



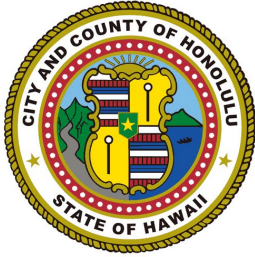
# CLEAN ENERGY SECTOR PARTNERSHIP



**Full Partnership Meeting**  
October 11, 2023  
10:00am - 11:30am

*Meeting will begin shortly...  
Please introduce yourself in the chat!*

# Mahalo to our Funders



# and our Conveners



# Mahalo to our Steering Committee



Office of Economic  
Development



COUNTY OF HAWAII  
RESEARCH & DEVELOPMENT



HAWAII CARPENTERS  
APPRENTICESHIP &  
TRAINING FUND



Hawaiian  
Electric

Ka 'Oihana 'Ōnaepuni 'Ōma'oma'o O Hawai'i  
Hawai'i Green Infrastructure Authority



SWINERTON



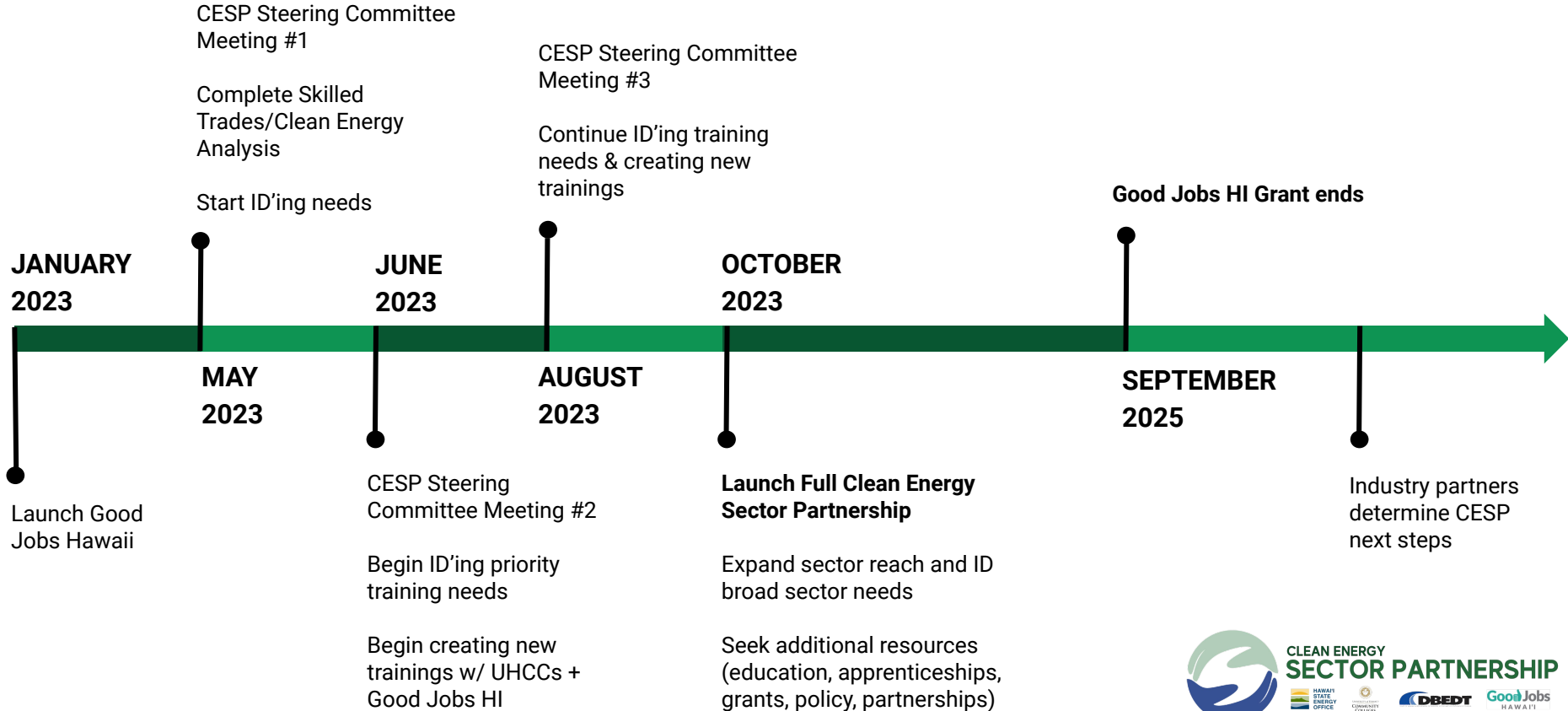
Sust 'āina ble Molokai  
Working to restore 'Āina Momona

# Today's Agenda



Time	Topic	Speaker
5 min	Welcome and Introductions	Cam Black, HSEO
10 min	Opening Remarks	Dane Wicker, DBEDT Mark Glick, HSEO
10 min	Overview of Sector Partnerships	Scott Murakami, DBEDT
10 min	Key Takeaways: Skilled Trades & Clean Energy Workforce Analysis	Anna Pacheco, SMS Research
2 min	Skilled Trades Funding Opportunity	Maria Quidez, Harold K.L. Castle Foundation
10 min	Good Jobs Hawaii	Marshall Norman, University of Hawaii
5 min	Good Jobs Hawaii: Clean Energy Trainings	Nicolette van der Lee, University of Hawaii
25 min	Breakouts: Priority Training Needs	Anna Pacheco, SMS Research
10 min	Report Back	Anna Pacheco, SMS Research
3 min	Next Steps & Key Dates	Cam Black, HSEO

# Clean Energy Sector Partnership Timeline



# Opening Remarks



## Dane Wicker

Deputy Director, DBEDT

# Opening Remarks



## Mark Glick

**Chief Energy Officer,  
Hawai'i State Energy Office**

# Overview: Sector Partnerships

## Scott Murakami

DBEDT Director's Office

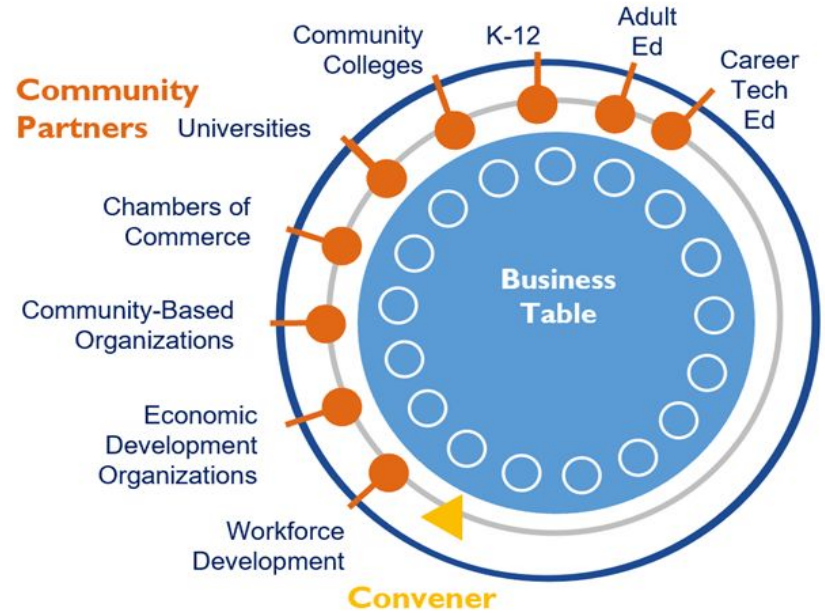




# Sector Partnerships are Industry-led

## Employers partner with us on:

1. Identifying in-demand entry-level occupations
2. Developing career pathways from entry-level jobs
3. Desired skills-training
4. Providing on-the-job training
5. Entry-level employment





# Sector Partnerships in Hawai'i

SECTOR	CONVENER	ESTABLISHED	PRIORITY WORKGROUPS	
<b>Healthcare</b>	Healthcare Association of Hawaii (HAH)	2018	1. Career Awareness 2. Training & Transitions to Employment 3. Curriculum Support	
<b>Technology</b>	Chamber of Commerce Hawaii	2022	1. Career Awareness 2. Training & Transitions to Employment 3. Alignment Between Education & Industry	
<b>Clean Energy/ Skilled Trades</b>	Hawaii State Energy Office (HSEO)	Fall 2023	TBD	
<b>Creative Industries</b>	Hawaii Creative Industries Division	Fall 2023	TBD	
<b>Engineering</b>	Chamber of Commerce Hawaii	2018	1. Career Awareness 2. Women in STEM	3. Math Readiness 4. Talent Recruitment & Retention
<b>Natural Resources</b>	KUPU	2022	1. Career Awareness 2. Connecting Students to 'Āina & Community 3. Investing in College & Career Prep., Access, & Transitions	



# Sector Partnership Governance



CREATIVE INDUSTRIES  
**SECTOR PARTNERSHIP**



## Steering Committee

*A select group of industry leaders that guides the Sector Partnership*  
***Steering committee meets quarterly***

## Full Partnership Members

*A broader group of 100+ stakeholders from industry, education, government and community*  
***Full partnership meets quarterly to address shared priorities***

### Priority Workgroup 1

*A subset of Full Partnership members participate in workgroups to focus on different priority initiatives*

***Workgroups meet as needed***

### Priority Workgroup 2

*Workgroups meet as needed*

### Priority Workgroup 3

*Workgroups meet as needed*

# Developing a Clean Energy Career Pathway

*Vision: for every clean energy job in Hawai'i there is a qualified local candidate.*

Kindergarten

Elementary

Middle School

High School

Post-Secondary

Career

*Awareness*

*Exploration*

*Preparation*

*Training*

*Advancement*



# Key Takeaways: Skilled Trades & Clean Energy Workforce Analysis

**Anna Pacheco**

**SMS Research**



# Project Background: Hawai'i Skilled Trades Workforce Analysis

*Funded by the Harold K.L. Castle Foundation & the Harry and Jeanette Weinberg Foundation*

## Overview:

- **Skilled trades workforce in Hawai'i**
  - Occupations
  - Licensing requirements
  - Training & education landscape
  - Industry credentials
  - Transferable skills
- **Skilled trades in Clean Energy**
  - Occupations
  - Sectors and growth
  - Clean Energy credentials
- **Stakeholder feedback**



HAROLD K.L. CASTLE  
FOUNDATION



The Harry and Jeanette  
Weinberg Foundation, Inc.

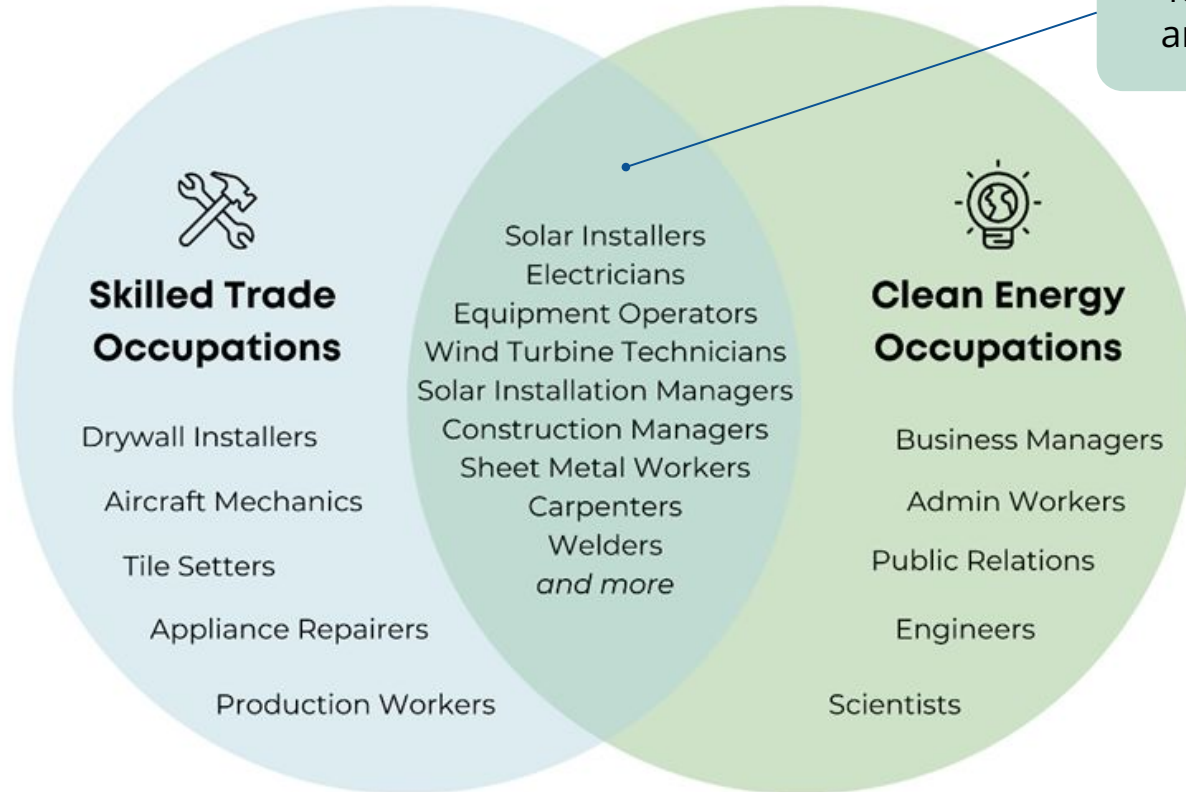


Chamber of Commerce  
HAWAII



# Skilled Trades & Clean Energy Occupations

46% of skilled trade occupations in analysis overlap with Clean Energy



*Typically requires apprenticeship, on-the-job training, and/or some postsecondary coursework*

*Typically requires a 2- or 4-year degree*

## Clean Energy includes:

- Battery Energy Systems
- Bioenergy
- Geothermal
- Hydroelectric
- Hydrogen
- Ocean
- Solar
- Wind
- Renewable Natural Gas
- Energy Efficiency (buildings, vehicles, etc.)

# Clean Energy Specific Trades Occupations

**Average annual  
wage: \$72,359**

Solar PV Installers and Wind Turbine Technicians are among *fastest growing occupations nationwide (2021-31)*

Solar PV Installers is the *fastest growing skilled trade occupation statewide (2018-28)*

Occupation	SOC Code	State Employment (2021)	State Growth Projections (2018-2028)	National Growth Projections (2021-2031)	Average Annual Wage (National Estimates)
Solar Photovoltaic Installers	47-2231.00	410	72.4%	27%	\$57,930
Biofuels Processing Technicians	51-8099.01	N/A	N/A	N/A	\$65,160
Biomass Plant Technicians	51-8013.03	N/A	N/A	N/A	\$98,680
Chemical Equipment Operators and Tenders	51-9011.00	N/A	N/A	N/A	\$48,090
Chemical Plant and System Operators	51-8091.00	N/A	N/A	N/A	\$70,200
Energy Auditors	47-4011.01	N/A	N/A	N/A	\$62,020
Geothermal Technicians	49-9099.01	N/A	N/A	N/A	\$70,740
Hydroelectric Plant Technicians	51-8013.04	N/A	N/A	N/A	\$98,680
Nuclear Power Reactor Operators	51-8011.00	N/A	N/A	N/A	\$104,620
Solar Energy Installation Managers	47-1011.03	N/A	N/A	N/A	\$94,850
Solar Thermal Installers and Technicians	47-2152.04	N/A	N/A	N/A	\$73,590
Weatherization Installers and Technicians	47-4099.03	N/A	N/A	N/A	\$39,850
Wind Turbine Service Technicians	49-9081.00	N/A	N/A	44%	\$56,260



# Renewable Energy Projects in Hawai'i

*Includes all projects operational and in development as of April 2023*

**66% Solar PV**  
**13% Hydroelectric**

Most projects are in Honolulu County (72) and Hawai'i County (28)

**In development:**  
26 Solar PV and 1  
Microgrid

TECHNOLOGY	COUNTY				STATE TOTAL
	Hawai'i	Honolulu	Kaua'i	Maui	
Biofuel/Biomass	1	3	1		5
Geothermal	1				1
Hydroelectric	10		8	1	19
Microgrid	3	3			6
Solar PV & Storage	9	58	11	16	94
Wave		1			1
Wind	2	3		3	8
Other	2	4	1	2	9
<b>COUNTY TOTAL</b>	<b>28</b>	<b>72</b>	<b>21</b>	<b>22</b>	<b>143</b>

## Clean Energy Technologies with Highest Workforce Demand in Hawai'i

Technology	2020 Job Estimates	2030 Job Estimates	Job Growth Needed to Meet 2030 Demand
Solar Energy	3,728	6,455-9,608	2,727-5,880
Wind Energy	261	320-491	59-230
Battery Storage	319	942-1,796	623-1,477
Energy Efficiency	178	783	605

National Renewable Energy Laboratory, Hawai'i's Clean Energy Jobs Potential Through 2030

# In-Demand Skilled Trades Occupations in Solar

- **Most in-demand skilled trade roles:**
  - Installers (520)
  - Electricians (520)
  - Heavy Equipment Operators (120)
- **Most difficult positions to fill with qualified local workers:**
  - Solar Management
  - Superintendents/Forepersons
  - Technicians (Battery Storage, Solar Inverter)
  - Laborers
- **Key experience and certifications:**
  - Entry-level: General construction knowledge and training, OSHA 10
  - Electricians: Journey Worker license required, High Voltage Certification desired
  - Solar installation certification desired
  - Battery systems installation experience desired

*HSEO Jobs Survey on 8 utility-scale solar projects under development (2020)*

# National Clean Energy Credentials

**Solar:** NABCEP PV Associate, Solar Heating Associate

**Wind:** ETA International Small Wind Installer

**Electric Vehicle Supply Equipment:** Electric Vehicle Infrastructure Training Program (EVITP)

**Energy Storage:** Energy Storage and Microgrid Training and Certification (ESAMTAC)

**Energy Efficiency:** Certified Energy Manager, Certified Energy Auditor

# Stakeholder Feedback

*Clean Energy Stakeholder Meeting, March 2023*

## **Local Workforce Challenges:**

- Aging workforce and retirements
- Shortage of qualified, reliable workers (mechanics, technicians, repair workers, etc.)
- Growing demand for skilled workers in installation and maintenance of clean energy technologies (EV, PV, modern grid)
- Apprenticeship recruitment and retention
  - Stigmatization of skilled trades among younger generation
  - Challenges passing apprenticeship entrance exams
- Inconsistent employment due to short-term nature/ebb and flow of project demand for construction and renewable energy projects
- Current skilled trades workers may be resistant to retraining in Clean Energy and other new technologies

# Stakeholder Feedback

*Clean Energy Stakeholder Meeting, March 2023*

## **Local Training Needs:**

- Long-term maintenance of PV systems
- Electric vehicle and charging station repair
- New alternative fuels (training in new clean energy technologies)

## **Growth and Opportunities:**

- Continue transitioning current energy workforce into clean energy workforce
- Good Jobs Hawaii Initiative and Clean Energy Sector Partnership providing support for clean energy training and employment
- HIDOE CTE Renewable Energy Pathway in development
- Projects in pipeline - Phase to prevent worker shortages
- Anticipated growth: Battery storage, electric vehicles/charging stations, electric planes/gliders, long-term maintenance of renewable systems

## Key Takeaways

### **Industry-wide collaboration and industry-education partnership is needed to address shared priorities through collective action:**

- Improve students' early career awareness and exposure to the skilled trades
- Better prepare candidates for entry to the field (e.g., math and professional skills)
- Reduce barriers to apprenticeship and training access (e.g., lack of transportation and childcare)
- Enhanced industry collaboration to achieve shared goals
- Increase access to local trainings in Clean Energy to build future workforce and upskill current workforce

# Skilled Trades Funding Opportunity

## Maria Quidez

Harold K.L. Castle Foundation





# Good Jobs Hawai'i



# Marshall Norman

## University of Hawai'i





# Good Jobs HAWAII



- \$35 million workforce development initiative that provides **no-cost skills training** and **job placement support** for high demand, well paying jobs; \$15 million has already been used
- Coalition of educators, businesses and community partners.
  - Creative Industries
  - Healthcare
  - IT
  - Clean Energy/Skilled Trades
- Funding for short-term training programs, paid internships, industry certification exams, and job placements

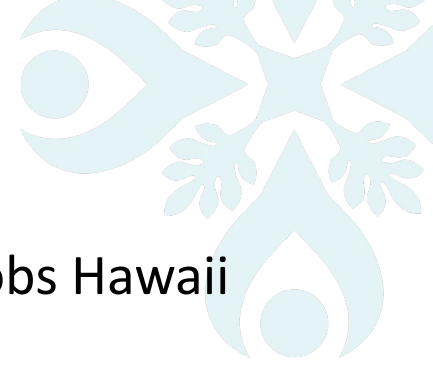
[goodjobshawaii.org](http://goodjobshawaii.org)



# Phases of Grant Implementation by Sector

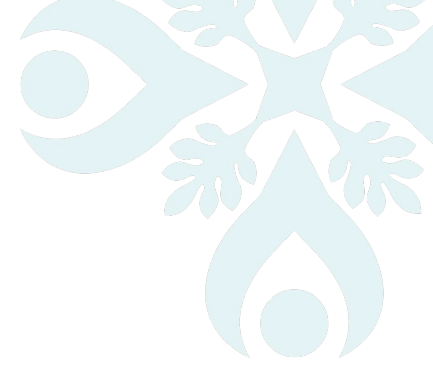


	Phase I: System Development	Phase II: Design	Phase III: Implementation
Creative Industries	✓	In process	
Healthcare	✓	✓	✓
IT	✓	✓	✓
Clean Energy	✓	In process	



# Enrollments

- Since launch, 1900 residents have enrolled in a Good Jobs Hawaii training
  - Healthcare: 1079
  - IT: 269
  - Clean Energy/Skilled Trades: 219
  - Creative Industries: 27
- Other Sectors (Funded by HCP): 306
- ≈60% have completed their trainings (some trainings are still ongoing)
- Job Outcomes are within 6 months; full data forthcoming



# Who is enrolling in trainings?

## GENDER

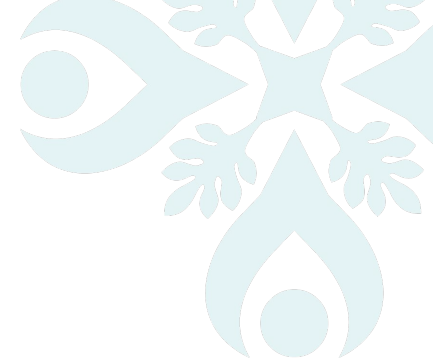
- Female: 1,121 (59%)
- Male: 703 (37%)
- Not specified: 76 (4%)

## NATIVE HAWAIIANS

- 342 (18%)

## PACIFIC ISLANDERS

- 95 (5%)



# Good Jobs Hawai'i Updates

- January 30: Official Launch
- Spring/Summer 2023: Statewide Partnership Meetings
  - Creative Industries Focus at Leeward CC
  - GED
  - NELHA
  - Observatories
  - IT Pathways
- EDA Visit
  - Regional Director Person-Whitley
- Fall 2023: Trainings Posted at **goodjobshawaii.org**
  - Spring 2024 in November

# How Can Industry Partners Engage with GJHI?

## Level One Engagement

- Sign the Pledge
- Join Sector Partnerships (IT, healthcare, clean energy, creative industries)
- Provide input on training needed

## Level Two Engagement

- Provide internships to high school and UHCC Good Jobs Trainees (\$2,000 funding per participant)
- Hire UHCC Good Jobs Graduates (\$2,000 funding per participant)
- Upskill current employees (fully subsidized)
- Request Funding for 3rd Party Training

# Good Jobs Hawai'i: Clean Energy Trainings



**Nicolette van der Lee**

**UH Community Colleges**



# Training Updates

- Current trainings:
  - Renewable Energy Certificate leading to NABCEP PV Associate certification
  - Solar Safety Training (NABCEP recognizes as equivalent to OSHA 10)
  - Related Skilled Trades: CDL, Forklift, ASE, Welding, Chainsaw Safety, Carpenter Pre-Apprenticeship
- Met with IBEW Local 1186 team to identify and discuss next steps for priority trainings:
  - Exam prep for apprenticeship program
  - EVITP Certification for licensed journeyworkers
  - ESAMTAC (Energy Storage Plus)
  - EV automotive training, and DOE pathways
- Nicolette van der Lee (Training Program Manager) working on third party training proposal for Certified Energy Manager training with Association of Energy Engineers
- Crosswalk will continue to be enhanced with additional data on in-demand workforce needs
- Welcome CESP input on further expanding the crosswalk



# Breakouts: Priority Training Needs

20 minutes

# Breakout Groups

## Group 1

Facilitator: Vanessa Rogers

Note Taker: Dan Doerger

## Group 2

Facilitator: Marshall Norman

Note Taker: Nicolette van der Lee

## Group 3

Facilitator: Cam Black

Note Taker: Anna Pacheco

# Discussion:

## Based on the trainings identified in the crosswalk:

- Is there anything missing?
- Which training gaps should be prioritized?
  - Identify associated training providers and/or certifications for priority needs



# Report Back

3 minutes per group

# Notes: Breakout Group 1



## Discuss:

### Based on the trainings identified in the crosswalk:

- Is there anything missing?
- Which training gaps should be prioritized?
- Identify associated training providers and/or certifications for priority needs

### Training Gaps:

- Ag Techs, Agronomist, Ag mechanics, Irrigation, Pipefitters
- Carbon smart techs
- Strong soil systems, Vertical farming, Cold storage
- Chemists, Engineers
- Administrative support (Marketing, Accounting)
- Cryogenics - Nitrogen, Hydrogen (handling and storing of gasses) ONLY TWO TECHS IN THE ENTIRE STATE
  - UPSKILLING of candidates (sometimes as much as \$10,000 to do that upskilling)
- Hydraulics and refrigeration (HVAC) (short term trainings)
- Sheet metal "Competent Person" - Foundational/safety skills to build upon to gain confidence on the job
- EV battery repair

### Important Trainings: These exist but are very important (some strong HS programs; where do students go from there)

- Mechanic Programs - Heavy equipment & Small equipment (engine repair)
- **CDL**
- Biomass
- Bio Fuels (numbers are off)
- First Aid/CPR (trainings start with the basics to get someone started and then add continued upskilling)

### Other Needs

- Cost Benefits Analysis for Bio Diesel and other energy sectors
- Life cycle Analysis for PV and EV
- Adapting to the changing nature of learning and the impact of social media
  - What do we need to learn about Generation Z?
- Impact of modality of instruction

**Spring 2024 Training Priorities:** CDL, Welding, Foundational Safety Training (competent person)

# Notes: Breakout Group 2



## Discuss:

### **Based on the trainings identified in the crosswalk:**

- Is there anything missing?
- Which training gaps should be prioritized?
- Identify associated training providers and/or certifications for priority needs

- **Missing Entry level: Energy Efficiency Practitioner** (AEE, Colin Spady) start in CESP > **Certified Energy Auditor “In-Training”** (need 4-5 yrs of experience for Certified Energy Auditor)
- **Electrical Journeyworkers** needed to supervise journeyworker apprentices; apprentices need exam prep for the new, challenging exam.
- More training needed in **branch circuit wiring**
- Is there an opportunity for a **Solar Journeyworker Electrician specialization**? Currently some hours that apprentices work for solar contractors count for licensure, but other tasks are outside the scope of pv work (Revolusun)
- **Community-oriented technical assistance** needed to support community development projects and competencies for energy sovereignty and development, systems, equity, land-use, e.g. Sustainable Molokai, Ho‘āhu Energy Cooperative, Waianae, e.g. nonprofit project managers who have dual competencies around RE development and community-based planning (Sebastian Selarque)
- **Other specialized energy auditing and retrofit specialization**, e.g. [Multi-family Building Analysis Training](#); [Multi-family Retrofit](#) (Ben Sullivan).
- [Building Operator Certification](#) and [LEED Green Associate](#) / [LEED AP](#) credentials were raised by Nicolette as other trainings UH has offered but no employers prioritized in our breakout.

# Notes: Breakout Group 3



## Discuss:

### **Based on the trainings identified in the crosswalk:**

- Is there anything missing?
- Which training gaps should be prioritized?
- Identify associated training providers and/or certifications for priority needs

- Building Operators Certifications - already at UH Maui
- Aquaculture/Algae
- Ag with Solar
- Home Retrofitting (BPI Energy Auditor/Building Analyst Professional)
- Utility-Scale Solar Project Training
- Controls Technicians and Installers (ACDC 1 or 2, SCDA)
- Maritime Skillsets and Ocean Engineering
- Sector Specific Project Management



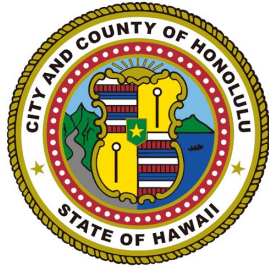


# Next Steps & Key Dates

# Next Steps

- **Employers:**
  - Sign Good Jobs Hawaii employer pledge
  - Complete intake form if ready to hire a Good Jobs Hawaii graduate
- **All:**
  - Provide input on CESP priorities: Survey to be distributed ahead of next full partnership meeting
  - **Spring 2024:** Full Partnership Meeting #2 (Date TBA)

# Mahalo to our Supporters!



STATE OF HAWAII  
**DLIR**  
DEPARTMENT OF LABOR  
AND INDUSTRIAL RELATIONS



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STATE  
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