PREPARATION

- ✓ Resume building
- ✓ Interview skills
- ✓ Guaranteed interviews
- ✓ School ELO and credit for work programs
- ✓ Leads to apprenticeship



**AGC MAINE**  
THE CONSTRUCTION ASSOCIATION



---

# ***OUR PLANS FOR 2024***



***10 YOUTH  
PROGRAMS***



***4 SUPPORTED  
ADULT PROGRAMS***



***EXPAND OFFERING TO  
ESL & IMMIGRANT***

---







**UNION CONSTRUCTION**  
A C A D E M Y  
*of Maine*

Building Community. **Building Maine.**



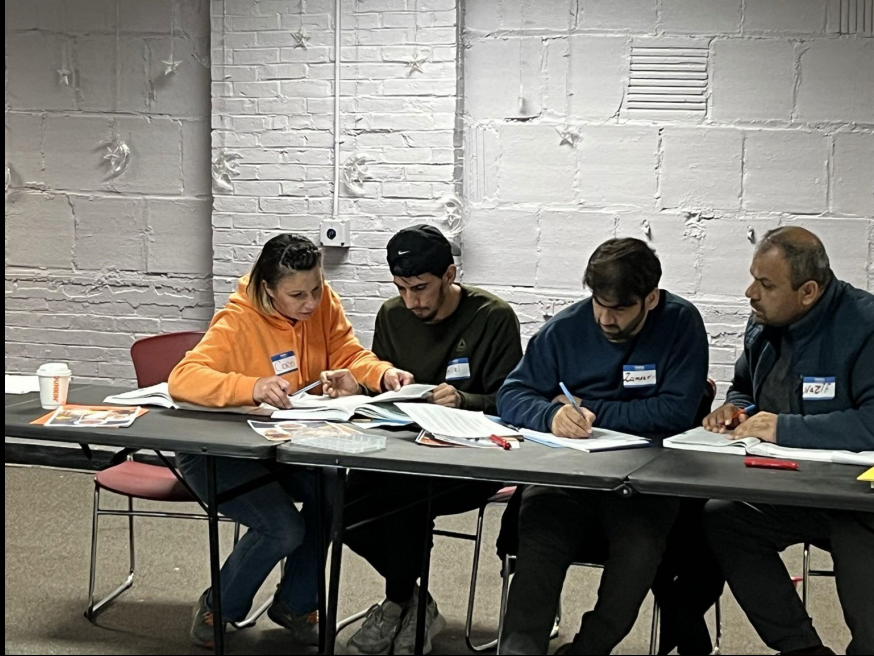


UCAM Portland Cohort, May 2023



UCAM Lewiston Cohort, August 2023





OSHA-10



First-Aid/CPR/AED





Scaffolding User



Line & Grade, Blueprint, Concrete





Site visits with Apprenticeship Directors



# CARRIÈRES DANS L'ÉNERGIE PROPRE

**Mardi, 13 Juin, 16h-19h**

**ST. MARY'S NUTRITION CENTER  
208 BATES ST. LEWISTON, ME**



Rejoignez-nous pour en savoir plus sur des emplois avec de bons salaires et avantages sociaux dans les syndicats des métiers du bâtiment et construction



**UN PROJET DU FRONTLINE CLIMATE FORMATION**













# REVISION ENERGY

**Our Mission: Make life better by building our just and equitable electric future.**





**REVISION ENERGY**  
ELECTRICAL APPRENTICESHIP





I DO ART

- ① Better prioritize tasks based on importance and urgency
- ② Better communicate clear time expectations (Action Cycle)
- ③ Better leverage tools to save time that work for you
- ④ Immediately implement time management techniques
- ⑤ Improve relationship



**REVISION ENERGY**  
MANAGER APPRENTICESHIP





**REVISION ENERGY**  
SOLAR DESIGN APPRENTICESHIP





*lw*  
LEARNINGWORKS

**SOLAR INSTALLATION**  
PRE-APPRENTICESHIP





PORTLAND  
ADULT  
EDUCATION



**RENEWABLE ENERGY  
CAREERS**  
PRE-APPRENTICESHIP





PORTLAND  
ADULT  
EDUCATION



**RENEWABLE ENERGY  
CAREERS**  
PRE-APPRENTICESHIP













passivhaus  
**MAINE**



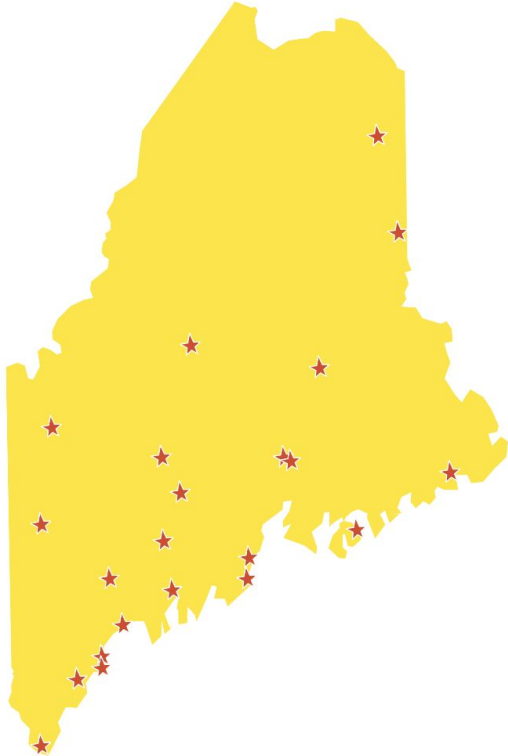
GEO-CEP funding  
phME trainings  
from pilot to retrofit mission



# Flagship Training- Getting to Code through PH principles

## Primary Goal: Accessibility

- Low cost
- Geographic diversity
- Presented by experienced builders/speakers
- Highlighting women professionals





# LEARNING

9-10:25 am: Welcome and Intro to New Building Codes + Passive House

10:25-10:45 am: Q&A/Break

10:45-11:15 am: Air Tightness

11:15-11:45 pm: Blower Door Test

11:45-12:15 am: Lunch

12:15-12:50pm: Super Insulation, Assemblies and Thermal Bridging

12:50-1:20 pm: Windows and Material Demo

1:20-1:40pm: Mechanical Systems and Energy Modeling

1:40-1:50 pm: The “Upsell”

1:50-2 pm: Final Questions and Closing Remarks



Agenda

## What Works -



Partnerships  
Instructors  
Classroom dialog

Maine Community  
College Systems  
SMCC  
CMCC  
EMCC  
NMCC  
College of the Atlantic  
Ecology School

---

## What's difficult?

Geographic diversity  
Gender/racial diversity



# Moving forward...

**trainings**  
planning a maine **RETROFITS**  
**CAMDEN**  
Planning a Maine Retrofit - Camden, ME  
Fri Oct 13 2023, 09:00am EDT to 03:00pm EDT

---

**trainings**  
high performance **COMPONENTS**  
**GREENVILLE**  
High Performance Building Components - Greenville, ME  
Fri Oct 20 2023, 09:00am EDT to 03:00pm EDT

---

**trainings**  
meeting maine's **ENERGY CODE**  
**HOULTON**  
Meeting Maine's Energy Code - Houlton, ME  
Thu Oct 26 2023, 09:00am EDT to 03:00pm EDT

---

**trainings**  
high performance **COMPONENTS**  
**PRESQUE ISLE**  
High Performance Building Components - Presque Isle, ME  
Fri Oct 27 2023, 09:00am EDT to 03:00pm EDT

TRAININGS cont..

And phME has committed to five career fairs in FY 24 focusing on workforce diver

# Retrofit Training

upcoming builder trainings

**THUR., JUNE 22**  
Meeting Maine's energy code  
Glickman Library at USM

**FRI., JUNE 23**  
Planning a Maine retrofit  
Glickman Library at USM

**\$25 per day-long session**



## FUTURE GOALS:

Training centers focused on **local training** to create **local experts** as part of scaling retrofits.

More actively identify and recruit non-traditional builders to fill the needed workforce for scaling retrofits.

Support new businesses entering the retrofit

We are building out a program which reflects our mission of reducing dependency on fossil fuels, while improving living and work circumstances with:

- **healthy interiors**
- **cost stabilization**
- **resilience in extreme weather**



**OffshoreWind4Maine:**  
**An offshore wind workforce development  
program for the state of Maine**

**Advisory Group meeting  
09.20.2023**



**Amrit Verma, PhD**  
**Assistant Professor of Mechanical Engineering,**  
**University of Maine (Orono)**

## Outline of the presentation

- ❖ Motivation of the project: Why?
- ❖ Scope of the task: What?
- ❖ Highlights: Participants and success stories
- ❖ Learning from the project



## Motivation of the Project: Why?

1. The Gulf of Maine (GOM) has one of the best *offshore wind resources* in the US.
2. **Thousands of new jobs** will be created in Maine which will require expertise in offshore wind.
3. However, *local companies have difficulty finding local professionals* resorting to hiring foreign talents.
4. Therefore, *Maine must advance its educational infrastructure* to prepare and train students and professionals in *offshore wind*, thus reducing this workforce gap.
5. There **was only one course on offshore wind** at the university and there was an immediate need to enrich our curriculum.

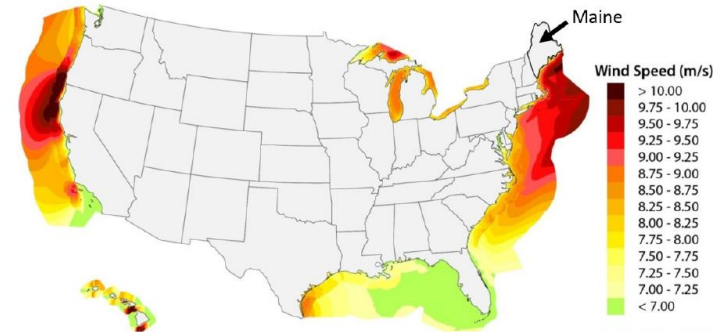


Figure 1: Offshore wind resource potential in US [7]  
<https://www.energy.gov/eere/articles/computing-america-s-offshore-wind-energy-potential>

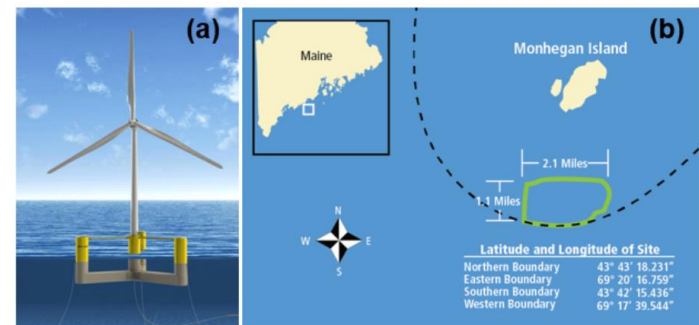
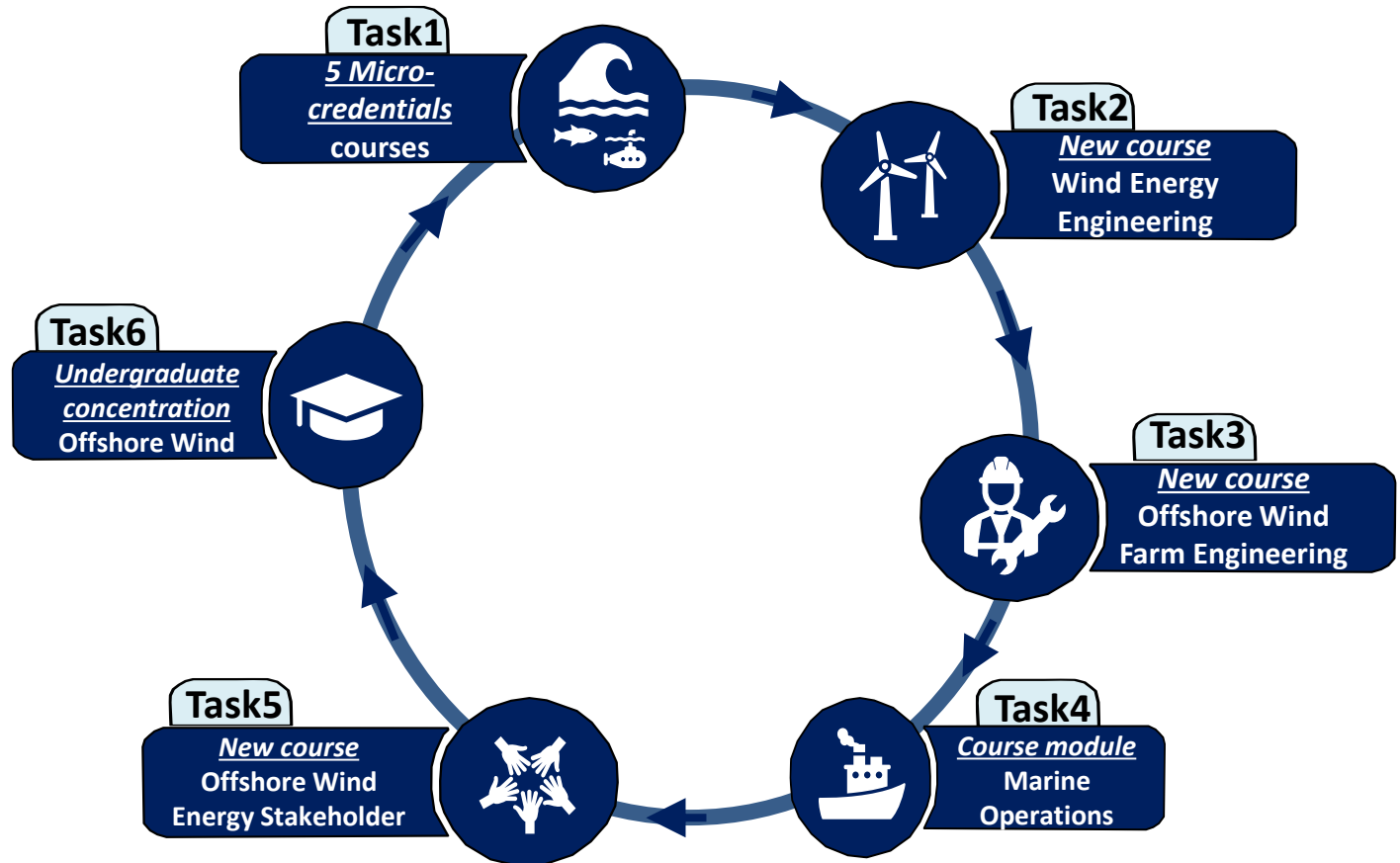


Figure 2: (a) UMaine VoltturnUS technology [8] (b) UMaine Deepwater Offshore Wind Test Site [9]

## Scope of the task: What?



**Target: These programs will benefit more than 300 students on campus during the project!**



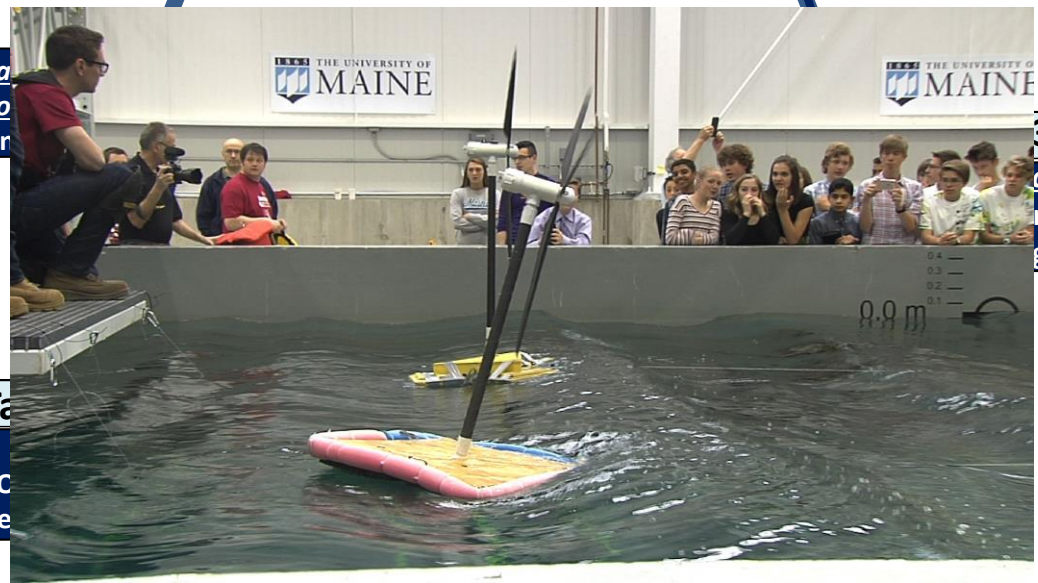
Score

## Youth Windstorm Challenge Micro-Credential



**Task 6**

*Undergraduate concentration*  
Offshore Wind



**3**  
*course*  
are Wind engineering


**Task**  
C  
En

**Target: These programs will benefit more than 300 students on campus during the project!**

# Highlights: Participants and success stories

## Who are the participants?

**Task1**  
 5 Micro-credentials  
 courses



**Task2**  
 New course  
 Wind Energy  
 Engineering



**Task3**  
 New course  
 Offshore Wind  
 Farm



**Task4**  
 Course module  
 Marine Operations



Total Number of participants: 637\*

Details:

Youth Windstorm Challenge: 565  
 Wind Energy Course: 31  
 Offshore Wind Farm Engineering  
 course/Module on Marine Operations: 41

**As of June 20:**

No. of micro-credential badges issued: 29  
 No. of credits to the transcript issued: 123

### CEP-FUNDED PROJECT METRICS

Total Number of participants: 637

Details

- School Students (K-12): 565
- Undergraduate: 49
- Graduate: 22 (including one veteran)
- Postdoc: 1

Total Number of participants: 637

Note: Here, we consider the highest degree attainment.

Details

- 565 middle school and high school students who have not obtained any school degree or high school diploma.
- 49 undergraduate bachelor students who had received high school diplomas.
- 16 master students who had received bachelor's degrees.
- 6 PhD students who had received master's degree.
- 1 postdoc researcher whose highest degree attainment was a doctoral degree.



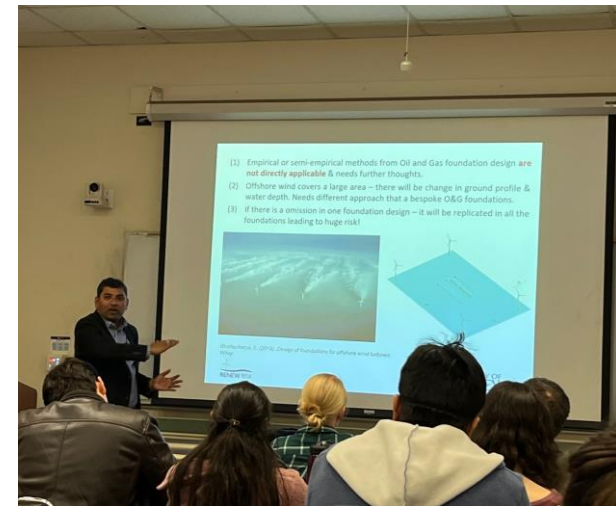
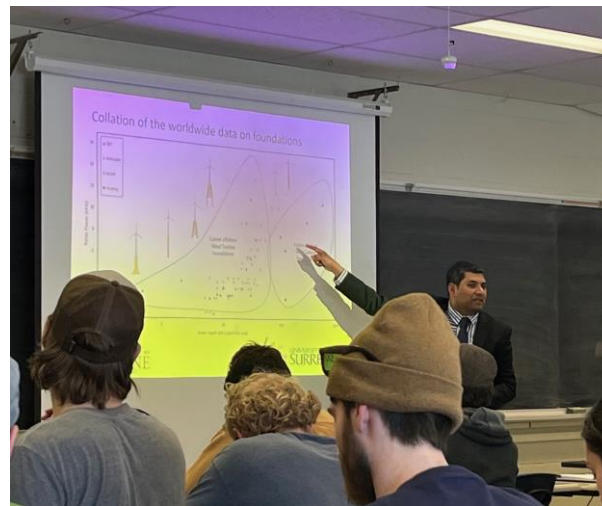
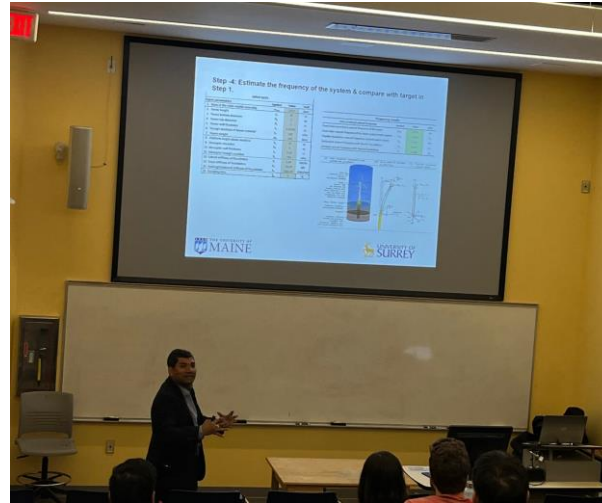
## Highlights: Participants and success stories



### *Success stories:*

- ❖ One of the first-ever courses on Offshore Wind Farm Engineering in the US
- ❖ Very High Interest: 41 students enrolled for the course (first time offered)
- ❖ 24 undergraduate students + 17 graduate students (several departments)
- ❖ Many undergraduate students were seniors and they were able to land graduate positions
- ❖ Invited a guest speaker from UK: Dr. Suby Bhattacharya, University of Surrey

# Guest lecturer from the University of Surrey, UK





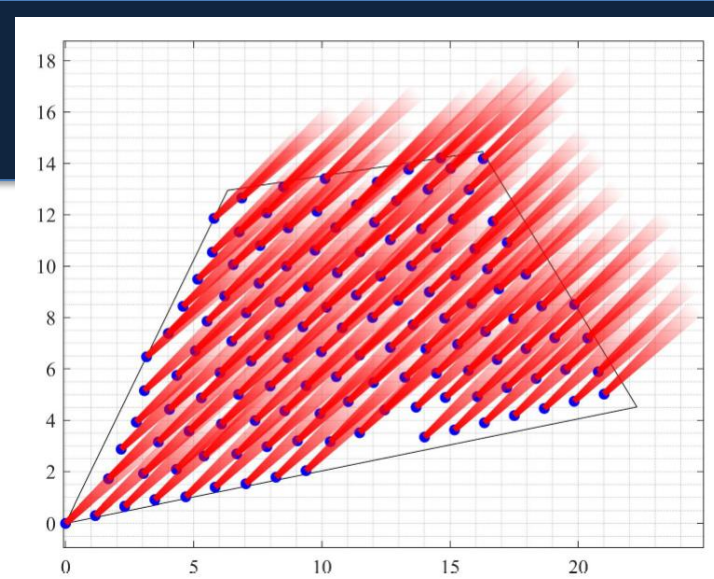
## Highlights: Participants and success stories



- ❖ One of the first-ever courses on Offshore Wind Farm Engineering in the US
- ❖ Very High Interest: 41 students enrolled for the course (first time offered)
- ❖ 24 undergraduate students + 17 graduate students
- ❖ Many undergraduate students were seniors and they were able to land graduate positions
- ❖ Invited a guest speaker from UK: Dr. Suby Bhattacharya, University of Surrey
- ❖ **Graduate students worked in groups and were evaluated for teamwork, communication, presentation skills (looking at different criteria: site selection, turbine selection, environmental aspects, foundation design, and installation)**



**Team B: Group Presentation**



**Wind farm Layout**



**Team D: Group Presentation**



**Team A: Group Presentation**

Parameter	Value
Annual energy yield of the farm	5,420 GWh
Number of people covered annually	846,875
Percentage of the Dutch community to benefit	4.83%
Global wind energy market share	0.29%
Global offshore wind power capacity share	3.91%



## Highlights: Participants and success stories



- ❖ One of the first-ever courses on Offshore Wind Farm Engineering in the US
- ❖ Very High Interest: 41 students enrolled for the course (first time offered)
- ❖ 24 undergraduate students + 17 graduate students
- ❖ Invited a guest speaker from UK: Dr. Suby Bhattacharya, University of Surrey
- ❖ Many undergraduate students were seniors and they were able to land graduate positions
- ❖ Graduate students worked in groups (looking at different criteria: site selection, turbine selection, environmental aspects, foundation design, installation)
- ❖ **UMaine Early Career Teaching Award + ASCC Award for Outstanding Faculty**

## Learning from the project

- ❖ Some graduate students found working in groups challenging
  - Communication
  - Workload with research
  - Time management
- ❖ *Next time model:* undergraduate students work together with graduate students
- ❖ Consider the course approval processing time at the university
- ❖ Maintaining balance in a cross-listed undergrad/grad course
- ❖ More industry invitations for guest speakers
- ❖ Project Evaluation is being done and a report will be made available to GEO



## Learning from the

- ❖ Some graduate stu
  - Commun
  - Workload
  - Time ma
- ❖ *Next time model:* u
- ❖ Consider the cours
- ❖ Maintaining balanc
- ❖ More industry invit
- ❖ Project Evaluation



### **Teamwork Report**

MEE 591 Group Project (Team A)

April 30, 2023

*Joseph Dagher*

*Lauren Dickson*

*Yuksel Rudy Alkarem*

e students

o GEO

# Feedback & Discussion

- What ideas do you have to broaden the reach of training and credentialing activities?
- What kinds of partnerships should we be supporting?
- What opportunities and challenges are you seeing?





# Next Steps



**Feedback**

**Next Meeting**

[www.maine.gov/energy/initiatives/cep](http://www.maine.gov/energy/initiatives/cep)