STATE OF CALIFORNIA
GRANT REQUEST FORM (GRF)
CEC-270 (Revised 12/2019) CALIFORNIA ENERGY COMMISSION

A) New Agreement # EPC-20-014 (to be completed by CGL office)

B) Division	Agreement Manager:	MS-	Phone
ERDD	Rachel Salazar	51	916-776-0806

C) Recipient's Legal Name	Federal ID Number
Next Energy Technologies, Inc.	27-2894903

D) Title of Project
Rapid Innovation Development of Energy Generating Windows for Zero- and Negative-Carbon Emission Buildings

E) Term and Amount

Start Date	End Date	Amount
4/16/2021	3/31/2025	$ 3,000,000

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 Ferreira Time Needed: 5 minutes

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

Agenda Item Subject and Description:
NEXT ENERGY TECHNOLOGIES, INC. Proposed resolution approving Agreement EPC-20-014 with Next Energy Technologies Inc. for a $3,000,000 grant to scale-up and demonstrate their production manufacturing methods for pilot-sized energy generating windows, and adopting staff's determination that this agreement is exempt from CEQA. The successful demonstration of directly coating the existing technology onto large sheets of heat-treated glass will allow for a more seamless application into the window manufacturing process that leads to much higher margins with low capital cost equipment. (EPIC funding) Contact: Michael Ferreira.

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)

Explain reason why Agreement is exempt under the above section: Section 15301 Existing Facilities provides an exemption for the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing structures, facilities, mechanical equipment, or topographical features involving negligible or no expansion of use beyond that existing. This project will conduct research, development, and manufacturing within already existing facilities with only minor interior alterations through the addition of small-scale fabrication equipment. There will be negligible or no expansion of existing use.

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**
Viracon, Inc.	$ 0 (match only)
Walters & Wolf Glass Company	$ 0 (match only)
GlassFab Tempering Services Inc.	$ 0 (match only)
TBD	$ 0 (match only)
Charles D. Lang	$ 0 (match only)

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**	**$3,000,000**

R&D Program Area: EERO: Buildings TOTAL: $ 3,000,000

Explanation for “Other” selection

Reimbursement Contract #: Federal Agreement #:

K) Recipient's Contact Information

1. Recipient's Administrator/Officer

Name: Bruno Caputo
Address: 600 Ward Dr Ste C
City, State, Zip: Goleta, CA 93111-2300
Phone: 757-553-2140
E-Mail: bruno@nextenergytech.com

2. Recipient's Project Manager

Name: Corey Hoven
Address: 5385 Hollister Ave Ste 115
City, State, Zip: Santa Barbara, CA 93111-2391
Phone: 805 722 0110
E-Mail: corey@nextenergytech.com

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

Agreement Manager **Date**

Office Manager **Date**

Deputy Director **Date**

Exhibit A
Scope of Work
Next Energy Technologies, Inc.

I. TASK ACRONYM/TERM LISTS

A. Task List

Task #	CPR[1]	Task Name
1		General Project Tasks
2	X	Large Area Coating Equipment
3	X	Large Area Coatings
4		Adjustable Width Coatings on Large Areas
5		Large Area Energy Generating Lite Fabrication Equipment
6		Large Area Energy Generating Lite Fabrication
7		Fabrication of Insulated Glass Units and Demo Wall
8		Fabrication of Larger Modules with Commercial Partners
9		Validation and Updating Cost, Market and Benefits.
10		Pilot Production Line
11		Evaluation of Project Benefits
12		Technology/Knowledge Transfer Activities

B. Acronym/Term List

Acronym/Term	Meaning
BIPV	Building Integrated Photovoltaic
CAM	Commission Agreement Manager
CAO	Commission Agreement Officer
CEC	California Energy Commission
CPR	Critical Project Review
GHG	Greenhouse Gasses
IGU	Insulated Glass Unit
IOU	Investor-Owned Utility
LCOE	Levelized Cost of Energy
Lite	Pane of glass
OPV	Organic Photovoltaic
Pilot Size	Commercially relevant sized modules ≥ 14” x 20”
PV	Photovoltaic
TAC	Technical Advisory Committee

[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
Next Energy Technologies, Inc.

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 demonstration of Pilot Sized energy generating windows using all pilot production manufacturing methods.

B. Problem/ Solution Statement

Problem

Buildings account for 41 percent of U.S. energy use, representing the single largest variable operating expense for commercial buildings. A growing number of developers are building to green/sustainability standards, and regulatory regimes are increasingly driving toward net zero energy buildings. Under the California Efficiency Strategic Plan, all new commercial buildings in California are to be designed to zero net energy standards by 2030. In light of these mandates substantial progress has been made making buildings more energy efficient, but the missing link to meeting the goals remains the lack of options for onsite clean energy generation, particularly for commercial buildings. For example, multilevel commercial buildings often don't have enough, or any, free rooftop space for conventional solar panels to offset their energy consumption. This project seeks to address this issue by developing power generating insulated glass units (IGUs) that can be directly installed on the vertical façade of commercial buildings, generating significantly more power than rooftop solar cells.

The Recipient's energy generating windows have demonstrated the feasibility of this technology on a bench scale, however, Pilot Sized energy generating windows still need to be demonstrated for commercialization. In addition, techniques required for pilot production that are not currently employed at a bench scale must be demonstrated. A major issue involves the fact the Recipient uses solution processing to fabricate organic photovoltaic (OPV) modules on glass over a large area at low cost. However, when a commercial window glass substrate is heat treated to improve mechanical strength, the original flat glass is replaced with features such as roller wave distortion, bow, and warp. Therefore, the aesthetics and performance of solution processed OPV modules must be re-optimized for each increase in glass substrate area, to ensure commercial viability of the product.

Solution

This project will demonstrate Pilot Sized energy generating windows using all pilot production manufacturing methods. Techniques that allow easier fit and less disruption of application of this technology into the window market and manufacturing will be demonstrated. For example, rather than printing on display glass and laminating to the outboard Lite of a window, this project will coat directly onto large sheets of heat-treated glass. The solution enables reduced distortions in the glass during the coating process allowing commercial glass to be suitable for precision coatings. Being able to coat directly on the window glass allows the Recipient's current technology to seamlessly integrate into an IGU line and produce a product in line with the window fabrication process leading to much higher margins with low capital cost equipment. The Recipient's approach to scaling up this solution processing method will result in throughput equal to that of an IGU fabrication line while adding significant value potential with its innovative manufacturing solutions.

Exhibit A
Scope of Work
Next Energy Technologies, Inc.

C. Goals and Objectives of the Agreement

Agreement Goals

The goals of this Agreement are to:

- Build a coating tool for the fabrication of organic photovoltaic modules capable of handling commercially fabricated window glass.
- Utilize coating tool to fabricate films with high aesthetic quality suitable for commercial window applications.
- Build necessary equipment to complete a large area coating line.
- Build and install a demonstration wall utilizing modules fabricated on large area coating line.
- Build and test a module with commercially relevant techniques at commercially relevant sizes.

Ratepayer Benefits:[2] This Agreement will result in the ratepayer benefits of greater electricity reliability, lower costs, and increased safety by accelerating the commercialization of energy generating windows. Greater reliability will be achieved by enabling net zero energy building by providing onsite energy generation to buildings. This will allow ratepayers to have reliable energy in self-sustaining buildings even during rolling blackouts and will reduce demand on California's energy grid. This approach also allows for lower cost through much lower module and balance of system costs, compared to other photovoltaic technologies, by utilizing substantial costs that are already being paid for in conventional windows by building owners. This significant innovation will have a profound impact on EPIC goals to lower cost; a levelized cost of energy (LCOE) of $0.03/kWh by 2030. This technological advancement will produce a product that increases safety of California ratepayers by significantly reducing greenhouse gas (GHG) emissions. Commercial buildings are one of the largest contributors of GHG emissions in California and in the world. The technology will address the missing ingredient for zero- and negative emission generation buildings for clean onsite energy generation.

Technological Advancement and Breakthroughs:[3] This Agreement will lead to technological advancement and breakthroughs to overcome barriers to the achievement of the State of California's statutory energy goals by rapid innovation of low-cost energy generating windows. This breakthrough technology converts infrared light into electricity allowing windows to look and function as high performance Low-Emissivity windows, while also generating significant clean energy. The accomplishments of this project will remove some last barriers between current benchtop scale and pilot scale, critical progress towards pilot production and will be a leap towards commercialization and meeting the state's statutory energy goals. The technology will be key part of the solution to decarbonize the electricity sector, expand the use of renewable energy, increase the resiliency of the electric system and cities to the impacts of climate change, and ultimately assist the State of California in meeting its statewide carbon neutrality goal

[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.

(Executive Order B-55-18) and 100 percent carbon-emission free electricity targets by 2045 goals (Senate Bill 100).

Agreement Objectives

The objectives of this Agreement are to:

- Transfer Recipient's optimized, demonstrated benchtop scale processes to large scale process compatible with commercial deployment. Quantitative Milestones for these modules include:
    - Build a glass coating tool that can transport industrial glass for coating at adjustable width levels.
    - Evaluate aesthetics, uniformity, and performance of coated layers from the new large area coater with spectrophotometer to ensure that devices exhibit the necessary levels for commercial viability within ASTM C1376.
    - Demonstrate fabrication of the device stack on glass with varying widths between 14" and 27", to prove ability to provide devices with comparable quality at different sizes.
    - Produce functional window–PV Lites within aesthetic and performance targets.
    - Manufacture IGUs using window-PV Lites with high level of uniformity, consistent with ASTM C1376.
- Integrate modules fabricated using the large-scale processing into IGUs and a demo wall. Quantitative Milestones for these modules include:
    - Consult with building window system manufacturers to fabricate IGUs that pass applicable safety and durability tests.
    - Collaborate with a building window system integrator to fabricate and install a glazing system integrating large area modules with an interactive element.
    - Work with a PV module manufacturer to demonstrate larger area (Pilot Line sized) 40" x 60" modules that are then built into IGUs.
- Validation and updating of cost, market, and benefits. Quantitative Milestones for these modules include:
    - Validate a potential projected LCOE of $0.03/kWh by 2030.
- Plan for upcoming Pilot Production Line
    - Provide competitive advantage.

Exhibit A
Scope of Work
Next Energy Technologies, Inc.

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:

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

Exhibit A
Scope of Work
Next Energy Technologies, Inc.

IV. TECHNICAL TASKS

*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. **Subtask 1.1 (Products)** describes the procedure for submitting products to the CAM.*

TASK 2: LARGE AREA COATING EQUIPMENT

The goal of this task is to build or purchase the tools and equipment needed to fabricate large area solution-processed films that meet appropriate performance metrics for coatings for fenestration and building envelopes. During this task, an initial Test Plan will be shown to set the groundwork on determining a capability requirements of a manufacturing ready coating tool using commercial glass with real-world characteristics.

The Recipient shall:

- Submit a *Test Plan Report* confirming and summarizing a test plan for incoming glass to be coated.
    - Confirm data is obtained on distortions that commonly result from the heat strengthening process to compare to tolerances used in coating.
    - Confirm experimental plan to adjust controls of the modular transport system to reduce substrate imperfections over the entire length and width.
- Build a modular substrate transport system capable of transporting glass of various sizes between 14" x 20" and 40" x 60" to meet commercial precision coating processing requirements.
    - Build a larger version of the prototypes that were proven prior to this agreement and incorporate custom-made controls to precisely transport large glass substrates consistent with high throughput coating of glass in a full-scale production environment.
    - Build substrate system according to finalized drawings of a modular substrate transport system.
    - Build a fixed width coating die capable of coating modules.
    - Purchase an ink delivery system.
    - Confirm that the modular transport system will meet the performance requirements.
- Build a modular coating station to slot-die coat modules, according to the finalized drawings.
- Build a substrate characterization table to sort incoming glass.
- Build a large area dryer, scaling up the existing prototype dryer.
- Integrate a curing station for functional coated films.
    - Purchase and install a curing setup that is in line with the modular coating system.
- Purchase and install buffer stations for module storage between coating steps.
- Purchase and install a large area, high temperature uniformity oven.
- Integrate engineering controls for large area coating tools.
    - Purchase and install an enclosure/exhaust/furnace around the modular coating system.
    - Establish proper communication and functionality between all components of the large area coating tools to ensure safe operation.

- Develop a final *Large Area Tools Integration Report* which will include, but not be limited to the following:
    - Summary of modular substrate transport and modular coating station fabrication and functionality.
    - Confirmation of acceptable tolerances using the substrate characterization table.
    - Summary comparing the Benchtop R&D Coaters (Recipient's existing coaters, one capable of up to 14" by 20" substrates) to the Large Area R&D Coater (equipment from this task) capabilities and improvements.
    - Pictures of the tools developed, once fully assembled, with high level descriptions of their functionality.
    - Summary of what was done, whether the results were as anticipated, and any lessons learned.

Products:

- Test Plan Report
- Large Area Tools Integration Report

TASK 3: LARGE AREA COATINGS

The goal of this task is to fabricate high quality films acceptable for window applications using the equipment and tools developed under Task 2. During this task, films will be coated onto glass substrates and measured for uniformity using a spectrophotometer to characterize transmission and color uniformity.

The Recipient shall:

- Acquire heat treated glass.
- Fabricate and characterize films on 14" x 20" substrates using Large Area R&D Coater (equipment from Task 2) utilizing established formulations developed externally for the Recipient's in-house R&D coating line.
- Fabricate, characterize, and test films and devices on 3.5" x 3.5" substrates and 14" by 20" substrates using Benchtop R&D Coaters to support large area coatings. This work will primarily be with annealed glass rather than heat treated glass since the benchtop equipment is not designed to coat on heat treated glass.
- Compare results of 14" x 20" films from Benchtop R&D Coater to Large Area R&D Coater.
- Fabricate and characterize films on 27" x 35" substrates using the Large Area R&D Coater (equipment from Task 2) utilizing established formulations developed on Recipient's in-house R&D coating line.
- Prepare a *Coating Process Report* that includes, but is not limited to the following:
    - Measure color information at predefined locations and compare to the average value to quantify uniformity within a sample and between samples.
    - Demonstrate high-quality uniform coated layer and full stack by measuring DeltaE2000 within and between samples to be < 4.5 as per ASTM C1376 on samples for each permutation using spectrophotometer.
    - Summary comparing results of 14" x 20" films from Benchtop R&D Coater to Large Area R&D Coater.
    - Summary comparing results of 14" x 20" films and 27" x 35" from the Large Area R&D Coater.

  - Summary of what was done, whether the results were as anticipated, and any lessons learned.
- Prepare a *Coating Progress Report* that compares results from ongoing coating efforts for module fabrication of varying sizes, including, but not limited to the following:
  - Measure color information at predefined locations and compare to the average value to quantify uniformity within a sample and between samples.
  - Provide a high-level summary confirming full stack color, VLT, and haze values for different size formats and ensure that all samples are within specifications.
  - Compare Demonstration of high-quality uniform coated full stack by measuring DeltaE2000 within and between different samples for different size formats to understand challenges encountered when scaling up to larger size formats.
  - Summarize observations to maximize coating quality for different size formats.
  - Summarize what was done, whether the results were as expected, and any lessons learned.

Products:
- Coating Process Report
- Coating Progress Report

TASK 4: ADJUSTABLE WIDTH COATINGS ON LARGE AREAS
The goal of this task is to adapt to the very custom nature of the window industry. During this task, the fixed width coating process will be modified by replacing the slot die in the fabrication process with an adjustable width coating die.

The Recipient shall:
- Fabricate adjustable width die from stainless steel.
  - Adjustable coating widths between 14” and 27”.
  - Install die on coating system.
- Define the test criteria in an adjustable width test plan that includes fabricating, characterize and test films and/or devices.
- Test the die according to the adjustable width test plan and confirm that the adjustable width dye is capable of being adjusted without fully opening the slot die.
- Prepare an *Adjustable Width Coating Summary Report* to include, but not be limited to:
  - Summary of the test plan, what was done, whether the results were as anticipated, and any lessons learned.

Products:
- Adjustable Width Coating Summary Report

TASK 5: LARGE AREA ENERGY GENERATING LITE FABRICATION EQUIPMENT
The goal of this task is to add further appropriate equipment to create a pilot line that is technically relevant to a production line. Installing a larger heating element to a laminator already in use will allow for larger modules to be made. Building and integrating a laser ablation patterning tool would also be completed as previously designed with a system already in house.

The Recipient shall:

- Build a laminator with a larger heating element (up to 27” x 35”).
    - Achieve acceptable lamination with edge seal on large area. (Glass/Glass).
        - Defect size is as per typical industrial incoming glass specification.
    - Achieve acceptable lamination with edge seal on large area. (Module/Glass).
        - Defect size is as per typical industrial incoming glass specification.
        - Defect size is defined by 1/16” max separated ≥ 12".
- Purchase/build laser for patterning and edge deletion.
- Develop and provide a *Laser Build Report* providing a high level summary of:
    - Module with geometric fill factor similar to the current, in-house R&D laser tool.
    - Edge deletion processes.
    - Description of what was done, whether the results were as anticipated, and any lessons learned.
- Build or purchase a bus bar applicator to accommodate large area modules up to 27” x 35”.
- Build or purchase an edge seal applicator to accommodate large area modules up to 27” x 35”.
- Build or purchase a precision interlayer cutting device to accommodate large area modules up to 27” x 35”.
- Build a wet leakage current testing apparatus to accommodate large area modules up to 40” x 60”.
- Provide a *Backend Fabrication Tool Report* summarizing:
    - Lamination build completion.
    - Laser build completion.
    - Bus bar and edge seal applicator completion.
    - Interlayer cutting device completion.
    - Description of what was done, whether the results were as anticipated, and any lessons learned.

Products:

- Laser Build Report
- Backend Fabrication Tool Report

TASK 6: LARGE AREA ENERGY GENERATING LITE FABRICATION

The goal of this task is to fabricate functional modules within aesthetic targets. Utilizing the tools built in Task 2 and Task 5, along with the film fabrication process utilized in Task 4, produce fully functional large area modules to achieve similar performances to R&D scale tools.

The Recipient shall:

- Fabricate 14” x 20” size modules using the new large area R&D coating system.
- Compare results to devices fabricated on large area R&D coating system and demonstrate similar performances as 14” x 20” modules fabricated on the Benchtop R&D Coater.
- Develop a *Transition from Benchtop R&D to Large Area Coating Report* summarizing:
    - Comparison of module size on performance.
    - Comparisons of coater on performance.
    - Description of what was done, whether the results were as anticipated, and any lessons learned.

- Fabricate single junction modules at a larger size (27” x 35”) on the Large Area R&D Coater and utilizing similar parameters as the pilot scale smaller modules (14” x 20”). Demonstrate the performance similar to 14” x 20” modules fabricated on same Large Area R&D Coater.
- Fabricate tandem junction modules at 27” x 35” size on a Large Area R&D Coater utilizing similar parameters as 14” x 20” modules. Demonstrate the performance similar to the 14” x 20” modules fabricated on the same Large Area R&D Coater.
- Develop a *Commercially Scalable Module Summary Report* that includes but is not limited to the following:
    - Confirmation of large area modules.
    - Pictures of fabricated modules.
    - High level description of what was done, whether the results were as anticipated, and any lessons learned.

Products:

- Transition from Benchtop R&D to Large Area Coating Report
- Commercially Scalable Module Summary Report

TASK 7: FABRICATION OF INSULATED GLASS UNITS AND DEMO WALL

The goal of this task is to build a demonstration wall that holds IGUs with the Recipient’s power generating windows capable of powering an interactive element.

The Recipient shall:

- Fabricate IGUs.
- Pass wet leakage current test utilizing [6] functional IGUs based on IEC 61215-2 (2016) section 4.15: “Any device over 0.1m^2 should have an insulative resistance, multiplied by the area of the module, should not be less than 40 MW/m^2 under applied voltage >500V to demonstrate insulation of the solar module against moisture penetration due to environmental conditions”.
- Build and install demo wall with larger area (27” x 35”) modules.
- Prepare a *Demo Wall Report* which:
    - Describes the interactive element demonstrating operation of the demo wall to the end user.
    - Confirms that color information is collected at predefined locations and compare to the average value to quantify uniformity within a sample and between samples, as per guidelines from commercial partners or industry standards.
    - Demonstrates high-quality uniform coated active layer and full stack by measuring DeltaE2000 within and between samples to be < 4.5 as per ASTM C1376 on samples for each permutation using spectrophotometer.
    - Summarizes wet leakage current test results.
    - Displays operational integrated demo wall with photographs detailing final product.
    - Describes what was done, what results were anticipated, and any lessons learned.

Products:

- Demo Wall Report

TASK 8: FABRICATION OF LARGER MODULES WITH COMMERCIAL PARTNERS
The goals of this task are to create larger modules at a size which prove to be commercially relevant for pilot production needs, and to fabricate IGUs.

The Recipient shall:

- Fabricate modules on 40" x 60" industrial heat treated glass.
    - Hand assembled modules will mimic pilot production techniques but will be produced in slower production rates.
- Ship modules to be laminated using commercial lamination with established process.
- Laminate and characterize large area modules to show acceptable levels of uniformity for integration into a commercial window product including:
    - Measure color information at predefined locations and compare to the average value to quantify uniformity within a sample and between samples.
    - Demonstrate high-quality uniform slot-die coated module by measuring DeltaE2000 within and between samples to be < 4.5 as per ASTM C1376 on samples for each permutation using spectrophotometer.
    - Pass wet leakage current test subsequent to installation of junction box.
- Convert laminated modules into IGUs.
- Prepare a *Pilot Size Module Report* that includes a high level description of:
    - Lamination results.
    - Device fabrication summary on larger substrates including aesthetic performance milestones.
    - Description of what was done, whether the results were as anticipated, and any lessons learned.

Products:

- Pilot Size Module Report

Task 9: VALIDATION AND UPDATING COST, MARKET AND BENEFITS
The goal of this task is to validate and update customer and market analysis, cost models, energy and non-energy benefits, other benefits for California Investor-Owned Utility (IOU) ratepayers, and benefits to disadvantaged and low-income communities. This work will demonstrate and build on the Recipient's existing stakeholder engagement efforts including outreach to external partners and collaborators.

The Recipient shall:

- Update the unit level cost model.
- Submit an *Updated Unit Level Cost Model Report* that utilizes a breakdown of the cost components of IGUs containing Recipient's technology on a per square foot basis. The report will summarize high level findings from the model.
- Update the system level cost model.
- Submit a *System Level Cost Model Report* that utilizes the unit level costs and the full balance of system costs for full installation of the BIPV window. The report will:

  - Summarize the system level cost model in the context of a return to building owner model to demonstrate the value proposition to the end user/customer of Recipient's BIPV windows.
  - Summarize a net present value analysis from the building-owner's perspective as well as a simple payback and environmental impact (carbon emissions reduction) calculations and will be based on specific energy production estimates, utility rates, and take into account energy generation along with accelerated depreciation and any available federal investment tax credit.
  - Summarize at a high level what was done, whether the results were as anticipated, and any lessons learned.
- Submit a *Stakeholder Engagement Summary* that summarizes engagement with direct stakeholders (fabricators) as well as end-customers (architects and building owners) and key supply chain partners (glaziers) to validate, gauge stakeholder interest and get feedback on the cost model as well as the identified market, and the developed solution.
- Expand stakeholder outreach efforts to engage partners and communities outside the window and glass value chain who are actively developing product and policy solutions that address California's clean energy goals of accessibility, affordability, equity and resiliency and that provide the highest impact and benefits for the IOU ratepayers and owners and residents of low-income and disadvantaged communities.
  - Engage with solar integrators and battery storage technologies to gauge interest and get feedback on a BIPV+Storage window product.
  - Engage with state energy agencies, housing owner/developers, environmental and housing advocates, and efficiency program implementers and contractors to identify project-specific challenges and opportunities for integrating Recipient's energy harvesting windows into low-income multi-family projects.
  - Provide a high level summary of what was done, whether the results were as anticipated, and any lessons learned.
  - Update ratepayer benefits.
- Prepare a *Ratepayer Benefits Report* that includes, but is not limited to the following:
  - Quantification of the energy benefits (energy savings, PV generation, consumer return on investment) and non-energy benefits (emissions reduction) of Recipient's technology.
  - Description of improvements of calculations based on data collected in previous tasks.
  - Verify that a simple payback of 10 years or less is achievable for an average California commercial building.
  - Summarize the incremental cost of Recipient's BIPV window fully installed compared to a standard commercial window fully installed.
  - Validate a potential projected LCOE of $0.03/kWh by 2030.
  - High level summary of what was done, whether the results were as anticipated, and any lessons learned.

Products:
- Updated Unit Level Cost Model Report
- System Level Cost Model Report
- Stakeholder Engagement Summary
- Ratepayer Benefits Report

TASK 10: PILOT PRODUCTION LINE

The goal of this task is to show a pilot production line based on technological merits from Task 3 is acceptable. During this task, a pilot scale production line concept will be discussed for future scale up of the technology.

The Recipient Shall:

- Using data from internal large area R&D line, characterize pilot production line to prove competitive advantage in an *Integrated Production Line Report* which summarizes:
  - Plan for initial production.
  - Confirm pricing, throughput, yield etc. are acceptable.
  - Confirm updated pricing including materials costs, labor costs, processing costs are acceptable.
  - High level description of what was done, whether the results were as anticipated, and any lessons learned.

Products:

- Integrated Production Line Report

TASK 11: 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.
- Complete and update the project profile on the CEC's public online project and recipient directory on the Energize Innovation website (www.energizeinnovation.fund), and provide *Documentation of Project Profile on EnergizeInnovation.fund*, 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 on the Energize Innovation website (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

TASK 12: 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: 21-0317-5c

STATE OF CALIFORNIA

STATE ENERGY RESOURCES
CONSERVATION AND DEVELOPMENT COMMISSION

RESOLUTION - RE: NEXT ENERGY TECHNOLOGIES, 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-20-014 with Next Energy Technologies Inc. for a $3,000,000 grant to scale-up and demonstrate their production manufacturing methods for pilot-sized energy generating windows. The successful demonstration of directly coating the existing technology onto large sheets of heat-treated glass will allow a more seamless application into the window manufacturing process that leads to much higher margins with low capital cost equipment; 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