



GRANT REQUEST FORM (GRF)

A) New Agreement # EPC-19-037 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Robin Goodhand		916-327-1412

C) Recipient's Legal Name	Federal ID Number
DASH2ENERGY LLC	82-2699288

D) Title of Project
Demand Based Renewable Hydrogen Power-to-Power Project

E) Term and Amount

Start Date	End Date	Amount
6/30/2020	3/29/2024	\$ 1,275,475

F) Business Meeting Information

ARFVTP agreements \$75K and under delegated to Executive Director

Proposed Business Meeting Date 6/10/2020 Consent Discussion

Business Meeting Presenter Robin Goodhand Time Needed: 5 minutes

Please select one list serve. EPIC (Electric Program Investment Charge)

Agenda Item Subject and Description:

DASH2ENERGY LLC. Proposed resolution approving Agreement EPC-19-037 with DASH2ENERGY LLC for a \$1,275,475 grant to establish a renewable hydrogen energy storage system. The project focuses on creating an electricity in/electricity out system by integrating electrolysis, high-pressure hydrogen storage, fuel cell electrical regeneration, and microgrid control systems into a single system. The system will be integrated with an existing 1 MW wind turbine to provide electricity, and will store the energy as hydrogen to be converted to back to electricity to provide cost savings and long duration resiliency for a municipal water treatment plant. Staff also request adopting the staff determination that this action is exempt from CEQA. (EPIC funding) Contact: Robin Goodhand.

G) California Environmental Quality Act (CEQA) Compliance

1. Is Agreement considered a "Project" under CEQA?

Yes (skip to question 2)

No (complete the following (PRC 21065 and 14 CCR 15378)):

Explain why Agreement is not considered a "Project":

2. If Agreement is considered a "Project" under CEQA:

a) Agreement IS exempt.

Statutory Exemption. List PRC and/or CCR section number:

Categorical Exemption. List CCR section number: Cal. Code Regs., tit 14, § 15301

Common Sense Exemption. 14 CCR 15061 (b) (3)



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Explain reason why Agreement is exempt under the above section: The project involves the design, installation, commissioning, and evaluation of a containerized fuel cell system that includes electrolysis; high-pressure, gaseous hydrogen storage; and a grid-connected, integrated microgrid. The design and evaluation work will mostly take place in the existing offices of the Recipient and subcontractors. Regarding installation and commissioning, the fuel cell(s), of possibly more than 500 kW capacity, will be housed in prefabricated containerized structures. The containers will be placed on already disturbed ground adjacent to an existing 1 MW wind turbine at the existing Leslie O. Carter Water Treatment Plant in Palmdale, California. Electrical and water connections will be made. Fire and explosion safety precautions will be taken regarding gaseous hydrogen storage and other project components.

The project consists of the operation, repair, maintenance, permitting, and minor alteration of operation of these existing private and public facilities, involving negligible or no expansion of existing or former use. Therefore, this project is exempt under California Code of Regulations, title 14, section 15301, Existing Facilities.

The Palmdale Water District is the Lead Agency under CEQA for the pilot test site at its water treatment plant. On May 12, 2020, the District filed a Notice of Exemption for its portion of the project, based on California Code of Regulations, title 14, section 15301, Existing Facilities.

b) Agreement **IS NOT** exempt. (consult with the legal office to determine next steps)

Check all that apply

- Initial Study
- Negative Declaration
- Mitigated Negative Declaration
- Environmental Impact Report
- Statement of Overriding Considerations

H) List all subcontractors (major and minor) and equipment vendors: (attach additional sheets as necessary)

Legal Company Name:	Budget
Engineering, Procurement & Construction, LLC	\$ 225,000
WIND ENERGY RESOURCES AND SOLUTIONS INC.	\$ 67,475
PALMDALE WATER DISTRICT PUBLIC FACILITIES CORPORATION	\$ 75,000
STOEL RIVES LLP	\$ 25,000
CHRISTINA CHOPIN	\$ 40,000
INNOVANT PUBLIC RELATIONS, LLC	\$ 25,000
AMERICAN INSTITUTE OF CHEMICAL ENGINEERS	\$ 50,000
TBD - SCADA Contractor	\$ 150,000
TBD - Construction Contractor	\$ 125,000



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Legal Company Name:	Budget
TBD - Installation Contractor	\$ 75,000

I) List all key partners: (attach additional sheets as necessary)

Legal Company Name:

J) Budget Information

Funding Source	Funding Year of Appropriation	Budget List Number	Amount
EPIC	18-19	301.001F	\$1,275,475
			\$
			\$
			\$
			\$
			\$

R&D Program Area: ESRO: ETSI

TOTAL: \$ 1,275,475

Explanation for "Other" selection

Reimbursement Contract #: Federal Agreement #:

K) Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Gordon Dash

Address: 2869 Historic Decatur Rd

City, State, Zip: San Diego, CA
92106-6176

Phone: 281-703-9224

E-Mail: Gordon@dash2energy.com

2. Recipient's Project Manager

Name: Gordon Dash

Address: 2869 Historic Decatur Rd

City, State, Zip: San Diego, CA
92106-6176

Phone: 281-703-9224

E-Mail: Gordon@dash2energy.com

L) Selection Process Used

Competitive Solicitation Solicitation #: GFO-19-305

First Come First Served Solicitation Solicitation #:

M) The following items should be attached to this GRF

1. Exhibit A, Scope of Work

Attached

2. Exhibit B, Budget Detail

Attached

3. CEC 105, Questionnaire for Identifying Conflicts

Attached



STATE OF CALIFORNIA

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 12/2019)

4. Recipient Resolution

N/A

5. CEQA Documentation

N/A

CALIFORNIA ENERGY COMMISSION

Attached

Attached

Agreement Manager

Date

Office Manager

Date

Deputy Director

Date

EXHIBIT A

Scope of Work

I. TASK ACRONYM/TEM LISTS

A. Task List

Task #	CPR ¹	Task Name
1		General Project Tasks
2	X	Technical Feasibility
3		Detailed Design Phase
4		Safety Plan
5	X	Procurement, Construction, and Commissioning
6		Operate, Enhance, and Optimize the Hydrogen System
7		Independent Measurement and Verification
8		Evaluation of Project Benefits
9		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CPR	Critical Project Review
GHG	Greenhouse Gas
M&V	Measurement and Verification
MOC	Management of Change
TAC	Technical Advisory Committee

II. PURPOSE OF AGREEMENT, PROBLEM/SOLUTION STATEMENT, AND GOALS AND OBJECTIVES

A. Purpose of Agreement

The purpose of this Agreement is to fund the development and deployment of a hydrogen energy storage system project. This project will test and validate the integration of the hydrogen energy storage systems with renewable generation and a microgrid that will manage charging and discharging of the entire system.

B. Problem/ Solution Statement

Problem

As companies investigate ways to reduce energy consumption, protect themselves from rising energy costs and increased peak demand charges, distributed generation resources play a critical role. Many companies are faced with greater challenges such as limited capacity on distribution circuits minimizing the amount of distributed generation they can install. Hydrogen can play a role in solving this problem, but there is an urgent need for new business models that enable cost-

¹ Please see subtask 1.3 in Part III of the Scope of Work (General Project Tasks) for a description of Critical Project Review (CPR) Meetings.

EXHIBIT A

Scope of Work

effective implementation of hydrogen-based energy storage systems. Additionally, growing climate impacts especially intensifying wildfires have created the need for local resilience for long-duration storage in excess of 24 hours.

Solution

This project will field test and validate an integrated, grid-connected, hydrogen-based energy storage system. The project is intended to validate the hydrogen system's potential for: increasing grid reliability, reducing demand charges, reducing interconnection costs, deferring distribution upgrades, and increasing penetration of distributed renewable energy systems on the grid. According to the Recipient, the project will leverage innovative business models and utilize the performance data collected to develop a financeable hydrogen product offering with predictable revenue streams for customer side of the meter applications that can scale across the state once validated in the field. In addition, the hydrogen system will have long duration storage capabilities, providing energy resiliency during public power safety shutdowns.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Design and develop an integrated hydrogen energy storage system that validates the system cost and benefits in a customer side of the meter application.
- Demonstrate cost-effective approaches to improving energy resilience and achieving SB 350, SB100, AB 2514 and SB 1369 goals.
- Optimize and improve the economic attractiveness of existing clean energy assets.
- Provide strategies for scaled adoption of hydrogen energy storage.
- Share project implementation lessons learned around hydrogen safety and protocols for stationary storage applications that can inform streamlining of the permitting process for cities and counties in California.

Ratepayer Benefits:² This Agreement is intended to result in the ratepayer benefits of validating the hydrogen energy system's energy resiliency, cost and safety. This project is intended to validate the hydrogen system's potential for integrating distributed energy resources, such as wind or solar, to serve as a base load resource in a customer side of the meter application. The project is intended to validate the hydrogen system's potential for stabilizing renewable energy generation and lowering of costs to ratepayers. According to the Recipient, the project will validate the hydrogen system's ability to provide cost savings and price stability in a customer side of the meter application. Lessons learned through this project will inform the development of innovative business models and help identify best practice to support further hydrogen system deployment in the State of California.

Technological Advancement and Breakthroughs:³ This Agreement is intended to lead to technological advancement and breakthroughs to overcome barriers to the achievement of the

² California Public Resources Code, Section 25711.5(a) requires projects funded by the Electric Program Investment Charge (EPIC) to result in ratepayer benefits. The California Public Utilities Commission, which established the EPIC in 2011, defines ratepayer benefits as greater reliability, lower costs, and increased safety (See CPUC "Phase 2" Decision 12-05-037 at page 19, May 24, 2012, http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/167664.PDF).

³ California Public Resources Code, Section 25711.5(a) also requires EPIC-funded projects to lead to technological advancement and breakthroughs to overcome barriers that prevent the achievement of the state's statutory and energy goals.

EXHIBIT A Scope of Work

State of California’s statutory energy goals by the integration of hydrogen storage and renewable energy systems, and is intended to validate new business models that have the potential to overcome deployment barriers to enable hydrogen technology to support the achievement of the State of California’s statutory energy goals. In addition, the project is intended to act as a demonstration for promising technical solutions to distribution deferral upgrades that limit the amount of renewable energy that can be deployed on the grid.

Agreement Objectives

The objectives of this Agreement are to:

- Design and construct an integrated hydrogen energy storage system and pilot a new power purchase arrangement that can provide electricity bill savings in a customer side of the meter application.
- The performance of the hydrogen energy system will be validated against the following key metrics:
 - The project will demonstrate a customer energy bill cost reduction and emissions reduction relative to the customer’s historical energy usage.
 - The site host will save in excess of:
 - ✓ \$18,000 from peak demand, and
 - ✓ \$10,500 from energy arbitrage annually.
 - The project will reduce carbon emissions by:
 - ✓ 133,225 pounds carbon dioxide equivalent.
 - The project will demonstrate energy resiliency during a simulated grid outage at the customer site for a period of 24 hours.
 - The project will perform a technical assessment of distribution network deferral benefits enabled by the hydrogen system, by evaluating the amount of additional generation that may be connectable at the site relative to the customer site’s existing (pre-project) capacity limit.

III. TASK 1 GENERAL PROJECT TASKS

PRODUCTS

Subtask 1.1 Products

The goal of this subtask is to establish the requirements for submitting project products (e.g., reports, summaries, plans, and presentation materials). Unless otherwise specified by the Commission Agreement Manager (CAM), the Recipient must deliver products as required below by the dates listed in the **Project Schedule (Part V)**. Products that require a draft version are indicated by marking “**(draft and final)**” after the product name in the “Products” section of the task/subtask. If “(draft and final)” does not appear after the product name, only a final version of the product is required. With respect to due dates within this Scope of Work, “**days**” means working days.

The Recipient shall:

For products that require a draft version, including the Final Report Outline and Final Report

- Submit all draft products to the CAM for review and comment in accordance with the Project Schedule (Part V). The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt, unless otherwise specified in the task/subtask for which the product is required.

EXHIBIT A

Scope of Work

- Consider incorporating all CAM comments into the final product. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product.
- Submit the revised product and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period, or approves a request for additional time.

For products that require a final version only

- Submit the product to the CAM for acceptance. The CAM may request minor revisions or explanations prior to acceptance.

For all products

- Submit all data and documents required as products in accordance with the following Instructions for Submitting Electronic Files and Developing Software:

- **Electronic File Format**

- Submit all data and documents required as products under this Agreement in an electronic file format that is fully editable and compatible with the Energy Commission's software and Microsoft (MS)-operating computing platforms, or with any other format approved by the CAM. Deliver an electronic copy of the full text of any Agreement data and documents in a format specified by the CAM, such as memory stick or CD-ROM.

The following describes the accepted formats for electronic data and documents provided to the Energy Commission as products under this Agreement, and establishes the software versions that will be required to review and approve all software products:

- Data sets will be in MS Access or MS Excel file format (version 2007 or later), or any other format approved by the CAM.
- Text documents will be in MS Word file format, version 2007 or later.
- Documents intended for public distribution will be in PDF file format.
- The Recipient must also provide the native Microsoft file format.
- Project management documents will be in Microsoft Project file format, version 2007 or later.

- **Software Application Development**

Use the following standard Application Architecture components in compatible versions for any software application development required by this Agreement (e.g., databases, models, modeling tools), unless the CAM approves other software applications such as open source programs:

- Microsoft ASP.NET framework (version 3.5 and up). Recommend 4.0.
- Microsoft Internet Information Services (IIS), (version 6 and up) Recommend 7.5.
- Visual Studio.NET (version 2008 and up). Recommend 2010.
- C# Programming Language with Presentation (UI), Business Object and Data Layers.
- SQL (Structured Query Language).
- Microsoft SQL Server 2008, Stored Procedures. Recommend 2008 R2.
- Microsoft SQL Reporting Services. Recommend 2008 R2.
- XML (external interfaces).

EXHIBIT A Scope of Work

Any exceptions to the Electronic File Format requirements above must be approved in writing by the CAM. The CAM will consult with the Energy Commission's Information Technology Services Branch to determine whether the exceptions are allowable.

MEETINGS

Subtask 1.2 Kick-off Meeting

The goal of this subtask is to establish the lines of communication and procedures for implementing this Agreement.

The Recipient shall:

- Attend a "Kick-off" meeting with the CAM, the Commission Agreement Officer (CAO), and any other Energy Commission staff relevant to the Agreement. The Recipient will bring its Project Manager and any other individuals designated by the CAM to this meeting. The administrative and technical aspects of the Agreement will be discussed at the meeting. Prior to the meeting, the CAM will provide an agenda to all potential meeting participants. The meeting may take place in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

The administrative portion of the meeting will include discussion of the following:

- Terms and conditions of the Agreement;
- Administrative products (subtask 1.1);
- CPR meetings (subtask 1.3);
- Match fund documentation (subtask 1.7);
- Permit documentation (subtask 1.8);
- Subcontracts (subtask 1.9); and
- Any other relevant topics.

The technical portion of the meeting will include discussion of the following:

- The CAM's expectations for accomplishing tasks described in the Scope of Work;
 - An updated Project Schedule;
 - Technical products (subtask 1.1);
 - Progress reports and invoices (subtask 1.5);
 - Final Report (subtask 1.6);
 - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
 - Any other relevant topics.
- Provide an *Updated Project Schedule*, *List of Match Funds*, and *List of Permits*, as needed to reflect any changes in the documents.

The CAM shall:

- Designate the date and location of the meeting.
- Send the Recipient a *Kick-off Meeting Agenda*.

Recipient Products:

- Updated Project Schedule (*if applicable*)
- Updated List of Match Funds (*if applicable*)
- Updated List of Permits (*if applicable*)

EXHIBIT A

Scope of Work

CAM Product:

- Kick-off Meeting Agenda

Subtask 1.3 Critical Project Review (CPR) Meetings

The goal of this subtask is to determine if the project should continue to receive Energy Commission funding, and if so whether any modifications must be made to the tasks, products, schedule, or budget. CPR meetings provide the opportunity for frank discussions between the Energy Commission and the Recipient. As determined by the CAM, discussions may include project status, challenges, successes, advisory group findings and recommendations, final report preparation, and progress on technical transfer and production readiness activities (if applicable). Participants will include the CAM and the Recipient, and may include the CAO and any other individuals selected by the CAM to provide support to the Energy Commission.

CPR meetings generally take place at key, predetermined points in the Agreement, as determined by the CAM and as shown in the Task List on page 1 of this Exhibit. However, the CAM may schedule additional CPR meetings as necessary. The budget will be reallocated to cover the additional costs borne by the Recipient, but the overall Agreement amount will not increase. CPR meetings generally take place at the Energy Commission, but they may take place at another location, or may be conducted via electronic conferencing (e.g., WebEx) as determined by the CAM.

The Recipient shall:

- Prepare a *CPR Report* for each CPR meeting that: (1) discusses the progress of the Agreement toward achieving its goals and objectives; and (2) includes recommendations and conclusions regarding continued work on the project.
- Submit the CPR Report along with any other *Task Products* that correspond to the technical task for which the CPR meeting is required (i.e., if a CPR meeting is required for Task 2, submit the Task 2 products along with the CPR Report).
- Attend the CPR meeting.
- Present the CPR Report and any other required information at each CPR meeting.

The CAM shall:

- Determine the location, date, and time of each CPR meeting with the Recipient's input.
- Send the Recipient a *CPR Agenda* and a *List of Expected CPR Participants* in advance of the CPR meeting. If applicable, the agenda will include a discussion of match funding and permits.
- Conduct and make a record of each CPR meeting. Provide the Recipient with a *Schedule for Providing a Progress Determination* on continuation of the project.
- Determine whether to continue the project, and if so whether modifications are needed to the tasks, schedule, products, or budget for the remainder of the Agreement. If the CAM concludes that satisfactory progress is not being made, this conclusion will be referred to the Deputy Director of the Energy Research and Development Division.
- Provide the Recipient with a *Progress Determination* on continuation of the project, in accordance with the schedule. The Progress Determination may include a requirement that the Recipient revise one or more products.

Recipient Products:

- CPR Report(s)
- Task Products (draft and/or final as specified in the task)

EXHIBIT A

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CAM Products:

- CPR Agenda
- List of Expected CPR Participants
- Schedule for Providing a Progress Determination
- Progress Determination

Subtask 1.4 Final Meeting

The goal of this subtask is to complete the closeout of this Agreement.

The Recipient shall:

- Meet with Energy Commission staff to present project findings, conclusions, and recommendations. The final meeting must be completed during the closeout of this Agreement. This meeting will be attended by the Recipient and CAM, at a minimum. The meeting may occur in person or by electronic conferencing (e.g., WebEx), with approval of the CAM.

The technical and administrative aspects of Agreement closeout will be discussed at the meeting, which may be divided into two separate meetings at the CAM's discretion.

- The technical portion of the meeting will involve the presentation of findings, conclusions, and recommended next steps (if any) for the Agreement. The CAM will determine the appropriate meeting participants.
- The administrative portion of the meeting will involve a discussion with the CAM and the CAO of the following Agreement closeout items:
 - Disposition of any state-owned equipment.
 - Need to file a Uniform Commercial Code Financing Statement (Form UCC-1) regarding the Energy Commission's interest in patented technology.
 - The Energy Commission's request for specific "generated" data (not already provided in Agreement products).
 - Need to document the Recipient's disclosure of "subject inventions" developed under the Agreement.
 - "Surviving" Agreement provisions such as repayment provisions and confidential products.
 - Final invoicing and release of retention.
- Prepare a *Final Meeting Agreement Summary* that documents any agreement made between the Recipient and Commission staff during the meeting.
- Prepare a *Schedule for Completing Agreement Closeout Activities*.
- Provide *All Draft and Final Written Products* on a CD-ROM or USB memory stick, organized by the tasks in the Agreement.

Products:

- Final Meeting Agreement Summary (*if applicable*)
- Schedule for Completing Agreement Closeout Activities
- All Draft and Final Written Products

REPORTS AND INVOICES

Subtask 1.5 Progress Reports and Invoices

The goals of this subtask are to: (1) periodically verify that satisfactory and continued progress is made towards achieving the project objectives of this Agreement; and (2) ensure that invoices contain all required information and are submitted in the appropriate format.

EXHIBIT A Scope of Work

The Recipient shall:

- Submit a monthly *Progress Report* to the CAM. Each progress report must:
 - Summarize progress made on all Agreement activities as specified in the scope of work for the preceding month, including accomplishments, problems, milestones, products, schedule, fiscal status, and an assessment of the ability to complete the Agreement within the current budget and any anticipated cost overruns. See the Progress Report Format Attachment for the recommended specifications.
- Submit a monthly or quarterly *Invoice* that follows the instructions in the “Payment of Funds” section of the terms and conditions, including a financial report on Match Fund and in-state expenditures.

Products:

- Progress Reports
- Invoices

Subtask 1.6 Final Report

The goal of this subtask is to prepare a comprehensive Final Report that describes the original purpose, approach, results, and conclusions of the work performed under this Agreement. The CAM will review the Final Report, which will be due at least **two months** before the Agreement end date. When creating the Final Report Outline and the Final Report, the Recipient must use the Style Manual provided by the CAM.

Subtask 1.6.1 Final Report Outline

The Recipient shall:

- Prepare a *Final Report Outline* in accordance with the *Style Manual* provided by the CAM. (See Task 1.1 for requirements for draft and final products.)

Recipient Products:

- Final Report Outline (draft and final)

CAM Product:

- Style Manual
- Comments on Draft Final Report Outline
- Acceptance of Final Report Outline

Subtask 1.6.2 Final Report

The Recipient shall:

- Prepare a *Final Report* for this Agreement in accordance with the approved Final Report Outline, Style Manual, and Final Report Template provided by the CAM with the following considerations:
 - Ensure that the report includes the following items, in the following order:
 - Cover page (**required**)
 - Credits page on the reverse side of cover with legal disclaimer (**required**)
 - Acknowledgements page (optional)
 - Preface (**required**)
 - Abstract, keywords, and citation page (**required**)
 - Table of Contents (**required**, followed by List of Figures and List of Tables, if needed)

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Scope of Work

- Executive summary (**required**)
- Body of the report (**required**)
- References (if applicable)
- Glossary/Acronyms (If more than 10 acronyms or abbreviations are used, it is required.)
- Bibliography (if applicable)
- Appendices (if applicable) (Create a separate volume if very large.)
- Attachments (if applicable)
- Ensure that the document is written in the third person.
- Ensure that the Executive Summary is understandable to the lay public.
 - Briefly summarize the completed work. Succinctly describe the project results and whether or not the project goals were accomplished.
 - Identify which specific ratepayers can benefit from the project results and how they can achieve the benefits.
 - If it's necessary to use a technical term in the Executive Summary, provide a brief definition or explanation when the technical term is first used.
- Follow the Style Guide format requirements for headings, figures/tables, citations, and acronyms/abbreviations.
- Ensure that the document omits subjective comments and opinions. However, recommendations in the conclusion of the report are allowed.
- Include a brief description of the project results in the Abstract.
- Submit a draft of the report to the CAM for review and comment. The CAM will provide written comments to the Recipient on the draft product within 15 days of receipt
- Consider incorporating all CAM comments into the Final Report. If the Recipient disagrees with any comment, provide a written response explaining why the comment was not incorporated into the final product
- Submit the revised Final Report and responses to comments within 10 days of notice by the CAM, unless the CAM specifies a longer time period or approves a request for additional time.
- Submit one bound copy of the *Final Report* to the CAM along with *Written Responses to Comments on the Draft Final Report*.

Products:

- Final Report (draft and final)
- Written Responses to Comments on the Draft Final Report

CAM Product:

- Written Comments on the Draft Final Report

MATCH FUNDS, PERMITS, AND SUBCONTRACTS

Subtask 1.7 Match Funds

The goal of this subtask is to ensure that the Recipient obtains any match funds planned for this Agreement and applies them to the Agreement during the Agreement term.

While the costs to obtain and document match funds are not reimbursable under this Agreement, the Recipient may spend match funds for this task. The Recipient may only spend match funds during the Agreement term, either concurrently or prior to the use of Energy Commission funds. Match funds must be identified in writing, and the Recipient must obtain any associated commitments before incurring any costs for which the Recipient will request reimbursement.

EXHIBIT A Scope of Work

The Recipient shall:

- Prepare a *Match Funds Status Letter* that documents the match funds committed to this Agreement. If no match funds were part of the proposal that led to the Energy Commission awarding this Agreement and none have been identified at the time this Agreement starts, then state this in the letter.

If match funds were a part of the proposal that led to the Energy Commission awarding this Agreement, then provide in the letter:

- A list of the match funds that identifies:
 - The amount of cash match funds, their source(s) (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied.
 - The amount of each in-kind contribution, a description of the contribution type (e.g., property, services), the documented market or book value, the source (including a contact name, address, and telephone number), and the task(s) to which the match funds will be applied. If the in-kind contribution is equipment or other tangible or real property, the Recipient must identify its owner and provide a contact name, address, telephone number, and the address where the property is located.
 - If different from the solicitation application, provide a letter of commitment from an authorized representative of each source of match funding that the funds or contributions have been secured.
- At the Kick-off meeting, discuss match funds and the impact on the project if they are significantly reduced or not obtained as committed. If applicable, match funds will be included as a line item in the progress reports and will be a topic at CPR meetings.
- Provide a *Supplemental Match Funds Notification Letter* to the CAM of receipt of additional match funds.
- Provide a *Match Funds Reduction Notification Letter* to the CAM if existing match funds are reduced during the course of the Agreement. Reduction of match funds may trigger a CPR meeting.

Products:

- Match Funds Status Letter
- Supplemental Match Funds Notification Letter (*if applicable*)
- Match Funds Reduction Notification Letter (*if applicable*)

Subtask 1.8 Permits

The goal of this subtask is to obtain all permits required for work completed under this Agreement in advance of the date they are needed to keep the Agreement schedule on track. Permit costs and the expenses associated with obtaining permits are not reimbursable under this Agreement, with the exception of costs incurred by University of California recipients. Permits must be identified and obtained before the Recipient may incur any costs related to the use of the permit(s) for which the Recipient will request reimbursement.

The Recipient shall:

- Prepare a *Permit Status Letter* that documents the permits required to conduct this Agreement. If no permits are required at the start of this Agreement, then state this in the letter. If permits will be required during the course of the Agreement, provide in the letter:
 - A list of the permits that identifies: (1) the type of permit; and (2) the name, address, and telephone number of the permitting jurisdictions or lead agencies.
 - The schedule the Recipient will follow in applying for and obtaining the permits.

EXHIBIT A

Scope of Work

The list of permits and the schedule for obtaining them will be discussed at the Kick-off meeting (subtask 1.2), and a timetable for submitting the updated list, schedule, and copies of the permits will be developed. The impact on the project if the permits are not obtained in a timely fashion or are denied will also be discussed. If applicable, permits will be included as a line item in progress reports and will be a topic at CPR meetings.

- If during the course of the Agreement additional permits become necessary, then provide the CAM with an *Updated List of Permits* (including the appropriate information on each permit) and an *Updated Schedule for Acquiring Permits*.
- Send the CAM a *Copy of Each Approved Permit*.
- If during the course of the Agreement permits are not obtained on time or are denied, notify the CAM within 5 days. Either of these events may trigger a CPR meeting.

Products:

- Permit Status Letter
- Updated List of Permits (*if applicable*)
- Updated Schedule for Acquiring Permits (*if applicable*)
- Copy of Each Approved Permit (*if applicable*)

Subtask 1.9 Subcontracts

The goals of this subtask are to: (1) procure subcontracts required to carry out the tasks under this Agreement; and (2) ensure that the subcontracts are consistent with the terms and conditions of this Agreement.

The Recipient shall:

- Manage and coordinate subcontractor activities in accordance with the requirements of this Agreement.
- Incorporate this Agreement by reference into each subcontract.
- Include any required Energy Commission flow-down provisions in each subcontract, in addition to a statement that the terms of this Agreement will prevail if they conflict with the subcontract terms.
- If required by the CAM, submit a draft of each *Subcontract* required to conduct the work under this Agreement.
- Submit a final copy of the executed subcontract.
- Notify and receive written approval from the CAM prior to adding any new subcontractors (see the discussion of subcontractor additions in the terms and conditions).

Products:

- Subcontracts (Final)

TECHNICAL ADVISORY COMMITTEE

Subtask 1.10 Technical Advisory Committee (TAC)

The goal of this subtask is to create an advisory committee for this Agreement. The TAC should be composed of diverse professionals. The composition will vary depending on interest, availability, and need. TAC members will serve at the CAM's discretion. The purpose of the TAC is to:

- Provide guidance in project direction. The guidance may include scope and methodologies, timing, and coordination with other projects. The guidance may be based on:
 - Technical area expertise;

EXHIBIT A

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- Knowledge of market applications; or
- Linkages between the agreement work and other past, present, or future projects (both public and private sectors) that TAC members are aware of in a particular area.
- Review products and provide recommendations for needed product adjustments, refinements, or enhancements.
- Evaluate the tangible benefits of the project to the state of California, and provide recommendations as needed to enhance the benefits.
- Provide recommendations regarding information dissemination, market pathways, or commercialization strategies relevant to the project products.

The TAC may be composed of qualified professionals spanning the following types of disciplines:

- Researchers knowledgeable about the project subject matter;
- Members of trades that will apply the results of the project (e.g., designers, engineers, architects, contractors, and trade representatives);
- Public interest market transformation implementers;
- Product developers relevant to the project;
- U.S. Department of Energy research managers, or experts from other federal or state agencies relevant to the project;
- Public interest environmental groups;
- Utility representatives;
- Air district staff; and
- Members of relevant technical society committees.

The Recipient shall:

- Prepare a *List of Potential TAC Members* that includes the names, companies, physical and electronic addresses, and phone numbers of potential members. The list shall include the expertise of each proposed TAC member and the value to the project. The list will be discussed at the Kick-off meeting, and a schedule for recruiting members and holding the first TAC meeting will be developed.
- Recruit TAC members. Ensure that each individual understands member obligations and the TAC meeting schedule developed in subtask 1.11.
- Prepare a *List of TAC Members* once all TAC members have committed to serving on the TAC.
- Submit *Documentation of TAC Member Commitment* (such as Letters of Acceptance) from each TAC member.

Products:

- List of Potential TAC Members
- List of TAC Members
- Documentation of TAC Member Commitment

Subtask 1.11 TAC Meetings

The goal of this subtask is for the TAC to provide strategic guidance for the project by participating in regular meetings, which may be held via teleconference.

The Recipient shall:

- Discuss the TAC meeting schedule with the CAM at the Kick-off meeting. Determine the number and location of meetings (in-person and via teleconference) in consultation with the CAM.

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- Prepare a *TAC Meeting Schedule* that will be presented to the TAC members during recruiting. Revise the schedule after the first TAC meeting to incorporate meeting comments.
- Prepare a *TAC Meeting Agenda* and *TAC Meeting Back-up Materials* for each TAC meeting.
- Organize and lead TAC meetings in accordance with the TAC Meeting Schedule. Changes to the schedule must be pre-approved in writing by the CAM.
- Prepare *TAC Meeting Summaries* that include any recommended resolutions of major TAC issues.

The TAC shall:

- Help set the project team's goals and contribute to the development and evaluation of its statement of proposed objectives as the project evolves.
- Provide a credible and objective sounding board on the wide range of technical and financial barriers and opportunities.
- Help identify key areas where the project has a competitive advantage, value proposition, or strength upon which to build.
- Advocate on behalf of the project in its effort to build partnerships, governmental support and relationships with a national spectrum of influential leaders.
- Ask probing questions that insure a long-term perspective on decision-making and progress toward the project's strategic goals.

Products:

- TAC Meeting Schedule (draft and final)
- TAC Meeting Agendas (draft and final)
- TAC Meeting Back-up Materials
- TAC Meeting Summaries

IV. TECHNICAL TASKS

TASK 2: TECHNICAL FEASIBILITY

The goal of this task is to gather, analyze, and develop the technical parameters for the integrated hydrogen energy storage system, and the economic feasibility of design choices. The task will establish the baseline measurements for evaluation and comparison with measurement and verification (M&V) phase.

Subtask 2.1 Data Gathering

The goal of this subtask is to gather the data required to analyze the customer site's energy usage, renewable generation output, utility tariff, and final energy costs.

The Recipient shall:

- Prepare an *Energy Analysis Report* describing the site's energy usage, number of rate tariffs, location of meters in the property and historical generation profiles.
 - Evaluate site's generation and load profiles using techniques such as hourly simulations to estimate:
 - the percentage of renewable energy that serves the facility,
 - the correlations between energy generation and energy usage,
 - the options for energy systems integration and associated potential benefits.

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Products:

- Energy Analysis Report (D211)

Subtask 2.2 Conceptual System Design

The goal of this subtask is to use the data from subtask 2.1 and develop the operating characteristics of the hydrogen system integrated with renewable generation.

The Recipient shall:

- Prepare a *Conceptual System Design Report* outlining the design choices and configuration options for integrating the hydrogen system.
 - Evaluate design choices, using techniques such as hourly simulations, to estimate energy performance and maximum production from the hydrogen system.
 - Evaluate the economics of the hydrogen system.

Products:

- Conceptual System Design Report (D221)

Subtask 2.3 Preliminary System Design

The goal of this subtask is to use the data from subtask 2.1 and 2.2 and develop the preliminary system design for the balance of plant, electrolyzer, storage and fuel cell components of the hydrogen system.

The Recipient shall:

- Prepare a *Preliminary System Design Report* describing the planned configuration of the hydrogen system, as well as a summary of the key factors that lead to the final design (such as design changes resulting from economic considerations, site operational considerations, or design modifications to meet permitting or certification requirements).
 - Develop process flow diagrams, electrical single line diagrams, overall control narrative and preliminary general arrangement drawings for the hydrogen and utility systems. The design will define the project final configuration.
 - Develop communication protocol between the system components and the utility grid.

Products:

- Preliminary System Design Report (D231)
- CPR Report #1 (Draft and Final) (D131 and D132)

TASK 3: DETAILED DESIGN PHASE

The goal of this task is to use the data from Task 2 and develop final drawings and complete permitting for the project.

The Recipient shall:

- Prepare a *System Detailed Design Report* to document and describe the overall technical design of the system, its operating parameters and expected performance once it is fully deployed and commissioned.
 - Develop final equipment specifications.
 - Complete site survey and soils analysis (if required).
 - Develop a bill of materials.
 - Develop final construction drawings for permitting such as piping, electrical, and civil.
 - Meet with the County and City and submit applications for building permits.

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- Define and design the grid integration strategy including interconnection of the system components with the utility distribution system.

Products:

- System Detailed Design Report (D301)

TASK 4: SAFETY PLAN

The goal of this task is to develop a safety plan and operator training program to ensure that the hydrogen system is designed and operated safely.

The Recipient shall:

- Prepare a *Safety and Training Report* that will summarize and document the approaches that will be implemented for this project, as well as key lessons learned, best practice guidance and recommendations for streamlining future hydrogen project deployment.
- Identify and apply best practice for design, operation and training that will be developed through stakeholder engagement and in accordance with the United States Department of Energy's Hydrogen Safety Panel's Safety Planning for Hydrogen and Fuel Cell Projects.
- Conduct a preliminary survey and engage stakeholders.
- Develop a safety approach and review with stakeholders.
- Implement the safety approach and train operators based on the best practice identified.

Products:

- Safety and Training Report (D401)

TASK 5: PROCURMENT, CONSTRUCTION, AND COMMISSIONING

The goal of this task is to procure and deploy the major equipment components of the hydrogen system and fully integrate them with the renewable generation and customer's site energy systems.

The Recipient shall:

- Prepare a *System Commissioning Report* that will summarize and document the as built system configuration, initial commissioning system performance, challenges encountered during system procurement, installation and commissioning, and planned approaches to optimize the system; as well as key lessons learned, best practice guidance and recommendations for streamlining future hydrogen project deployment.
 - Procure, install and commission the hydrogen system.
 - Inspect and verify that all of the system components (hardware, software, etc.) are installed and configured correctly; and that the system is operating according to drawings, specifications and expectations.

Products:

- System Commissioning Report (D501)
- D133 CPR Report #2 (Draft and Final) (D133 and D134)

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TASK 6: OPERATE, ENHANCE, AND OPTIMIZE THE HYDROGEN PROJECT

The purpose of this task is to provide operations and maintenance support for the hydrogen system, optimize system performance and enhance the system capabilities. The objectives of this task are to:

- Provide operations and maintenance support to the project.
- Optimize the system to increase value over time.
- Communicate and disseminate meaningful system performance information to staff at the host site to facilitate greater understanding of the benefits of the hydrogen project and the customer's cost savings.

The Recipient shall:

- Prepare a *System Performance and Optimization Report* that will summarize and document the operational challenges encountered; optimization efforts, comparison of initial and enhanced system performance, as well as key lessons learned in system operations, best practice guidance and recommendations for streamlining future hydrogen project deployment.
 - Provide the host site with timely and accurate information to support their behind-the-meter optimization strategies to maximize the value of energy cost savings, demand charge savings, grid services market revenues, and other stacked value streams. This resource optimization support will increase participants' ability to provide the required level of energy or capacity to the managed clean energy portfolio and minimize the risk of underperformance.
 - Upgrade the technology functionality over time. Upgrades and functionality enhancements will be required over time to adapt to the value of behind the meter services and adjusting to the resource. In addition, learning algorithms will be incorporated into the platform to improve the existing forecasting and optimization functions.

Products:

- System Performance and Optimization Report (D601)

TASK 7: INDEPENDENT MEASUREMENT AND VERIFICATION

The goal of this task is to establish a detailed methodology for M&V of the system, and to evaluate the performance of the previous Tasks in terms of the predicted versus actual energy use, cost, and greenhouse gas (GHG) emissions.

The Recipient shall:

- Prepare a *M&V Plan* that will detail the system parameters that will be measured to evaluate system performance, the baseline metrics and performance improvement goals, as well as the verification methodology that will be used to validate the results.
- Prepare a *Measurement and Verification Report* that will detail the validated measured system performance, the baseline metrics and performance achieved, the data sources and analytical methodology used in the evaluations of system performance, energy use and GHG emissions. Costs and benefits will be evaluated from the perspective of customers and ratepayers.

Products:

- M&V Plan (draft and final) (D701 and D702)
- M&V Report (draft and final) (D703 and D704)

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TASK 8: EVALUATION OF PROJECT BENEFITS

The goal of this task is to report the benefits resulting from this project.

The Recipient shall:

- Complete three Project Benefits Questionnaires that correspond to three main intervals in the Agreement: (1) *Kick-off Meeting Benefits Questionnaire*; (2) *Mid-term Benefits Questionnaire*; and (3) *Final Meeting Benefits Questionnaire*.
- Provide all key assumptions used to estimate projected benefits, including targeted market sector (e.g., population and geographic location), projected market penetration, baseline and projected energy use and cost, operating conditions, and emission reduction calculations. Examples of information that may be requested in the questionnaires include:
 - For Product Development Projects and Project Demonstrations:
 - Published documents, including date, title, and periodical name.
 - Estimated or actual energy and cost savings, and estimated statewide energy savings once market potential has been realized. Identify all assumptions used in the estimates.
 - GHG and criteria emissions reductions.
 - Other non-energy benefits such as reliability, public safety, lower operational cost, environmental improvement, indoor environmental quality, and societal benefits.
 - Data on potential job creation, market potential, economic development, and increased state revenue as a result of the project.
 - A discussion of project product downloads from websites, and publications in technical journals.
 - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
 - Additional Information for Product Development Projects:
 - ✓ Outcome of product development efforts, such copyrights and license agreements.
 - ✓ Units sold or projected to be sold in California and outside of California.
 - ✓ Total annual sales or projected annual sales (in dollars) of products developed under the Agreement.
 - ✓ Investment dollars/follow-on private funding as a result of Energy Commission funding.
 - ✓ Patent numbers and applications, along with dates and brief descriptions.
 - Additional Information for Product Demonstrations:
 - ✓ Outcome of demonstrations and status of technology.
 - ✓ Number of similar installations.
 - ✓ Jobs created/retained as a result of the Agreement.
 - For Information/Tools and Other Research Studies:
 - Outcome of project.
 - Published documents, including date, title, and periodical name.
 - A discussion of policy development. State if the project has been cited in government policy publications or technical journals, or has been used to inform regulatory bodies.
 - The number of website downloads.

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- An estimate of how the project information has affected energy use and cost, or have resulted in other non-energy benefits.
 - An estimate of energy and non-energy benefits.
 - Data on potential job creation, market potential, economic development, and increased state revenue as a result of project.
 - A discussion of project product downloads from websites, and publications in technical journals.
 - A comparison of project expectations and performance. Discuss whether the goals and objectives of the Agreement have been met and what improvements are needed, if any.
- Respond to CAM questions regarding responses to the questionnaires.

The Energy Commission may send the Recipient similar questionnaires after the Agreement term ends. Responses to these questionnaires will be voluntary.

Products:

- Kick-off Meeting Benefits Questionnaire (D801)
- Mid-term Benefits Questionnaire (D802)
- Final Meeting Benefits Questionnaire (D803)

TASK 9: TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to develop a plan to make the knowledge gained, experimental results, and lessons learned available to the public and key decision makers.

The Recipient shall:

- Prepare an *Initial Fact Sheet* at start of the project that describes the project. Use the format provided by the CAM.
- Prepare a *Final Project Fact Sheet* at the project's conclusion that discusses results. Use the format provided by the CAM.
- Prepare a *Technology/Knowledge Transfer Plan* that includes:
 - An explanation of how the knowledge gained from the project will be made available to the public, including the targeted market sector and potential outreach to end users, utilities, regulatory agencies, and others.
 - A description of the intended use(s) for and users of the project results.
 - Published documents, including date, title, and periodical name.
 - Copies of documents, fact sheets, journal articles, press releases, and other documents prepared for public dissemination. These documents must include the Legal Notice required in the terms and conditions. Indicate where and when the documents were disseminated.
 - A discussion of policy development. State if project has been or will be cited in government policy publications, or used to inform regulatory bodies.
 - The number of website downloads or public requests for project results.
 - Additional areas as determined by the CAM.
- Conduct technology transfer activities in accordance with the Technology/Knowledge Transfer Plan. These activities will be reported in the Progress Reports.
- When directed by the CAM, develop *Presentation Materials* for an Energy Commission-sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the California Energy Commission.

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- Provide at least (6) six *High Quality Digital Photographs* (minimum resolution of 1300x500 pixels in landscape ratio) of pre and post technology installation at the project sites or related project photographs.
- Prepare a *Technology/Knowledge Transfer Report* on technology transfer activities conducted during the project.

Products:

- Initial Fact Sheet (draft and final) (D901 and D902)
- Final Project Fact Sheet (draft and final) (D903 and D903)
- Presentation Materials (draft and final) (D905 and D906)
- High Quality Digital Photographs (D907)
- Technology/Knowledge Transfer Plan (draft and final) (D908 and D909)
- Technology/Knowledge Transfer Report (draft and final) (D910 and D911)

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: DASH2ENERGY LLC.

RESOLVED, that the State Energy Resources Conservation and Development Commission (CEC) adopts the staff CEQA findings contained in the Agreement or Amendment Request Form (as applicable); and

RESOLVED, Proposed resolution approving Agreement EPC-19-037 with Dash2energy LLC for a \$1,275,475 grant to establish a renewable hydrogen energy storage system. The project focuses on creating an electricity in/electricity out system by integrating electrolysis, high-pressure hydrogen storage, fuel cell electrical regeneration, and microgrid control systems into a single system. The system will be integrated with an existing 1 MW wind turbine to provide electricity, and will store the energy as hydrogen to be converted to back to electricity to provide cost savings and long duration resiliency for a municipal water treatment plant; and

FURTHER BE IT RESOLVED, that the Executive Director or his/her designee shall execute the same on behalf of the CEC.

CERTIFICATION

The undersigned Secretariat to the Commission does hereby certify that the foregoing is a full, true, and correct copy of a Resolution duly and regularly adopted at a meeting of the CEC held on June 10, 2020.

AYE:

NAY:

ABSENT:

ABSTAIN:

Cody Goldthrite
Secretariat