STATE OF CALIFORNIA

GRANT REQUEST FORM (GRF)

CEC-270 (Revised 12/2019) CALIFORNIA ENERGY COMMISSION

A) New Agreement # EPC-20-020 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Maggie Deng		916-445-5328

C) Recipient's Legal Name	Federal ID Number
Feasible, Inc.	81-0682370

D) Title of Project
Machine Learning enhanced Acoustic Inspection to improve Battery Manufacturing

E) Term and Amount

Start Date	End Date	Amount
3/24/2021	6/30/2025	$ 1,000,000

F) Business Meeting Information

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

Proposed Business Meeting Date 3/17/2021 ☐ Consent ☒ Discussion

Business Meeting Presenter Michael Ferreria Time Needed: 5 minutes

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

Agenda Item Subject and Description:

FEASIBLE, INC. Proposed resolution approving agreement EPC-20-020 with Feasible, Inc. for a $1,000,000 grant to support the commercialization of a machine learning driven battery inspection platform called EchoStat and adopting staff's determination that this action is exempt from CEQA. EchoStat uses ultrasound and data analytics to detect manufacturing issues earlier and with more sensitivity. This project aims to reduce battery cell cost and to reduce the likelihood of safety incidents from unexpected battery failures. (EPIC funding) Contact: Michael Ferreria.

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; Cal. Code Regs., tit. 14, § 15306
   ☐ Common Sense Exemption. 14 CCR 15061 (b) (3)

   Explain reason why Agreement is exempt under the above section: The project involves development, testing, and validation of a machine-learning-driven battery

inspection platform called EchoStat. The development and assembly will take place at a Feasible, Inc.'s existing facility in Emeryville, California. This will include minor interior alterations and operation of facilities and mechanical equipment. There will be no change of use and no expansion of the building. The testing and validation will be performed at one or more existing manufacturers' facilities already in operation, possibly the facilities of a Tier 1 German automaker.

The project consists of the operation of these existing public or private 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. In addition, the project involves data collection and research, which would not result in a serious or major disturbance to an environmental resource. Therefore, this project is exempt under California Code of Regulations, title 14, section 15306, Information Collection.

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**

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	19-20	301.001G	$1,000,000

R&D Program Area: EDMFO: EDMF TOTAL: $ 1,000,000

Explanation for "Other" selection

Reimbursement Contract #: Federal Agreement #: DE-AR0000845

K) Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Shaurjo Biswas

Address: 1175 Park Ave

City, State, Zip: Emeryville, CA 94608-3631

Phone: 734-757-0131
E-Mail: shaurjo@feasible.io

2. **Recipient's Project Manager**
Name: Shaurjo Biswas
Address: 1175 Park Ave
City, State, Zip: Emeryville, CA 94608-3631
Phone: 734-757-0131
E-Mail: shaurjo@feasible.io

L) Selection Process Used

☒ Competitive Solicitation Solicitation #: GFO-20-301
☐ 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
4.	Recipient Resolution	☒ N/A	☐ Attached
5.	CEQA Documentation	☐ N/A	☒ Attached

Maggie Deng *2/9/2021*
Agreement Manager **Date**

Erik Stokes *2/9/2021*
Office Manager **Date**

Linda Spiegel *2/9/2021*
Deputy Director **Date**

Exhibit A
Scope of Work
Feasible, Inc.

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR [1]	Task Name
1		General Project Tasks
2	X	Concept Evaluation at Cell Prototyping Scale
3	X	Capability Demonstration Off-line at Cell Pilot Scale
4		Evaluation of Project Benefits
5		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CPR	Critical Project Review
EV	Electric Vehicle
LRIP	Low Rate Initial Production - a pilot line classification
ML	Machine Learning
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 design, validation, pilot-scale demonstration of an acoustics-based battery inspection platform for rapid detection of manufacturing issues during production to improve yield, quality, and safety of batteries without sacrificing throughput.

B. Problem/ Solution Statement

Problem

The Li-ion battery manufacturing industry lacks a measurement technique that can reliably detect process variation, defects, and cell quality while also being fast enough to

[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.

be applicable to 100% of cells at production-scale. As a result, cell manufacturers resort to electrical testing (which requires battery operation and is inexact) or x-ray imaging (which is slow and expensive). Only samples per batch are tested, and it can take days to months for flaws to be detected and performance quality to be validated. Because of varying and unpredictable cell quality, cell integrators such as electric vehicle (EV) manufacturers and grid-storage providers overbuild their battery packs by up to 25% of extra capacity. Additionally, as the industry at-large moves towards wider-area and higher-power cell designs, the existing measurement technologies' efficacy will continue to decline when fast, accurate inspection is most needed. There exists a substantial opportunity for a new type of diagnostic technology that is sensitive to manufacturing defects and process variation, while also being fast and nondestructive.

Solution

EchoStat, an acoustic analysis platform, is intended to bridge a major gap in battery diagnostics by combining the speed and scalability of electrical methods, with the dimensional information from x-rays. With fast measurement times (<1 sec per measurement) and the ability to gather spatially-resolved information (which electrical methods are not capable of), its non-invasive acoustic based diagnostic method aims to enable battery makers to screen every cell and gain deep physical insights into their performance quality prior to deployment. EchoStat, comprising measurement hardware and advanced analytics, can be scaled to accommodate different battery sizes and geometries at production-line throughputs. Preliminary evidence suggests that EchoStat is able to 1) detect outliers in construction quality that electrical methods miss, and 2) predict the lifetime performance of batteries beyond what electrical methods are capable of. In doing so, Feasible, Inc. products aim to enable valuable physical insights in the battery development, manufacturing, and management life cycle that will be critical in the efforts to develop storage technologies that can meet the demands of renewable-enabled grid-scale energy storage and an increasing EV market share. Also, because EchoStat can be applied at multiple process steps along a production line, manufacturers should be able to identify production drifts and defective cells much earlier in the process, preventing waste and improving yield.

C. Goals and Objectives of the Agreement

Agreement Goals

The goal of this Agreement is to:

- Demonstrate EchoStat's capability and techno-economic value to detect manufacturing issues earlier and with more sensitivity than SoA methods at customer cell prototyping and pilot production lines.

Ratepayer Benefits:[2] This Agreement is intended to result in the ratepayer benefits of:

[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,

- **Lower costs:** At scale, the EchoStat target is a reduction in battery cell cost by $14/kWh. Aligned with *SB 350*, the proposed project is intended to enable lower cost EV and ESS batteries as well as reduced scale-up time for next generation battery materials. (Additionally, efficiently storing excess daytime solar/wind energy generation through Vehicle-Grid Integration decreases the need for expensive peaker plants during morning and evening, decreasing overall cost to ratepayers.)
- **Greater reliability:** Pairing high-quality, high-performance batteries with renewable energy sources should lead to greater reliability by mitigating unexpected intermittencies. Additionally, accurate monitoring of batteries is critical for predictive maintenance to ensure that there are no surprise power outages due to unexpected failures.
- **Increased safety:** The technology detects manufacturing and inherent physical defects earlier and more robustly than standard electrical methods. This dramatically reduces the likelihood of safety incidents from unexpected battery failures for EVs and ESS, as occurred in Arizona where it was determined that an internal short in a lithium-ion cell was the cause of an explosion in a large ESS container

Technological Advancement and Breakthroughs:[3] This Agreement is intended to lead to technological advancement and breakthroughs to overcome barriers to the achievement of the State of California's statutory energy goals by reducing the cost of batteries and help to improve manufacturing processes and yields for EV and ESS applications, therefore easing taxpayer burden. Additionally, Echostat should enable faster development of new or improved battery technologies by providing the same fast, accurate physical insight to researchers and process developers, accelerating the development and scaling of new processes and techniques.

Agreement Objectives

The objectives of this Agreement are to:

- Demonstrate how EchoStat creates value in cell R&D and pilot production on multiple cell types.
- Clearly define system requirements and roadmap for commercial adoption.
- Secure follow-on commitments to support deployment of EchoStat at production scales.

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]

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).** All products submitted which will be viewed by the public, must comply with the accessibility requirements of Section 508 of the federal Rehabilitation Act of 1973, as amended (29 U.S.C. Sec. 794d), and regulations implementing that act as set forth in Part 1194 of Title 36 of the Federal Code of Regulations**.** All technical tasks should include product(s). 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.
- 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:

Exhibit A
Scope of Work
Feasible, Inc.

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 California Energy Commission's (CEC) 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.

  The following describes the accepted formats for electronic data and documents provided to the CEC 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.
  - 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).

Any exceptions to the Electronic File Format requirements above must be approved in writing by the CAM. The CAM will consult with the CEC'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 CEC 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;
  - Invoicing and auditing procedures;
  - 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 (subtask 1.5);
  - Final Report (subtask 1.6);
  - Technical Advisory Committee meetings (subtasks 1.10 and 1.11); and
  - Any other relevant topics.

- Provide *Kick-off Meeting Presentation* to include but not limited to:
  - Project overview (i.e. project description, goals and objectives, technical tasks, expected benefits, etc.)
  - Project schedule that identifies milestones
  - List of potential risk factors and hurdles, and mitigation strategy

- Provide an *Updated Project Schedule, Match Funds Status Letter,* and *Permit Status Letter*, 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:

- Kick-off Meeting Presentation
- Updated Project Schedule *(if applicable)*
- Match Funds Status Letter (subtask 1.7) *(if applicable)*
- Permit Status Letter (subtask 1.8) *(if applicable)*

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 CEC 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 CEC 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 CEC.

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 CEC, 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 and submit 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.
- 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* with 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)

CAM Products:
- CPR Agenda
- 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 CEC 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 procured equipment.
    - The CEC'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 copies of *All Final Products* on a USB memory stick, organized by the tasks in the Agreement.

Products:
- Final Meeting Agreement Summary *(if applicable)*
- Schedule for Completing Agreement Closeout Activities
- All Final 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.

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 Funds 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. When creating the Final Report Outline and the Final Report, the Recipient must use the CEC 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 *Energy Commission Style Manual* provided by the CAM.

Recipient Products:

- Final Report Outline (draft and final)

CAM Product:

- Energy Commission 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, Energy Commission 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)
    - 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)
- Submit a draft of the Executive Summary to the TAC for review and comment.
- Develop and submit a *Summary of TAC Comments* received on the Executive Summary. For each comment received, the recipient will identify in the summary the following:

  - Comments the recipient proposes to incorporate.
  - Comments the recipient does propose to incorporate and an explanation for why.
- 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.
- Incorporate all CAM comments into the *Final Report*. If the Recipient disagrees with any comment, provide a *Written Responses to Comments* explaining why the comments were not incorporated into the final product.
- Submit the revised *Final Report* electronically with any Written Responses to Comments within 10 days of receipt of CAM's Written Comments on the Draft Final Report, unless the CAM specifies a longer time period or approves a request for additional time.

Products:
- Summary of TAC Comments
- Draft Final Report
- Written Responses to Comments *(if applicable)*
- 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 CEC 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.

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 CEC 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 CEC 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.

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 each 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 *(draft if required by the CAM)*

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;
  - 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.
- 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, to the extent the TAC members feel is appropriate, 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.

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 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.
- 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.
- Review and provide comments to proposed project performance metrics.
- Review and provide comments to proposed project Draft Technology Transfer Plan.

Products:

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

Subtask 1.12 Project Performance Metrics

The goal of this subtask is to finalize key performance targets for the project based on feedback from the TAC and report on final results in achieving those targets. The performance targets should be a combination of scientific, engineering, techno-economic, and/or programmatic metrics that provide the most significant indicator of the research or technology's potential success.

The Recipient shall:

- Complete and submit the project performance metrics from the *Initial Project Benefits Questionnaire,* developed in the Evaluation of Project Benefits task*,* to the CAM.
- Present the draft project performance metrics at the first TAC meeting to solicit input and comments from the TAC members.
- Develop and submit a *TAC Performance Metrics Summary* that summarizes comments received from the TAC members on the proposed project performance metrics. The *TAC Performance Metrics Summary* will identify:
    - TAC comments the recipient proposes to incorporate into the *Initial Project Benefits Questionnaire*.
    - TAC comments the recipient does not propose to incorporate with and explanation why.
- Develop and submit a *Project Performance Metrics Results* document describing the extent to which the recipient met each of the performance metrics in the *Final Project Benefits Questionnaire*.

- Discuss the *Project Performance Metrics Results* at the Final Meeting.

Products:
- TAC Performance Metrics Summary
- Project Performance Metrics Results

IV. TECHNICAL TASKS

TASK 2: CONCEPT EVALUATION AT PROTOTYPING SCALE

The goal of this task is to generate results that demonstrate our platform's capabilities at a cell prototyping scale. A bench-scale EchoStat System will be built at Feasible's facility. A *System Engineering Requirements Report* will be produced listing the System's features and specifications. The System will be setup at an existing cell prototyping facility to collect and analyze acoustic data from batches of battery cells with variations in manufacturing process conditions. The validation of the EchoStat system at a bench-scale will establish system repeatability and reliability and ensure sensitivity to changes in cell fabrication process conditions. Preliminary ML algorithms will be developed in Task 2. The EchoStat system and the algorithms will be used in Task 3 for demonstration of capability at a cell manufacturing pilot line.

The Recipient shall:

- Design and build bench-scale Echostat System and produce a *Draft Echostat System Engineering Requirements Report*. This document will be 3-10 pages, will include graphics and figures, and will have an executive summary that is written for a non-technical audience. The document shall list the System features and specification (e.g. dimensions, weight, cell sizes that can be measured, etc.).
- Incorporate feedback from CAM and submit *Final Echostat System Engineering Requirements Report*. This document will have the final features and specifications of the EchoStat System.
- Develop and execute *Draft Validation Test Plan*, with a clearly defined design-of-experiments and success criteria. This document will be 2-10 pages, will have an executive summary written for a non-technical audience, and will include a list of battery cell manufacturing process conditions that will be tested with EchoStat.
- Incorporate feedback from CAM and submit *Final Validation Test Plan.*
- Prepare a *Critical Project Review (CPR) Report #1* and present progress at the CPR meeting.

Products:

- Echostat System Engineering Requirements Report (Draft/Final)
- Validation Test Plan (Draft/Final)
- CPR Report #1

Exhibit A
Scope of Work
Feasible, Inc.

TASK 3 CAPABILITY DEMONSTRATION OFF-LINE AT PILOT SCALE

The goal of this task is to perform off-line proof-of-concept testing during cell finishing at one or more existing battery manufacturers' battery cell pilot line facilities already in operation. A pilot line is a small-scale battery cell production facility with the ability to produce experimental cells. The *Proof-of-Concept Test Plan* will be produced in collaboration with the cell pilot line, which defines the tasks and expected results to be carried out in a given timeframe. Based on the *System Engineering Requirements Report* and the scope of the *Proof-of-Concept Test Plan*, an *In-house Acceptance Test* will be conducted at Feasible to demonstrate that the EchoStat System meets all the features and specification requirements. The EchoStat system shall then be setup at the pilot line facility, and a *Site Acceptance Test* will be conducted along with the pilot line to ensure that the System meets their site requirements (power ratings, dimensions, system repeatability, etc). EchoStat measurement and ML algorithms generated from Task 2 will be run on the cells produced by the Pilot Line. The results of these experiments will be documented in the *Pilot Line Results Report*.

The Recipient shall:

- Develop *Draft Proof-of-Concept Test Plan* & define success metrics with customers, which are the cell pilot lines. The Proof-of-Concept Test Plan document will be 3-10 pages, will include a table with subtasks and associated milestones, a Gantt chart with expected timelines, and will have an executive summary that is written for a non-technical audience.
- Incorporate feedback from CAM and submit *Final Proof-of-Concept Test Plan.*
- Produce a *Draft In-house Acceptance Test Report*, that documents EchoStat System features and specifications required for the Cell Pilot Line testing, which will be carried out at Feasible's facility. This document will be 2-5 pages and will include a checklist of EchoStat System features as specified in *Echostat System Engineering Requirements Report*, and an executive summary.
- Incorporate feedback from CAM and submit *Final In-house Acceptance Test Report.*
- Commission system at Cell Pilot Line and produce a *Draft Site Acceptance Test Report*. This document will be 2-5 pages and contain an executive summary of procedure and results of system requirements test carried out at the Pilot Line.
- Incorporate feedback from CAM and submit *Final Site Acceptance Test Report*.
- Execute off-line validation tests on Cell Pilot Line.
- Verify data pipeline performance, validate ML-based analytics models, and produce a *Draft Pilot Line Results Report*. This document will be 3-10 pages, will include graphics and figures, and will have an executive summary that is written for a non-technical audience. This report will summarize the results of tests run at the pilot line as outlined in the *Proof-of-Concept Test Plan.*
- Incorporate feedback from CAM and submit *Final Pilot Line Results Report.*
- Prepare a *CPR Report #2* and present progress at the CPR meeting.

Products:

- Proof-of-Concept Test Plan (Draft/Final)
- In-house Acceptance Test Report (Draft/Final)
- Site Acceptance Test Report (Draft/Final)
- Pilot Line Results Report (Draft/Final)
- CPR Report #2

TASK 4 EVALUATION OF PROJECT BENEFITS

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

The Recipient shall:

- Complete the *Initial Project Benefits Questionnaire*. The *Initial Project Benefits Questionnaire* shall be initially completed by the Recipient with the 'Relevant data collection period' set to 'Kickoff' and submitted to the CAM for review and approval.
- Complete the Annual Survey by January 31 of each year. The Annual Survey includes but is not limited to the following information:
    - Technology commercialization progress
    - New media and publications
    - Company growth
    - Follow-on funding and awards received
- Complete the *Final Project Benefits Questionnaire.* The *Final Project Benefits Questionnaire* shall be completed by the Recipient with the 'Relevant data collection period' set to 'Final' and submitted to the CAM for review and approval.
- Respond to CAM questions regarding the questionnaire drafts.
- Recipient Shall:
- Complete and update the project profile on the CEC's public online project and recipient directory at www.energizeinnovation.fund, and provide *Documentation of Project Profile* on *EnergizeInnovation*, including the profile link.
- If the Prime Recipient is an Innovation Partner on the project, complete and update the organizational profile on the CEC's public online project and recipient directory at www.energizeinnovation.fund, and provide *Documentation of Organization Profile* on EnergizeInnovation.fund, including the profile link.

Products:

- Initial Project Benefits Questionnaire
- Annual Surveys
- Final Project Benefits Questionnaire
- Documentation of Project Profile on EnergizeInnovation.fund
- Documentation of Organization Profile on EnergizeInnovation.fund

Exhibit A
Scope of Work
Feasible, Inc.

TASK 5 TECHNOLOGY/KNOWLEDGE TRANSFER ACTIVITIES

The goal of this task is to conduct activities that will accelerate the commercial adoption of the technology being supported under this agreement. Eligible activities include, but are not limited to, the following:

- Scale-up analysis including manufacturing analysis, independent design verification, and process improvement efforts.
- Technology verification testing, or application to a test bed program located in California.
- Legal services or licensing to secure necessary intellectual property to further develop the technology
- Market research, business plan development, and cost-performance modeling.
- Entry into an incubator or accelerator program located in California.

The Recipient Shall:

- Develop and submit a Technology Transfer Plan (Draft/Final) that identifies the proposed activities the recipient will conduct to accelerate the successful commercial adoption of the technology.
- Present the Draft Technology Transfer Plan to the TAC for feedback and comments.
- Develop and submit a Summary of TAC Comments that summarizes comments received from the TAC members on the Draft Technology Transfer Plan. This document will identify:
  - TAC comments the recipient proposes to incorporate into the *Final Technology Transfer Plan*.
  - TAC comments the recipient does not propose to incorporate with and explanation why.
- Submit the *Final Technology Transfer Plan* to the CAM for approval.
- Implement activities identified in *Final Technology Transfer Plan.*
- Develop and submit a *Technology Transfer Summary Report (Draft/Final)* that includes high level summaries of the activities, results, and lessons learned of tasks performed relating to implementing the *Final Technology Transfer Plan*. This report should not include any proprietary information.
- When directed by the CAM, develop presentation materials for an CEC-sponsored conference/workshop(s) on the project.
- When directed by the CAM, participate in annual EPIC symposium(s) sponsored by the CEC.
- 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.

Products:

- Technology Transfer Plan (Draft/Final)
- Summary of TAC Comments

- Technology Transfer Summary Report (Draft/Final)
- High Quality Digital Photographs

V. PROJECT SCHEDULE

Please see the attached Excel spreadsheet.

RESOLUTION NO: 21-0317-5h

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: FEASIBLE, INC.

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, that the CEC approves Agreement EPC-20-020 with Feasible, Inc. for a $1,000,000 grant to support the commercialization of a machine learning driven battery inspection platform called EchoStat. EchoStat uses ultrasound and data analytics to detect manufacturing issues earlier and with more sensitivity. This project aims to reduce battery cell cost and the likelihood of safety incidents from unexpected battery failures; 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 CEC 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 March 17, 2021.

AYE:
NAY:
ABSENT:
ABSTAIN:

_____
Patricia Carlos
Secretariat