Los Angeles Department of Water & Power

LOS ANGELES GREEN HYDROGEN HUB

Committee Meeting

May 5, 2022

LA100 STUDY OUTCOMES

FINAL REPORT RELEASED – MARCH 24, 2021

- **100% renewable energy is achievable** through multiple pathways
- Building and transportation electrification key to affordability
- LA100 scenario cost range
  - Investment of approx. $57-87B **in addition to existing obligations** (e.g. Reliability & Resilience)
- Significant job creation (9,500 jobs) across all sectors
- We can achieve **100% by 2035**
- **There are common investments across all pathways to 100%**

LA100 STUDY – BULK ELECTRIC SYSTEM

ACROSS ALL LA100 SCENARIOS

Electrification
Efficiency
Flexible Load

Customer
Rooftop Solar

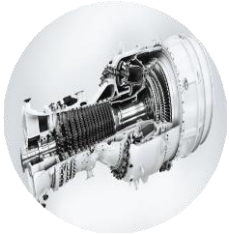
Renewable
Energy

Solar: + >5,700 MW
Wind: + >4,300 MW

Storage

+ >2,600 MW

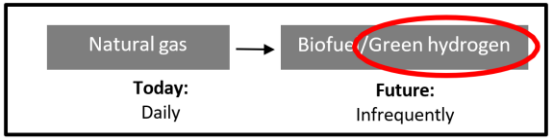
Transmission,
Distribution



Renewably Fueled
Dispatchable Turbines

+>2,600 MW
(in basin)

Much More



TRANSFORMING LOCAL GENERATION

ALIGNING WITH LA100 – GREEN HYDROGEN

- One of LA100's **key findings** is that L.A. will need **in-basin**, reliable combustion generation
- LA100 assumes **hydrogen in all of the scenarios** to help achieve the last 10% toward a 100% carbon-free power supply that is reliable and resilient
- Hydrogen may be critical in decarbonizing **hard-to-electrify industries**
- LADWP also plans to use green **hydrogen** as a **clean fuel to supplement** a generation portfolio largely dominated by renewables
- **Green hydrogen Request for Information (RFI)** for all in-basin generating stations. Construct **hydrogen capacity at Scattergood**. Retrofit **Haynes to recycled water cooling.**

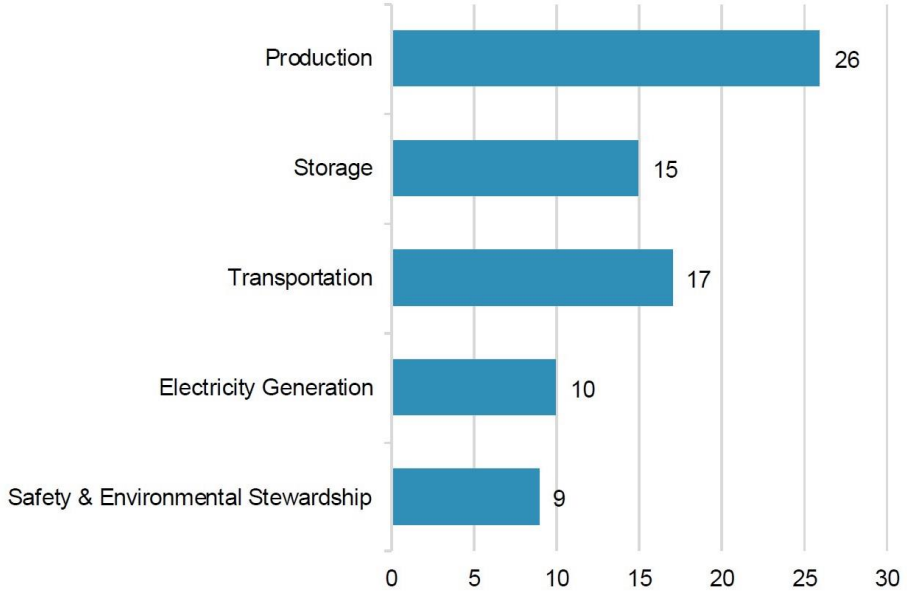
LADWP GREEN H_2 RFI – RESULTS

REQUEST FOR INFORMATION – IN BASIN

26
Individual Companies

36
Total Submittals

22
Submittals Addressed Multiple Technologies of Interest



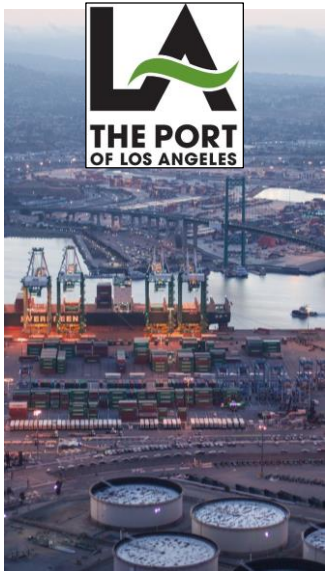
Responding Industries

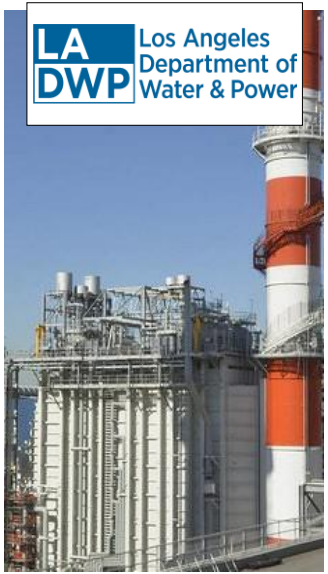
- Turbine OEMs
- Electrolyzer Manufacturers
- Fuel Cell Manufacturers
- Gas Providers
- Green Ammonia Producers
- Renewable Developers
- Safety Products
- Consultants
- Project Developers

GREEN HYDROGEN – CITYWIDE COLLABORATION

LOS ANGELES HAS LARGE GREEN HYDROGEN POTENTIAL – OFFTAKE & PRODUCTION

LOS ANGELES





BIPARTISAN INFRASTRUCTURE LAW

HYDROGEN HIGHLIGHTS

- **COVERS $9.5B FOR CLEAN HYDROGEN**
  - $8B for at least four regional clean hydrogen hubs
  - $1B for electrolysis research, development and demonstration
  - $500M for clean hydrogen technology manufacturing and recycling R&D
- **ALIGNMENT**
  - Aligns with Hydrogen Shot priorities by directing work to reduce the cost of clean hydrogen to $2 per kilogram by 2026
- **STRATEGY**
  - Requires developing a National Hydrogen Strategy and Roadmap

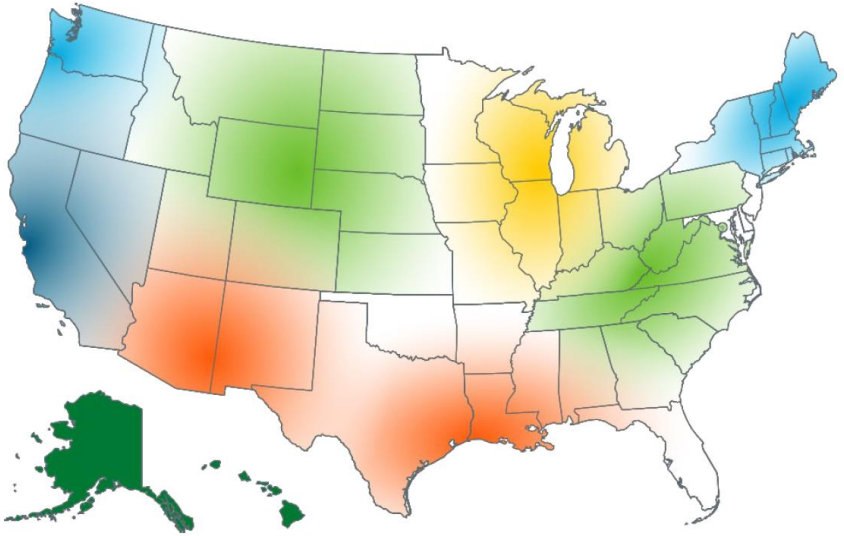
Credit: DOE

President Biden Signs the Bipartisan Infrastructure Bill on November 15, 2021.

SELECTION OF REGIONAL CLEAN HYDROGEN HUBS

- **CRITERIA.**
  - The Secretary shall select regional clean hydrogen hubs under paragraph (2) using the following criteria:

- **(A) FEEDSTOCK DIVERSITY.**
  To the maximum extent practicable—
  - (i) at least 1 regional clean hydrogen hub shall demonstrate the production of **clean hydrogen from fossil fuels**;
  - (ii) at least 1 regional clean hydrogen hub shall demonstrate the production of **clean hydrogen from renewable energy**; and
  - (iii) at least 1 regional clean hydrogen hub shall demonstrate the production of **clean hydrogen from nuclear energy**.



Credit: DOE

SELECTION OF REGIONAL CLEAN HYDROGEN HUBS

- **(B) END-USE DIVERSITY.**

  To the maximum extent practicable—

  - (i) at least 1 regional clean hydrogen hub shall demonstrate the end-use of clean hydrogen in the electric power **generation sector**;
  - (ii) at least 1 regional clean hydrogen hub shall demonstrate the end-use of clean hydrogen in the **industrial sector**;
  - (iii) at least 1 regional clean hydrogen hub shall demonstrate the end-use of clean hydrogen in **the residential and commercial heating sector**; and
  - (iv) at least 1 regional clean hydrogen hub shall demonstrate the end-use of clean hydrogen in the **transportation sector**.

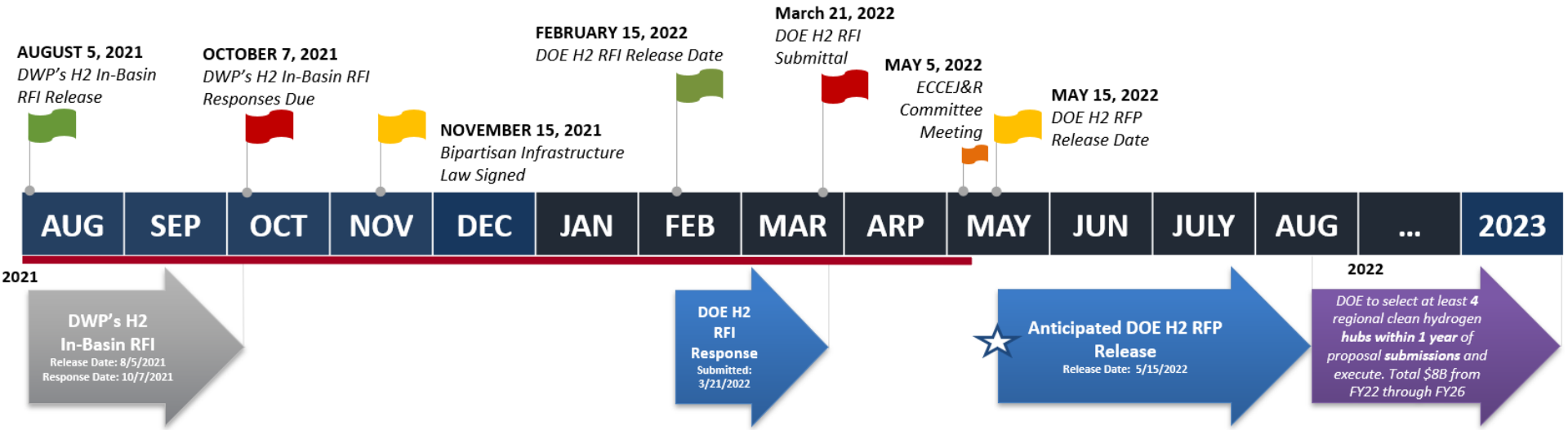
- **(C) GEOGRAPHIC DIVERSITY**

  To the maximum extent practicable, each regional clean hydrogen hub—

  - (i) shall be located in a **different region** of the **United States**; and
  - (ii) shall use **energy resources** that are **abundant** in that region.

Credit: DOE

U.S. DOE H_2 HUB – TIMELINE



L A U N C H

Stakeholder Engagement: Webinars, Workshops, H2 Matchmaker, Pre-Solicitation Meetings, etc.

Launch #1
$4-5B
DOE Share

Phase 1:
Hub Planning
(3-18 months)

Eval / Select, Negotiation
(9 months)

Phase 2:
Hub Deployment
(5+ years)

***Phase 1**: 8-12 awards, $1-4M DOE Share each (Total DOE funding $15-40M); non-Federal cost share % TBD*

***Phase 2**: 4-6 awards $0.5-$1B each (Total DOE funding $4-5B); 50% non-Federal cost share required (i.e. $0.5B-$1B per project)*

Hub Implementation & Management (e.g. Data Collection/Impact Reports, Independent Engineering Firm, Reviewers, Lab Technical Assistance. etc.)

Other Potential Funding Mechanisms to Leverage Funds (e.g., Engagement with State & Local Gov., Tribes, etc.)

THANK YOU