| **Docketed** |
|-----------------|-----------------|
| **Docket Number:** | 22-BUSMTG-01 |
| **Project Title:** | Business Meeting Agendas, Transcripts, Minutes, and Public Comments |
| **TN #:** | 242802 |
| **Document Title:** | Presentation - April 26, 2022 Business Meeting |
| **Description:** | N/A |
| **Filer:** | Ngoc Tran |
| **Organization:** | California Energy Commission |
| **Submitter Role:** | Public Advisor |
| **Submission Date:** | 4/26/2022 8:18:54 AM |
| **Docketed Date:** | 4/26/2022 |
California Energy Commission
Business Meeting
April 26, 2022
10:00 a.m.
Pledge of Allegiance

I pledge allegiance to the Flag of the United States of America, and to the Republic for which it stands, one Nation under God, indivisible, with liberty and justice for all.
Consent Calendar: a. – c.

a. Order Instituting Rulemaking Proceeding (Docket Number 22-AAER-02). Contact: Carlos Baez

b. School of Arts and Enterprise. Contact: Sean Lockwood

c. Proposed Order Delegating Approval of Certain Agreements and Amendments Under Health and Safety Code Section 44272. Contact: Allan Ward
Item 2: Order Instituting Informational Proceeding

April 26, 2022 Business Meeting

Heather Raitt, Assistant Executive Director, Policy Development
Benefits to Californians

• Authority to collect information needed for the 2022 IEPR Update
  • Hearings and workshops
  • Data requests

• Information is foundational to good policy development
2022 IEPR Update Scope

Tracks in 2022 IEPR Update:

1. Equity and Environmental Justice
2. California Planning Library
3. Emerging Topics

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Parallel to 2022 IEPR Update, two additional order instituting informational proceedings:

1. Decarbonizing the gas system
2. Distributed energy resources

Allows deep analysis beyond IEPR timeline
Staff Recommendations

• Approve request for Order Instituting Informational Proceeding for the 2022 IEPR Update
Item 3: Russell City Energy Center
May 2021 Incident: Gap Analysis Report
April 26, 2022

Presenting: Elizabeth Huber, Manager, Safety and Reliability Office and Geoff Lesh, Manager, Engineering Office
Siting, Transmission and Environmental Protection Division
Dian Vorters, Lead Counsel
Restarting Russell City Energy Center
Russell City Energy Center Investigation
Steam Turbine Debris Field

- **Drying Beds**: Approximately 500 Feet, Largest Piece 50 lbs.
- **NAV Center**: Approximately, 1200 Feet, 12 lbs.
- **Hayward Water Pollution Control Facility**: Approximately 500 Feet, several copper pieces.
- **Estimated debris field**: Majority LP Turbine pieces.
- **Estimated Debris Field**: Majority Generator Pieces.
Heat Recovery Steam Generator
Russell City Energy Center’s HRSG Reheater Schematic

HRSG #1
- COLD (Slightly warm)
- Water
- CRH-1

HRSG #2
- HOT
- Steam
- CRH-2

“Hot Reheat” Steam Lines HRH

Header
CRV-2
CRV-1
HRH-2
HRH-1

IP Turbine

“Closed Drains”

One-way Stop/Check Valves

“Cold Reheat” Steam Lines CRH (Return from HP turbine)

Failed to Completely Close

Seized in Open Position
Causal Factor 1 – Equipment Maintenance and Monitoring
Causal Factor 2 – Deficiencies in Operator Interface and Training
Causal Factor 3 – Inadequate Water Induction Protection
• Modify preventative maintenance and monitoring programs
• Re-configure the CRH stop valve to close based on actuator torque value
• Implement an annual preventative maintenance program for the steam attemperators and mixers for review and approval.
• Synchronize control system clocks
• Consolidate the alarms generated by the control systems
• Implement control logic to alleviate pressure within offline HRSG
• Implement control logic to discharge water from offline HRSG
• Provide an ASME TDP-1-2013 conformance analysis
• Convert the HRH stop/check valve from manual to electrical actuation
• Revise operations procedures
• Reduce the occurrence of nuisance/false alarms
City of Hayward

- City staff have been participating on Joint Agency Working Group with CEC and CPUC staff
- Consistent with the CEC Order to allow Calpine to restart operations at RCEC, City staff and Calpine staff have meeting “to discuss any needed modifications of [RCEC’s] standard operating procedures for first responders to implement when responding to incidents on site, including establishing a process for reimbursement of reasonable expenses.”
- Finalizing joint City/Calpine hazardous materials resiliency and action plan – this includes partial funding for a hazardous materials response vehicle
- Insurance claims for Homeless Navigation Center being processed
- Conversations with Russell City descendants/community action group underway – additional monetary contribution from Calpine proposed
Hayward First Responder Training Plan Enhancements

- Notified City of Hayward of plant management changes on March 10.
- Schedule Annual HFD/City Manager/RCEC Meeting - TBD
- Knox Box Updated 12/14/2021
  - Updated MSDS’s
  - Updated plot plan with location of oil filled equipment and hazardous materials
- Met with Hayward Fire Department Training Battalion Chief on March 14, 2022
- Hazmat Tabletop Drill – TBD

- Schedule plant tour for new fire company officers – TBD
  - Identifying hazardous material locations
  - Review Emergency Action Plan
  - Identify possible fire/explosive areas
  - Identify areas of static electricity potential for aerial ladder trucks
  - Identify water supply locations and access points
- Rope Rescue Scenario Drill (incapacitated victim on platform or scaffolding) – TBD
Joint Agency Investigation Team

California Energy Commission
• Geoff Lesh
• Brett Fooks
• Tim Smith
• Shahab Khoshmashrab
• Elizabeth Huber
• John Heiser
• Paul Trygstad
• Ivan Clark
• Shawn Pittard

California Public Utilities Commission
• Jim Cheng
• Chris Lee
• Stephen Lee
• Nika Kjensli
• Lee Palmer
Staff Recommendation

• Adopt corrective actions
• Delegate to the Executive Director the verification of the corrective actions
Item 5: Overview of 2021 EPIC Annual Report

April 26, 2022 Business Meeting

Molly O’Hagan
Energy Deployment and Market Facilitation Office
Energy Research and Development Division
EPIC by the Numbers

>$1B
EPIC FUNDS INVESTED

$7.8B
PRIVATE INVESTMENT AFTER RECEIVING EPIC SUPPORT

437
PROJECTS FUNDED

55%
INCREASE IN SUCCESSFUL EXITS BY START-UP COMPANIES
EPIC Demonstration Projects in Underresourced Communities

EPIC TD&D HAS INVESTED:

- $172,500,000+ in Disadvantaged Communities
- $117,500,000+ in Low-Income Communities

Source: California Energy Commission
EPIC Investment Areas

Entrepreneurial Ecosystem: $210M
Resiliency & Safety: $182M
Building Decarbonization: $232M
Grid Decarbonization & Decentralization: $219M
Industrial & Agricultural Innovation: $133M
Transportation Electrification: $68M
Entrepreneurial Ecosystem: Ubiquitous Energy

- **26B**: Approximate square feet of coated architectural glass produced and installed annually
- **60 GW**: Additional solar generation capacity possible from that glass if treated with the UE Power™ coating
- **10%**: The amount of California’s annual electricity consumption that can be offset by full market penetration of UE Power™
- **1 x 1 inch**: The size of Ubiquitous Energy’s solar window prototype when they first received EPIC funding in 2019
- **14 x 20 inch**: The size of solar windows to be produced from the first California production line that Ubiquitous Energy is developing under their current EPIC award
- **2000**: The number of 14x20-inch solar windows Ubiquitous Energy seeks to produce per year by the end of their current CEC project in 2024
Resiliency & Safety: Humboldt State University

Coast Guard search and rescue in action.
Source: Shutterstock

- **7x:** The amount of time Humboldt County customers experienced sustained outages in 2020 as compared to other California customers.

- **50,000:** Flights per year served by Humboldt County’s airport, including commercial, private, and emergency medical flights, that could be significantly impacted by outages.

- **20:** The number of customer meters in Humboldt County, including the airport and Coast Guard Air Station, served by this first-ever community-driven, front-of-the-meter microgrid.

- **0:** The number of times polluting diesel generators are expected to be needed for outages once the microgrid is fully operational.
Building Decarbonization: SkyCool Systems

- **42,500**: Approximate number of supermarkets and cold storage facilities in the United States
- **60%**: Average amount of electricity used for refrigeration in supermarkets and cold storage facilities
- **10-40%**: Efficiency improvement from integrating SkyCool Panels with a refrigeration system
- **$3,000**: The monthly electricity bill savings one grocery store achieved with SkyCool Panels
- **0**: Refrigerants with global warming potential used in Skycool Panels

SkyCool Panels mount with conventional solar panel racking.

Source: SkyCool Systems, Inc.
Grid Decarbonization & Decentralization: RCAM Technologies

- **80 meters**: The approximate height of conventional wind turbine towers in the United States due to logistical constraints
- **140 meters**: The potential height of a 3DCP wind turbine printed onsite using RCAM’s technology
- **>20%**: Increase in turbine energy captured from 140-meter towers compared to conventional 80-meter towers
- **11%**: The levelized cost of energy reduction for 3DCP towers compared to conventional towers
- **<1 day**: The amount of time RCAM is targeting for on-site fabrication of a new tower

UC Irvine Team with the 3DCP Tower Assembly. Source: UC Irvine AM3 Lab
9 million: Acres of irrigated farmland that contribute to California’s $21.7 billion in agricultural exports

10,000 acres: Current scale of AgMonitor’s demonstration for its new, programmable irrigation load shifting software, helping California farmers improve energy efficiency, save water, and cut costs

$200 per acre: Increase in profits from electricity and water savings for farms that implemented AgMonitor’s PumpMonitor and CropMonitor solutions

3 MW: Permanent load shift as of August 2021 provided by California agricultural irrigation pumps intelligently controlled with AgMonitor, supporting grid reliability

Source: AgMonitor
Transportation Electrification: Cuberg

A battery R&D scientist preparing to work with testing Cuberg lithium-metal cells.
Source: Cuberg

• **250 miles**: Median range of electric vehicles offered for sale in the United States

• **70%**: Increase in range enabled by Cuberg’s lithium-metal battery technology

• **3000**: Number of battery cells Cuberg can produce per month as a result of their CEC EPIC award

• **3x**: Increase in California jobs at Cuberg since 2021
## EPIC Opportunities in 2022

<table>
<thead>
<tr>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advanced Prefabricated Zero-Carbon Homes</td>
</tr>
<tr>
<td>Energy Efficiency and Demand Response in Industrial and Commercial Cold Storage</td>
</tr>
<tr>
<td>Energy Efficiency and Load Shifting in Indoor Farms</td>
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<tr>
<td>Optimizing Long-Duration Energy Storage to Improve Grid Resiliency and Reliability in Under-resourced Communities</td>
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<tr>
<td>The Role of Green Hydrogen in a Decarbonized California—A Roadmap and Strategic Plan</td>
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<tr>
<td>Valuation of Investments in Electricity Sector Resilience</td>
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<tr>
<td>Vehicle-to-Building for Resilient Back-up Power</td>
</tr>
<tr>
<td>Offshore Wind Energy Technologies</td>
</tr>
<tr>
<td>Realizing Accelerated Manufacturing and Production for Clean Energy Technologies (RAMP) 2022</td>
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</table>
Staff Recommendation

• Approve 2021 EPIC Annual Report
Item 5: The Next EPIC Challenge: Reimagining Affordable Mixed-Use Development in a Carbon-Constrained Future

April 26, 2022 Business Meeting

Anthony Ng, Molly Mahoney, Rachel Salazar, and Molly O’Hagan
Energy Deployment and Market Facilitation Office
Energy Research and and Development Division
Benefits to Californians

• Replicable designs and plans for affordable zero-emission mixed-use developments
  • Improve grid reliability
  • Increase the value proposition of grid interactive technologies
  • Provide an economical pathway to develop decarbonized high-density mixed-use developments
The Next EPIC Challenge

• Design-build competition for a mixed-use development incorporating:
  • Cutting-edge clean energy technologies
  • Innovative tools for planning, design, and construction practices
  • Affordability and equity
  • Resistance to climate change impacts and extreme weather
Minimum Site Requirements

1. Must be mixed-use.

2. 20%+ must be affordable housing units.

3. 10%+ dedicated to lower income units.

4. Minimum of 50 housing units.

5. Minimum density of 30 residential units per acre.
Minimum Design Requirements

1. All electric building end-uses

2. Building must be able to island from the main grid

3. Building’s residential load during peak demand, must be met through a combination of onsite generation, storage, and load management.

4. DER assets must be interoperable with aggregation platforms such as Virtual Power Plants.

5. 20% of all parking spaces must have EV-charging stations that can respond to grid- and building-signals. Rest to be EV ready.
## Two Phase Approach

<table>
<thead>
<tr>
<th>Project Group</th>
<th>Number of Awards - Design Phase</th>
<th>Number of Awards - Build Phase</th>
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<tbody>
<tr>
<td>Group 1: Bay Area Region</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Group 2: Central Valley/Northern California</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Group 3: Los Angeles Region</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Group 4: Imperial Valley, Inland Empire, and San Diego County</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Total Number of Awards</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>Total Amount of Funding</td>
<td>$12 million</td>
<td>$36 million</td>
</tr>
</tbody>
</table>
The Northern California Land Trust, Inc.

- 50-unit permanently-affordable housing development for low-income renters.
- Pathways to community ownership.
- Office spaces for community organizations, including the Homeless Action Center.
- 20 Vehicle-to-Grid (V2G) charging stations with demand response services.
Net Positive Resilient All-Electric Affordable Housing at Pacific Station North Transit Center

- 94 apartment units, with mixed office and retail spaces, public space, and new METRO transit hub.
- Culmination of 7+ years of community input.
- First of its kind multifamily housing project in the Central Coast to use mass timber construction methods.
- 14 electric bus capacity
Reimagining Affordable Mixed-Use Development in a Carbon-Constrained Future

- 100-unit affordable housing development for low- and very low-income renters.

- Vehicle-to-Grid (V2G) charging stations with demand response services for 20% of the parking spaces.

- Plug-in battery storage for each residential unit.

- Potential workforce development opportunities provided by the local colleges and project team.
Fairview Terrace

Mutual Housing

- 59-unit permanently affordable housing, infill development for senior citizens.
- Property will be owned and managed by a local community organization (STAND) and Mutual Housing.
- Adjacent to health clinic and public transit.
- Using a third-party certified Social, Economic, and Environmental Design (SEED) approach to meaningful community engagement.
Santa Ana Environmental Justice Innovation Zone

Innovative Housing Opportunities, Inc.

- 160 affordable units for low-income affordability levels and will include office space and light retail.

- Virtual power plant with a user interactive application designed by Community Electricity utilizing NREL's ForeSee™ software.

- Advanced framing systems that will save floor and wall material costs by 30%.
Paseo Adelanto: City Hall & Zero-Emission Affordable Housing Design

- New city hall in partnership with the City of San Juan Capistrano.
- 50 affordable units for low-income individuals at risk for homelessness, including military veterans.
- Engage and educate residents through direct outreach and the formation of a new Resident Council.
- Islandable microgrid and smart system control.

San Juan Capistrano, CA
Zero Emission Affordable Housing Design: Palm City Village

San Diego, CA

National Community Renaissance of CA

- Transit Oriented Development infill project including 288 apartment homes, community center/resiliency hub, childcare facility and retail area.
- Transactive platform to inform and engage occupants of energy use, DR, car-sharing and other transactive benefits.
- Panelized bamboo cavity walls for thermal performance, reduced embodied energy and construction times.
The Zero Energy Live/Learn Residential EcoVillage

- 120 units, community kitchen, pocket park and public workforce training center located in Transit Oriented Development zone.

- Design based on a prefabricated "kit of parts" to reduce time and cost of construction.

- BIPV replacing tiled roof, combines glazing and weatherproof curtain wall systems.
The Newton Avenue Project

Family Health Centers of San Diego, Inc.

- 80 units, entirely low-income plus ground floor office space
- Use of single use shipping container units, offsite prefabrication to streamline construction
- Grid responsiveness helps save capacity for Port of SD cruise ship shore power and industrial electrification projects
Staff Recommendation

• Approve and adopt staff's findings that these projects are exempt from CEQA.
Item 6: California State Lands Commission Interagency Agreement

April 26, 2022

Rhetta deMesa, Electric Generation System Program Specialist, Siting, Transmission, and Environmental Protection Division, Energy Resource and Land Use Planning Office
Background and Purpose

• Improves understanding of where new port infrastructure may be able to support offshore wind

• Complements ongoing port inventory work

• Informs offshore wind planning considerations and follow-on studies

Source: OCS Study, BOEM, 2016
The Humboldt and Morro Bay Wind Energy Areas

Humboldt Wind Energy Area

Morro Bay Wind Energy Area
Agreement Overview

- **Identify** potential new port locations and their characteristics

- **Assess** the feasibility of the new locations to support offshore wind activities

- **Inform** the development of an offshore wind strategic plan (required by AB 525)
Staff Recommendation

• Approve interagency agreement

• Adopt CEQA exemption determination
Item 7: Zero Emission Transit Fleet Infrastructure Deployment GFO-20-602

April 26, 2022, Business Meeting

Esther Odufuwa, Energy Commission Specialist I
Fuels and Transportation Division
Medium and Heavy Duty Zero Emission Technologies Office, Freight & Transit Unit
Benefits to California

- Replicable solutions
- Reduced emissions
- Increased resilience
- Creates Jobs

Source: City of Culver City

Source: AC Transit
7a: City of Culver City Project Overview

Culver City Battery Electric Bus Transportation Facility Electrification

Rendering of bus yard for overhead charging
Source: City of Culver City
City of Culver City Route Services

Legend
- Turquoise: Culver City Bus Lines
- Red: SB 535 Disadvantaged Areas

Culver City Bus Service and SB 535 DAC
Source: City of Culver City
Division 4 Hydrogen Refueling Infrastructure Upgrade

Aerial View of AC Transit’s D4 Station and site for Hydrogen Infrastructure
Source: AC Transit
AC Transit Route Services

AC Transit Division 4 Routes Servicing SB 535 Disadvantaged Communities

Legend
- SB 535 Disadvantaged Communities

Source: AC Transit
California Market Potential

≈ 11,500 transit buses in California

≈ 76 fuel cell buses in CA as of 4/1/2022

≈ 58 hydrogen refueling stations in CA

Source: AC Transit
Staff Recommendation

APPROVE
• City of Culver City agreement
• Alameda-Contra Costa Costa Transit District

ADOPT
• Staff’s determination that action is exempt from CEQA
Item 8: GFO-20-608: Ultra-Low-Carbon Fuel: Commercial-Scale Production Facilities & Blending Infrastructure

April 26, 2022 Business Meeting

Hieu Nguyen, Energy Commission Specialist
Fuels and Transportation Division
Transportation Integration and Production Office,
Manufacturing and Production Unit
Solicitation Overview

- Commercial-Scale Facilities
  - Fuel Production
  - Fuel Blending
- >1 million diesel gallon equivalents per year
- New or Existing Facilities
  - New: $3 million max
  - Existing: $1.5 million max
- Ultra-Low-Carbon Fuel: <30 gCO2e/MJ

GRANT FUNDING OPPORTUNITY

Clean Transportation Program
Ultra-Low-Carbon Fuel: Commercial-Scale Production Facilities & Blending Infrastructure

Addendum 3
6FG0-20-668
https://www.energy.ca.gov/funding-opportunities/solicitations
State of California
California Energy Commission
August 2021
Project Overview of California Grinding

Source: California Grinding, Inc.
Benefits of California Grinding

- Provides 29 new jobs.
- Diversion of waste from landfills.
- Offset ~55,022 MT CO2e per year.
- Eliminate 6,000 refuse truck trips.
Project Overview of SoCal Biomethane

- Produce 1.6 million diesel gallon equivalents of low-carbon RNG.
- Displace 18,256 MT CO2e per year.
Benefits of SoCal Biomethane

- Provides 10 new jobs.
- Stop flaring at Victor Valley Wastewater Reclamation Authority facility.
- Offset up to 365,110 MT CO2e over 20-years.
Project Overview of AltAir Paramount

Current AltAir Terminal Operation

Biodiesel IN

On Site

B20 Blend OUT

Rail Drop Off
20 Miles away

Truck Transload
3rd party

Storage Tank

Blending Rack

AltAir Biodiesel Terminal Project

On Site

B20 Blend OUT

Biodiesel IN

Rail Unloading Rack & Spill Containment Upgrades

New Pipeline

Storage Tank Retrofit

Blending Rack Upgrade

Source: AltAir Paramount, LLC
Benefits of AltAir Paramount

- Provides 100+ short term jobs.
- 4,500 fewer fuel tanker truck trips per year.
- Annual displacement of 1.58 million MT CO2e.
Staff Recommendation

• California Grinding, Inc.
  o Approve grant agreement for $3,000,000.
  o Adopt Staff CEQA findings.

• SoCal Biomethane, LLC
  o Approve grant agreement for $1,500,000.
  o Adopt Staff finding that project is CEQA Exempt.

• AltAir Paramount, LLC
  o Approve grant agreement for $2,000,000.
  o Adopt Staff CEQA findings.
Item 9: IDEAL ZEV Workforce Pilot (GFO-21-602)

April 26, 2022 Business Meeting

Larry Rillera, Air Pollution Specialist
Fuels and Transportation Division, Transportation Integration and Production Office
Benefits to Californians

- Develop ZEV and infrastructure career pathways
- Create jobs
- Advocacy for the ZEV industry
- Support priority communities and skills development

Source: California Community Colleges
Source: Green Energy Consumers Alliance

- Proposed agreement with the Community Resource Project, Inc.
- Priority communities, workforce engagement, and training solutions
- Training for ZEV manufacturing, EV charging installation, operation, and service
- Facilitate creation of 75 jobs
Item 9. b. Kern Community College District

- Proposed agreement with the Kern Community College District
- Develop EV charging curricula and training
- Prepare electricians for Electric Vehicle Infrastructure Training Program (EVITP) Certification
- Address skills gap in EV charging installation, service, and replacement
- ~300 trainees are estimated for training
- Facilitate job placement
Staff Recommendation

• Approve Community Resource Project, Inc. agreement
• Adopt staff’s determination that action is exempt from CEQA

• Approve Kern Community College District agreement
• Adopt staff’s determination that action is exempt from CEQA