South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

REVISED

TECHNOLOGY COMMITTEE MEETING

Committee Members

Council Member Carlos Rodriguez, Chair
Supervisor Andrew Do
Supervisor Curt Hagman
Board Member Gideon Kracov
Mayor Larry McCallon
Board Member Veronica Padilla-Campos

April 21, 2023 ♦ 12:00 p.m.

TELECONFERENCE LOCATIONS

Kenneth Hahn Hall of Administration
500 W. Temple Street, Room 372
Los Angeles, CA 90012

County Administration North
400 West Civic Center Drive
First Floor, Room 101
Santa Ana, CA 92701

A meeting of the South Coast Air Quality Management District Technology Committee will be held at 12:00 p.m. on Friday, April 21, 2023 through a hybrid format of in-person attendance in the Dr. William A. Burke Auditorium at the South Coast AQMD Headquarters, 21865 Copley Drive, Diamond Bar, California, and remote attendance via videoconferencing and by telephone. Please follow the instructions below to join the meeting remotely.

Please refer to South Coast AQMD's website for information regarding the format of the meeting, updates if the meeting is changed to a full remote via webcast format, and details on how to participate:

http://www.aqmd.gov/home/news-events/meeting-agendas-minutes

ELECTRONIC PARTICIPATION INFORMATION
(Instructions provided at bottom of the agenda)

Join Zoom Meeting - from PC or Laptop
https://scaqmd.zoom.us/j/96669409722
Zoom Webinar ID: 966 6940 9722 (applies to all)
Teleconference Dial In
+1 669 900 6833
One-Tap Mobile
+16699006833, 96669409722#

Audience will be allowed to provide public comment in person or through Zoom connection or telephone.

PUBLIC COMMENT WILL STILL BE TAKEN

AGENDA

Members of the public may address this body concerning any agenda item before or during consideration of that item (Gov't. Code Section 54954.3(a)). If you wish to speak, raise your hand on Zoom or press Star 9 if participating by telephone. All agendas for regular meetings are posted at South Coast AQMD Headquarters, 21865 Copley Drive, Diamond Bar, California, at least 72 hours in advance of the regular meeting. Speakers may be limited to three (3) minutes total for all items on the agenda.

CALL TO ORDER

ROLL CALL

ACTION ITEMS (1-2):

1. Execute Contracts using U.S, EPA DERA Funds for Carl Moyer Truck Projects and Amend Contract with Sunline Transit Agency
(Motion Requested)

Joseph Lopat
Program Supervisor

In April 2020, the Board recognized a U.S. EPA Diesel Emissions Reduction Act (DERA) award of $2,289,581 into the Clean Fuels Fund (31) for a Truck Trade Down Program. Due to low truck inventory, costs increase and CARB's Truck and Bus Regulation's compliance deadline, there is no longer a demand for this program. The funding will be reallocated to replace newer model year trucks eligible for the Carl Moyer Program. Also, in September 2020, the Board approved a contract with SunLine Transit Agency for $5,906,601 to deploy five fuel cell transit buses using funding from a U.S. EPA FY19 Targeted Airshed Grant (TAG) award. Sunline received Hybrid, and Zero-Emission Truck and Bus Voucher discounts and requested to add a bus to the project to utilize the balance of awarded U.S. EPA funds. These actions are to 1) authorize the Executive Officer to execute contracts using the FY19 DERA funds of $2,106,405 for Carl Moyer zero-emission truck projects, 2) reimburse the General Fund (01) using FY19 DERA funds from the Clean Fuels Program Fund (31) up to $63,176 for administrative costs, and 3) authorize the Executive Officer to execute a no-cost contract amendment with SunLine Transit Agency for the deployment of an additional fuel cell transit bus for a total of six buses.

2. Execute Contract to Study Regional Air Quality and Health Impacts of Utilizing Hydrogen Blends in Commercial Buildings and Industrial Applications *(Motion Requested)*

Maryam Hajbabaei
Program Supervisor

The University of California, Irvine (UCI) has been awarded $1.7 million by the CEC to lead a technical study to assess hydrogen's decarbonization potential in California's large commercial and industrial sectors. UCI is proposing to assess the regional air quality impacts of hydrogen in end-use appliances within Commercial and Industrial applications. This action is to execute a contract with UCI in an amount not to exceed $150,000 consisting of up to $80,000 from Clean Fuels Program Fund (31) and up to $70,000 from the Air Quality Investment Program Fund (27) EO Mitigation Fund.

INFORMATIONAL ITEM:

3. Mainspring will provide an informational presentation on how linear generators operate and applications.

Adam Simpson
Mainspring Chief Product Officer & Founder

4. Other Business

Any member of the Committee, or its staff, on his or her own initiative or in response to questions posed by the public, may ask a question for clarification, may make a brief announcement or report on his or her own activities, provide a reference to staff regarding factual information, request staff to report back at a subsequent meeting concerning any matter, or may take action to direct staff to place a matter of business on a future agenda. (Gov't. Code Section 54954.2)

5. Public Comment Period

At the end of the regular meeting agenda, an opportunity is provided for the public to speak on any subject within the Committee's authority that is not on the agenda. Speakers may be limited to three (3) minutes each.

6. Next Meeting Date

Friday, May 19, 2023 at 12:00 p.m.

ADJOURNMENT

Document Availability

All documents (i) constituting non-exempt public records, (ii) relating to an item on an agenda for a regular meeting, and (iii) having been distributed to at least a majority of the Committee after the agenda is posted, are available by contacting Penny Shaw Cedillo at 909.396.3179, or send the request to pcedillo@aqmd.gov.

Americans with Disabilities Act and Language Accessibility

Disability and language-related accommodations can be requested to allow participation in the Technology Committee meeting. The agenda will be made available, upon request, in appropriate alternative formats to assist persons with a disability (Gov't Code Section 54954.2(a)). In addition, other documents may be requested in alternative formats and languages. Any disability or language-related accommodation must be requested as soon as practicable. Requests will be accommodated unless providing the accommodation would result in a fundamental alteration or undue burden to South Coast AQMD. Please contact Penny Shaw Cedillo at 909.396.3179 from 7:00 a.m. to 5:30 p.m., Tuesday through Friday, or send the request to pcedillo@aqmd.gov.

INSTRUCTIONS FOR ELECTRONIC PARTICIPATION

Instructions for Participating in a Virtual Meeting as an Attendee

As an attendee, you will have the opportunity to virtually raise your hand and provide public comment.

Before joining the call, please silence your other communication devices such as your cell or desk phone. This will prevent any feedback or interruptions during the meeting.

Please note: During the meeting, all participants will be placed on Mute by the host. You will not be able to mute or unmute your lines manually.

After each agenda item, the Chairman will announce public comment.

Speakers may be limited to a total of 3 minutes for the entirety of the consent calendar plus board calendar, and three minutes or less for each of the other agenda items.

A countdown timer will be displayed on the screen for each public comment.

If interpretation is needed, more time will be allotted.

Once you raise your hand to provide public comment, your name will be added to the speaker list. Your name will be called when it is your turn to comment. The host will then unmute your line.

Directions for Video ZOOM on a DESKTOP/LAPTOP:

- If you would like to make a public comment, please click on the **"Raise Hand"** button on the bottom of the screen.
- This will signal to the host that you would like to provide a public comment and you will be added to the list.

Directions for Video Zoom on a SMARTPHONE:

- If you would like to make a public comment, please click on the **"Raise Hand"** button on the bottom of your screen.
- This will signal to the host that you would like to provide a public comment and you will be added to the list.

Directions for TELEPHONE line only:

- If you would like to make public comment, please **dial *9** on your keypad to signal that you would like to comment.

BOARD MEETING DATE: May 5, 2023 AGENDA NO.

PROPOSAL: Execute Contracts using U.S. EPA DERA Funds for Carl Moyer Truck Projects and Amend Contract with Sunline Transit Agency

SYNOPSIS: In April 2020, the Board recognized a U.S. EPA Diesel Emissions Reduction Act (DERA) award of $2,289,581 into the Clean Fuels Fund (31) for a Truck Trade Down Program. Due to low truck inventory, costs increase and CARB's Truck and Bus Regulation's compliance deadline, there is no longer a demand for this program. The funding will be reallocated to replace newer model year trucks eligible for the Carl Moyer Program. Also, in September 2020, the Board approved a contract with SunLine Transit Agency for $5,906,601 to deploy five fuel cell transit buses using funding from a U.S. EPA FY19 Targeted Airshed Grant (TAG) award. Sunline received Hybrid, and Zero-Emission Truck and Bus Voucher discounts and requested to add a bus to the project to utilize the balance of awarded U.S. EPA funds. These actions are to 1) authorize the Executive Officer to execute contracts using the FY19 DERA funds of $2,106,405 for Carl Moyer zero-emission truck projects, 2) reimburse the General Fund (01) using FY19 DERA funds from the Clean Fuels Program Fund (31) up to $63,176 for administrative costs, and 3) authorize the Executive Officer to execute a no-cost contract amendment with SunLine Transit Agency for the deployment of an additional fuel cell transit bus for a total of six buses.

COMMITTEE: Technology, April 21, 2023, Recommended for Approval

RECOMMENDED ACTIONS:

1. Authorize the Executive Officer to execute contracts using the FY19 DERA funds of up to $2,106,405 from Clean Fuels Program Fund (31) for Carl Moyer zero-emission truck projects;
2. Reimburse the General Fund (01) using FY19 DERA funds from the Clean Fuels Program Fund (31) up to $63,176 for administrative costs; and

3. Authorize the Executive Officer to execute a no-cost contract amendment with SunLine Transit Agency for the deployment of an additional fuel cell transit bus for a total of six buses.

Wayne Nastri
Executive Officer

AK:MW:JL:MH

Background

In April 2020, the Board recognized $2,289,581 in FY19 DERA funds into the Clean Fuels Program Fund (31) to implement a Truck Trade Down Program. Under this program, fleets could receive up to $100,000 in incentive funding towards the purchase of a new near-zero-emission (NZE) natural gas-powered Class 8 truck along with a $25,000 trade-in credit for their 2014 or newer diesel truck. The dealer would sell the 2014 or newer diesel truck for a maximum of $30,000 to a small fleet owner of a 2009 or older Class 8 diesel truck. The 2009 or older diesel truck would be scrapped at a South Coast AQMD qualified truck dismantler. The dealers would retain up to $5,000 per truck for administration and participation in the Truck Trade Down Program. Market conditions led to higher prices for trucks being traded-in and delivery delays for new NZE model year Class 8 trucks. In addition, the CARB Truck and Bus Regulation went into effect in 2023 and all Class 8 trucks with engine model years prior to 2010 are, with certain exceptions, no longer allowed to operate in California. Meanwhile, South Coast AQMD's Carl Moyer Program was oversubscribed and EPA has approved using the DERA award to deploy additional zero-emission (ZE) technology trucks under the Carl Moyer Program.

In September 2020, the Board approved a contract with SunLine using funding from a U.S. EPA TAG award from the Advanced Technology, Outreach, and Education Fund (17) for up to $6,111,601 to deploy five fuel cell transit buses. SunLine subsequently received Hybrid and Zero-Emission Truck and Bus Voucher discounts from CARB in 2021, thus reducing the project cost. To utilize the remaining EPA funds, Sunline requested to deploy an additional fuel cell transit bus, and the U.S. EPA has approved that. As such, a no-cost contract amendment with SunLine is needed to include one additional fuel cell bus to the scope of work.

Proposal

This action is to authorize the Executive Officer to execute contracts using FY19 DERA funds of up to $2,106,405 from Clean Fuels Program Fund (31) for Carl Moyer zero-emission truck projects and to reimburse the General Fund (01) using FY19 DERA funds from the Clean Fuels Program Fund (31) up to $63,176 for administrative costs.

In addition, this action is to execute a no-cost contract amendment with SunLine Transit Agency to add one more fuel cell transit bus for a total of six fuel cell transit buses.

Benefits to South Coast AQMD

Successful implementation of these projects will permanently remove higher-emitting heavy-duty on-road diesel trucks with ZE trucks. This project will potentially reduce 20.2 tons of NOx and 14,846 tons of CO2 over the lifetime of the vehicles throughout the Basin with priority being given to ZE truck applications that benefit disadvantaged communities. The accelerated replacement of diesel trucks with ZE trucks will help realize immediate emission reductions in drayage and goods movement sectors and within fleets operating in the Basin. Projects to replace heavy-duty diesel trucks are included in the *Technology Advancement Office Clean Fuels Program 2022 Plan Update* under the category "Electric/Hybrid Technologies and Infrastructure." The additional ZE SunLine Transit fuel cell bus will provide emission reductions in lieu of using a traditional transit bus with a combustion engine.

Resource Impacts

Total funding for projects under the U.S. EPA FY19 DERA Grant and Carl Moyer Program will not exceed $8,799,581, comprised of $2,289,581 of U.S. EPA funds and $6,510,000 of Carl Moyer Program funds. The fleets will contribute an additional $1,883,595 of the cost share, as shown in the project cost-share table below. In addition, the General Fund (01) will be reimbursed using FY19 DERA funds from the Clean Fuels Program Fund (31) up to $63,176 for administrative costs. The amendment to SunLine Transit Agency contract is a no-cost amendment as the same amount of EPA awarded funds will now support six buses instead of five.

Funding Source	Funding Amount
EPA FY19 DERA Project	$2,289,581
Carl Moyer Program*	$6,510,000
Fleet*	$1,883,595
Total	**$10,683,176**

*Carl Moyer funding is based on emission reduction, amount shown is best case scenario

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Agenda Item #1

Execute Contracts using U.S. EPA DERA Funds for Carl Moyer Truck Projects and Amend Contract with Sunline Transit Agency

Joseph Lopat

DERA Fund Reallocation

Background

- In 2019, the Board recognized $2,289,581 in FY19 U.S. EPA Diesel Emissions Reduction Act (DERA) funds to promote a Truck Trade Down Program for CNG trucks

Proposal

- Reallocate $2,106,405 in U.S. EPA DERA funding towards replacement of 2010 and newer class 8 diesel trucks with zero-emission trucks in the Carl Moyer Program

Sunline Transit

Background

- In 2020, Sunline Transit was awarded $5,906,601 U.S. EPA Targeted Air Shed Grant (TAG) funding to deploy 5 Fuel cell buses. Through HVIP discounts, Sunline was left with a balance of EPA funds

Proposal

- Revise no-cost contract with Sunline to use remaining U.S. EPA TAG funds to add an additional hydrogen powered bus

Recommended Actions

- Reallocate FY19 DERA funds to supplement Carl Moyer grants for zero emission trucks
- Reimburse the General Fund (01) from Clean Fuels Program Fund (31) for additional FY19 DERA Administrative Funds
- Amend contract with Sunline to increase scope for additional hydrogen fuel cells powered bus

BOARD MEETING DATE: May 5, 2023 AGENDA NO.

PROPOSAL: Execute Contract to Study Regional Air Quality and Health Impacts of Utilizing Hydrogen Blends in Commercial Buildings and Industrial Applications

SYNOPSIS: The University of California, Irvine (UCI) has been awarded $1.7 million by the CEC to lead a technical study to assess hydrogen's decarbonization potential in California's large commercial and industrial sectors. UCI is proposing to assess the regional air quality impacts of hydrogen in end-use appliances within Commercial and Industrial applications. This action is to execute a contract with UCI in an amount not to exceed $150,000 consisting of up to $80,000 from Clean Fuels Program Fund (31) and up to $70,000 from the Air Quality Investment Program Fund (27) EO Mitigation Fund.

COMMITTEE: Technology, April 21, 2023; Recommended for Approval

RECOMMENDED ACTION:
Authorize the Executive Officer to execute a contract with the University of California, Irvine (UCI) to conduct a study of air quality impacts of hydrogen in end-use appliances for commercial buildings and industrial applications in an amount not to exceed $150,000 consisting of up to $80,000 from the Clean Fuels Program Fund (31) and up to $70,000 from the Air Quality Investment Program Fund (27) EO Mitigation Fund.

Wayne Nastri
Executive Officer

AK:MW:MH

Background
The combustion of conventional natural gas is a significant source of energy use in California that releases GHG emissions and criteria pollutants such as NOx and PM. Hydrogen blended with natural gas is being considered to mitigate the climate impact

of conventional natural gas consumption. Hydrogen is a low-carbon energy carrier and has the potential to be a scalable, long-term store of renewable energy. To meet the South Coast Air Basin's attainment goals, assessing any adverse NOx or PM emissions impact in the application of hydrogen blends for commercial building and industrial processes is crucial.

The proposed study will help understand emission impacts from the use of hydrogen in combustion equipment within large commercial buildings and industries. This study will review the blending tiers as a function of percentage volume hydrogen in natural gas, and the retrofit technologies and operational changes of using hydrogen in existing equipment. The results from this study will provide an understanding of how renewable hydrogen can best be utilized to reduce GHG emissions in California and mitigate any NOx emission impact in the South Coast Air Basin and assist in advancing its clean air goals.

Proposal

UCI was awarded $1.7 million by the CEC to investigate the impacts of utilizing hydrogen as a delivered fuel, blended with natural gas or 100 percent hydrogen, to equipment as a decarbonization strategy for the diversity of large commercial buildings and industrial processes in California. This proposal will expand the scope of the CEC award to include air quality modeling, allowing for a more comprehensive understanding of the direct air emissions impacts of hydrogen blending scenarios, including NOx, ground-level ozone, and PM2.5 along with public health impacts of air quality changes specifically within disadvantaged communities, and providing a roadmap for hydrogen blending in the South Coast Air Basin towards achieving and advancing clean air goals.

Sole Source Justification

Section VIII.B.2. of the Procurement Policy and Procedure identifies provisions under which a sole source award may be justified. The request for sole source award is made under provision B.2.d.(8): Research and development efforts with educational institutions or nonprofit organizations. UCI is an educational institution and the Advanced Power and Energy Program (APEP) at UCI addresses the broad utilization of energy resources and the emerging nexus of electric power generation, infrastructure, transportation, water resources and the environment. Built on a foundation established in 1970 with the creation of the UCI Combustion Laboratory and the 1998 dedication of the National Fuel Cell Research Center, APEP focuses on education and research on clean and efficient distributed power generation and integration.

Benefits to South Coast AQMD

Supporting the expanded application of hydrogen in the commercial and industrial sector is consistent with the Technology Advancement Office Clean Fuels Program

2023 Plan Update under the category of "Conduct Emission Studies on Biofuels, Alternative Fuels and Other Related Environmental Impacts" and the 2022 AQMP.

South Coast AQMD supports studies to expand the use of renewable fuels in power generation to reduce fossil fuel dependency and GHG emissions if there are no adverse regional air quality and health impacts. This study focuses on assessing the application of hydrogen blends in commercial and industrial sectors while investigating the air quality and health impacts.

Resource Impacts
South Coast AQMD's support of the air quality impacts assessment of hydrogen in end-use appliances, provided through an agreement with UCI, shall not exceed $150,000 consisting of up to $80,000 from the Clean Fuels Program Fund (31) and up to $70,000 from the Air Quality Investment Program Fund (27) EO Mitigation Fund. Project partners and proposed funding are as follows:

Project Partners	**Funding***	**Percentage**
California Energy Commission	$1,770,000	52%
SoCalGas	$700,000	21%
GTI Energy Utilization Development (UTD) and EPRI	$785,000	23%
South Coast AQMD (*requested)*	$150,000	4%
Total (not to exceed)	**$3,405,000**	100%

Sufficient funds are available from the Clean Fuels Program Fund (31) and the Air Quality Investment Program Fund (27) EO Mitigation Fund for this proposed project. The Clean Fuels Program Fund (31) is established as a special revenue fund resulting from the state mandated Cleans Fuels Program. The Clean Fuels Program, under Health and Safety Code Sections 40448.5 and 40512 and Vehicle Code Section 9250.11, establishes mechanisms to collect revenues from mobile sources to support projects to increase the utilization of clean fuels, including the development of the necessary advanced enabling technologies. Funds collected from motor vehicles are restricted, by statute, to be used for projects and program activities related to mobile sources that support the objectives of the Clean Fuels Program. The Air Quality Investment Program Fund (27) EO Mitigation Fund is established to account for mitigation fee payments made by power generators in lieu of emission offsets. Proceeds are used to generate RECLAIM Trading Credits (RTCs) to offset excess emissions.

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Agenda Item #2

Execute Contract to Study Regional Air Quality and Health Impacts of Utilizing Hydrogen Blends in Commercial Buildings and Industrial Applications

Maryam Hajbabaei

Background

- Hydrogen may play a significant role in displacing conventional natural gas
- California Energy Commission funded a study to assess hydrogen's decarbonization potential in California's large commercial and industrial sectors
- Critical to assess potential benefits or adverse NOx or PM emission impacts of this study in the South Coast Air Basin

Proposal

- University of California, Irvine (UCI) will perform air quality modeling to understand the direct criteria emissions impacts of hydrogen blending scenarios, including NOx, ground-level ozone, and PM
- UCI will use air quality modeling results to evaluate public health impacts of air quality changes, specifically, within disadvantaged communities

Proposed Project Budget

Funding Source	Amount	Percent
California Energy Commission	$1,770,000	52%
Southern California Gas Company	$700,000	21%
Gas Technology Institute (GTI) Energy, Utilization Development (UTD), and Electric Power Research Institute	$785,000	23%
South Coast AQMD (Proposed)	**$150,000**	**4%**
Total	**$3,405,000**	**100%**

Recommended Action

Execute a contract with UCI to conduct a study of air quality impacts of hydrogen blends in end-use appliances for commercial buildings and industrial applications in an amount not to exceed $150,000, consisting of up to $80,000 from the Clean Fuels Program Fund (31) and up to $70,000 from the EO Mitigation Air Quality Investment Program Fund (27)

Mainspring

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Agena Item #3

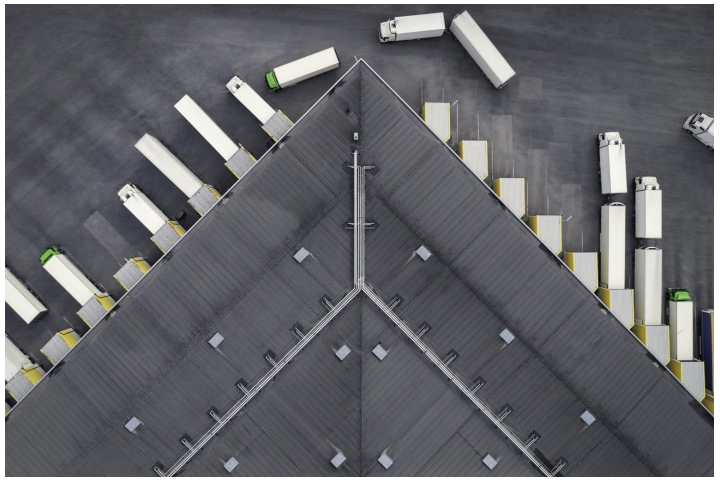
Powering the grid transition

About Mainspring

Delivering a new category of power generation	Stanford University origins, now commercially scaling
Proven solutions	Local, dispatchable, clean, firm power at utility scale with industry-leading reliability
Blue-chip customers	Fortune 500 companies and leading utilities
Experienced energy-focused team	Leaders from SunPower, Tesla, Honeywell, Invenergy, and Alliant Energy
Strong financial backing	Investors include Khosla Ventures, Bill Gates, AEP, Lightrock, and NextEra

Solving top challenges to get to the net-zero grid

Capacity



Rapidly add capacity to enable electrification and grid expansion

Resilience

Deploy locally to defend against grid outages and extreme events

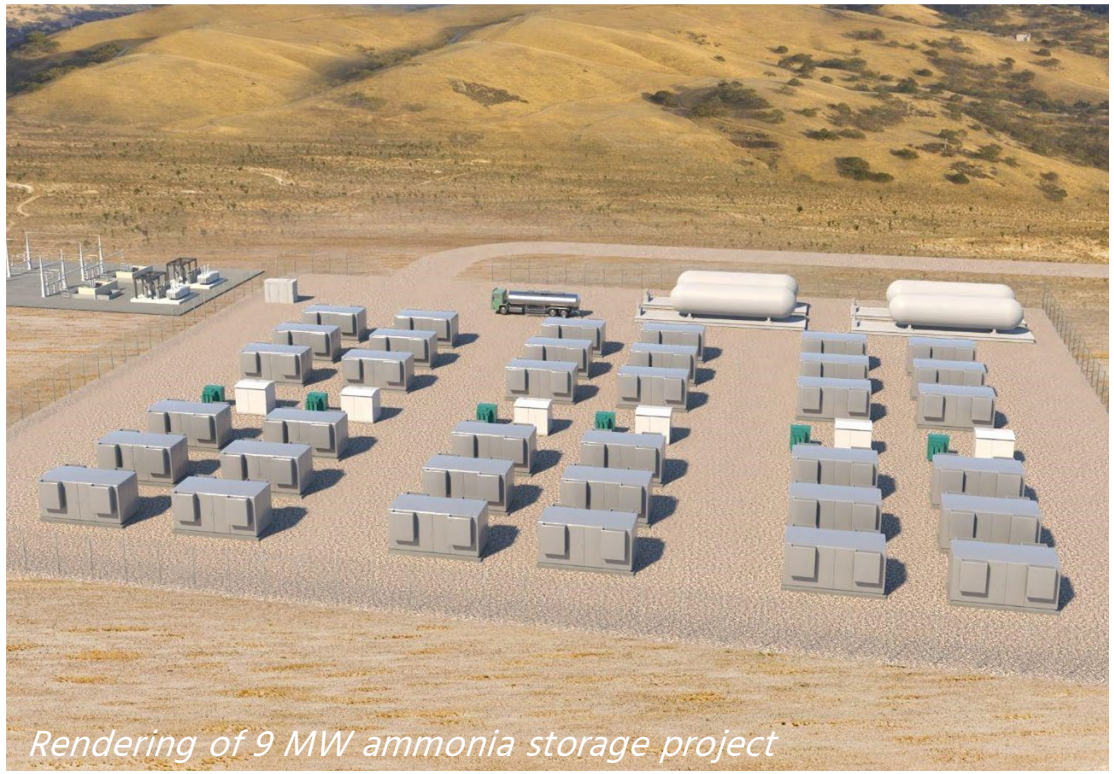
Long-Duration Firming

Ensure power supply across days, weeks, and seasons

Local, scalable, fuel-flexible power

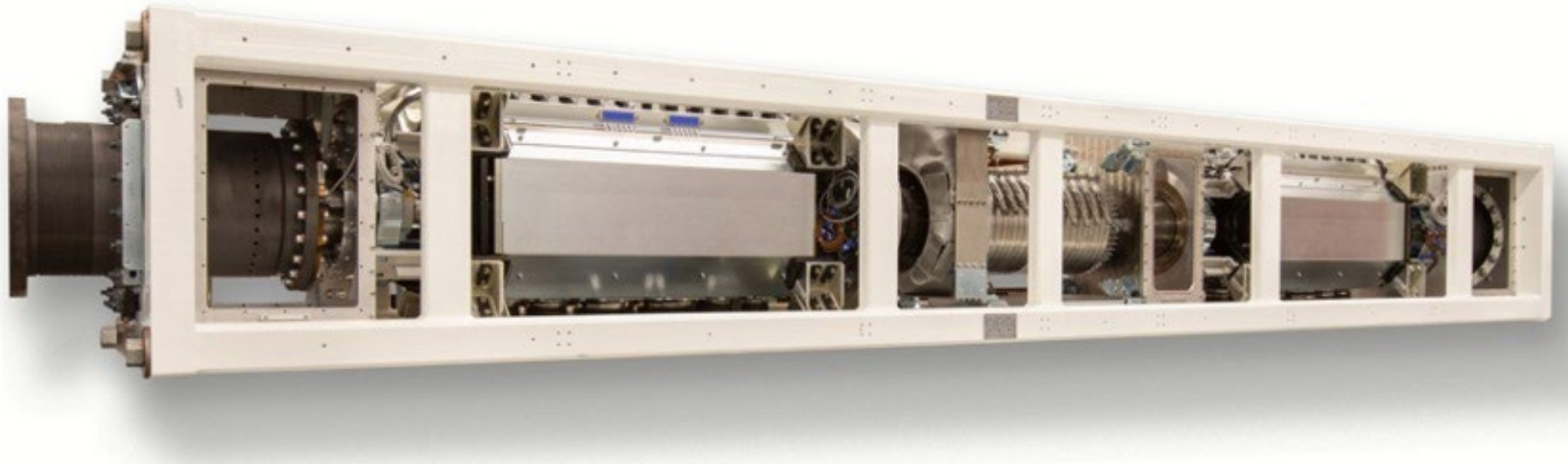
Commercial Behind-the-Meter

Zero-Carbon Grid-Scale Capacity



Rendering of 9 MW ammonia storage project

Ultimate flexibility in power generation



Any Fuel

Software control of every reaction means seamless change from hydrogen, ammonia, RNG, natural gas, and others

Any Scale

Scalable from behind-the-meter applications to grid-connected utility projects

Any Time

Firms the grid with fast-ramping, dispatchable power to compensate for increasing levels of weather dependent resources

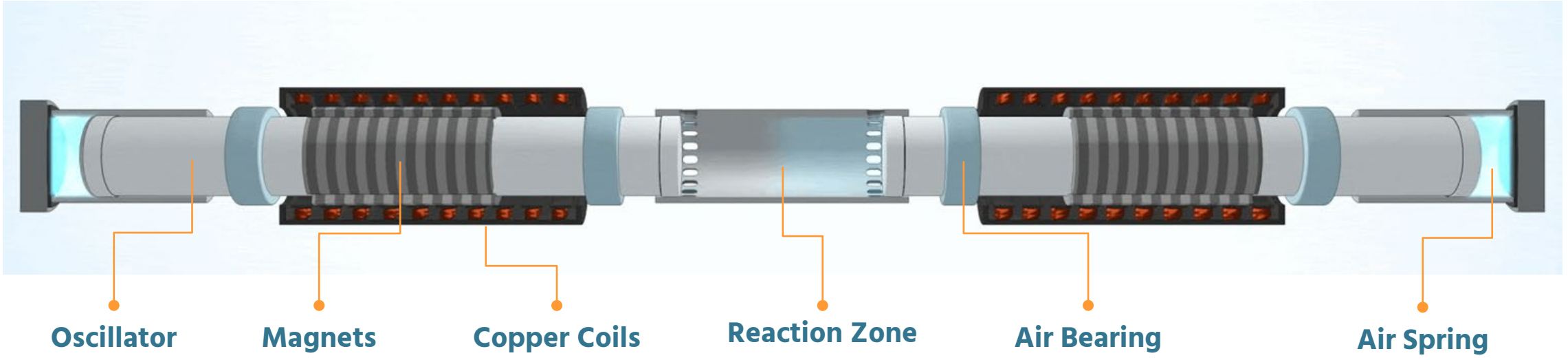
Anywhere

Mobile and modular. Easy to permit, install, and interconnect.

Mainspring

Learn How it Works

Software drives core flexibility and performance



Dispatchable	**Fuel Flexible**	**Ultra-Low Emissions**
High Efficiency	**Low Maintenance**	**High Reliability**

Unmatched combination of benefits for local power

	Mainspring Linear Generator	Fuel Cells	Turbines	Engines
Ultra-Low Emissions	✓	✓		
Fuel Flexible / H2 Ready	✓			
Dispatchable / Renewable Firming	✓		✓	✓
Low Total Cost of Ownership	✓			

Delivering power for trusted top-tier partners

$150M NextEra Financing Agreement

"Mainspring is able to integrate clean onsite generation with both renewables and the grid and we're pleased to support bringing this innovative product to market."

John Ketchum
NextEra Energy President and CEO

In-Field Power Generation Experience

20+ Years Core Run Time	2.5+ Years Customer Operation	Availability Beats Industry Average[1]

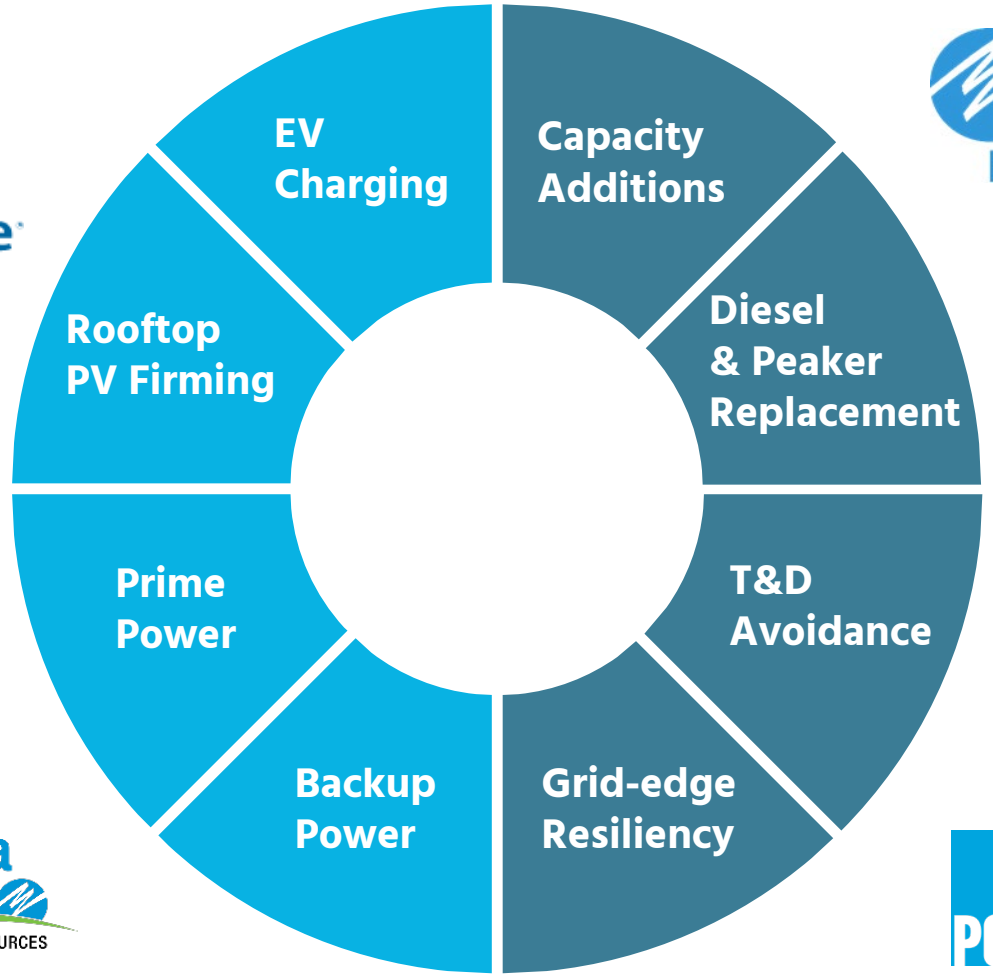
Kroger · Lineage · PG&E · FPL

Mainspring

[1] Average unplanned downtime based on survey of 85% of US and Canada units based on NERC mandatory reporting (8,000 generators of >20MW size in US and Canada, 2012-2015). Murphy, S. Correlated Generator Failures and Power System Reliability Carnegie Mellon PhD Thesis, May 2019, p44

Clean firm power for a broad range of needs

Commercial & Industrial



Utility & Grid Infrastructure

Lineage

FPL

Kroger

AMERICAN ELECTRIC POWER

NEXTera ENERGY RESOURCES

PG&E

Mainspring

Lineage pairs Mainspring with rooftop solar

- Installation of 3.3 MW solar array and two Mainspring Linear Generators for firming
- Reached deal to deploy up to 150 Mainspring units across 50 US facilities (2022-24)

"Mainspring's technology will help support our move to net zero carbon energy, improve energy independence, and buffer our growing use of solar power, while offering the potential future use of zero carbon fuels like green hydrogen and others. "

Chris Thurston, Director of Energy & Sustainability, Lineage Logistics

The Lineage Logistics cold storage facility in Colton, CA

AEP avoids transmission constraints

- Perfectly sized, easily permitted projects
- Lower cost, longer duration than batteries
- Island-mode capable, clean-fuel ready
- Mobile and seasonal deployment options
- Accelerates electrification for EVs, buildings

"We are very interested in the scalability of Mainspring's flexible platform and its potential use in a variety of applications from customer-resiliency projects to grid-scale power plants."

Carlos Casablanca, Managing Director, Distribution Planning and Analysis for AEP

Yolo County, Calif. runs 100% landfill biogas

- Municipal solid waste landfills are the 3rd largest source of human-related methane emissions in the U.S.
- Fuel-agnostic linear generator can convert variable biogas to electricity onsite

"We are excited to partner with Mainspring and continue to demonstrate production of renewable electricity using a new and innovative technology that has the potential to increase efficiency of electricity production and reduce air emissions."

Ramin Yazdani, Director of Integrated Waste Management , Yolo County

Fast-charging EV infrastructure

- Speeds power infrastructure build-out for EV expansion
- Builds local resilience
- Incentivizes investment in EV fleets
- Fuel-flexibility reduces risk
- Local installations reduce grid congestion

For one U.S. EV truck fleet customer, Mainspring delivers cost savings over traditional generators AND a path to clean fuel alternatives while shrinking the time to power from more than 2 years to 8 months.

Diesel replacement at data centers

- Offers clean reliable power to data centers constrained by diesel to meet carbon goals
- Avoids power delivery delays
- Offers fuel flexibility - no other tech can run on hydrogen and ammonia, saving space and cost
- Long duration resilience that can’t be met with batteries

Mainspring

Thank you