

#WaterpowerWorkforceChallenge

What in the Industry Are We Doing About Workforce?

Connecting Resources In Our Workforce Pipeline



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

#waterpowerworkforcechallenge



Jennifer Daw

Senior Researcher
National Renewable Energy Laboratory (NREL)
U.S. Department of Energy



Linda Ciocci

Executive Director
Hydropower Foundation



Debbie Gray

Senior Energy Policy Manager
International Hydropower Association (IHA)



Alison Jakupca

Senior Regulatory Consultant
Kleinschmidt Associates



Elise DeGeorge

Senior Project Leader
National Renewable Energy
Laboratory (NREL)
U.S. Department of Energy



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Framing Our Discussion



Authors

Jennifer Daw, Jeremy Stefek, Elise DeGeorge, Ritu Treisa Philip, Arielle Cardinal, and Linda Parkhill
National Renewable Energy Laboratory



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Also Framing Our Discussion



Energy Sector Management Assistance Program (ESMAP). 2023. Power with Full Force: Getting to Gender Equality in the Hydropower Sector. Washington, DC: The World Bank.



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Structure of Today's Session

Phase I: Hear from Jennifer Daw on **Recruiting** takeaways, with Debbie Gray adding in

Phase II: Hear what the industry is *doing* to address gaps, problems, and otherwise solve for the workforce pipeline dilemma

Phase III: Learn about how *you* can join in to support these solutions, from helping generate more awareness or actively participating in any of these (and other) great programs

Then repeat the above focusing on **Retention**



#waterpowerworkforcechallenge



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Key Takeaways from NREL's Analysis

Recruitment

1. Access To Curricula That Teaches Hydropower
2. Competition From Other Renewable (Or Just Any Other) Industry
 - Fewer new engineers entering the workforce

Retention

1. Loss Of Institutional Knowledge
2. What It Means To Have Changing Demographics



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Let's Start From the Top

Recruitment

1. Lack Of Access To Curricula That Teaches Hydropower
2. Competition From Other Renewable (Or Just Any Other) Industries
 - Fewer New Engineers Entering The Workforce



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Access to Curricula

U.S. Education System Survey



- **Nearly 70% of U.S. schools surveyed do not offer hydropower degree programs.**
- Schools are interested in expanding programs, but many lack funding to do so. Schools won't teach hydro without student demand.
- Schools said **students were unaware of the importance or relevance of hydropower.**

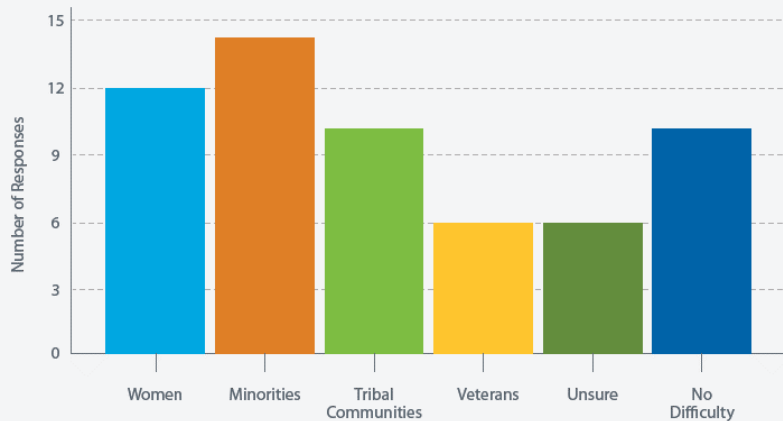
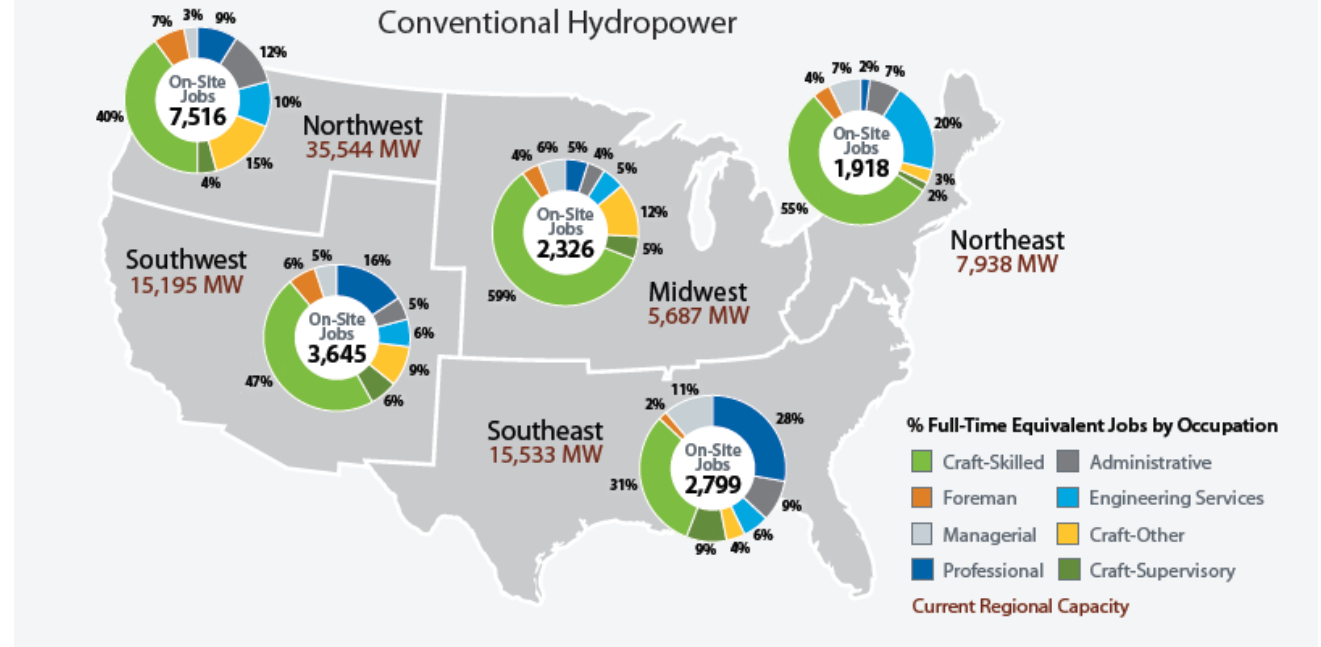
U.S. Student Survey



- 93% of surveyed students view hydropower as a renewable energy source.
- **76% said hydro coursework would interest them** – however they lack access to it.
- Hydro is **not specifically taught to craft and trade workers.**
- **60% of students did not see hydro as a growing field. Many lack awareness, have negative/inaccurate associations of hydro.**
- **Students and other job seekers are not aware** of the breadth of hydro jobs or career paths, and encounter difficulty finding jobs.

Competition for Workers

Recruiting



- **There is increasing demand and competition for workers, particularly:** skilled craft/trades, operators, engineers, scientists; specialties like procurement and power scheduling.
- **Traditional recruiting methods aren't effective** (word of mouth, "hydro found me"). Employers report difficulty finding workers. Hydro jobs are power sector jobs!
- **Attracting a diverse workforce is a challenge**, especially when awareness of hydro jobs is limited. 73% of industry has difficulty hiring women, BIPOC, and veterans due to limited interest and fewer qualified applicants.

Other Recruiting Challenges



Familiarity with hydropower

Interest or misconceptions about hydropower

Relevant experience or skill sets to meet job requirements

Relevant degrees or coursework

Interest in **geographic location**

Interest in **available jobs**

Interest from wide range of demographics

Competition with other industries for **transferable skills**

Unwilling to work for **wages**

Not enough applicants















Menti: What are you doing that's helping
you recruit and raise visibility of hydro jobs?



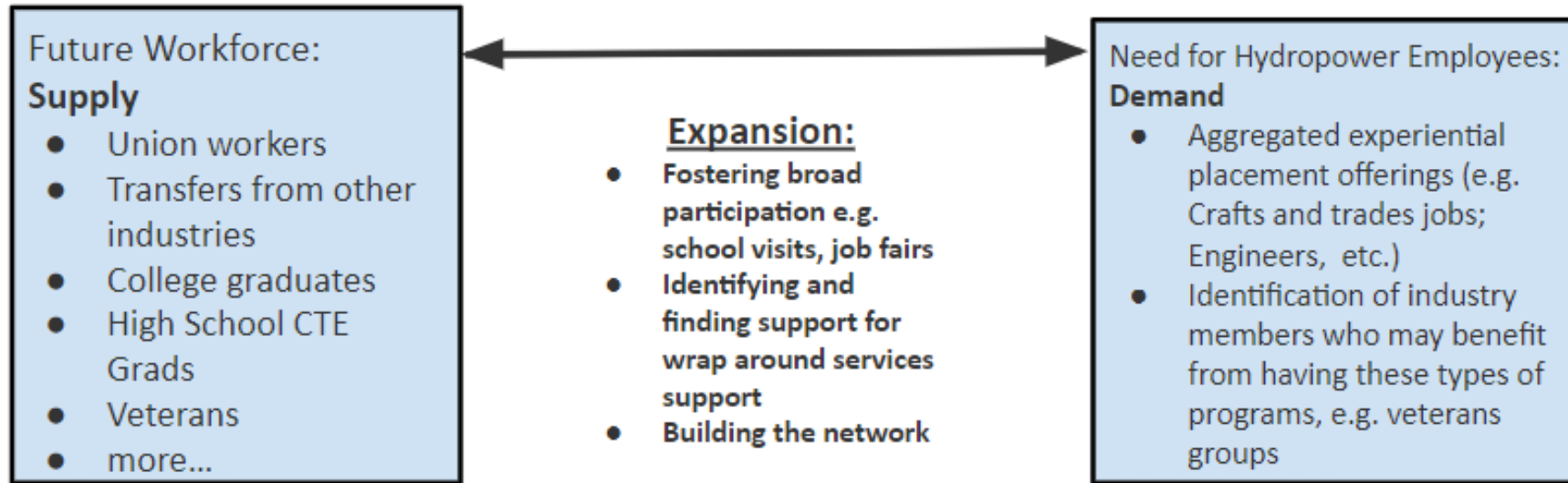
So What Are We *Doing* About This? – Resources and Solutions



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Resource or Solution	Organization Administrator	What is it?	
Think Tanks	Hydro Foundation	A three-day competition for post-secondary students from universities and trade schools hosted within a region, placed into teams and given a hydropower challenge to solve.	
Waterpower Clubs	Hydro Foundation	Facilitates the development of partnerships between higher education and the community, aligning industry organizations on a state, regional, and sub-regional basis in order to provide nationwide learning opportunities for students	 
Hiring for Hydro	Hydro Foundation	Connecting students interested in a hydropower career with the hydropower community	 
Julie Keil Scholarship	Hydro Foundation	The scholarship(s) awarded to women who reflect Julie's attributes and are interested in any aspect of hydropower.	
Hydropower Collegiate Competition	U.S. DoE WPTO/NREL with HF	A national competition for undergraduate and graduate students	
K-12: partnerships/curricula development	NEED & KidWind via U.S. DoE/NREL	Introduces students and teachers to waterpower through experiential learning	 
			 
HydroConnections	U.S. DoE/NREL	<i>In-discussion</i> Nationwide hydropower jobs connections collaborative	
Career Maps	U.S. DoE/NREL	Understand the opportunities and associated pathways of various work functions in hydro	
STEM/Workforce Portal	U.S. DoE/NREL with HF	Understand the opportunities and associated pathways of various work functions in hydro	

Hydro Connections



3 prong approach: connections, expansion, and essentials

The Ballast:

- Baseline water power Education and Exposure.... (including Industry engagement in the Classrooms and more)
- Support for Companies Wanting to Develop their Own Experiential Programs - Roadmap



Upcoming Deadlines: [REcharge Academy Applications - March 15](#) | [Sim Challenge- March 15](#) | [Art Challenge - March 15](#)

KidWind

[KidWind Challenge](#)

[Teacher Training](#)

[Class Activities](#)

[Gear](#)

[Support KidWind](#)

⚡ Hydropower 101

Your Future in Hydropower Teacher Guide

Career and Technology Education activities that provide hands-on experience with tools, circuits, materials, fluids, and job readiness.



Grade Level:

Secondary

Subject Areas:

Science

Careers

Math

Engineering

Technology



Hydropower 101

4/20: 10:00AM-1:00PM Eastern

[Register](#)

Join us for this hydropower virtual workshop to explore the science of water based power!

During this virtual workshop, educators will learn the foundations of water power including the science and technology of hydropower turbines. We will also introduce activities for the classroom that engage students in dynamic, hands-on energy-based learning.

KidWind



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Additional organizations have resources contributing to recruitment

- Clean Energy Jobs
- SkillsUSA
- Manufacturing Institute
- Skillbridge
- Consortium of Hybrid Resilient Energy Systems (CHRES)
- Consortium for Research and Education in Power and Energy Systems (CREPES)
- IREC - Apprenticeships in Clean Energy Program and IREC Training Program
- Department of Labor Apprenticeship.gov website
- Job Corps – Civilian conservation centers operated by USDA: jobcorps.gov
- Green Economy Network
- Jobs First NYC
- Get into energy with Centre for energy workforce Development
- CREW Ambassador Program
- Oak Ridge Institute for Science and Education STEM Internships
- MassCEC (Massachusetts Clean Energy Center) Internships
- Voith
- FWEE
- Quebec Hydro
- Southern Company
- Identify union-focused apprenticeships
- IBEW



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

OPPORTUNITIES IN HYDROPOWER

CONNECTING STUDENTS INTERESTED IN A HYDROPOWER CAREER WITH THE
HYDROPOWER COMMUNITY!

HIRING FOR HYDRO™

Thinking about your long-term career?

What if you could:

- Attend an industry conference filled with technical professionals with a similar degree as yours?
- Participate in a workshop about potential careers in hydropower, followed by a special session to talk with hiring managers.
- Receive a complimentary review of your resume, tips on networking & interviews.
- Meet like-minded students
- Learn more at www.hydrofoundation.org or scan the QR code.



Learn more and join the club at Waterpowerclub@hydrofoundation.org



STUDENT COMPETITIONS

HYDROPOWER COLLEGIATE COMPETITION

- A national competition for undergraduate and graduate students. Bring your team to compete for cash in the 2025 competition. This is a two-semester commitment with longterm rewards!

HYDRO THINK TANK™

- A three-day competition for post-secondary students from universities and trade schools hosted within a region, placed into teams and given a hydropower challenge to solve.
- Learn about career opportunities in hydropower
- Network with hydropower employers, looking for someone like you to join their team.
- Work in a team and provide innovative solutions to real-world challenges.



WWW.HYDROFOUNDATION.ORG



2023 Hydropower Collegiate Competition



2023 SE Hydro Think Tank Competition



JULIE KEIL SCHOLARSHIP AWARD

- An education scholarship program for women enrolled in an accredited college or university and majoring in a discipline relevant to entering the hydropower field.
- The scholarship(s) awarded to women who reflect Julie's attributes and are interested in any aspect of hydropower.
- Grants to women who plan to enter the hydropower industry to assist with expenses to attend an industry event.
- Apply today at www.hydrofoundation.org
- Now accepting applications for the 2024 recipient
- The deadline to apply is May 15th



2023 Recipient

**Natalie Coash
Auburn University**

Strength

Enthusiasm

Leadership



Courage

Energy

Persistence



2020



2021



2018

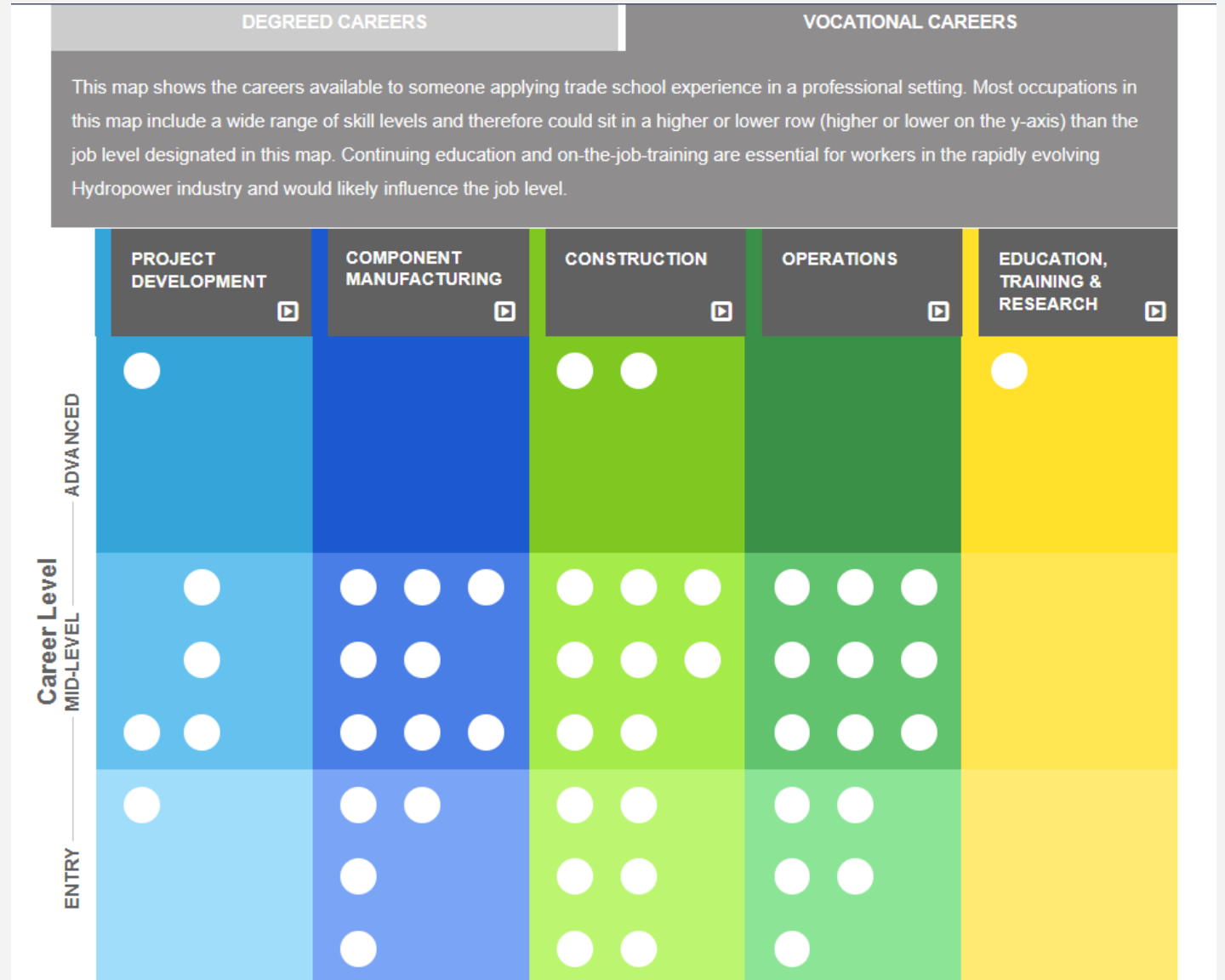


2022



2019

Hydropower Career Map



This map shows the careers available to someone applying trade school experience in a professional setting. Most occupations in this map include a wide range of skill levels and therefore could sit in a higher or lower row (higher or lower on the y-axis) than the job level designated in this map. Continuing education and on-the-job-training are essential for workers in the rapidly evolving Hydropower industry and would likely influence the job level.



STEM for Hydropower

This information-sharing portal is designed to help spur innovation and growth in the hydropower energy technologies industry and support workforce development.

STEM for Hydropower

Science, Technology, Engineering, and Math for Hydropower

Hydropower energy technologies play an important role in the growing renewable energy industry, but there are not enough workers to fill open jobs in the sector. To continue to spur innovation and growth in these exciting technology areas, the industry needs to inspire the next generation of hydropower energy workers. The U.S. Department of Energy and the National Renewable Energy Laboratory are developing the STEM for Hydropower and [STEM for marine energy portals](#) to help interested students learn and to provide resources for academia and industry to educate the future workforce.

[Access Educator Resources](#)

[Contact Us](#)



What Do We Need From The Industry?

- Engage with those working on this effort
- Collaborate with synergistic organizations on workforce recruitment
- Remove constraints such that more women pursue STEM degrees
- Tell the story of how wonderful the waterpower sector is #WithHydropower
- Increase community engagement, build awareness about jobs
- Raising awareness to promote hydropower as appealing career for a diverse workforce



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

#waterpowerworkchallenge

LinkedIn – other social media OK

Tell your story of how you came to waterpower as a career



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Next up: Retention – Key Takeaways

1. Loss Of Institutional Knowledge Before Workers Arrive Means “Build Airplane While Flying It”
2. What It Means To Have Changing Demographics

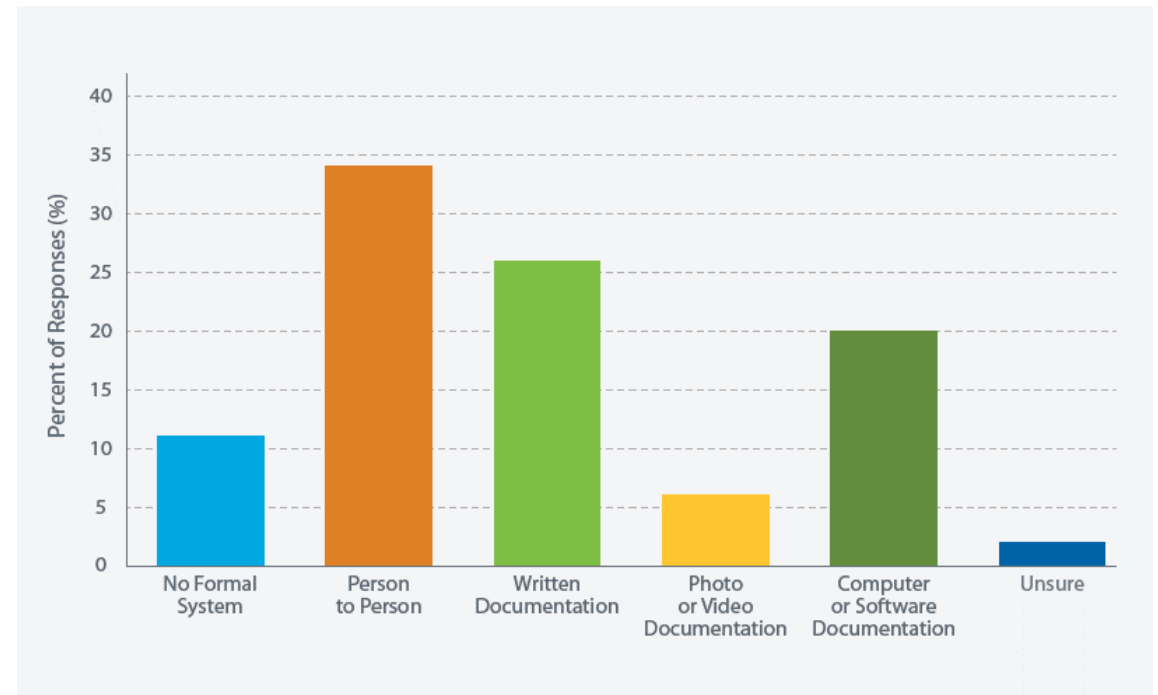


WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Loss of Institutional Knowledge

Worker Retirement

- **Significant retirement challenges exist** for the hydro, particularly for skilled craft/tradespeople, engineers/technicians and project managers over the next 5-10 years.
- Many **lack the bandwidth to prepare for retirements through succession planning and knowledge transfer**, risking organizational knowledge loss.



Worker Retention

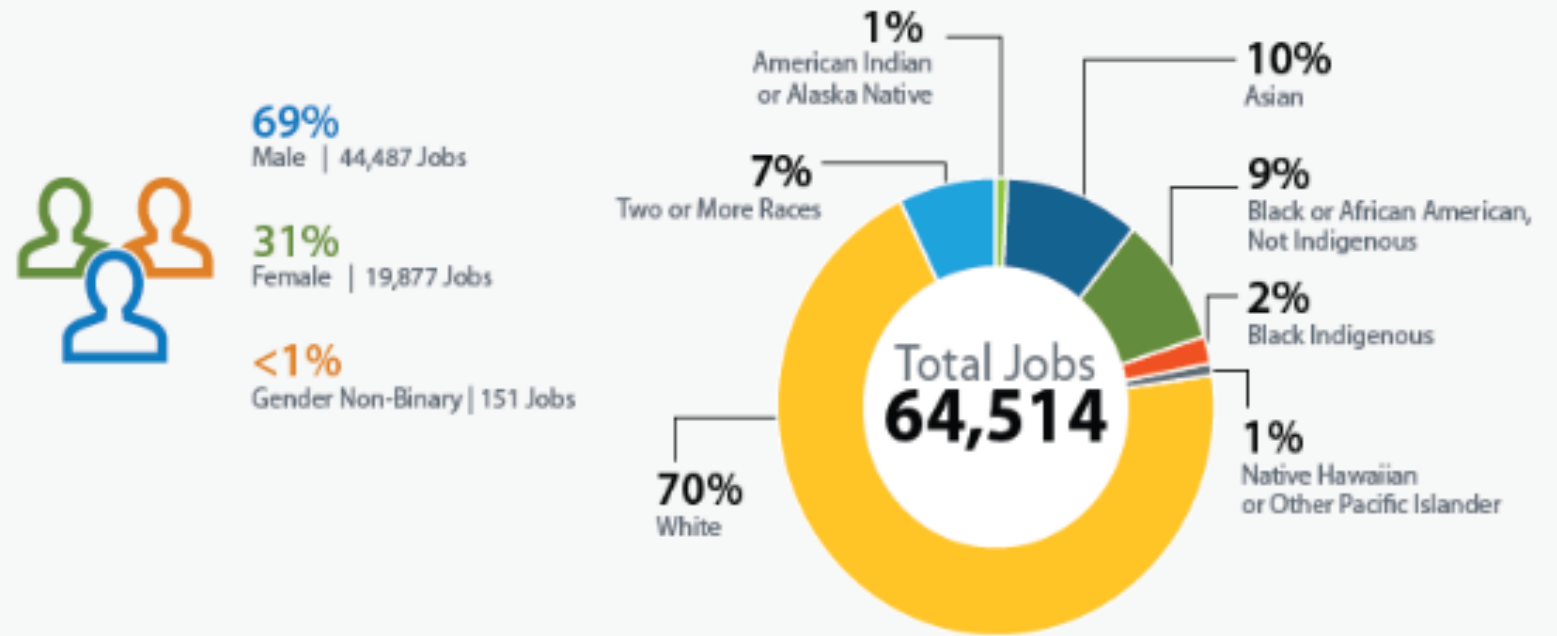


- **Hydropower is seeing more turnover in staff**, leaving for new jobs, hybrid/remote work environments or higher pay.
- There is **more turnover for workers with 10 years or less of experience**.
- Many junior staff are being mentored within the hydro industry; **fewer receive mentorship within their organization**.

Changing Demographics

Hydropower Workforce Diversity

Hydropower Workforce Demographics



- **There is room to improve diversity in the hydro workforce**
- Why does this matter?
 - Helps hydro industry better understand/represent the communities it serves
 - Brings new perspectives into the industry and its leadership
 - Share opportunities that hydro provides with a broader range of people who can benefit from meaningful careers
- **But diversity is not a destination, it is a process**

Diversity, Equity, Inclusion, Accessibility & Retention



Credit: Russ Sanford, Kleinschmidt

- **Job applicants often mirror local population**, it may take more effort to build workforce diversity.
- Many hydro organizations have diversity goals and trainings, **establishing a supportive culture is very important.**
- **Creating a sense of inclusion and belonging for all workers is critical to staff retention.**

So What Are We *Doing* About This? – Resources and Solutions



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

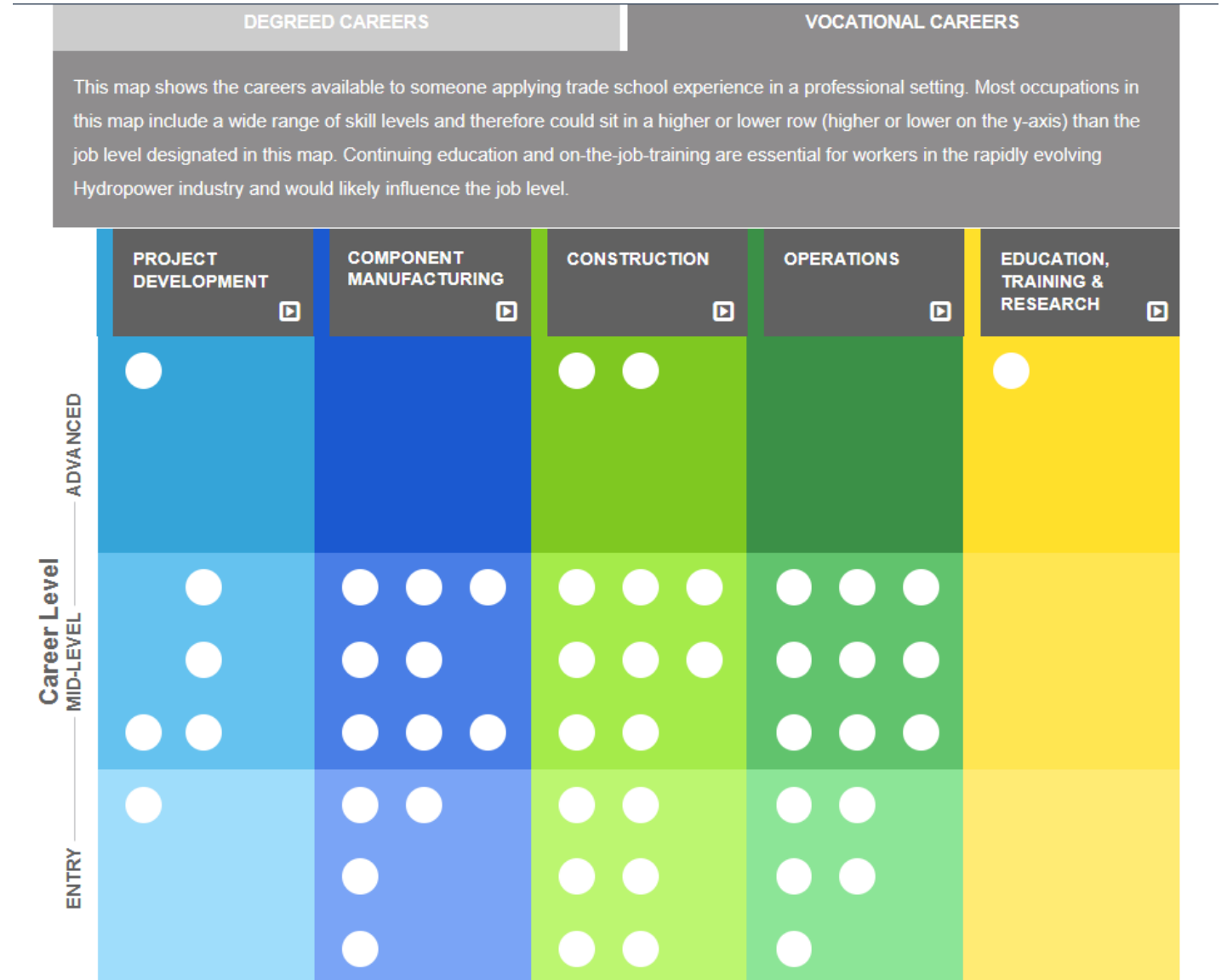
Resources and Solutions – Retention

- **Knowledge Transfer/Succession Planning Toolkit**
 - **Career Maps (again!)**
 - **Provide Mentoring!**
 - **FLOW (Future Leaders of Waterpower)**
-
- **Kleinschmidt's company culture nurturing enthusiasm**
 - **Family atmosphere**



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Hydropower Career Map



JOIN OUR PROGRAM



Be matched with other women from the hydropower sector in mentorship pairs or triad groups



Expand Your Network, Share Experiences, New Connections, Additional Perspective and Support



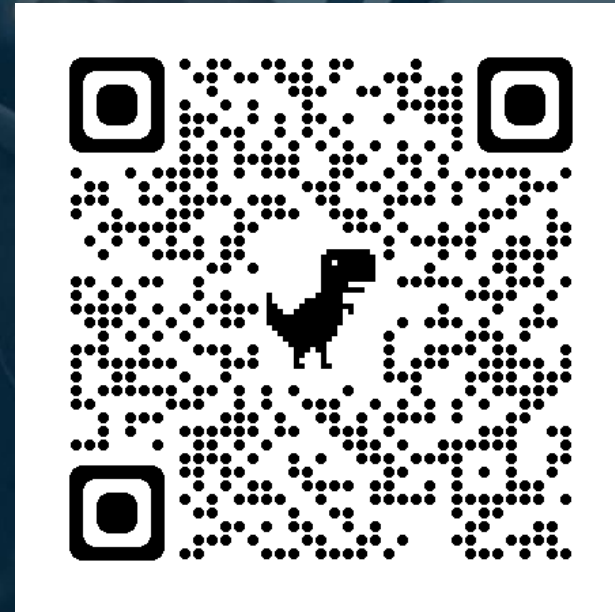
Become collaborators in each other's success



Meet once a month for 8 months (October to May)



Applications will be available mid-June and accepted through August 1; Pairings/Triad groups announced by end of September



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

FUTURE LEADERS OF WATERPOWER (FLOW)

Get more involved with NHA, learn from industry leaders, and make lasting connections!



About FLOW

FLOW is NHA's platform for supporting talented, diverse professionals, young professionals, and professionals new to the industry by creating a welcoming environment and by providing a clear pathway for professional growth.



Career Development



Networking



Diversity, Equity & Inclusion

Succession Planning Toolkit

Criticality: Impact of the position on the mission	Vulnerability: No successor position identified for this position			
	Low Vulnerability	Moderate Vulnerability	High Vulnerability	High Vulnerability
High Criticality	Moderate Risk	High Risk	High Risk	High Risk
Moderate Criticality	Low Risk	Moderate Risk	High Risk	High Risk
Low Criticality	Low Risk	Low Risk	Moderate Risk	Moderate Risk

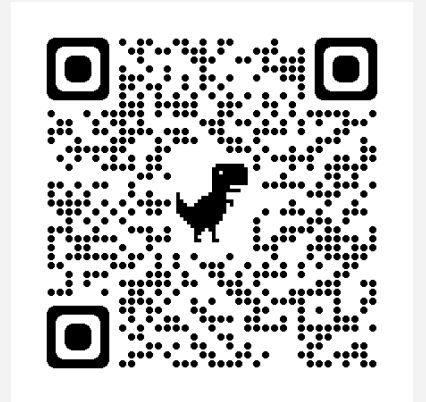


What Do We Need As An Industry?

- Please help with examples or case studies for Knowledge Transfer Toolkit (Jennifer.daw@nrel.gov)
- Send publicly available DEIA resources for our library that will be available to the industry
 - Renewables Forward
- Fill Out the Survey for Employment on International Renewable Energy Agency www.irena.org/gendersurvey



Become a mentor!
Tell others about the mentorship
program



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

Feedback from You

- **Now that we have a picture of (most but unlikely all) of the resources available for Recruitment and Retention....**
 - Where Do We Go From Here?
 - What Other Gaps Can We Fill?
 - What Strategic Questions Should We Collaborate On At the 30,000 ft level?



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM

#WaterpowerWorkforceChallenge

LinkedIn – other social media OK

Reach out to three associates in the mentorship program and let them know how important they are // they make a difference!



WATER.POWER.WEEK.
WASHINGTON, D.C. • MARCH 13-15, 2024
CAPITAL HILTON • WATERPOWERWEEK.COM