

A Hydrogen Hub Blueprint for the California Supply Chain

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Introduction

Hydrogen technology presents a viable opportunity to decarbonize the California supply chain, offering a powerful pathway to meet strict state emissions mandates and global climate goals. For diesel-reliant industries such as shipping, rail, and trucking that are notoriously difficult to decarbonize without disrupting operations, hydrogen is especially promising. Yet one critical factor is being left out of the conversation—people. The “Hydrogen Blueprint for the Southern California Supply Chain” provides an evidence-based assessment to help freight leaders ensure that workforce development keeps pace with the rollout of new hydrogen technologies. The Blueprint identifies workforce development challenges associated with the emerging maritime, cargo-handling, rail, and trucking segments of the supply chain that connect freight moving from the San Pedro Bay ports to destinations statewide, nationally, and internationally.

Study Methods

To kick off the launch of the Blueprint, the Center for International Trade and Transportation (CITT) formed partnerships with faculty and leadership at five California State Universities (CSU) based in Southern California (specifically Long Beach, Dominguez Hills, Los Angeles, Northridge, Fullerton, and Pomona), also known as the CSU5+, and with Industry Advisor Cory Shumaker,

Director of Market Development for the California Hydrogen Business Council. The Blueprint includes a literature review of the existing hydrogen workforce development programs within the U.S. and from other countries; a labor market analysis of California; and the development of a survey to document the courses offered by the members of the CSU5+, along with how they are developing the knowledge, skills, and abilities needed by the future workforce. During the labor market analysis, the Blueprint team visited facilities with hydrogen equipment in operation to better understand the workforce needs of companies participating in the hydrogen supply chain. At the end of the project, CITT hosted a peer exchange with the CSU5+ representatives to facilitate a candid discussion on the current state of the hydrogen supply chain and to review the results of the survey to facilitate knowledge transfer.

Findings

The workforce development documentation and analysis in this Blueprint make clear that, beyond narrowly focused hydrogen-related occupations and hydrogen-adjacent occupations, it will be federal and state lawmakers and regulators who will serve as the gatekeepers for production, transport, and end-use of hydrogen across the state and national supply chains. Developing a skilled and prepared workforce for an

entirely new energy sector will require careful strategic workforce development planning and skills mapping to ensure that the full project lifecycle of new hydrogen production and fueling infrastructure is developed to support supply chain systems of the future. Building hydrogen infrastructure and launching related consumer and industrial marketplaces will be an iterative process with many fits and starts. Navigating those fits and starts will require long-range strategic planning, unprecedented public private partnerships (P3) innovation, and a willingness for all parties involved to leave their egos at the door and challenge assumptions when evidence-based research supports such reconsideration.

If California maintains its current industrial energy policies and regulations without adjustment, efforts to decarbonize established industries could result in unintended consequences, ethical concerns, and strategic setbacks that undermine its clean energy goals.

Policy Recommendations

The Mine hydrogen technology demonstrations and early implementations to identify new KSA gaps and related workforce development needs. Then develop responsive certificate trainings. Curriculum is updated in real-time due to technology-transfer public-private partnerships (P3s). To address rapid rates of change in the hydrogen sector, leaders in Professional and Continuing Education (PaCE) units on college campuses throughout California can partner with industry leaders in hydrogen production, transport, storage, and fueling systems to develop certificate training programs that respond to the KSA gaps identified by feedback from frontline workers, managers, and original equipment manufacturers as part of interview-based assessments and brief surveys about challenges associated with designing, developing, operating, and maintaining specific hydrogen infrastructure systems and vehicles. Launch a CSU5+ Lecture Series to Incubate P3 Innovations and Generate Awareness for Hydrogen Pilot Certification. The CSU5+ team led by

CSULB's CITT and the Institute of Innovation and Entrepreneurship should host a series of guest lectures addressing mission-critical hydrogen issues. The format for each lecture and subsequent pilot curriculum would use the five principles of collective impact previously mentioned in this Blueprint along with five principles for practicing futures thinking identified by the Institute for The Future (ITTF):

1. Forget about predictions;
2. Focus on signals;
3. Look back to see forward;
4. Uncover patterns; and
5. Create a community.

About the Authors

Dr. Tyler Reeb serves as Executive Director at the Center for International Trade and Transportation at California State University, Long Beach. He oversees a multimillion-dollar portfolio of sponsored research that addresses rural, Tribal, Intelligent Transportation Systems (ITS), supply-chain and logistics, zero-emission technologies, automation, data privacy, community engagement, and a range of workforce development issues.

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To Learn More

For more details about the study, download the full report at transweb.sjsu.edu/research/2461



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