Location(s) of Work Documentation

DE-FOA-0002678

Control Number: 2678-1765

Prime Applicant/ Team Member	Address	City	State	Nine Digit Zip Code (ZIP+4)
Group14 Technologies	8502 Maltby Rd	Woodinville	WA	98072-8021
Group14 Technologies	[redacted] (b) (4)	Moses Lake	WA	[redacted]

Instructions and Summary

Award Number: _____ **Date of Submission:** _____

Award Recipient: _____ **Form submitted by:** _____

(May be award recipient or sub-recipient)

Please read the instructions on each worksheet tab before starting. If you have any questions, please ask your EERE contact! Do not modify this template or any cells or formulas!

1. If using this form for award application, negotiation, or budget revision, fill out the blank white cells in workbook tabs a. through j. with total project costs. If using this form for invoice submission, fill out tabs a. through j. with total costs for just the proposed invoice and fill out tab k. per the instructions on that tab.
2. Blue colored cells contain instructions, headers, or summary calculations and should not be modified. Only blank white cells should be populated.
3. Enter detailed support for the project costs identified for each Category line item within each worksheet tab to autopopulate the summary tab.
4. The total budget presented on tabs a. through i. must include both Federal (DOE) and Non-Federal (cost share) portions.
5. All costs incurred by the preparer's sub-recipients, vendors, and Federal Research and Development Centers (FFRDCs), should be entered only in section f. Contractual. All other sections are for the costs of the preparer only.
6. Ensure all entered costs are allowable, allocable, and reasonable in accordance with the administrative requirements prescribed in 2 CFR 200, and the applicable cost principles for each entity type: FAR Part 31 for For-Profit entities; and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.
7. Add rows as needed throughout tabs a. through j. If rows are added, formulas/calculations may need to be adjusted by the preparer. Do not add rows to the Instructions and Summary tab. If your project contains more than five budget periods, consult your EERE contact before adding additional budget period rows or columns.
8. ALL budget period cost categories are rounded to the nearest dollar.

BURDEN DISCLOSURE STATEMENT

Public reporting burden for this collection of information is estimated to average 24 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Office of Information Resources Management Policy, Plans, and Oversight, AD-241-2 - GTN, Paperwork Reduction Project (1910-5162), U.S. Department of Energy 1000 Independence Avenue, S.W., Washington, DC 20585; and to the Office of Management and Budget, Paperwork Reduction Project (1910-5162), Washington, DC 20503.

SUMMARY OF BUDGET CATEGORY COSTS PROPOSED

The values in this summary table are from entries made in subsequent tabs, only blank white cells require data entry

Section A - Budget Summary

	Federal	Cost Share				Total Costs	Cost Share %	Proposed Budget Period Dates
Budget Period 1	$52,888,730	$117,908,429				$170,797,159	69 03%	04/03/2023 - 04/05/2024
Budget Period 2	$47,111,271	$105,028,345				$152,139,616	69 03%	04/06/2024 - 10/06/2025
Budget Period 3	$0	$0				$0	0.00%	
Budget Period 4	$0	$0				$0	0.00%	
Budget Period 5	$0	$0				$0	0.00%	
Total	$100,000,000	$222,936,774				$322,936,774	69 03%	

Section B - Budget Categories

CATEGORY	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total Costs	% of Project	Comments (as needed)
a. Personnel	[redacted]							
b. Fringe Benefits								
c. Travel								
d. Equipment								
e. Supplies								
f. Contractual								
Sub-recipient								
Vendor								
FFRDC								
Total Contractual								
g. Construction	$0	$0	$0	$0	$0	$0	0.00%	
h. Other Direct Costs	$3,158,200	$616,800	$0	$0	$0	$3,775,000	1.17%	
Total Direct Costs	$162,566,768	$142,872,498	$0	$0	$0	$305,439,266	94 58%	
i. Indirect Charges	$8,230,391	$9,267,117	$0	$0	$0	$17,497,508	5.42%	
Total Costs	$170,797,159	$152,139,616	$0	$0	$0	$322,936,774	100 00%	

(b) (4)

Additional Explanation (as needed):

Detailed Budget Justification

a. Personnel

INSTRUCTIONS PLEASE READ!!!

1. List project costs solely for employees of the entity completing this form. All personnel costs for subrecipients and vendors must be included under f. Contractual.
2. All personnel should be identified by position title and not employee name. Enter the amount of time (e.g., hours or % of time) and the base pay rate and the total direct personnel compensation will automatically calculate. Rate basis (e.g., actual salary, labor distribution report, state civil service rates, etc.) must also be identified.
3. If loaded labor rates are utilized, a description of the costs the loaded rate is comprised of must be included in the Additional Explanation section below. DOE must review all components of the loaded labor rate for reasonableness and unallowable costs (e.g. fee or profit).
4. If a position and hours are attributed to multiple employees (e.g. Technician working 4000 hours) the number of employees for that position title must be identified.
5. Each budget period is rounded to the nearest dollar.

SOPO Task #	Position Title	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Project Total Hours	Project Total Dollars	Rate Basis
		Time	Pay	Total	Time	Pay	Total	Time	Pay	Total	Time	Pay	Total	Time	Pay	Total			
	Total Personnel Costs	[redacted]		[redacted]			[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]		[redacted]	[redacted]

(b) (4)

Additional Explanation (as needed)

b. Fringe Benefits

INSTRUCTIONS - PLEASE READ!!!
1. Fill out the table below by position title. If all employees receive the same fringe benefits, you can show "Total Personnel" in the Labor Type column instead of listing out all position titles.
2. The rates and how they are applied should not be averaged to get one fringe cost percentage. Complex calculations should be described/provided in the Additional Explanation section below.
3. The fringe benefit rates should be applied to all positions, regardless of whether those funds will be supported by Federal Share or Recipient Cost Share.
4. Each budget period is rounded to the nearest dollar.

Labor Type	Budget Period 1			Budget Period 2			Budget Period 3			Budget Period 4			Budget Period 5			Total Project
	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	Personnel Costs	Rate	Total	
EXAMPLE!!! Sr. Engineer	$170 000	26%	$44 200	$10 000	20%	$2 000	$10 000	20%	$2 000	$10 000	20%	$2 000	$10 000	20%	$2 000	$48 200
[redacted]																
Total			[redacted]			[redacted]		[redacted]		[redacted]		[redacted]		[redacted]		[redacted]

(b) (4)

A federally approved fringe benefit rate agreement, or a proposed rate supported and agreed upon by DOE for estimating purposes is required at the time of award negotiation if reimbursement for fringe benefits is requested. Please check (X) one of the options below and provide the requested information if not previously submitted.

A fringe benefit rate has been negotiated with, or approved by, a federal government agency. A copy of the latest rate agreement is/was included with the project application.*

There is not a current federally approved rate agreement negotiated and available.**

*Unless the organization has submitted an indirect rate proposal which encompasses the fringe pool of costs, please provide the organization's benefit package and/or a list of the components/elements that comprise the fringe pool and the cost or percentage of each component/element allocated to the labor costs identified in the Budget Justification (Form EERE 335.1).

**When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided in the Sample Rate Proposal at https://www.energy.gov/eere/funding/downloads/sample-indirect-rate-proposal-and-profit-compliance-audit, or a format that provides the same level of information and which will support the rates being proposed for use in the performance of the proposed project.

Additional Explanation (as necessary): Please use this box (or an attachment) to list the elements that comprise your fringe benefits and how they are applied to your base (e.g. Personnel) to arrive at your fringe benefit rate.

[redacted]

e. Supplies

INSTRUCTIONS - PLEASE READ

1. Supplies are generally defined as an item with an acquisition cost of $5,000 or less and a useful life expectancy of less than one year. Supplies are generally consumed during the project performance. Please refer to the applicable Federal regulations in 2 CFR 200 for specific supplies definitions and treatment.
2. List all proposed supplies below, providing a basis of costs (e.g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify the need for the Supplies as they apply to the Statement of Project Objectives. Note that Supply items must be direct costs to the project at this budget category, and not duplicative of supply costs included in the indirect pool that is the basis of the indirect rate applied for this project.
3. Multiple supply items valued at $5,000 or less used to assemble an equipment item with a value greater than $5,000 with a useful life of more than one year should be included on the equipment tab. If supply items and costs are ambiguous in nature, contact your DOE representative for proper categorization.
4. Add rows as needed. If rows are added, formulas/calculations may need to be adjusted by the preparer.
5. Each budget period is rounded to the nearest dollar.

SOPO	General Category of Supplies	Qty	Unit Cost	otal Cost	Basis of Cost	Justification of need
				Budget Period 1		
4,6	**EXAMPLE** Wireless DAS components	10	$360.00	$3,600	Catalog price	For Alpha prototype - Task 2.4
[redacted]						
	Budget Period 1 Total			**$9,286,009**		
				Budget Period 2		
[redacted]						
	Budget Period 2 Total			$2,653,146		
				Budget Period 3		
	Budget Period 3 Total			$0		
				Budget Period 4		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 4 Total			$0		
				Budget Period 5		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 5 Total			$0		
	PROJECT TOTAL			[redacted]		

(b) (4)

Additional Explanation (as needed):

Detailed Budget Justification

c. Travel

INSTRUCTIONS PLEASE READ!!!
1. Identify Foreign and Domestic Travel as separate items. Examples of Purpose of Travel are subrecipient site visits, DOE meetings, project mgmt. meetings, etc. Examples of Basis for Estimating Costs are past trips, travel quotes, GSA rates, etc.
2. All listed travel must be necessary for performance of the Statement of Project Objectives.
3. Only travel that is directly associated with this award should be included as a direct travel cost to the award.
4. Federal travel regulations are contained within the applicable cost principles for all entity types.
5. Travel costs should remain consistent with travel costs incurred by an organization during normal business operations as a result of the organizations written travel policy. In absence of a written travel policy, organizations must follow the regulations prescribed by the General Services Administration.
6. Columns E, F, G, H, I, J, and K are per trip.
7. The number of days is inclusive of day of departure and day of return.
8. Recipients should enter City and State (or City and Country for International trave) in the Depart from and Destination fields.
9. Each budget period is rounded to the nearest dollar.

SOPO Task #	Purpose of Travel	Depart From	Destination	No. of Days	No. of Travelers	Lodging per Traveler	Flight per Traveler	Vehicle per Traveler	Per Diem Per Traveler	Cost per Trip	Basis for Estimating Costs
	Domestic Travel				**Budget Period 1**						
1	EXAMPLE!!! Visit to PV manufacturer			2	2	$250	$500	$100	$160	$2,020	Current GSA rates
[redacted]											
		Total								$13,196	
					Budget Period 2						
[redacted]											
	International Travel										
										$0	
										$0	
										$0	
										$0	
	Budget Period 2 Total									[redacted]	
	Domestic Travel				**Budget Period 3**						
										$0	
										$0	
										$0	
										$0	
	International Travel										
										$0	
										$0	
										$0	
										$0	
	Budget Period 3 Total									$0	
	Domestic Travel				**Budget Period 4**						
										$0	
										$0	
										$0	
										$0	
	International Travel										
										$0	
	Budget Period 4 Total									$0	
	Domestic Travel				**Budget Period 5**						
										$0	
										$0	
										$0	
										$0	
	International Travel										
										$0	
	Budget Period 5 Total									$0	
	PROJECT TOTAL									[redacted]	

Additional Explanation (as needed)

(b) (4)

d. Equipment

INSTRUCTIONS - PLEASE READ!!!
1. Equipment is generally defined as an item with an acquisition cost greater than $5,000 and a useful life expectancy of more than one year. Please refer to the applicable Federal regulations in 2 CFR 200 for specific equipment definitions and treatment.
2. List all equipment below, providing a basis of cost (e.g. vendor quotes, catalog prices, prior invoices, etc.). Briefly justify items as hey apply to the Statement of Project Objectives. If it is existing equipment, provide logical support for the estimated value shown.
3. During award nego iations, provide a vendor quote for all equipment items over $50,000 in price. If the vendor quote is not an exact price match, provide an explanation in the additional explanation section below. If a vendor quote is not practical, such as for a piece of equipment that is purpose-built, first of its kind, or otherwise not available off the shelf, provide a detailed engineering estimate for how the cost estimate was derived.
4. Each budget period is rounded to the nearest dollar.

SOPO	Equipment Item	Qty	nit Cost	tal Cost	Basis of Cost	Justification of need
				Budget Period 1		
3,4,5	**EXAMPLE!!!** Thermal shock chamber	2	$70,000	$140,000	Vendor Quote - Attached	Reliability testing of PV modules- Task 4.3
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 1 Total			$0		
				Budget Period 2		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 2 Total			$0		
				Budget Period 3		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 3 Total			$0		
				Budget Period 4		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 4 Total			$0		
				Budget Period 5		
				$0		
				$0		
				$0		
				$0		
				$0		
				$0		
	Budget Period 5 Total			$0		
	PROJECT TOTAL			**$0**		

Additional Explanation (as needed):

f. Contractual

INSTRUCTIONS - PLEASE READ!!!

1. The entity completing his form must provide all costs related to sub-recipients, vendors, and FFRDC partners in he applicable boxes below.

2. Sub-recipients (partners, sub-awardees): Subrecipients shall submit a Budget Justification describing all project costs and calculations when their total proposed budget exceeds either (1) $250 000 or (2) 25% of total award costs. These sub-recipient forms may be completed by either the sub-recipients themselves or by the preparer of his form. The budget totals on he sub-recipient's forms must match he sub-recipient entries below. A subrecipient is a legal entity to which a subaward is made, who has performance measured against whether he objectives of the Federal program are met, is responsible for programmatic decision making, must adhere to applicable Federal program compliance requirements, and uses the Federal funds to carry out a program of the organization. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.

3. Vendors (including contractors): List all vendors and contractors supplying commercial supplies or services used to support the project. For each Vendor cost wi h total project costs of $250,000 or more, a Vendor quote must be provided. A vendor is a legal entity contracted to provide goods and services within normal business operations, provides similar goods or services to many different purchasers, operates in a competitive environment, provides goods or services that are ancillary to the operation of the Federal program, and is not subject to compliance requirements of the Federal program. All characteristics may not be present and judgment must be used to determine subrecipient vs. vendor status.

4. Federal Funded Research and Development Centers (FFRDCs): FFRDCs must submit a signed Field Work Proposal during award application. The award recipient may allow the FFRDC to provide this informa ion directly to DOE, however project costs must also be provided below.

5. Each budget period is rounded to the nearest dollar.

SOPO	Sub-Recipient	Purpose and Basis of Cost	Budget	Budget	Budget	Budget	Budget	Project
2,4	EXAMPLE!!! XYZ Corp.	Partner to develop op imal lens for Gen 2 product. Cost estimate based on	$48,000	$32,000	$16,000	$8,000	$4,000	$108,000
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
								$0
		Sub-total	$0	$0	$0	$0	$0	$0

SOPO Task #	Vendor Name/Organization	Purpose and Basis of Cost	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Project Total
6	EXAMPLE!!! ABC Corp.	Vendor for developing robotics to perform lens inspection. Estimate provided by	$0	$32,900	$86,500	$0	$0	$119,400
[redacted]								
2,11		Sub-total	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

SOPO	FFRDC	Purpose and Basis of Cost	Budget	Budget	Budget	Budget	Budget	Project
								$0
								$0
								$0
								$0
		Sub-total	$0	$0	$0	$0	$0	$0

	Total Contractual		[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

Additional Explanation (as needed): Vendor quotes and cost justifica ions attached & uploaded with Letters of Commitment

g. Construction

PLEASE READ
1. Construction, for the purpose of budgeting, is defined as all types of work done on a particular building, including erecting, altering, or remodeling. Construction conducted by the award recipient is entered on this page. Any construction work that is performed by a vendor or subrecipient should be entered under f. Contractual.
2. List all proposed construction below, providing a basis of cost such as engineering estimates, prior construction, etc., and briefly justify its need as it applies to the Statement of Project Objectives.
3. Each budget period is rounded to the nearest dollar.

Overall description of construction activities **Example Only - Build wind turbine platform**

SOPO	General Description	Cost	Basis of Cost	Justification of need
	Budget Period 1			
3	EXAMPLE ONLY!!! Three days of excavation for platform site	$28,000	Engineering estimate	Site must be prepared for construction of platform.
	Budget Period 1 Total	$0		
	Budget Period 2			
	Budget Period 2 Total	$0		
	Budget Period 3			
	Budget Period 3 Total	$0		
	Budget Period 4			
	Budget Period 4 Total	$0		
	Budget Period 5			
	Budget Period 5 Total	$0		
	PROJECT TOTAL	**$0**		

Additional Explanation (as needed):

h. Other Direct Costs

INSTRUCTIONS - PLEASE READ

1. Other direct costs are direct cost items required for the project which do not fit clearly into other categories. These direct costs must not be included in the indirect costs (for which the indirect rate is being applied for this project). Examples are: tuition, printing costs, etc. which can be directly charged to the project and are not duplicated in indirect costs (overhead costs).

2. Basis of cost are items such as vendor quotes, prior purchases of similar or like items, published price list, etc.

3. Each budget period is rounded to the nearest dollar.

SOPO	General Description and SOPO Task #	Cost	Basis of Cost	Justification of need
			Budget Period 1	
5	**EXAMPLE** Grad student tuition - tasks 1-3	$16,000	Established UCD costs	Support of graduate students working on project
[redacted]				
	Budget Period 1 Total	$3,158,200		
			Budget Period 2	
[redacted]				
	Budget Period 2 Total	$616,800		
			Budget Period 3	
	Budget Period 3 Total	$0		
			Budget Period 4	
	Budget Period 4 Total	$0		
			Budget Period 5	
	Budget Period 5 Total	$0		
	PROJECT TOTAL	[redacted]		

Additional Explanation (as needed):

i. Indirect Costs

INSTRUCTIONS - PLEASE READ

1. Fill out the table below to indicate how your indirect costs are calculated. Use the box below to provide additional explanation regarding your indirect rate calculation.
2. The rates and how they are applied should not be averaged to get one indirect cost percentage. Complex calculations or rates that do not do not correspond to the below categories should be described/provided in the Additional Explanation section below. If questions exist, consult with your DOE contact before filling out this section.
3. The indirect rate should be applied to both the Federal Share and Recipient Cost Share.
4. Each budget period is rounded to the nearest dollar.

	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	Total	Explanation of BASE
Provide ONLY Applicable Rates							
[redacted]							
Total indirect costs requested	$8,230,391	$9,267,117	$0	$0	$0	$17,497,508	

(b) (4)

A federally approved indirect rate agreement, or rate proposed (supported and agreed upon by DOE for estimating purposes) is required if reimbursement of indirect costs is requested. Please check (X) one of the options below and provide the requested information if it has not already been provided as requested, or has changed.

An indirect rate has been approved or negotiated with a federal government agency. A copy of the latest rate agreement is included with this application, and will be provided electronically to the Contracting Officer for this project.

There is not a current, federally approved rate agreement negotiated and available*.

***When this option is checked, the entity preparing this form shall submit an indirect rate proposal in the format provided by your DOE contact, or a format that provides the same level of information and which will support the rates being proposed for use in performance of the proposed project. Additionally, any non-Federal entity that has never received a negotiated indirect cost rate, except for those non-Federal entities described in Appendix VII to Part 200—States and Local Government and Indian Tribe Indirect Cost Proposals, paragraph D.1.b, may elect to charge a de minimis rate of 10% of modified total direct costs (MTDC) which may be used indefinitely.As described in §200.403 Factors affecting allowability of costs, costs must be consistently charged as either indirect or direct costs, but may not be double charged or inconsistently charged as both. If chosen, this methodology once elected must be used consistently for all Federal awards until such time as a non-Federal entity chooses to negotiate for a rate, which the non-Federal entity may apply to do at any time.**

You must provide an explanation (below or in a separate attachment) and show how your indirect cost rate was applied to this budget in order to come up with the indirect costs shown.

[redacted]

Cost Share

PLEASE READ!!!

1. A detailed presentation of the cash or cash value of all cost share proposed must be provided in the table below. All items in the chart below must be identified within the applicable cost category tabs a. through i. in addition to the detailed presentation of the cash or cash value of all cost share proposed provided in the table below. Identify the source organization & amount of each cost share item proposed in the award.

2. Cash Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) for costs incurred and paid for during the project. This includes when an organization pays for personnel, supplies, equipment, etc. for their own company with organizational resources. If the item or service is reimbursed for, it is cash cost share. All cost share items must be necessary to the performance of the project. **Vendors may not provide cost share.** Any partial donation of goods or services is considered a discount and is not allowable.

3. In Kind Cost Share - encompasses all contributions to the project made by the recipient, subrecipient, or third party (an entity that does not have a role in performing the scope of work) where a value of the contribution can be readily determined, verified and justified but where no actual cash is transacted in securing the good or service comprising the contribution. In Kind cost share items include volunteer personnel hours, the donation of space or use of equipment, etc. The cash value and calculations thereof for all In Kind cost share items must be justified and explained in the Cost Share Item section below. All cost share items must be necessary to the performance of the project. If questions exist, consult your DOE contact before filling out In Kind cost share in this section. Vendors may not provide cost share. Any partial donation of goods or services is considered a discount and is not allowable.

4. Funds from other Federal sources MAY NOT be counted as cost share. This prohibition includes FFRDC sub-recipients. Non-Federal sources include any source not originally derived from Federal funds. Cost sharing commitment letters from subrecipients and third parties must be provided with the original application.

5. Fee or profit, including foregone fee or profit, **are not allowable** as project costs (including cost share) under any resulting award. The project may only incur those costs that are allowable and allocable to the project (including cost share) as determined in accordance with the applicable cost principles prescribed in FAR Part 31 for For-Profit entities and 2 CFR Part 200 Subpart E - Cost Principles for all other non-federal entities.

6. NOTE: A Recipient who elects to employ the 10% de minimis Indirect Cost rate **cannot claim the resulting indirect costs as a Cost Share contribution.**

7. NOTE: A Recipient **cannot claim "unrecovered indirect costs"** as a Cost Share contribution, **without prior approval.**

8. Each budget period is rounded to the nearest dollar.

Recipient Provided Cost	Organization/Source	Type (Cash or In	Cost Share Item	Budget	Budget	Budget	Budget	Budget	Total
[redacted]									
Grand Total Cost Share All Sources (Recipients)			Totals	$117,908,429	$105,028,345	$0	$0	$0	$222,936,774
			Cost Share Percentage per Budget Period	60.3%	59.4%	0.0%	0.0%	0.0%	

(b) (4)

Total Project Cost: $322,936,774

Cost Share Percent of Award: 69.0%

Additional Explanation (as needed):

Applicant Name: _____ Award Number: _____

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity	Catalog of Federal Domestic Assistance Number	Estimated Unobligated Funds		New or Revised Budget			
		Federal	Non-Federal	Federal	Non-Federal		Total
(a)	(b)	(c)	(d)	(e)	(f)		(g)
1. Budget Period 1				$52,888,730	$117,908,429		$170,797,159
2. Budget Period 2				$47,111,271	$105,028,345		$152,139,616
3. Budget Period 3				$0	$0		$0
4. Budget Period 4				$0	$0		$0
5. Budget Period 5				$0	$0		$0
6. Totals				$100,000,000	$222,936,774		$322,936,775

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity					Total (5)
	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	
a. Personnel	[redacted]					
b. Fringe Benefits						
c. Travel						
d. Equipment						
e. Supplies						
f. Contractual						
g. Construction						
h. Other	$3,158,200	$616,800	$0	$0	$0	$3,775,000
i. Total Direct Charges (sum of 6a-6h)	$162,566,768	$142,872,498	$0	$0	$0	$305,439,266
j. Indirect Charges	$8,230,391	$9,267,117	$0	$0	$0	$17,497,508
k. **Totals** (sum of 6i-6j)	$170,797,159	$152,139,616	$0	$0	$0	$322,936,774
7. Program Income						$0

(b) (4)

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Applicant Name: _____ Award Number: _____

Budget Information - Non Construction Programs

OMB Approval No. 0348-0044

Section A - Budget Summary

Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget			
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)		Total (g)
1. Budget Period 1				$52,888,730	$117,908,429		$170,797,159
2. Budget Period 2				$47,111,271	$105,028,345		$152,139,616
3. Budget Period 3				$0	$0		$0
4. Budget Period 4				$0	$0		$0
5. Budget Period 5				$0	$0		$0
6. Totals				$100,000,000	$222,936,774		$322,936,775

Section B - Budget Categories

6. Object Class Categories	Grant Program, Function or Activity					Total (5)
	Budget Period 1	Budget Period 2	Budget Period 3	Budget Period 4	Budget Period 5	
a. Personnel	[redacted]					
b. Fringe Benefits						
c. Travel						
d. Equipment						
e. Supplies						
f. Contractual						
g. Construction						
h. Other	$3,158,200	$616,800	$0	$0	$0	$3,775,000
i. Total Direct Charges (sum of 6a-6h)	$162,566,768	$142,872,498	$0	$0	$0	$305,439,266
j. Indirect Charges	$8,230,391	$9,267,117	$0	$0	$0	$17,497,508
k. **Totals** (sum of 6i-6j)	$170,797,159	$152,139,616	$0	$0	$0	$322,936,774
7. Program Income						$0

(b) (4)

SF-424A (Rev. 4-92)
Prescribed by OMB Circular A-102

Previous Edition Usable

Authorized for Local Reproduction

Data Management Plan (DMP)

I. Summary of data generation activities

Data generated during the course of the proposed project will pertain to validation and quality control of three key steps in the product development chain listed below:

(b) (4)

II. Data handling and management systems

In order for Group14 to maintain full control over Factory Operations, Improve Production Visibility, and Drive Quality, Group14 will be using [redacted]

[redacted] will be used to manage schedules, control supply chains and monitor material inventory levels while incorporating oversight of the enterprise-level assets, such as staffing levels and financial resources.

[redacted] will be used to manage and preserve the associated batch data via Electronic Batch Records (EBR), batch deviations, standard operating procedures (SOPs), training and competency records, quality control data, electrochemical performance data, process line data, and batch disposition. Quality critical data collected in the EBR will be integrated into the [redacted]. These data will be critical when identifying optimum process parameters for manufacturing repeatability, as well as providing a record of quality control assurance. Materials manufacturing process information will be collected and preserved in [redacted]

[redacted] system incorporates automatic In-Line data integrity checks, built-in calculations and real-time training enforcement to ensure that critical processes are always complete and compliant. For example, SOPs that are controlled within the document module will be digitally integrated into the EBR to ensure that operators always use the correct versions and launch deviations directly from the record to ensure in-line quality assurance. Manual processes and routine procedures will be enforced via data-driven prompts to hand-enter data directly into the EBR. Electronically generated data derived from specific process equipment PLCs will also be linked into the EBR as well.

Quality will be embedded into every process across the entire development life cycle of SCC55. Limits, controls, and thresholds within the EBR, for example, will help to automatically assess risk and launch quality events directly from the production line without slowing production. Analytics and in-process dashboards provide real-time operational visibility and optimization.

III. Data Preservation and Sharing

Data as it specifically pertains to the deliverables outlined in this proposal will be collected, maintained, and stored within [redacted] in real time. Both systems can only be accessed by authorized personnel using multi-factor authentication. Where applicable, data collected, maintained, and stored by Group14 will be made available to appropriate Group14 employees, shareholders, and DOE personnel upon request. Any written and/or digital data collected, maintained, and stored by Group14 will be marked "Confidential" for correspondence between Group14 and third parties; typically, such an instance requires a mutual non-disclosure and/or materials transfer agreement between both parties.

IV. **Data Dissemination:**

Group14 holds patents (granted and pending) regarding SCC55 composition of matter and manufacturing process and notes that certain intellectual property is held in the form of trade secrets. With respect to the findings and deliverables under the award, Group14 generally does not plan to make the underlying research data publicly available for up to 5 years since such data will be considered protected under the award. Such information will be shared with, and thus validated by, DOE personnel who will have access to the research data upon request and at need to advance the current project.

Other than providing deliverables as specified in the award, Group14 Technologies does not intend to publish the results from the project. However, if such an opportunity arises for a publication that includes results of the project, the underlying research data will be made available according to the policies of the publishing media. Where no such policy exists, Group14 Technologies will indicate on the publication a means for requesting and digitally obtaining the underlying research data. This includes the research data necessary to validate any results, conclusions, charts, figures, or images in the publications. In any case, all published data arising from this project will be made available to the public in accordance with the DOE Public Access Plan; specifically, all published data arising from this project will be made available through the Public Access Gateway for Energy and Science (PAGES).

In closing, it is important to note that Group14 was previously funded by a DOE EERE VTO grant to scale SCC-55 manufacturing from the lab to the lab-pilot scale. That project was successfully completed, evidence that Group14 is capable of adhering to a data management plan in accordance with the requirements of the EERE Policy on Digital Data Management.

NETL F 451.1-1/6
Revised: 11/1/2010
Reviewed: 12/9/2014
(Previous Editions Obsolete)

U.S. DEPARTMENT OF ENERGY

PREPARATION OF ENVIRONMENTAL VOLUME

I. GENERAL

This volume shall be submitted with the original proposal and must be found acceptable prior to contract negotiations and award. The Environmental Volume shall provide, in detail, all information as outlined in the following sections.

II. CONTENT

A. ENVIRONMENTAL INFORMATION DESCRIBING THE PROJECT AND THE PROJECT SITE(S).

This section of the Environmental Volume shall contain a detailed, self-contained description that summarizes the proposed action, its alternatives, and, most importantly, the existing environment. It shall be prepared in the following format:

1. Summary

[redacted]

(b) (4)

The proposed project will result in the engineering design, procurement, construction and operation of two 2000 tonne/year silicon anode production facilities. The facility will have typical environmental, health and safety concerns of construction of a manufacturing facility. [redacted]. There will be a positive impact on the socioeconomic assessment of the area due to the number of high paying jobs created in the surrounding region. The construction phase will last approximately one year and the facility will phase into full production over a 6 month commissioning and start up period.

2. Proposed Project and Its Alternatives

a. Proposed Project

The proposed project will result in two module structures being scontruced and operated adjacent to already planned modules, support facilities, and administrative facilities.

The proposed project will result in the engineering design, procurement, construction and operation of two 2000 tonne/year silicon anode production facilities. The facility will have typical environmental, health and safety concerns of construction of a manufacturing facility. [redacted]. There will be a positive impact on the socioeconomic assessment of the area due to the number of high paying jobs created in the surrounding region. The construction phase will last approximately one year and the facility will phase into full production over a 6 month commissioning and start up period.

DOE F 540
(04-2017)

OMB Number 1910-5175
Exp. 11/30/2020

OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY

ENVIRONMENTAL QUESTIONNAIRE

SECTION I. PROJECT SUMMARY	
Control Number:	2678-1765
Project Title:	Commercia Manufacturing of a Stab e Si icon Anode Materia towards Fostering a Strong U S Battery Supp y Chain
Applicant:	Group14 Technologies, Inc
[redacted]	[redacted] (b) (4)
FOA Number:	DE-FOA-0002678
FOA Title: Bipartisan Infrastructure Law (BIL) Battery Materials Processing and Battery Manufacturing .	

SECTION II. BACKGROUND AND INSTRUCTIONS

Pursuant to the U.S. Department of Energy's National Environmental Policy Act (NEPA) implementing regulations (10 C.F.R. Part 1021), the Office of Energy Efficiency and Renewable Energy (EERE) is required to evaluate the potential environmental impact of projects that it is considering for funding. EERE must determine at the earliest possible time whether any proposed project qualifies for a categorical exclusion under 10 C.F.R.§ 1021.410 or will require further environmental review within an environmental assessment or an environmental impact statement.

You are required to answer the questions below for the project as a whole, including all work to be performed by the Recipient, its subrecipients and contractors, including any work outside of the United States. You may not limit your responses to work performed by the Recipient only unless instructed to do so by EERE. In completing this questionnaire, you must provide specific information regarding the nature of your proposed project, including information on its size, operations, and the types and quantities of air emissions, wastewater discharges, solid wastes, land disturbances, etc. You should identify the location(s) of the proposed project and describe the activities that would occur at each location.

The form should be completed and signed by the Principal Investigator for the project or another member of your organization who has sufficient knowledge of the project to answer the questions truthfully and accurately.

Failure to fully and adequately complete this form will delay EERE's environmental review of your proposed project. Please note that false statements or misrepresentations may result in civil and/or criminal penalties under 18 U.S.C. § 1001.

BURDEN DISCLOSURE STATEMENT
Public reporting burden for this collection of information is estimated to average 60 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Office of Information Resources Management Policy, Plans, and Oversight, AD-241-2-GTN, Paperwork Reduction Project (1910-1800), U.S. Department of Energy, 1000 Independence Avenue S.W., Washington, D.C. 20585; and to the Office of Management and Budget (OMB), Paperwork Reduction Project (1910-1800), Washington, D.C. 20503.

SECTION III. PROJECT EVALUATION

1a. In the box below, please provide a brief summary of the proposed project activities. Describe physical activities, not goals and objectives. Specify if this project is part of a larger project or connected to another project.

Example: The proposed project activities include the design, development, fabrication, and field testing of advanced biomass harvesting equipment. Design, development, and fabrication activities would occur at our research and development facility adjacent to our manufacturing plant in Dearborn, Michigan. Equipment testing would occur in various agricultural fields in the surrounding area over a two-year period.

Explanation:

The proposed project will result in the engineering design, procurement, construction and operation of two 2000 tonne/year silicon anode production facilities. The project will require the construction of two process module buildings at a larger facility planned and in development by Group14 Technologies. The site is currently undeveloped. By the time the two modules proposed are constructed a small campus of administration building, support structures and two modules will be constructed. However, the project will build out the campus on undisturbed land. All supporting utilities will be installed already and the proposed project would include connection of the utilities to the new modules

1b. Is there other Federal government involvement outside of EERE in any aspect of this project (e.g., funding, permitting, technical assistance, project located on Federally administered land)?

Yes ☒ | **No** ☐

If you checked "Yes," please list the agency, describe the nature of its involvement, and provide a point of contact at the agency, if known.

Explanation:

There are two potential permits issued by the Federal government that will be fully evaluated for applicablity during the permitting stage of the project. It is not clear if one or both will be required and will required coordination with the Federal Agencies to reach that conclusion.

Section 10 of the Endangered Species Act requires private, non-federal entities undertaking otherwise lawful projects that could result in the take of endangered species to obtain an incidental take permit issued by the United States Department of Fish and Wildlife. An initial environmental assessment performed by a third party contractor at the proposed location did not find any evidence of federally listed endangered species in the vicinity. A full assessment will be required for the project and it's future activities, but at the moment it is not certain this permit will be triggered.
The Federal Aviation Adminstration issues Notice of Proposed Construction or Alteration permits for projects that have the ppotential to construct or alter airspace either vertically or horizontally near an airport. Their is an airport within approximatley 2 miles of the proposes site and the potential exists this permit will need to be obtained.

1c. Is the proposed project limited exclusively to intellectual, academic, or analytical activities?

Intellectual, academic, and analytical activities include, but are not limited to:

- Literature searches and information gathering
- Data analysis
- Computer modeling
- Analytical reviews
- Conceptual design
- Feasibility studies
- Document preparation
- Data dissemination
- Paper studies

You must answer "No" to this question if the proposed project involves any laboratory research and/or development, physical experiments, pilot-scale projects, demonstration projects, field tests, land-disturbance, construction, or similar activities.

Yes ☐ | **No** ☒

If you checked "Yes," proceed directly to Section IV (Certification) and complete the information and signatures as requested. If you checkned "NO" you must complete the entire questionnaire.

Explanation:

If you checked "Yes," proceed directly to Section IV (Certification) and complete the information and signatures as requested. If you checked "No," you must complete the entire questionnaire.

2a. Is the project fully defined at this point (i.e., all sites and activities are known)?

Yes ☒ | **No** ☐

If you checked "No," please describe those sites and/or activities/tasks that are yet to be defined and complete the remainder of the questionnaire to the best of your knowledge.

Explanation:

2b. In the chart below, please describe the following four types of identifying information concerning project activities to be performed:

(1) each location where work would be performed, including address or coordinates, names of facilities, and whether this is a Recipient, Subrecipient, or Contractor location;
(2) the nature of the location (e.g., urban, industrial, suburban, agricultural, university campus, manufacturing facility) and the current condition and/or use of the site;
(3) the types of activities to be conducted at that location;
(4) land administration (e.g., BLM, USFWS, DOD, state, private).

(1) *List all Locations Where Project Activities Would Occur (Facility Name and Address or Coordinates) and Indicate Recipient, Subrecipient, or Contractor*	*(2)* *Nature of Location and Current Condition/Use*	*(3)* *Activities to be Performed at Each Location*	*(4)* *Land Administration*
[redacted]	Currently undeveloped. Historically agricultural.	Activities at the project site would include construction and operation of the proposed facility.	Private
[redacted] (b) (4)	Engineering design and some project management tasks will take place at this facility	Engineering design and some project management tasks will take place at this facility	Private
[redacted]	[redacted]	[redacted]	Private
[redacted]	[redacted]	Contracted engineering and procurement design	Private
Example 1: Smith Laboratory (recipient) 1234 College Lane Baltimore, MD XYZ Corporation (subrecipient) 1232 Industrial Drive Golden, CO	Smith Laboratory – Dedicated University Laboratory Facility XYZ Corporation – Manufacturing Facility in Industrial Park	Activities would include design and fabrication of a gallium-nitrate battery at XYZ Corporation's battery manufacturing facility using existing equipment. The battery would then undergo testing including battery charge/discharge cycling at Smith Laboratory. Data analysis would also occur at Smith Laboratory.	Smith Laboratory – State property XYZ Corporation – Private property
Example 2: Capital High School (recipient) 1234 Eagle Lane Golden, CO	High school property in a suburban environment that has been previously disturbed and is owned by the City.	Activities would include the installation of a 50 kW wind turbine adjacent to the football stadium. The final height for the turbine would not exceed 140 feet (hub height) or 170.6 feet (maximum blade height) with a blade radius of 31.5 feet. There is an airport 15 miles away from project site location.	City

2c. In the box below, please identify and describe: (1) any known or potential health and safety hazards to the public or project workers that may result from or are associated with your proposed project; and (2) any efforts that would be taken to mitigate these hazards. <u>Describe individually for each site discussed in Question 2b.</u>

Example (Hazards): The project would involve the use and handling of various hazardous materials, including metals and industrial solvents. All such handling would occur in-lab, and our organization is dedicated to proper hazardous material handling and disposal practices, so the project activities that involve these materials would pose no risk to the public. All hazardous materials would be managed in accordance with Federal, state, and local environmental regulations.

Example (Mitigation): Existing corporate health and safety policies and procedures would be followed, including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. Additional policies and procedures would be implemented as necessary as new health and safety risks are identified. This would help ensure compliance with applicable health and safety regulations, and minimize health and safety risks to employees and the public.

Explanation:

Group14 Project Site:

The construction of the proposed facility will have typical hazards associated with construction activities Group14 Technologies employs Environmental Health and Safety professionals to assure that all contractors have safety plans that meet the Group14 Technologies requirements along with all applicable local state and federal requirements

The production facility will use silane a pyrophoric gas Hydrogen a flammable gas is also required for production of silane The proposed facility would fall under the requirements 29 CFR 1910 110 (Process Safety Management of Highly Hazardous Chemicals) and 40 CFR 68 (Chemical Accident Prevention Programs) Safety in operation begins with taking these programs the operational knowledge of Group14 Technologies staff who have decades of experience in silane production and best engineering practices to assure the design is as safe as possible n addition Group14 Technologies employs Health Safety and Environmental professionals with experience in silane operations These experienced professionals will develop the systems and safety requirements to safely handle chemicals including but not limited to FR Gear full chemical goggles leather gloves escape air packs or re breathers and safety shoes The engineering staff will not only design with safety in mind they will incorporate safety systems and response systems to minimize any potential impact should an accidental release occur This includes using the PHA process to identify engineering hazards designing redundant safety instrumented systems into the control systems utilizing plant wide alarm systems to notify staff of danger and installing fire water monitors to create curtains to contain any release

The office sites listed will have typical hazardous associated with office work All sites will follow best practices in office place safety

2d. In the box below, please identify and describe any of the following that would be associated with the proposed project. <u>Describe individually for each site discussed in Question 2b.</u>

(1) any physical modification of existing facilities or construction of new facilities (this does NOT include modification to equipment, only facilities);
(2) ground disturbing activities;
(3) any change in the use, mission, or operation of existing facilities;
(4) installation or deployment of equipment outdoors including the area of disturbance, what currently exists at the site, the dimensions of the installation, any associated infrastructure, etc.

Example 1: Physical modification of existing facilities and ground disturbing activities -To accommodate testing facilities necessary for the project, the current testing facility would have to be expanded by approximately 4,500 square feet.

Example 2: Change in use of existing facility - A room within our facility that has served as a dedicated wind tunnel would be modified to serve as an environmental test chamber. This would require the adaptation of the chamber's construction to partition off part of the room and seal it to allow generated environmental fluctuations within.

Example 3: Installation of equipment outdoors and ground disturbing activities - The proposed turbine location is on school property located in a previously disturbed area south of the existing school building and near the high school athletic facilities and fields. East of the school are two golf courses; south and north are single family residential neighborhoods; and to the west are two public park properties. There are wooded areas located on the school property to the south and west. The foundation of the wind turbine would be approximately 25 square feet with an additional 5 square feet of disturbance during construction. The foundation would be approximately 10-15 feet in depth. There would be a minor, temporary land disturbance adjacent to the proposed site for crane work and the tower staging area. Existing roads would be used to access the project location.

Explanation:

[redacted] [redacted]

[redacted]

2e. In the box below, please identify and describe any existing, modifications to, or new permits, licenses, or authorizations that would be required to perform project activities (such as environmental permits, operating permits, or drilling permits). <u>Describe individually for each site discussed in Question 2b.</u>

Example 1: The project would generate small amounts of effluent waste which will be discharged into the Potomac River, requiring our organization to secure the requisite discharge permit pursuant to state and Federal regulations.

Example 2: The project activities would be conducted for the next three years. We would be required to replace our current solid waste disposal permit with an updated permit that may alter the nature of what and how we are permitted to dispose of solid waste.

Example 3: The project activities would take place in marine navigable waters and would require permits from the U.S. Coast Guard and the U.S. Army Corps of Engineers.

Explanation:

(b) (4)

2f. In the box below, please list the estimated quantities of materials to be used (e.g., feedstock, chemicals, water) and produced by the project (e.g., biofuel). Describe individually for each site discussed in Question 2b.

Explanation:

2g. In the box below, please quantify, to the extent possible, all emissions into the ambient air resulting from project activities. Indicate if the project site is within an attainment or non-attainment area. Describe air emissions individually for each site discussed in Question 2b.

Note: Potential emissions include, but are not limited to, greenhouse gas emissions, particulate matter, and airborne pollutants. Sources of emissions can include stationary sources, such as boilers, process heaters, generators, and/or solvent usage, or mobile sources such as vehicles. It is presumed that every project would result in some emissions being released into the ambient air, so applicants answering "none" must explain why no emissions would be released. Non-attainment areas are designated parts of the country where air pollution levels persistently exceed the national ambient air quality standards. See 42 U.S.C. 7501(2).

Explanation:

2h. In the box below, please describe: (1) all non-hazardous wastes that would be generated by the proposed project including recycled materials, and (2) the method of their disposal. Describe individually for each site discussed in Question 2b.

Note: It is presumed that every project would generate solid wastes, so applicants answering "none" must explain why no waste would be generated. Non-hazardous waste is any garbage, refuse or trash, sludge from a wastewater treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semi-solid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities. See 40 C.F.R. § 261.2.

Explanation:

(b) (4)

3. Is the proposed project near, or does it involve, any of the following resources? Please indicate below any and all resources that could be affected by any project activities. (See Attachment 1 to the Environmental Questionnaire for resource definitions.)

- ☒ a. Historical, archeological, or cultural resources (includes listed and eligible resources over 50 years old or of cultural significance)
- ☐ b. Threatened or endangered species (whether proposed or listed by state or Federal governments), including their habitat
- ☐ c. Marine mammals or essential fish habitat
- ☐ d. Floodplains or wetlands
- ☐ e. Tribal lands or resources of Tribal interest/sensitivity
- ☐ f. Ocean resources (e.g., coral reefs)
- ☐ g. Land resources (e.g., tundra, rainforests)
- ☐ h. Coastal zones
- ☐ i. Migratory birds, or Golden or Bald Eagles
- ☐ j. Areas having a special designation (e.g., Federal and state designated wilderness areas, national parks, national natural landmarks, wild and scenic rivers, state and Federal wildlife refuges, and marine sanctuaries)
- ☐ k. Prime farmland, unique farmland, or other farmland of statewide or local importance
- ☐ l. Special sources of water (e.g., sole source aquifers)

If you checked any boxes above, provide a detailed description of: (1) the resources that could be affected, and (2) how project activities may affect those resources.

Explanation:

[redacted]

(b) (4)

4. **Does the proposed project involve any of the following activities or areas of concern? Please indicate below any and all activities or areas of concern that exist in the vicinity of your project, are required for your project, or could affect your project.** (See Attachment 1 for definitions of each activity or area of concern.)

- ☒ a. Clearing or excavation
- ☐ b. Dredge and/or fill
- ☐ c. Pre-existing contamination
- ☐ d. Pesticide use
- ☐ e. Asbestos or lead-based paint
- ☐ f. Polychlorinated biphenyls (PCBs)
- ☒ g. Navigable air space
- ☐ h. Underground storage tanks
- ☐ i. Underground extraction/injection
- ☐ j. Use of a non-renewable resource

If you checked any boxes above, provide a detailed description of: (1) each activity or area of concern, and (2) the effects of each activity or area of concern on your project and/or the surrounding area.

Explanation:

[redacted]

5. Would the proposed project have the potential to result in impacts to the surrounding community? Please indicate below all areas of concern that exist in the vicinity of your project, are required for your project, or could affect your project.

- [x] a. Visual impacts
- [ ] b. Populations of low income or minorities (Environmental Justice)
- [x] c. Changes in local employment
- [ ] d. Changes in local traffic patterns or density
- [ ] e. New transportation access
- [ ] f. New utility lines or right-of-ways
- [ ] g. Other impacts

If you checked any boxes above, please provide a detailed description of: (1) the communities affected, and (2) what effects the project would have.

Explanation:

[redacted]

(b) (4)

6. Would the proposed project use, result in, or require the management, storage, transport, or disposal of radioactive, toxic, or hazardous chemicals, waste, or other materials that require special handling?

Note: Hazardous chemicals and materials include those which, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may increase the risk of mortality or pose a substantial threat to human health or the environment when improperly stored, transported, disposed of, or otherwise managed.

Yes ☒ | **No** ☐

If you checked "Yes," please provide a detailed description of: (1) the materials; (2) approximate quantity of each; (3) their role in the project; and (4) storage, transport, and disposal procedures for each material.

Explanation:

[redacted]

(b) (4)

7. Would the proposed project involve the use or development of recombinant DNA or genetically engineered microorganisms, plants, animals, or similar technologies?

Yes ☐ | **No** ■

If you checked "Yes," please provide a detailed description of: (1) the genetic modifications, (2) the safety procedures in place for their handling and use over the course of the project, and (3) how they would be disposed of at the project's conclusion.

Explanation:

8. Does the project involve the use of any nanoscale materials or nanotechnology?

Note: Nanotechnology is defined as research and technology development at the atomic, molecular, or macromolecular levels using a length scale of approximately one to one hundred nanometers in any dimension; the creation and use of structures, devices and systems that have novel properties and functions because of their small size; or the ability to control or manipulate matter on an atomic scale.

Yes ☐ | **No** ☒

If you checked "Yes," please describe: (1) the nanoscale materials used, (2) potential risks those materials may pose, and (3) how they would be disposed of.

Explanation:

9. Is there any public opposition concerning any of the project activities?

Yes ☐ | **No** ☒

If you checked "Yes," please describe the nature of the opposition and any actions you may have taken or plan to take to address it.

Explanation:

10. Would the project involve activities or deployments into marine/freshwater aquatic environments?

Yes ☐ | **No** ■

If you checked "Yes," please provide a detailed description of: (1) the proposed activities or deployment, (2) where and when these activities would occur, and (3) what permit/authorizations have been or would be acquired for this activity.

Explanation:

11. Would the proposed project result in a discharge of any type of wastewater, pollutant, or contaminant, including thermal discharges, to a sewer system, stormwater system, soils, retention ponds, or any water resources (e.g., surface water, including lakes, rivers, creeks, and wetlands; and ground water)?

Note: Under Federal law, the term "pollutant" means dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water. See 33 U.S.C. § 1362(6). The term "contaminant" means any physical, chemical, biological, or radiological substance or matter in water. See 42 U.S.C. § 300f(6).

Yes ■ | **No** ☐

If you checked "Yes", please quantify and characterize the wastewater or pollutants and provide a detailed description of the: (1) wastewater, pollutants, or contaminants to be released; and (2) the water resources that may be affected.

Explanation:

[redacted]

(b) (4)

12. Would the proposed project have the potential to generate noise impacts to adjacent communities, employees working at the project site, wildlife, and/or sensitive receptors including hospitals, schools, daycare facilities, and elderly housing?

Yes ☐ | **No** ☒

If you checked "Yes", please provide a description of: (1) the receptors that may be impacted and their estimated distance from the project activities, (2) the level of noise generated (in A-weighted decibels (dbA)) to each receptor, and (3) anticipated duration.

Explanation:

The short-term noise associated with the proposed project includes noise from construction equipment and activities. Most of the construction is expected to occur during daytime hours only with minor activities occurring during the night inside the module process buildings, if needed. There will be a variety of construction equipment and activities used throughout the construction process. This could include dozers, loaders, backhoes, and trucks used during site preparation. Construction activities and equipment will vary in time and location throughout the project site, and once the structures are erected, construction activities will continue inside those structures. Temporary construction noise is exempt from volume limits during daytime hours (i.e., between 7 am and 10 pm) (WAC 173-60-050). Because noise from the project is not expected to exceed the levels specified in WAC 173-60-040 and MLMC 8.28 (during the day or night), no mitigation is required.

13. Please provide a detailed description of how the project would be decommissioned, including the disposition of equipment and materials.

Explanation: The proposed project will continue operation beyond the period of commissioning and startup in order to support the continued supply of silicon dominant anodes.

SECTION IV. CERTIFICATION

I hereby certify that I am authorized to submit, and I do so hereby submit, the information in this questionnaire on behalf of the Recipient named below. I certify that the information provided herein is accurate and complete as of the date shown below. I understand that false statements or misrepresentations may result in civil and/or criminal penalties under 18 U.S.C. § 1001. If I receive any information that would indicate that any of the above-referenced answers are no longer correct or complete, I agree to notify EERE immediately. If it is necessary for EERE to modify the information I provide, EERE will request that I recertify the revised form.

Name	Henry R. Costantino, Ph. D.
Title	CTO
Applicant	Group14 Technologies, Inc
Signature	Henry R Costantino
Date	6/30/2022

EERE ENVIRONMENTAL QUESTIONNAIRE
ATTACHMENT 1

Definitions for Question 3 –Resources*

Historical, Archeological, or Cultural Resources. The National Historic Preservation Act; the Historic Sites, Buildings and Antiquities Act; the American Indian Religious Freedom Act; and the Archeological Recovery Act provide for the preservation of sites, buildings, structures, or objects of historic, archeological, or architectural significance designated by Indian, Federal, state, or local governments or listed or eligible for listing on the National Register of Historic Places. The Archeological Resources Protection Act, Antiquities Act, and Native American Graves Protection and Repatriation Act also apply if the proposed project is on Federal and tribal land. This item should be checked "yes" if a proposed project is in an area that meets any of the above, or if an archeological survey has not been performed. Provide documentation of any consultation or State Historic Preservation Officer determination letters if available. If this information is not available or a survey has not been conducted recently, DOE may require such a survey to be conducted prior to any proposed project implementation.

Threatened/Endangered (T/E) Species and/or Critical Habitat. The Endangered Species Act provides for protection of animals, birds, fish, plants, and other living organisms that are in danger of extinction. A list of T/E species is provided in 50 C.F.R. Part 17. Consultations with the U.S. Department of Interior Fish and Wildlife Service (FWS), National Marine Fisheries Services (NMFS), and the corresponding state agency should be documented. This item should be checked "yes" if any state- or Federally-listed or proposed threatened or endangered species or critical habitat is located in the proposed project area, or could be indirectly affected by the proposed project. If the status of T/E species at the proposed project location is unknown, please contact the local or state office of the FWS or NMFS to obtain a listing of potential species and habitats found in the area.

Floodplains. Floodplains are lowlands adjoining inland and coastal waters with a 1 percent or greater chance of inundation in any given year. Indicate "yes" if the proposed project location is in or adjacent to a floodplain area. If documentation is available noting the floodplain boundaries, please provide a copy. Appropriate documentation of the 100 year floodplain [or 500 year floodplain for critical actions**] boundaries include: Flood Insurance Rate Maps or Flood Hazard Boundary Maps prepared by the Federal Emergency Management Agency (FEMA) of the U.S. Department of Homeland Security. Executive Order 11988 Floodplain Management requires Federal agencies to avoid incompatible development in floodplains, and consider the conformance of the proposed project to floodplain standards, potential effects of the proposed projects on floodplains, and potential effects of floodplain modifications on other local properties and improvements.

** Critical actions as defined in the Implementing Guidelines to Executive Order 11988 are activities for which chance of flooding is too great.

Wetlands. Wetlands are areas inundated by surface or groundwater with a frequency sufficient to support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction, [10 C.F.R. 1022.4]. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflow, mudflats, and natural ponds. Man-made ponds can qualify as wetlands if invasion of appropriate flora or fauna has occurred. Appropriate documentation of presence or absence of wetlands within the area of project effect includes: FWS National Wetlands Inventory; U.S. Department of Agriculture Soil Conservation Service Local Identification Maps; U.S. Geological Service (USGS) Local Identification Maps; USGS Topographic Maps; state wetland inventories; and regional or local government sponsored wetland and land use inventories. Executive Order 11990 Protection of Wetlands requires Federal agencies to consider the effects of proposed projects on wetlands, and to avoid, to the extent possible, destruction and modification of wetlands. If the status of land in or around the proposed project location is unknown, please contact the state or local U.S. Army Corps of Engineer's office.

Coastal Zones. Coastal zones are the coastal waters and adjacent shore lands of the Great Lakes, and the Atlantic, Pacific, and Arctic Oceans, Gulf of Mexico, and Long Island Sound. The term "coastal state" includes the states bordering on those bodies, plus Puerto Rico, the Virgin Islands, Guam, the Commonwealth of Northern Mariana Islands, and the Trust Territories of the Pacific Islands and American Samoa. Coastal states have authority regarding actions, which directly affect coastal zones, in accordance with the Department of Commerce regulations promulgated under the Coastal Zone Management Act. Federal activities and Federal development projects must be consistent with state coastal zone management (CZM) programs to the maximum extent possible. Federal activities are those performed by or on behalf of a Federal agency in the exercise of its statutory responsibilities. Indicate "yes" if the proposed project is located in a coastal zone State or is in the vicinity of a coastal zone State. If a consistency determination has been obtained, or a written "negative determination" (indicating that a consistency determination is not required) please provide a copy. See 15 C.F.R. 930.

Migratory Birds, Golden or Bald Eagles. Other Federal and state laws that protect wildlife species include the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. Examples of protected migratory birds include Canadian geese and great blue herons. This item should be checked "yes" if the proposed project may directly or indirectly impact any of these species or their habitats. If the status of other protected species is unknown in the proposed project location, please contact the local or state office of the FWS to obtain a listing of potential species and habitats found in the area.

Areas Having a Special Designation. Various Federal laws restrict the ability of Federal agencies to aid developments affecting national wilderness areas, national memorial parks, national parks, national monuments, national primitive areas, national preserves, national recreational areas, national wild and scenic rivers, national grasslands, national wildlife refuges, national forests, national lakeshore or seashore, and national trails. Indicate "yes" if any of these areas of special environmental or natural significance is located in close proximity to the proposed project location and describe the specific special designation.

Prime Farmland, Unique Farmland, or Other Farmland of Statewide or Local Importance. The Farmland Protection Policy Act requires Federal agencies to consider ways to lessen the effects of proposed projects that convert or adversely affect prime farmland which is not currently classified or designated for future urban development or water storage. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor, and without intolerable soil erosion. Prime farmland also includes land that possesses the above characteristics, but is being used currently to produce livestock and timber. Prime farmland does not include lands designated for future urban development, such as land that has been identified for commercial, industrial, or residential development by zoning code, ordinance, or a comprehensive land use plan [7 U.S.C. 4201(c)(1)]. The U.S. Department of Agriculture Natural Resource Conservation Service (NRCS) field office serving the area can provide assistance in determining whether a proposed location or site meets the definition of prime farmland. Form AD 1006, the Farmland Conversion Impact Rating Form, available at NRCS offices, should be used for this purpose.

Special Sources of Water. Through the Safe Drinking Water Act, EPA and states designate Critical Aquifer Protection Areas and Sole or Principal Source Aquifers, and State-Designated Wellhead Protection Areas in accordance with 42 U.S.C. 300h-6(b), 42 U.S.C. 300h-3(e), and 42 U.S.C. 300h-7(e), respectively. Such areas are accorded special protection to assure the quality and availability of public water supplies. Indicate "yes" if the proposed project is located in an area designated for protection (e.g., is included in an area wide groundwater quality protection plan), or would constitute a potential source of contamination within an existing or expected wellhead protection area serving a public water supply. If aquifer designations are not known for the proposed project area, contact the environmental protection office for the State.

* Definitions and requirements are subject to regulatory changes.

Definitions for Question 4 – Activities or Areas of Concern*

Clearing or Excavation. Clearing or excavation refers to the removal of vegetation, soil, sediments, or disturbance of land surfaces and subsurface including cutting, burning, digging, grading, filling, or blasting. Provide the estimated area to be affected, the quantity of material to be added or removed, and the planned disposition of spoils. Describe the potential for runoff or erosion, any control techniques to be employed, and the distance to nearby surface water bodies, including wetlands.

Dredge and/or Fill. Dredge and/or fill are the excavation of material from waters of the United States. Filling is the discharge of material into waters of the United States to change the bottom elevation. Waters of the United States are all interstate waters, and intrastate lakes, rivers, streams, mudflats, wetlands, sloughs, plays, or natural ponds. These activities include "ocean dumping" as regulated under Sections 102 and 103 of the Clean Water Act, construction of dams, dikes, piers, or others that could alter the course of waters of the United States. Also included is any shore activity with the potential for runoff to waters of the United States. If available, include documentation of appropriate consultation(s), e.g., with the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act or Sections 9 and 10 of the Rivers and Harbors Act; and with EPA [40 C.F.R. Parts 220-233].

Pre-Existing Contamination. Indicate if the proposed project will disturb hazardous substances, pollutants, contaminants, or Comprehensive Environmental Response and Liability Act (CERCLA)-excluded petroleum and natural gas products that pre-exist in the environment. Quantify and characterize such pre-existing substances, including whether they are present above background or regulatory levels. Also quantify the volume of contaminated materials (e.g. soil, sediment, groundwater, debris, etc.) which would require transport to a properly permitted treatment, storage, or disposal facility as the result of the proposed project.

Pesticide Use. A pesticide is a substance intended for preventing, destroying, repelling, or mitigating any type of pest including insects, rodent, nematode, fungus, or weed, and any substance intended for use as a plant regulator, defoliant, or desiccant. While the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) imposes no requirements on private applicators, commercial pesticide applicators must be certified by the state or U.S. EPA. Additionally, FIFRA requires that certain pesticides known as “restricted use pesticides” (listed in 40 C.F.R. 152.175) to only be applied by certified applicators. If either commercial or private pesticide application or the utilization of restricted use pesticides is anticipated, indicate "yes". If a private application is anticipated, document measures to be undertaken to assure safe storage, use, and disposal.

Asbestos. If the proposed project includes demolition or renovation of an existing building, you must determine if asbestos is present. Common asbestos-containing building materials may include but are not limited to floor tile, mastics, wall board, joint compound, acoustic ceiling tiles, thermal insulation, spray-on fire proofing, glazing, caulking, roof flashing, and felts. Demolition and renovation activities that may impact asbestos containing building materials are regulated by the U.S. Occupational Health and Safety Administration (OSHA) through the Asbestos in Construction Standard and asbestos air emissions from asbestos abatements are regulated by the EPA as a hazardous air pollutant under the Clean Air Act (CAA). Include a description of measures to be undertaken to comply with asbestos removal requirements of 29 C.F.R. 1926.1100 and 40 C.F.R. 61 (Subpart M).

Polychlorinated Biphenyls (PCBs). PCBs are a family of man-made organic chemicals that were domestically manufactured from 1929 until banned in 1979 due to their toxicity and persistence in the environment. Given their non-flammability, chemical stability, high boiling point, and electrical insulating properties, PCBs were largely used as dielectric and coolant fluids in transformers, capacitors, electric motors, etc. Manufacture, processing, transport, use, marking, storage, and disposal of PCBs are regulated by EPA [40 C.F.R. Part 761] in accordance with the Toxic Substances Control Act. Some states also regulate PCBs as hazardous waste. If the proposed project involves replacement or removal of capacitors, transformers, voltage regulators, circuit breakers, switches, cables, electromagnets, or other electrical equipment, presence or absence of PCBs should be ascertained. A "yes" indication

should be supported with information on the anticipated concentration and quantity of PCB oil, and the intended method/location of disposal.

Navigable Air Space. The U.S. Department of Transportation Federal Aviation Administration (FAA) regulates objects which invade navigable air space or otherwise constitute an obstruction to air navigation, and determines whether such activities constitute a navigation hazard. Indicate "yes" if the proposed project involves construction or alteration more than 200 feet above ground level, any construction or alteration in instrument approach areas, and other construction or alteration identified in 14 C.F.R. 77.13. Document notification of the appropriate Manager, Air Traffic Division, of the FAA Regional Office for the area within which the construction or alteration will be located. Copies of FAA Form 7460-1 Notice of Proposed Construction or Alteration may be obtained from the regional FAA office or electronically through FAA's website.

Underground Storage Tanks. Indicate "yes" if 10 percent or more of tank volume (including the volume of underground pipes) will be beneath surface of the ground. Indicate if installation, use, or removal of underground storage tanks is anticipated, and whether tank use is/was for storage/collection of hazardous waste, heating oil, other petroleum or petroleum-based substances, stormwater, or wastewater. Describe any leak detection/monitoring methods to be used for storage of hazardous waste or regulated petroleum products like gasoline or diesel.

Underground Extraction/Injection. Underground extraction/injection is the subsurface emplacement of fluids through a bored, drilled, or driven well, or through a dug well where the depth of the well is greater than the largest surface dimension. If the proposed project involves construction or use of an injection well, indicate "yes," and describe the class of the well as defined in 40 C.F.R. 146.5, the type and quantity of contaminants (e.g., waste disposal, hydrocarbon or mineral extraction) and whether the injection involves an exempt aquifer as defined in 40 C.F.R. 146.4.

Use of a Non-Renewable Resource. Non-renewable resources are naturally occurring substances (e.g., metals, minerals, fossil fuels) that are in limited supply and cannot be replaced or regenerated. The exhaustion or threatened exhaustion of such resources could have significant ramifications. Indicate "yes" if the proposed project would involve a resource that is in limited supply.

* Definitions and requirements are subject to regulatory changes.

EQUITY PLAN

Group14 embraces the project requirement for an Equity Plan, which reflects our shared vision of fostering equal opportunity across the full spectrum of cultures and people that shape and define our local communities. The principles of the Equity Plan are part of Group14's corporate philosophy: sustainable community economic development and prosperity, community worker engagement, job quality, diversity, equity, inclusion, accessibility, and investments in clean energy to benefit disadvantaged communities.

Group14 was spun out of a company whose technology was originally developed at the University of Washington, where it continues to engage in local initiatives and internships. Out of its current Woodinville, WA headquarters Group14 continues its support of the local community. For example, Group14 has provided donations to support locally owned businesses whose operations were under severe economic pressure during the height of the coronavirus pandemic. Group14's investment in climate solutions and clean energy technology is rooted in workplace practices that incentivize transparency and provide equal opportunity for employees of diverse backgrounds and experiences. As Group14's workforce and production expand, it is committed to doing the work that benefits underrepresented groups. ***Regardless of the outcome of this proposal's review, Group14 commits to this Equity Plan.***

Group14 Equity Planning Board

Governance of Group14's Equity Plan is the responsibility of the Company's Equity Planning Board (EPB). This board is chaired by the Group14's CEO, with the other participants selected from various leadership roles in the Company representing various facets of the Equity Plan (**Table 1**). The Equity Planning Board is a company-wide initiative, but the below details apply to the Moses Lake, WA facilities related to the proposed project.

Table 1. Group14 Equity Planning Board (EPB) Key Members and Focus Areas.

Focus Area	Person
Chairperson	CEO
Community Outreach	Communications Coordinator
Job Quality and Skilled Workforce	Director of Recruitment
Workplace Safety and Health	EHS Manager
Diversity, Equity, Inclusion & Accessibility	Director of DEIA
Justice40 Initiative	CFO

Community Engagement

The proposed Moses Lake, WA facility represents an opportunity to become an anchor of not only varied jobs and individual prosperity, but also of economic transformation for the community and City of Moses Lake. From the initiation of the Moses Lake facilities project, Group14 and its project partners have centered community benefit and engagement at each stage of project development.

Community Engagement Philosophy

Group14 believes every project is best when the people shaped by it are at its center. That's why we put people first in the planning process to create more connected, equitable, and sustainable communities. Our approach is rooted in the International Association for Public Participation (IAP2) Spectrum of Public participation[1] as shown in **Figure 1.**

SPECTRUM OF PARTICIPATION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.
EXAMPLE TECHNIQUES	- Fact sheets - Web sites - Open houses	• Public comment • Focus groups • Surveys • Public meetings	• Workshops • Deliberative polling	• Citizen advisory commitees • Consensus building • Participatory desicion-making	• Citizen juries • Ballots • Delegated desicion

Adopted from the International Association for Public Participation, Canada. © Group14, 2022.

Figure 1. Spectrum of Participation adapted by Group14 based on IAP2.[1]

[1] https://cdn.ymaws.com/www.iap2.org/resource/resmgr/pillars/Spectrum_8.5x11_Print.pdf

The IAP2 engagement process centers on promises made to the public, transparent communication around those promises, and empowerment of those affected by the project to shape its outcomes. Marginalized populations, seniors, young professionals, families, youth, people with disabilities, tribal members, and other disadvantaged populations all have specific needs, and our communication strategy will be tailored to achieve the highest level of impact and value to these community members.

Group14 overcomes barriers to community participation by constantly innovating to make engagement more accessible, inclusive, and equitable. This effort draws on well-established principles adapted to each project environment.[2] Together, we commit to investment in understanding the historical, social, and cultural context of the local community so that the community not only recognizes but leverages its own voice in everything our team will create.

Group14 expands public access to projects by translating complicated, technical concepts into clear information, bringing them to life online, in print, and in person. Our strategic partnership with vendors provides Group14 access to a creative team to collaborate on project brand development for channels including web development and social media, with skilled resources specializing in brand design, copywriting, and Public Relations ensuring the best communications experts in each field contribute to the equitable focus of this project.

Identification and Engagement with Local Stakeholders

We have identified and engaged with *more than 20 community-based organizations* in the vicinity of Moses Lake representing local stakeholders (see Table 2). Dating back to 2019, Group14 has been regularly engaged with many of these community groups.

Table 2. Community Stakeholders and method of engagement.

Stakeholder		Point of Contact & Title	Area of Engagement	Method of Engagement
Tribal Nations	Confederated Tribes and Bands of the Yakama Nation	Kate Valdez, Tribal Historic Preservation Officer	Strategic Relationship Building Initiative, scholarship programs, internship program, CCLP, Environmental review, cultural resource assessment, Community Benefits Agreement, DEIA and recruitment	Project advisory council (PAC) meetings, project webpage, briefings, reports
	Confederate Tribes of the Colville Reservation	Guy Moura, Tribal Historic Preservation Officer		
	Spokane Tribe of Indians	Randy Abrahamson, Tribal Historic Preservation Officer		

[2] N. Armos, "Beyond Inclusion: Equity in Public Engagement: a Guide for Practitioners," SFU Morris J. Wosk Centre for Dialogue, 2020.

Stakeholder		Point of Contact & Title	Area of Engagement	Method of Engagement
Local Government	Moses Lake City Council	Dean Hawkins, David Eck, Mark Fancher, Judy Madewell, Deanna Martinez, Don Myers, and Dustin Swartz	Environmental reviews, community outreach, future permits, project schedule, and Community Benefits Agreement	PAC meetings, project webpage, briefings, and reports
	Grant County Economic Development Council	Brant Mayo, Executive Director	Strategic Relationship Building Initiative, Project schedule, Community Benefits Agreement, and community engagement coordination	PAC meetings, project webpage, briefings, reports, Economic Development Council Round Table Luncheon
Labor Unions & Worker Organizations	Workforce Alliance	Stela Heuschkel, President	Strategic Relationship Building Initiative, employee recruitment initiatives, internship	Email updates, open houses, project webpage, and meetings
	Grant County Industrial Alliance	Chuck Sutton, President	Strategic Relationship Building Initiative, collaboration with local service and supply vendors and industry-supported community initiatives	PAC Meetings, briefings, email updates, project webpage, and meetings
	Columbia Basin Job Corps	Susan Mann, Liaison Specialist	Strategic Relationship Building Initiative, scholarship programs, educational program development, CCLP, and recruitment of employees from underserved communities	Youth Advisory Council, email updates, project webpage, and meetings
	Career Connected Learning	Cari Horning, CCL Specialist	Scholarships and educational program development, and recruitment of employees from underserved communities	
Community-based Organizations	Boys & Girls Club of the Columbia Basin	Kim Pope, Executive Director	Scholarship programs, internship programs, educational program development	Youth Advisory Council, email updates, project webpage
	Moses Lake Rotary Club	Dr. Terry Leas, President	CCLP, Scholarship programs, educational program development	
	Moses Lake Senior Center	Marilyn Stewart, General Manager	CCLP, Engagement in community initiatives and volunteer programs	
Local Schools	Moses Lake School District	Monty Sabin, President	CCLP, Scholarship and internship programs, educational program development, and recruitment of employees from underserved communities	PAC Meetings, Youth Advisory Council, email updates, project webpage
	Columbia Basin Technical School	Christine Armstrong, Director	CCLP, Scholarship and internship programs, educational program development, recruitment and	Youth Advisory Council, email updates, project webpage

Stakeholder		Point of Contact & Title	Area of Engagement	Method of Engagement
			career-focused learning	
	Big Bend Community College	Dr. Sara Thompson Tweedy, President	CCLP, Scholarship programs, educational program development, recruitment	
Local Businesses & Events	Big Bend Career Fair	Daneen Berry-Guerin	Scholarship programs, internship programs, educational program development, recruitment	
	Moses Lake Chamber Business Expo	Debbie Doran-Martinez	Strategic Relationship Building Initiative, collaboration with local service and supply vendors and industry-supported community initiatives	PAC Meetings, briefings, email updates, project webpage, and meetings
	Grant County Fair	Jim McKiernan	Collaboration with local service and supply vendors, industry-supported community initiatives, Investment in community events	Briefings, email updates, project webpage, meetings, and public events

Creation of Key Engagement Councils

Community engagement is a key element to project success. Community outreach events will be facilitated throughout the duration of the project to gather qualitative input regarding community vision, needs, opportunities, and priorities. These efforts will focus on collaborating with every facet of the community to ensure equity is prioritized, inform the development of the project, and provide project transparency so that the community becomes an active participant in the decision-making process. Our team of facilitators empowers everyone to feel heard, guaranteeing that no single viewpoint is given disproportionate focus, and creates the space for innovative suggestions to be made when conflict arises.

The focus for these community engagement efforts will be to foster interactions with seniors, young professionals, families, youth, tribal members and marginalized populations to achieve the greatest possible overall community benefit. Group14 proposes to engage the local community by establishing two Community Engagement Groups, listed below:

- **Project Advisory Council (PAC)**: Group14 will work with local stakeholders to form a Project Advisory Council. This council will be comprised of City staff, tribal leaders, community group representatives, Group14 employees, union leadership, and other key stakeholders identified above with the purpose to discuss and address concerns of key stakeholder groups in the local community. The PAC will meet quarterly leading up to, throughout and after the project's completion to provide qualitative input on relevant community topics & feedback. Group14 will collaborate with local officials and community leaders regarding their opportunities and challenges to meaningfully engage with underrepresented and disadvantaged members of the community.
- **Youth Advisory Council (YAC)**: Group14 will work with local stakeholders to form a Youth Advisory Council. This council will be comprised of the Moses Lake school district, the Columbia Basin Technical School, community college leadership and local youth

organizations, such as the Boys & Girls Club of the Columbia Basin, to identify participants for a Youth Advisory Council. Efforts to engage local youth will also be coordinated with the statewide Career Connected Learning Initiative[3] to provide experiential learning opportunities to help students identify careers in technology, manufacturing and industry. Group14 will work with this Council quarterly throughout the project to not only generate feedback but also collaboratively develop creative Science, Technology, Engineering, Math (STEM) programming. This council will continue after the completion of the project.

Equitable Public Engagement Process

Our goal is to amplify the voices of the community. The best way to build community consensus is to engage the public early and often, helping people get to know each other, foster understanding, and ultimately build more connected and sustainable communities.

We will use a combination of traditional and innovative outreach strategies to engage the public throughout the entire study process. Group14's Equity Planning Board will work closely with Group14's construction market analysis team to identify any historically underrepresented community members, community members with environmental justice concerns, and others for whom equity has been unrealized to date.

The team will focus on hearing and meeting the needs of the entire community, including accommodation of time, location, and access for all meetings. We will hold in-person meetings at locations comfortable for underserved community members, ensuring that access to meetings is not a constraint to those interested in being involved. We will endeavor to hold our meetings in an ADA compliant environment with multilingual materials/handouts as needed.

The project will have a dedicated website conformant to Web Content Accessibility Guidelines 2.1[4] to provide an opportunity for non-attendees to access the same information as in-person attendees, provide feedback via webform or email, and track how feedback has been incorporated into the project development process.

The public engagement process is detailed below:

Before project initiation:

- **Project Website:** A project microsite will be created that offers users the ability to learn and provide feedback about the project and will remain throughout the life of the project, creating a single source of project information.
- **Establish YAC:** The establishment of YAC in collaboration with the Moses Lake school district, the Columbia Basin Technical School, community college leadership and local youth organizations will engage local youth and identify opportunities to provide experiential learning programming to help students identify careers in technology, manufacturing and industry.

[3] https://www.ncesd.org/service/career-connected-learning/
[4] https://www.w3.org/TR/WCAG21/

- **Establish PAC:** The PAC establishes collaboration with local officials and community leaders regarding the opportunities and challenges to meaningfully engage with underrepresented and disadvantaged members of the community

During the project:

- **Public Meetings:** With input from the PAC, YAC and stakeholder/elected officials, Group14 will plan and execute online public meetings, virtual public meetings, and telephone town halls. Public meetings are designed to be held simultaneously in person and virtually. The focus of the first meeting will be the education about the current state of the lithium battery manufacturing industry, and the impact it may have on the various stakeholders within the community. Live, interactive polling activities for both in-person and online participants will empower the community to provide personal feedback on their knowledge and experiences. Language accessibility, disability accessibility, and distribution methods such as local event attendance and organizational partnerships will be prioritized.
- **Event Booth Campaign:** Group14 will work with the City of Moses Lake, interested public agencies, and local community organizations to host booths at community events where a critical mass of community members will be gathered to raise awareness about opportunities created by the project, and solicit direct feedback via on-the-spot surveys. Opportunities for event booth campaigns include the weekly Saturday Farmers' market, Big Bend career fair in February, Moses Lake Chamber of Commerce business expo, Grant County Fair, and the EDC's round table luncheon or monthly EDC board meetings.
- **Scenario Development Public Meeting(s):** A continuous feedback loop will guide the project team as it collaborates with the PAC, YAC and stakeholders/ elected officials, and the public. The combination of this feedback and our team's industry expertise results in various community development recommendations that will need to be in alignment with both project and community goals. Depending on the complexity and number of scenarios modeled, either one or a series of public meetings will be held to gather as much input as possible. The input will be used to directly inform the community goals as they relate to the project development plan for the Project Advisory Council for review.

After the project is completed:

- **Public Meetings:** Using direct feedback from the previous public meetings, these meetings will incorporate community feedback to create visioning scenarios that continually identify possibilities for increased DEI opportunity and describe the benefits of the project for the community in ways that directly relate to their concerns.

<u>Community Benefit Agreements</u>

Group14 is committed to the Community Benefits Agreement listed in section 2 of the Justice40 Initiative Plan agreement described further in this document, and we acknowledge that this will be memorialized in a legally enforceable document upon receiving this grant award.

<u>Metrics for Success for Community Engagement</u>

Table 3 presents the initial SMART goals supporting community engagement. Group14's Community Outreach Sub-leader is responsible for setting additional SMART goals as required as related to community outreach and monitoring the progress of the various community outreach initiatives. SMART Goals and their specific metrics of success will be updated with continued input from the community/committee.

Table 3. Initial Metrics of Success for Community Engagement.

Metric	Year 1	Year 2	Year 3
Number of community engagement events attended or hosted	4	4	4
Local suppliers/vendors on site (%)	50%	60%	75%
Attendance at public meetings (number per meeting)	48	48	48
Employees sourced through public engagement efforts (%)	20%	30%	35%

Job Quality and Skilled Workforce:

Highest Standards of Workplace Safety and Health

Our first and highest CORE VALUE is the safety and health of all employees, contractors, visitors, vendors, neighbors, the environment, and the communities in which we operate. Group14 Technologies will market, distribute, and manufacture our products as a reliable and responsible corporate citizen. We recognize that ensuring the continued safety and health of all of our people, our environment, and the community we inhabit is our license to operate. To demonstrate our commitment to this CORE VALUE we have established, and continue to maintain, and execute a comprehensive, continuously improving, and sustainable EHS Management System. Some examples of how we achieve these principals are as follows:

Table 4. Group14 Health, Safety, and Environmental Programs

Health, Safety, and Environmental Programs	
[redacted]	[redacted]
[redacted]	[redacted]
[redacted] (b) (4)	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]
[redacted]	[redacted]

(b) (4)

Contractor Safety and Management Program: [redacted]

Strategy to Attract, Train, and Retain a Diverse, Skilled and Well-Qualified workforce

For the proposed project to stay on schedule, Group14 needs to attract, train, and retain a skilled workforce to both construct and operate the silicon anode plant (see **Table 5**).

Table 5. Timeline for the creation of quality jobs and a skilled workforce

Job Category	BP1	BP2	Post Project
Number of skilled trade workers/fieldworkers for plant construction	300	300	0
Number of technical/operations staff for plant operation	150	200	200

Group14 commits to the creation and retention of well-paying jobs and to maintaining an actively anti-discrimination and anti-harassment work environment where employees have a free and fair choice to join, form, or assist unions. Talent attraction requires a combination of efforts made by myriad stakeholders to be effective.

To achieve our ambitious goals and establish US dominance in the clean energy economy, we know that our people are core to our success. Group14 fosters an employee-first culture for every individual on our staff. This approach is fundamental to our values and always will be. We believe that maintaining a working environment geared towards employee retention bolsters employee satisfaction and our capability to recruit talented people. Our current staff of 87 people is growing. While we are a relatively young company, employee retention has been excellent at Group14 with >97.5% quarterly retention since inception of the company in 2015.

When hired, employees receive a warm onboarding and orientation process, competitive compensation, perks such as insurance for health care (both physical and mental), and support of a healthy work-life balance through ample paid time off for vacation and public holidays. **Additionally, employees from low and moderate income communities will have direct access our training and personal development programs (such as lean six sigma), mentorship programs (such as leadership coaching and Professional Engineer (P.E.) training mentorship), receive frequent supportive and constructive feedback from supervisors, and complete dedication to employee health and safety.** Finally, at Group14, we value and celebrate

recognition and acknowledgement of employee success both big and small. These often range from catered celebrations for group victories to employee bonuses and even pay increases for achieving major goals.

It is expected that the proposed project will require more than 300 well-paying skilled trade workers to construct the proposed plant, and hire an additional 200 technical/operational staff to commission, ramp up, and sustain production. These roles span various positions, including engineers, process operators, and laboratory technicians. Some of these roles require technical expertise that can be learned through training programs and on the job training.

We propose to work directly with the City of Moses Lake and the Grant County Economic Development Council to both bolster existing programming and propose new programming to attract and retain the right talent with the necessary skills. The Site Selectors Guild—a national professional association for global site selectors—noted in the most recent survey of its members and readers that 41% of Guild members[5] believe skills shortages are the new normal, and manufacturing and transportation/warehousing will be the industries most impacted by the global talent crisis.

Our proposed facility campus, in collaboration with local and regional stakeholders, can serve as an economic development catalyst, empowering the Grant County area to defy expectations and fulfill the promise of the Biden administration's goals.

Creation of Key Partnerships

Group14 will partner with national program providers to facilitate attracting, training and retaining skilled workers. These partnerships offer both national exposure for our project and the strength of national support via toolkits that Group14 can leverage to replicate talent development best practices from across the United States. Group14 proposes to specifically incorporate the following job retention and transition strategies for our employees, identifying and selecting several national programs, listed below:

- **STEM Careers Coalition**[6]: The STEM Careers Coalition™ addresses the STEM workforce and inspiration gap by bridging industry and classrooms at an unprecedented scale. It is powered by a coalition of corporate leaders and anchored in schools in Discovery Education—a trusted curriculum partner committed to equity in education, serving public, private charter, homeschool, and tribal school students by leveraging the power of digital to close the access gap.
- **The Manufacturing Institute**[7]: Among business leaders and the American workforce, the Manufacturing Institute creates and facilitates best-in-class workforce and education programs that support and grow the manufacturing workforce through professional development, skills training, and industry-leading research. Programs include:

[5] https://siteselectorsguild.com/site-selectors-survey-reveals-impact-of-global-talent-shortage-on-corporations-and-communities/
[6] https://stemcareerscoalition.org/
[7] https://www.themanufacturinginstitute.org/

- **The Federation for Advanced Manufacturing Education (FAME):** FAME helps students become highly skilled, globally competitive, well-rounded, and sought-after talent meeting the unique needs and challenges of today's modern manufacturing workforce. FAME graduates transition into well-paying, diverse career pathways in critical disciplines across the U.S. manufacturing industry.
- **Second Chance Hiring:** This program focuses on outreach to and hiring of the marginalized population of those who currently possess a criminal record. Without second chance opportunities, too many of our fellow citizens are excluded from the workforce, needlessly leaving them on the sidelines as employers search for candidates who can fill skills gaps.
- **Workforce Projects:** The Manufacturing Institute has partnered with employers, educators, and communities across the nation to implement solutions to build a skilled manufacturing talent pipeline.

Local Partnerships: Group14 will partner with Big Bend Community College and Washington State Labor Council.

- **Big Bend Community College (BBCC)**[8]: BBCC is a publicly funded community college based in Moses Lake, Washington, founded in 1962 and serving a 4,600-square-mile service district, including all of Grant and Adams counties and a portion of Lincoln County. The service district population of 110,000 lives in 15 primary communities, many of which experience high numbers of intergenerational poverty and low educational attainment rates. In the 2020-21 academic year, BBCC served a student body of nearly 3500 from diverse ethnic backgrounds. BBCC is a comprehensive community college with programs for academic transfer, professional/technical, and developmental education. At BBCC, 70% of students receive need-based financial aid. The College is accredited by the Northwest Commission on Colleges and Universities and is a Hispanic Serving Institution as defined by Title V[9].

  During the project, Group 14 aims to increase earn-and-learn programs through an innovative sector partnership model. Group14 plans to work with both The Manufacturing Institute and local educational partners like Big Bend Community College to co-create a streamlined educational pathway to 'earn-and-learn' in the lithium battery manufacturing industry. As noted in their letter of support, Big Bend Community College has a new Workforce Education Center that houses programs directly relevant to the manufacturing sector. Programs include Industrial Systems, Mechatronics, and Welding. These resources can be used in partnership with efforts by Group14 to train and build the local workforce, providing substantial opportunity for job creation.

- **Washington State Labor Council (WSLC)**[10]: Widely considered to be the "voice of labor" in Washington state, the Washington State Labor Council, AFL-CIO, represents and

[8] https://www.bigbend.edu/academics/programs-degrees/
[9] https://www.bigbend.edu/about-us/administration/
[10] https://www.wslc.org/

provides services for hundreds of local unions throughout Washington state. Currently, there are more than 600 local unions affiliated with the WSLC, representing more than 550,000 union members. The WSLC is the largest labor organization in Washington state and is the only organization representing all AFL-CIO unions in the state.

- **Workforce Empowerment Opportunities**: Group14 is committed to wage equity that reflects higher-than-average compensation packages when compared to industry standards. We will work with representatives from the Washington State Labor Council for guidance on creating a comprehensive compensation package for members at every level of the organization for the proposed project. This includes holding our vendors to fair wage standards and transparency to ensure that the closed-loop economy within our facility campus is rooted in equitable wage practices.

Job Retention and Transition

Group14 has already been actively recruiting individuals from the oil and gas industry to work in our production facilities. 16% of our operations staff at our commercial pilot plant in Woodinville, WA worked in the oil and gas industry prior to joining Group14. We have found that a large majority of the skill sets required to operate our production facilities are also required in the oil and gas refining industry. Group14 also recruits employees from the local Bellingham Community College Process Technology Program. This program is mainly geared toward oil refinery work, but we have found that graduates from this program are very well versed in skills required in our industry.

At Group14 we understand that adoption and expansion of the clean energy economy will inevitably displace jobs in the fossil fuel industry and reliance on fossil fuels continues to diminish. **And that is why Group14 will commit to actively recruit from the oil and gas industry and maintain at least 10% plant process operator staff who formerly worked in this industry for the project.**

Diversity, Equity, Inclusion, & Accessibility (DEI&A)

Affirmatively advancing equity, civil rights, racial justice, and equal opportunity are the responsibility of the whole of our government,[11] and also for the executive team at Group14. Such principles are integral to Group14's operations globally, and in equal measure will be applied to all aspects of this project.

Disadvantaged Business Enterprises (DBEs) as Vendors, Contractor and Subcontractors

Group14 commits to identifying DBEs, including Minority Business Enterprises, Minority-owned Businesses, Woman-owned Businesses, and Veteran-owned Businesses to solicit as vendors and subcontractors for bids on supplies, services, and equipment. In order

[11] https://www.whitehouse.gov/briefing-room/presidential-actions/2021/06/25/executive-order-on-diversity-equity-inclusion-and-accessibility-in-the-federal-workforce/

to set meaningful SMART goals in context for the current project, the process starts with identifying any prevailing goals at the state or local level then applying these to the size and scope of work being solicited. Specifically for the current project, it is appropriate to look at regional guidelines.

An example state guideline is provided by the Washington State Department of Transportation, which specifies a 19% DBE goal.[12] The municipal airport of the closest city to Moses Lake and largest city by population in eastern Washington—Spokane, WA—provides a DBE goal of 1.26%.[13] Group14 and our key partners on the project are currently working with local city government and economic development partners to identify the availability and capacity of DBE firms, such as Minority Business Enterprises, Minority-owned Business, Woman-owned Business, or Veteran-owned Business, located within 75-100-mile radius of the project site.

The Washington State Employment Security Department lists the most current unemployment rate for Grant Count at 5.8% for April 2022. The labor force participation rate was last reported for 2019 at 62%. According to the US Census Bureau, the median household income was $59,165 (2020 dollars) and 13.6% of the population is in poverty.

(b) (4) [redacted] We also have information [redacted] who provided information regarding their own historical spend on projects in or near Moses Lake (Quincy, Washington) where they built key strategic relationships with diverse firms resulting in 17% diverse spend on that recent large project.

We will work closely with both our contractors leading offsite costs and inner plant costs towards setting and achieving goals related to vendors and subcontractors for the project. We will model these activities on the principles already set forth by [redacted] who will be deploying a strategic relationship building initiative and a field mentorship program.[14] The next step in our goal setting process consists of working closely with our a deeper analysis with the project team of the scope, size, mobilization schedule, etc. of each bid package to be procured, any existing trade partner relationships we or our partners have in each of these bid packages, the relationships we or our partners have directly with diverse firms in each bid package as well as the existing relationships of our larger trade partners, and any opportunities to mentor smaller firms to build capacity in bid packages lacking a diverse pool. We and our partners will conduct an analysis at least 30 days prior to any bid packages being due to collect the historical and current contract and onsite workforce diversity of interested subs offering our proven best practices to increase our collective economic impact on the residents and businesses within and surrounding Moses Lake.

Table 6 Presents a summary of specific DEI&A-related milestones for the project as part of the overall Equity Plan. Our DEI&A Goals include at least one SMART milestone per budget period supported by metrics to measure the success of the proposed actions.

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[12] https://www.wsdot.wa.gov/about/secretary/strategic-plan/dashboard/inclusion/diverse-business-spending.htm
[13] https://business.spokaneairports.net/core/files/business/uploads/files/Business/GEG%20GoalDocument_for%20FY%2021-23%20dated%202020-10-07.pdf
[redacted]

Table 6. Summary of DEI&A Milestones.

Milestone	BP	M	Type	Description
[redacted]	[redacted]	[redacted]	[redacted]	[redacted] (b) (4) [redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

(b) (4)

Key: *P = progress, T = technical. S = SMART, M = month, BP = budget period (Note the BP1 is 12 months duration and BP2 is 18 months duration).*

Justice40 Initiative Plan:

Identification of applicable DACs to which the anticipated project benefits will flow

As detailed in the above section, our initiatives are aligned with community expectations around diversity, equity, and accessibility as well as the government expectations within The Justice40 Initiative.

Several tools have been developed to aid in identifying DACs throughout the country. Identification of DACs will allow compliance with the Justice40 Initiative, which seeks to have at least 40 percent of overall benefits of federal investment flow to underserved communities. Two of these tools are the DOE Energy Justice Dashboard[15] and the Council on Environmental Quality's Climate and Economic Justice Screening Tool.[16]

According to the DOE Energy Justice Dashboard[17], two of the four census tracts (2010 Census) within the City of Moses Lake are considered disadvantaged communities. At a very local level, the implementation of the proposed project will present opportunities to these disadvantaged communities.

According to the Climate and Economic Justice Screening tool, Census Tracts 25010902 and 25011100 in Grant County are disadvantaged in the area of clean energy and energy efficiency as the area is in the 93rd percentile for fine particulate matter in the air and the 73rd percentile for low-income households. Many of the surrounding areas are also disadvantaged in clean energy and energy efficiency, as shown in the below map (**Figure 2**).

Successful implementation of the proposed project will further aid these DACs and other vulnerable populations by increasing access to non-fossil fuel energy options and accelerating adoption across the state. One such specific example of a DAC that would benefit from the acceleration in non-fossil fuel energy storage would be Region 9 in Washington State. This area, on the eastern part of Washington state, comprises seven counties and three tribal areas which see a disproportionate effect from climate-related disasters such as wildfires and droughts. The disasters are becoming more severe every year. While Group14's technology will not directly

[15] https://energyjustice.egs.anl.gov/
[16] https://screeningtool.geoplatform.gov/en/#7.3/47.4/-119.756
[17] https://www.energy.gov/diversity/energy-justice-dashboard-beta

reduce climate-related disasters in this area, it would drive non-fossil fuel electric infrastructure adoption over the tipping point.

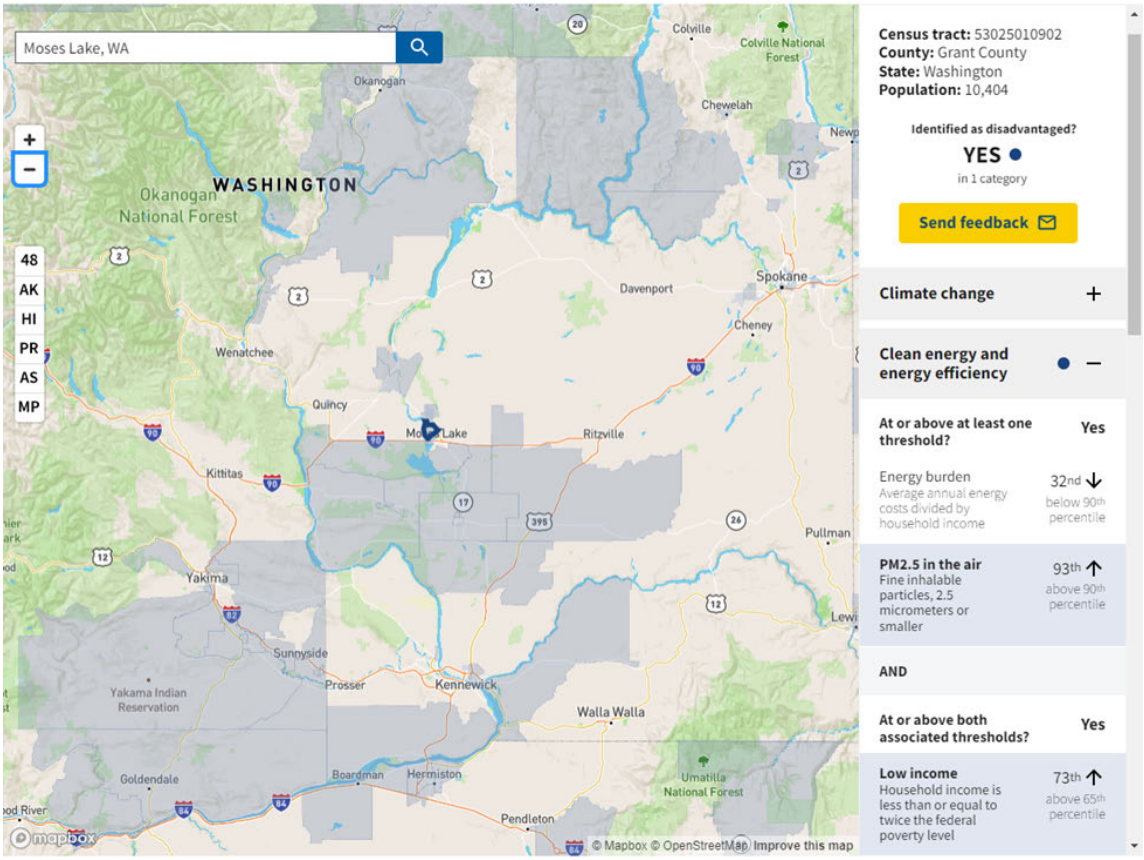

Figure 2. Map of area near Moses Lake, WA from the Climate and Economic Justice Screening tool showing disadvantaged areas in terms of income, energy burden, and fine particulate matter in the air.

<u>Identification of Applicable Benefits</u>

Group14 believes that it should be a leader in all the communities where it has production facilities. There are powerful synergies that can be created between Group14's commercial activities and the communities that live near Group14 facilities. A stronger community will only benefit Group14 in the long-term, and vice versa. There are many direct benefits that Grant County, and its surrounding areas, will receive from Group14 building out a battery materials manufacturing facility in the area. Regardless of whether Group14 successfully receives an award in the DOE program, it intends to execute on the following initiatives:

- **Increased job creation (construction phase)**: The construction of the proposed project will create many well-paying jobs in the region. The construction phase is anticipated to last approximately 12 months and will require more than 300 direct contractors to fully build out the facility. In addition, the construction of the facility will create significant indirect employment in the region, given the project's requirement to source materials and services from local businesses.

- **Increased job creation (production phase)**: Group14 plans to retain 200 employees to commission, ramp up, and sustain production at the facility once it's operational. These are long-term, well-paying jobs, requiring advanced skills and educational backgrounds from the individuals being hired. Group14 commits to maintaining its high standards for a free and fair workplace, free from discrimination and harassment, embracing diversity and establishing meaningful engagement with local communities, particularly those that are undeserved, underrepresented, or disadvantaged, including individuals from Tribal Nations.
- **Increased income levels:** Group14 will be offering high average wages for the jobs created during both the construction and the production phases, especially as compared to the median household income in Grant County of $55,556 in 2019. During the construction phase, average annual salaries are expected to be $150,000, and during the production phase average annual salaries are expected to be $85,000, representing increases over the median household income in Grant County by 270% and 53%, respectively.
- **Diversity hiring**: Census data suggests that there is a disproportionate level of poverty among non-white ethnic groups in Grant County. Group14 will have a goal of hiring individuals to support its production facility that is more in line with the demographics of Grant County, based on periodic census data. While the jobs, in and of themselves, will serve to decrease poverty levels as a whole, Group14's diversity employment practices will also serve to better balance the economic benefits amongst its diverse community members, including individuals from Tribal Nations.
- **Clean energy job training:** Group14 plans to work with Big Bend Community College to enhance programming and provide opportunities to local community members. The training in these emerging fields such as process operations, quality control, quality assurance, process engineering, instrumentation technicians, automation and mechatronics, control systems engineering and more will enhance opportunities for this community to move from relatively lower paying work to well-paying highly skilled jobs. To this end, Group14 is committed to contributing $50,000 per year to fund program development for the industry, manufacturing, trades, and STEM programs at the college.
- **Higher education scholarship program:** Grant County has a low level of higher education enrollment as compared to national averages. Group14 plans to establish a scholarship program at Big Bend Community College to provide $50,000 per year to fund tuition for individuals entering the industry and STEM programs at the college. Given the current average tuition rate at Big Bend Community College is approximately $4,500 per year, this would provide the opportunity for the equivalent of more than 10 full-time students to attend Big Bend Community College, who otherwise would not have been able to afford college for financial reasons. Group14 will work with Big Bend Community College to determine the criteria for eligibility of the scholarship program, with emphasis placed on disadvantaged individuals and diversity including individuals from Tribal Nations.
- **Internship program:** Group14 plans to offer paid internships to college and high school-level students to provide them with exposure to the battery industry and give them practical business experience. This is meant to excite those individuals about a fast growing and high paying industry, which in turn, should inform them as to the direction

of their studies, as well as to incent them to ultimately complete their high school and college degrees. With such degrees, these individuals will be better positioned to secure higher skilled and higher paying jobs, regardless of whether they eventually join Group14 as a full-time employee. Group14 plans to offer internships that pay up to an aggregate of $50,000 per year to participating individuals.

- **High school outreach programs:** Grant County has a relatively high level of high school degree non-attainment. Without a high school degree, individuals are in a much-disadvantaged position to obtain higher skilled and higher paying jobs. Group14 believes that as a business leader it should play a role in reaching out to public schools in the community and engaging students to get excited by their studies, as well as post-education employment. To this end, Group14 intends to spend $50,000 per year in programs and equipment that would specifically be used to engage students in STEM curricula and in the science and benefits of batteries.
- **Increased access to low-cost capital:** Individuals with lower credit scores—common within disadvantaged communities—do not have access to low-cost capital to purchase homes, automobiles, etc. They typically only qualify for subprime loans or mortgages bearing higher interest rates and requiring larger down payments. By offering higher paying wages, Group14 can enable its employees to increase their credit scores and thus decrease the cost of capital available to them. This will result in increased buying power, including the possibility of purchasing homes, which may have previously been cost-prohibitive. Group14 will look to track this goal by asking its employees to voluntarily provide their credit score data on a periodic basis.

Group14's project will provide many other benefits that are much broader in nature and will reach a much larger population of disadvantaged communities than just Grant County. As previously described in this submission, Group14's SCC55™ material provides significant and immediate improvements over incumbent battery technologies, which serve to dramatically decrease the cost of battery power, and could provide the following benefits to DACs:

- **Decrease in energy burden:** Group14's silicon battery technology enables affordable electric vehicles (EV) for the mass market and to more disadvantaged populations. Given soaring gasoline prices, electric vehicle owners will have a much lower cost of operating their vehicles, resulting in decreased energy costs as a percentage of income.
- **Decrease in environmental exposure:** More affordable EVs will enable a more rapid decline of the United States' dependency on fossil fuel, one of the key drivers of CO2 emissions, airborne particulates, as well as other negative impacts on our environment.
- **Increase in energy democracy and clean energy technology access and adoption:** Group14's technology will allow for the adoption of silicon batteries in grid applications, including at the consumer level. Silicon battery storage can lower energy costs, providing families additional control over the cost of powering their homes, and keep essential devices powered during outages. Currently, home battery systems are expensive and not as compelling an option for disadvantaged communities. In Washington State, an average personal energy storage system of 13kWh would cost between $11,749 to $15,895, far above the means of vulnerable populations in the state. Group14's

technology could be deployed within more competitively priced personal backup power options by eventually lowering the total $/kWh of home-use backup batteries.

- **Energy resilience:** Whether at a utility-scale or at a consumer-level, the usage of silicon batteries to manage electricity across the grid can smooth out loads, which should result in far fewer blackouts, brownouts, etc. When electricity disruptions do occur, home battery systems can minimize the impact on consumers and vulnerable populations.

Local disadvantaged communities in this area are categorized as such due to low income levels, combined with constraints on energy access and high levels of small particulate matter in the air. Thus, key benefits of this potential project will be to increase employment through higher paying jobs while reducing energy burden and aid in the removal of greenhouse gas emissions to the local community.

The key benefit of the project will be high-quality job creation and clean energy job training. The new facility will bring approximately 200 new direct jobs to the region, which will provide opportunities for quality jobs with a good long-term outlook to this area. The training in these emerging fields such as battery materials production, mechatronics, battery materials analysis and characterization, and electrochemical science will enhance opportunities for this rural community. One goal is to hire at least 40% of our Moses Lake staff from the local community within the first 2 years of operation.

The technology from the proposed project will allow for improved energy infrastructure across the state, further reducing energy costs by making energy storage easier on off-peak hours through deployment as backup energy sites. Energy reliability would also increase, as silicon batteries help buffer times when electricity is not being actively generated from a plant or other power generation site. [redacted] to minimize environmental impact and ease the burden on local and vulnerable populations during power outages. Currently, personal backup power options are costly and impractical for large groups of people. For instance, in Washington State, an average personal energy storage system of 13kWh would cost between $11,749 to $15,895, far above the means of vulnerable populations in our state. Our technology could be deployed as a more competitive personal backup power option at home by eventually lowering the total $/kWh of home-use backup batteries.

(b) (4) [redacted]

This project will also decrease environmental exposure and associated burdens. The citing of the two facilities adjacent to each other will reduce transportation costs and enhance production capabilities while minimizing impacts to the local community. The process will reduce harmful greenhouse gas emissions and potentially enhance local air quality. One potential measurable benefit will be levels of fine particulate matter in the air surrounding the facility. Group14 will measure air quality and seeks to reduce greenhouse gasses by, or at the very least not contribute any new or additional pollutants while operating the new facility.

It is expected that significant benefits will flow directly to the targeted DACs in various ways, with improvements in air quality and associated potential reduction in health impacts occurring due to proximity to the facility. The benefits of high-quality job creation will be targeted to DACs through public involvement and development of programs through local institutions, including

youth involvement. Efforts will be made to maximize benefits through data collection and monitoring and periodic re-evaluations of the program implementation strategies. For example, keeping track of the utilization of partner programs and adjustments made based on participant feedback.

Anticipated Negative Impacts on DACs

There are no negative impacts to any of the DACs and no significant environmental impacts (b) (4) [redacted] ticipated with this project. As mentioned above, [redacted] The project is not expected to create any displacement or to adversely impact any local population. Rather, the project will enhance opportunity through the concentration of industry and the development of a regional center of excellence.

Table 7 presents the specific benefits to DACs afforded by this project as they relate to specific Justice40 Covered Programs.[18] One of the most tangible benefits of the project is that Group14's customers using SCC55™ can produce batteries with lower cost on a $/kWh basis, directly translating to lower cost for EVs, which makes them more affordable and accessible. SCC55™ enables EVs to reach cost parity with combustion engine vehicles, accelerating EV adoption and reduction of harmful transportation emissions. Furthermore, this tipping point of EV adoption will contribute significantly to reduction of greenhouse gasses and local air pollution. Beyond EVs, silicon batteries powered by SCC55™ can be broadly deployed including the establishment of a more stable energy grid. Finally, there are substantial benefits that the current project delivers to DACs related to training and workforce development. For all of these benefits, it is important to note that achievement is de-risked with SCC55's™ proven scalability and the modular manufacturing approach can be rapidly deployed.

Table 7. Specific benefits to DACs afford by this proposed by Justice40 Covered Programs

Covered Program	Specific Benefit to DACs Afforded by this Proposal
Clean Transportation	• Access to affordable electric vehicles • Reduction of exposure to harmful transportation-related emissions
Climate Change	• Reduction of greenhouse gas (GHG) emissions and local air pollution
Clean Energy and Energy Efficiency	• Establishment of stable grid benefits to disadvantaged communities
Training and Workforce Development	• Increased participation in clean energy good job training and subsequent good job placement/hiring, including providing the free and fair chance to join a union.

The current project will deliver quantitative benefits in terms of jobs creation to the surrounding community comprising several DACs. Over the life of the newly constructed SCC55™ production modules (est. 20 years), the project will achieve specific benefits based on the value of new job creation for both construction and production of almost 50% of the total project cost.

[18] https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf

ERIC (RICK) C. LUEBBE

3224 NE 100th Street, Seattle, WA 98125
(206) 465-7243
rluebbe@group14.technology

WORK EXPERIENCE

Group14 Technologies, Inc. – CEO, *Founder*
Dec 2015 - Present *Seattle, WA*

- Founded and lead company that is commercializing silicon-carbon composite anodes for Li-ion batteries
- Founded company by spinning the technology out of EnerG2, Inc prior to its acquisition by BASF
- Raised over $435 million over three investment rounds

Oscilla Power, Inc. – Director
Feb 2015 - Present *Seattle, WA*

- Serve on Board of Directors for a market-leading wave energy company
- Provide direction and governance to the executive team

EnerG2, Inc. – CEO, *Founder*
2003-Oct 2018 *Seattle, WA*

- Founded and led company that manufactures engineered carbons for clean energy applications
- Provided start-up leadership through 15 years of product development, market development, and fund raising
- Led the acquisition of EnerG2 by BASF

Hubspan, Inc. – *CEO, Founder, VP Business Development*
2000-2002 *Seattle, WA*

- Founded and led company that provides trading partner integration service for Fortune 1000 customers.
- Closed $7.5M contract with Fortune 20 company resulting in over 90% of Hubspan revenues
- Raised $5 million in venture capital in two rounds from Intel, Accenture, and Seapoint Ventures

Booz • Allen & Hamilton, Inc. – S*enior Associate, Operations Management Group*
1997-1999 *San Francisco, CA*

- Evaluated component supply chain for an aerospace assembly plant. Identified 25% procurement cost savings.
- Redesigned production processes and part flow reducing production flow time by 80%.
- Simplified ordering system for $300M business unit. System was adopted by $40B parent company.

United States Army – *Aviation Officer*
1988-1995 *Colorado, Germany, Persian Gulf*

- Commanded an AH-64 Apache Attached Helicopter Company in the 4th Infantry Division
- Led Aeroscout platoon in combat operation against the Iraqi Republican Guard during Operation Desert Storm
- Flown over 1000 hours in AH-64, OH-58, and UH-1 helicopters

EDUCATION

Stanford University Graduate School of Business
Masters of Business Administration – June 1997. *Palo Alto, CA*

Cornell University, College of Arts & Sciences
Bachelor of Arts, Biology – May 1988 *Ithaca, NY*

AWARDS AND HONORS

- Bronze Star Medal: Meritorious leadership during operations Desert Shield, Desert Storm, and Provide Comfort
- Air Medals (2): Superior airmanship and leadership in combat operations against the Iraqi Republican Guard
- FAA certified commercial pilot

Henry R Costantino, Ph.D.
Chief Technology Officer, Group14 Technologies

Highly experienced executive with proven track record of scientific leadership, product and process development, and commercial manufacturing across various industries and applications. Successfully history as Principal Investigator on multiple DOE EERE VTO awards (2016-date).

PROFESSIONAL PREPARATION

M.I.T	Chemical Engineering	PhD	1990 - 1995
The Johns Hopkins University	Chemical Engineering	MS	1988 - 1989
The Johns Hopkins University	Chemical Engineering	BS	1984 - 1988

ACADEMIC /PROFESSIONAL APPOINTMENTS

2016 – present	Co-Founder and CTO, Group14 Technologies, Woodinville, WA
2009 – 2016	Vice President of Research and Development, EnerG2, Seattle, WA
2008 – Present	Founder, Costantino Consulting, Woodinville, WA
2003 – 2008	Chief Scientific Officer (last position), MDRNA, Inc (formerly Nastech)
1998 – 2003	Sr. Staff Scientist (last position), Alkermes, Inc, Cambridge, MA
1995 – 1998	Scientist (last position), Genentech, Inc, South San Francisco, CA
1995	Post Doctoral Fellow, M.I.T. Dept. of Chemistry, Cambridge, MA
1990 – 1995	PhD Research Scientist, M.I.T. Dept. of Chem. Engineering, Cambridge, MA
1989 – 1990	MS Research Scientist, The Johns Hopkins University, Baltimore, MD
1987 – 1988	URI/ONR Undergraduate Fellow, Center of Marine Biotechnology, Baltimore, MD
1986 – 1987	Undergraduate Research Assistant, The Johns Hopkins University, Baltimore, MD

PATENT & PUBLICATION EXAMPLES (from 100+ issued/pending patents & 50+ publications)

- Costantino HR; Dhanabalan A; Sakshaug AJ; Timmons C; Patel R, "Highly efficient manufacturing of silicon-carbon composites materials comprising ultralow Z," US Patent 11,335,903.
- Dhanabalan A; Sakshaug AJ; Costantino HR, "Silicon carbon composites comprising ultra low Z," US Patent 11,174,167.
- Costantino HR; Alan T-Y; Kron BE; Sakshaug AJ; Thompkins LA; Feaver AM, "Methods for sol-gel polymerization in absence of solvent and creation of tunable carbon structure from same," US Patent 10,711,140.
- Sakshaug AJ; Costantino HR; Feaver AM; Thompkins LA; Geramita K; Kron BE; Fredrick S;c Afkhami F; Strong, "Materials with extremely durable intercalation of lithium and manufacturing methods thereof," US Patent 10,147,950.
- Costantino HR; Goodwin C; Scott WD, Feaver AM "Enhanced packing of energy storage particles," US Patent 8,654,507 issued 2/18/14.
- Costantino HR; Feaver AM; Scott WD, "Manufacturing methods for the production of carbon materials," US Patent 8,293,818 issued 10/23/12.

EXAMPLE COLLABORATORS AND OTHER AFFILIATIONS:

Asgarzadeh F (Alkermes); Bonassar Larry (Univ of Mass); Brandt, Gordon (MDRNA); Brandt, Ludwig (JHU); Brown, Steven (JHU); Crawford, Doug (JHU); Griebenow, Kai, (MIT, University of Puerto Rico); Hotz, Joyce (Alkermes); Hsu, Chung (Genetech); Illum, Lisbeth (Molecular Profiles); Kelly, Robert (JHU); Klibanov, Alex (MIT); Langer, Robert (MIT); Maa, Yuh-fun (Genentech); Middaugh, Russ (Univ of Kansas); Pikal, Mike (Univ of Conn); Quay, Steven (MDRNA); Rhodes, Christopher (Amylin); Rytting, Howard (Univ of Kansas); Schwendeman, Steve (MIT); Tracy, Mark (Alkermes).

Advisors: PhD (MIT): Prof. Robert Langer, Dept. of Chemical Engineering, Prof. Alex Klibanov, Department of Chemistry; MS (JHU): Prof. Robert Kelly, Department of Chemical Engineering and Prof. Dennis Powers, Department of Biology.

Chris D. Timmons

EXPERIENCE

VP of Engineering - *January 2020 - Current*
Group14 Technologies, Inc. – *Woodinville, WA*
- Responsible for all aspects of engineering, global manufacturing strategy and implementation

Director of Process Developme*nt* - *December 2016 - January 2020*
Group14 Technologies, Inc. – *Woodinville, WA*
- Responsible for all aspects of process development and scale up of novel lithium ion battery anode materials

Engineering Manager - *May 2011 – December 2016*
EnerG2, Inc. - *Albany, OR*
- Onsite technical leader for $30 million project to build a battery electrode material manufacturing facility
- Responsible for all technical and engineering aspects of the plant start-up, commissioning, and operation
- Manage a team of plant engineers to develop all facility protocols for safe and effective operations
- Directed engineering aspects required to complete ISO 9001 and ISO 14001 certifications
- Maintain correspondence with state and local regulatory bodies to keep the plant environmentally compliant
- Established and managed the plant preventative maintenance program
- Conduct cost of goods sold (COGS) analysis and implement engineered solutions to improve profit margins
- Managed plant quality control department personnel
- Implement six sigma and lean manufacturing methodologies to improve process capability and cost of goods sold

Research and Development Scientist II - *April 2010 – May 2011*
EnerG2, Inc. - *Seattle WA*
- Developed processing methods to produce novel battery and ultracapacitor electrode materials in a joint materials science and electrochemical testing facility
- Lead research projects on new materials development and scale-up processing
- Built small scale test reactors for a pilot facility to produce material and developed designs for large scale-up equipment
- Technical lead for toll manufacturing operations world-wide
- Technical lead on design team to build a battery electrode material manufacturing facility

Research Scientist II - *December 2007 – December 2009*
Asemblon, Inc. - *Redmond, WA*
- Collaborated with industrial engineers and chemical engineers to scale up specialty chemicals production to pilot and bulk manufacturing levels

Synthetic Chemist - *August 2006 – December 2007*
Asemblon, Inc. - *Redmond, WA*
- Designed and conducted complex synthetic pathways for high-purity production of new chemicals

EDUCATION
University of Puget Sound - *Graduated May 2006* - Bachelor of Science: Chemistry

Prime Applicant: Group14 (Control #2678-1765)

Project Title: Commercial Manufacturing of a Stable Silicon Anode Material towards Fostering a Strong U.S. Battery Supply Chain

Principal Investigator:	Henry R Costantino, Ph.D.
Key Partners:	Group14 Technologies Inc, [redacted] (b) (4)
Proposed Project Duration:	3 Years

	Federal	Group14 Cost Share
Budget Period 1	$52,888,730.00	$117,908,429.00
Budget Period 2	$47,111,271.00	$105,028,345.00
Budget Period 3	$0	$0
Budget Period 4	$0	$0
Budget Period 5	$0	$0
Total	$100,000,000.00	$222,936,774.00

Proposed Objective:

- Secure the U.S. battery supply chain by expanding manufacturing capacity of stable silicon anode battery material by 4,000 tonnes annual production by 2025

Project Impact/Takeaway:

- Establish U.S. leadership as the premier world producer of advanced, next generation silicon anode materials
- Accelerate EV adoption and reduce emissions by increasing EV driving ranges up to 50%, lowering battery costs to <$100/kWh, and enabling fast charging times to <10 min
- Bolster the rural eastern Washington economy and employ a highly skilled, and diverse workforce to construct, commission, and run the silicon anode production facility

Key Deliverables/Accomplishments:

- Demonstrate expanded production capacity of silicon anode material by 4,000 tonnes annual production by 2025

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Statement of Project Objectives

Commercial Manufacturing of a Stable Silicon Anode Material towards Fostering a Strong U.S. Battery Supply Chain

A. OBJECTIVES

The overall project objective is to create a sustainable, resilient, and equitable U.S. battery supply chain by establishing U.S. dominance as the premier world producer of advanced, next generation silicon anode powder. To this end, the proposed project will complete the construction, commissioning, and ramp to full production of two commercial-scale modules for Group14's high-performing silicon-based anode powder, SCC55™. Each production module will be capable of 2,000 tonnes/year, for a total capacity of 4,000 tonnes/year. Expanding production capacity of SCC55™ will accelerate electric vehicle (EV) adoption and reduce emissions by increasing EV driving ranges up to 50%, lowering battery costs to [redacted], and enabling fast charging times to 10-20 min. Additionally, this project will bolster rural Eastern Washington State economy and employ a skilled and diverse workforce to construct, commission, and operate the silicon anode production facility.

B. SCOPE OF WORK

The project will be divided into two main scopes, inside battery limits (ISBL) and outside battery limits (OSBL). The ISBL scope comprises [redacted] (b) (4) [redacted]

The OSBL scope will be provided by [redacted]. Note that at the time of this application Group14 is already underway with engineering and procurement for two identical anode production facilities, and thus, the engineering portion of this work plan is relatively short because much of this engineering can be utilized from the ongoing projects.

The project will be conducted in two (2) budget periods:

Budget Period 1: Engineering, Procurement, Mobilization, and Module Construction

Budget period 1 includes engineering, procurement, mobilization, and module construction. For ISBL activities, this includes [redacted]

Budget Period 2: Module Construction, Equipment Installation, Commissioning, Module Startup, and Demonstration

Budget period 2 consists of module construction, equipment installation, commissioning, module startup, and demonstration. For ISBL activities, this would include [redacted] (b) (4) [redacted], confirmation of substantial completion, and regulatory approval.

C. TASKS TO BE PERFORMED

The following tasks will be conducted:

All Budget Periods

Overall Project Management and Planning

The recipient will perform project management activities to include project planning and control, subcontractor control, financial management, data management, management of supplies and/or equipment, risk management, and reporting as required to successfully achieve the overall objectives of the project.

Task 0.0 – Project Management and Planning:

The Recipient shall develop and maintain the Project Management Plan (PMP). The content, organization, and requirements for revision of the PMP are identified in the Federal Assistance Reporting Checklist and Instructions. The Recipient shall manage and implement the project in accordance with the PMP.

Task 0.1- Kick-Off Meeting:

The Recipient will participate in a project kickoff meeting with the DOE within 30 days of project initiation.

Budget Period 1: Engineering, Procurement, Mobilization, and Module Construction

Task 1.1 – Issue Scope of Work and Contracting:

Subtask 1.1.1 – The recipient will [redacted] (b) (4) [redacted]

Subtask 1.1.2 – The recipient will [redacted]

Task 1.2 – Engineering:

Subtask 1.2.1 – The recipient will host an engineering kickoff workshop with the [redacted]

Subtask 1.2.2 – The recipient will [redacted] (b) (4) [redacted] The recipient will facilitate engineering and design coordination between the ISBL EPC Contractor and the OSBL EPC Contractor.

Subtask 1.2.3 – The recipient will oversee the OSBL EPC Contractor's engineering and design of the OSBL scope. [redacted] Extensions of the utility pipe racks and associated piping, access drives, connections into the drainage system, and tie-in into the electrical system will be designed as a part of this scope of work.

Subtask 1.2.4 – The recipient will review and approve the ISBL and OSBL designs prior to release for procurement.

Task 1.3 – Utility Coordination:

Subtask 1.3.1 – The recipient will coordinate with the local utilities to coordinate on the impacts of facility expansion. Those utilities include sewer, water, natural gas, and electrical. No utility system upgrades are anticipated to be required based on the proposed project.

Task 1.4 – Procurement:

Subtask 1.4.1 – The recipient will [redacted] (b) (4) [redacted]

Subtask 1.4.2 – The recipient will [redacted]

Subtask 1.4.3 – The recipient will [redacted]

Task 1.5 – Permitting:

Subtask 1.5.1 – The recipient will [redacted]

Subtask 1.5.2 – The recipient will [redacted]

Subtask 1.5.3 – The recipient will [redacted]

Subtask 1.5.4 – The recipient will [redacted]

(b) (4)

Task 1.6 – Shop-Fab Equipment Inspection:

Subtask 1.6.1 – The recipient will [redacted] The intent of the shop visits will be to verify that the equipment is being fabricated in accordance with project plans and specifications and on schedule.

Subtask 1.6.2 – The recipient will [redacted]

Task 1.7 – Mobilization & Modules #3 and #4 Prep Work:

Subtask 1.7.1 – The recipient will confirm that building permits have been approved and give notice to proceed to the [redacted].

Subtask 1.7.2 – The recipient will provide construct management oversight of the [redacted].

(b) (4)

Milestone	Type	Description
M1.1. Contracts in Place with [redacted]	Technical	[redacted] are agreed upon and contracts are negotiated and executed.
M1.2. Approval of Engineering for Procurement and Fabrication	Technical	ISBL and OSBL Engineering is reviewed and approved [redacted]
M1.3. Long Lead Procurement Orders Placed	Technical	Orders are placed for long lead equipment and materials.
M1.4. [redacted]s #3 and #4 Prep Work	Technical	[redacted].

M1.5. [redacted]	Technical	[redacted] (b) (4) [redacted]
M1.6. ISBL and OSBL Design Reviewed and Approved for Procurement of all Equipment and Materials and Release for Shipment	Technical, SMART, Go/No Go	Issued final ISBL design review report, wherein 100% of engineering plans for individual ISBL components have been reviewed against project basis of design and specifications. Issued final OSBL design review report, wherein 100% of engineering plans for individual OSBL components have been reviewed against project basis of design and specifications Approval of the ISBL and OSBL design review reports triggers procurement of all equipment and materials and release for shipment.

Continuation: The recipient is **NOT** authorized to initiate any scope in the next budget period without the DOE Contracting Officer's prior written approval in accordance with the award terms and conditions.

Budget Period 2: Module Construction, Equipment Installation, Commissioning, Startup and Demonstration:

Task 2.1 – OSBL Steel Receipt & Erection:

Subtask 2.1.1 – The recipient will oversee the [redacted] (b) (4)

Subtask 2.1.2 – The recipient will oversee the [redacted]

Subtask 2.1.3 – The recipient will oversee the [redacted]

Subtask 2.1.4 – The recipient will perform [redacted]

Task 2.2 – OSBL Module Building Outfitting & General Construction:

Subtask 2.2.1 – The recipient will [redacted]

Subtask 2.2.2 – The recipient will [redacted]

Subtask 2.2.3 – The recipient will [redacted]

Task 2.3 – ISBL Receipt of Equipment Onsite:

Subtask 2.3.1 – The recipient will oversee the [redacted]

Subtask 2.3.2 – The recipient will [redacted]

Subtask 2.3.3 – The recipient will [redacted]

(b) (4)

Task 2.4 – Installation of ISBL Equipment in the Module Build

Subtask 2.4.1 – The recipient will [redacted].

Subtask 2.4.2 – The recipient will c[redacted]

Subtask 2.4.3 – The recipient will [redacted].

Task 2.5 – Initial Testing of Systems:

Subtask 2.5.1 – The recipient will [redacted]

Subtask 2.5.2 – The recipient will [redacted]

Task 2.6 – Pre-Commissioning Kick-Off Meeting:

Subtask 2.6.1 – The recipient will [redacted].

Task 2.7 – Cold Commissioning:

Subtask 2.7.1 – The recipient will [redacted].

Subtask 2.7.2 – The recipient will [redacted]

Subtask 2.7.3 – The recipient will [redacted]

Subtask 2.7.4 – The recipient will [redacted]

Task 2.8 – Hot Commissioning:

Subtask 2.8.1 – The recipient will [redacted]

Subtask 2.8.2 – The recipient will [redacted].

Subtask 2.8.3 – The recipient will [redacted]

Subtask 2.8.4 – The recipient will [redacted]

(b) (4)

Task 2.9 – Substantial Completion:

Subtask 2.9.1 – The recipient will [redacted]

Subtask 2.9.2 – The recipient will [redacted]

Task 2.10 – Punch list:

Subtask 2.10.1 – The recipient will [redacted]

Task 2.11 – Final Completion:

Subtask 2.11.1 – The recipient will [redacted]

Task 2.12 – Facility Startup & Demonstration:

Subtask 2.12.1 – The recipient will [redacted]

Subtask 2.12.2 – The recipient will demonstrate that the facility meets quality requirements and also meets the output requirements associated with full production.

Milestone	Type	Description
M2.1. [redacted]	Technical	[redacted]
M2.2. [redacted]	Technical	[redacted]
M2.3. [redacted]	Technical	[redacted]

(b) (4)

		[redacted]. (b) (4)
M2.4. [redacted]	Technical, SMART	[redacted] All of the ISBL equipment is installed in the Module Buildings and ready for testing.
M2.5. [redacted]	Technical	[redacted].
M2.6. [redacted]	Technical	[redacted]
M2.7. [redacted]	Technical	[redacted]
M2.8 Final Completion	Technical, SMART	Issued EPC close out report that documents 100% of punch list items associated with the project are complete and accepted by the recipient. EPC portion of the project is complete.
M2.9. Facility Startup	Technical	The project is complete and [redacted] (b) (4)
M2.10. Achievement of Final Project Objective: Demonstration of Full Production for Both	Technical, SMART,	Issued facility start up report documenting the facility is confirmed to produce product that meets quality requirements (see table in Deliverables

SCC55™ Facilities at Total Plant Capacity	End of Project	section below) and also meets the output requirements associated with full production as defined by the process specifications and guarantees [redacted]

(b) (4)

D. DELIVERABLES

In addition to the reports specified in the "Federal Assistance Reporting Checklist", the Recipient will provide the following to the DOE Project Officer (identified in Block 15 of the Assistance Agreement as the Program Manager):

- Summary of accomplishments and project work report will be prepared for inclusion in the Vehicle Technologies Office annual programmatic progress report. Report will be due by October 31 of each year.
- The completion of this project will result in two SCC55™ production facilities each capable of 2,000 tonnes/year at [redacted] and meeting all specifications required for SCC55™ as listed in the table below:

Property	Metric	Target
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

(b) (4)

[redacted]	[redacted]	[redacted]

[redacted] (b) (4) [redacted]

E. BRIEFINGS AND TECHNICAL PRESENTATIONS

- A technical presentation at the Vehicle Technologies Annual Merit Review Meeting held in Washington, DC.
- Detailed project status update briefings at Washington, DC or via communication/conferencing media approximately twice per year. Briefings will explain the plans, progress, and results of the technical effort.
- Technical paper(s) and presentations as appropriate at technical society meetings, or at technical exchange meetings.

PROJECT SUMMARY

Applicant: Group14 Technologies, Inc.
Principal Investigator: Henry R. Costantino, Ph.D. (CTO, co-Founder, Group14)
Project Title: Commercial Manufacturing of a Stable Silicon Anode Material towards Fostering a Strong U.S. Battery Supply Chain

Project Objective:
The overall project objective is to create a sustainable, resilient, U.S. battery supply chain by establishing U.S. leadership as the premier world producer of advanced, next generation silicon anode powder. The proposed project will complete the construction, commissioning, and ramp to full production of two commercial-scale modules for Group14's high-performing silicon-based anode powder, SCC55™. Each module will be capable of producing 2,000 tonnes/year, for a total capacity of 4,000 tonnes/year. Expanding production capacity of SCC55™ will accelerate electric vehicle (EV) adoption and reduce emissions by increasing EV driving ranges up to 50%, lowering battery costs to <$100/kWh, and enabling fast charging times to under 10 minutes. Additionally, this project will bolster the rural Eastern Washington State economy and employ a highly-skilled and diverse workforce to construct, commission, and operate the silicon anode production facility.

Description:
Group14's next-generation silicon-carbon composite to displace graphite in lithium ion battery (LIB) anodes, called SCC55™, is the world's premier silicon battery anode material, based on customer-validated performance and proven manufacturing scalability. SCC55™ facilitates dramatic reductions in battery cost and carbon footprint on a per unit basis as compared to incumbent graphite anode material. SCC55™ is an innovative composite of amorphous, nano-sized silicon within a porous carbon scaffold. This patented structure results in unparalleled performance in terms of energy density, cycle stability, and fast charge capability. Importantly, SCC55™can be deployed directly in current LIB production equipment with very low switching costs and rapid implementation timelines.

Such features, combined with scalable and efficient manufacturing, make SCC55™ a critical component of a strong U.S. battery supply chain. Group14 is proposing to build two 2,000 ton per year commercial manufacturing modules. The engineering unit operations and reactor designs are validated via our Washington State commercial launch factory that has already produced and shipped multiple tons of SCC55™ to customers worldwide. The project will benefit the local community and employ a highly-skilled, diverse workforce to construct, commission, and run the production facility.

COVER PAGE

Project Title	Commercial Manufacturing of a Stable Silicon Anode Material towards Fostering a Strong U.S. Battery Supply Chain
FOA Area of Interest	9 - Commercial-scale Domestic Next Generation Silicon Anode Active Materials and Electrodes
Technical Point of Contact	Henry R Costantino, CTO and co-Founder 8502 Maltby Road Woodinville, WA 98072 Phone: 425-210-2268 Email: rcostantino@group14technologies.com
Business Point of Contact	Eric Luebbe, CEO and co-Founder 8502 Maltby Road Woodinville, WA 98072 Phone: 206-465-7243 Email: rluebbe@group14technologies.com
Team Members	Group14 Technologies Inc. [redacted]
Senior/Key Personnel	Henry R. Costantino, Ph.D. (PI, CTO, co-Founder, Group14) Christopher Timmons (VP, Engineering, Group14) [redacted] Group14) [redacted]
Statement Regarding Confidentiality	Pages 2-50 of this document may contain trade secrets, confidential, proprietary, or privileged information that is exempt from public disclosure. Such information shall be used or disclosed only for evaluation purposes or in accordance with a financial assistance or loan agreement between the submitter and the Government. The Government may use or disclose any information that is not appropriately marked or otherwise restricted, regardless of source.

(b) (4) [redacted]

PROJECT OVERVIEW

Background: Group14 Technologies Inc is an independent private company formed in 2015 to enable next-generation silicon batteries. Group14's scientists and engineers previously collaborated on commercializing nano-tuned carbon-based battery materials, including a project supported by the Department of Energy (DOE) to construct an ISO-certified manufacturing plant capable of ~1,000 tonnes/year scale production that was completed on time and within budget.[1]

Building upon this deep expertise, Group14 has developed SCC55™, a novel, silicon-carbon composite active material powder designed as a drop-in for today's lithium ion battery (LIB) anodes. The commercial progress of SCC55™ benefits from support of several U.S government partnerships, including a successfully completed DOE project[2] achieving all milestones that focused on early scale up, and a current DOE project[3] that is successfully on track to achieve battery performance targets relevant for electric vehicle (EV) applications. The manufacturing process for SCC55™ was designed for rapid scale up and modular deployment, and comprises [redacted]

(b) (4)

As the technical baseline for scale, SCC55™ is currently manufactured in Group14's Woodinville, WA commercial pilot plant designed for 120 metric tonnes/year (t/y) production. From launch over a year ago,[4] this commercial pilot plant has fulfilled hundreds of customer orders up to multi-tonne in scope. [redacted] This experience validates the engineering unit operations and equipment design for further scale-up. Group14 is teaming with the same equipment technology provider to establish a modular approach wherein each turn-key factory supports 2,000 t/y modular manufacturing.

In terms of performance technical baseline, depending on the degree of substitution for graphite in the anode, SCC55™ boosts battery energy density by up to 50% or more,[5] while providing additional critical benefits such as outstanding cycle stability (>1,000 cycles to 20% fade) and fast charging as rapid as 5-10 minutes.[6] As a specific example, performance data have been generated for large format (82 Ah) automotive batteries comprising SCC55™ in the anode at a relatively low percentage blend with graphite. These batteries were built and tested as part

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[1] "Recovery Act: Nanoengineered Ultracapacitor Material Surpasses the $/kW Threshold for Use in EDV's," Annual Merit Review Meeting presentation, May 16, 2012.

[2] "Low Cost Manufacturing of Advanced Silicon-Based Anode Materials," Award DE-EE0007312.

[3] "Rationally Designed Lithium-Ion Batteries Towards Displacing Internal Combustion Engines," Award DE-EE0009187.

[4] https://group14.technology/en/news/group14-launches-commercial-manufacturing-factory-to-onshore-domestic-battery-supply-chain

[5] "Silicon-Carbon Anodes to Unlock the Future of Electrified Transportation," Oral Presentation at the Advanced Automotive Battery Conference (AABC), December 7, 2021.

[6] https://www.prnewswire.com/news-releases/storedot-and-group14-technologies-partner-to-enhance-extreme-fast-charging-battery-technology-with-lithium-silicon-301427462.html

of a project supported by the DOE and the U.S. Advanced Battery Consortium (USABC).[7] Battery performance - as measured by an independent national laboratory - successfully met project objectives. The energy density was 330 Wh/kg, representing a 25% boost over traditional LIBs, with a cycle stability (defined as number of cycles to 20% energy loss) in excess of 1,500 cycles. These batteries demonstrated satisfactory temperature operating range of -20 to 55 °C, low resistance, and fast charging (from 10% to 80% state-of-charge) under 20 minutes.

Based on manufacturing and performance baselines, SCC55™ has passed the criteria for technology readiness level 7 (TRL7). No other silicon-based material can match this proven combination of scalability and performance. Moreover, SCC55™ is easy to use as a drop-in with current anode electrode and LIB manufacturing lines. As such, the current project is uniquely relevant for meeting the specific objective of Area of Interest 9 (AOI9) of DE-FOA-0002678 to construct new facilities to manufacture U.S. silicon-based anode powder.

Project Objective: The overall project objective is to establish and expand a sustainable, resilient, and equitable U.S. battery supply chain by establishing U.S. dominance as the premier world producer of advanced, next generation silicon anode powder. To this end, Group14 seeks DOE assistance to add 4,000 t/y capacity for producing our flagship silicon-based anode powder, SCC55™, by 2025-2026. This capacity will be achieved via construction of two modular manufacturing lines, with key processing steps that support 2,000 t/y for each module (**Table 1**).

Table 1. Summary of Manufacturing Project Targets (Per Module).

Process Step	Metric	Minimum Target[a]	Improvement to Baseline[b]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

[redacted] (b) (4)

Table 1 presents the proposed target throughput for [redacted] Also presented in **Table 1** are the fold improvements for each target relative to the baseline technology as demonstrated in the current commercial pilot manufacturing plant. Beyond achieving the production targets, the material produced at 2,000 t/y scale must match certain key physicochemical and electrochemical properties for products manufactured at the commercial pilot scale (**Table 2**). In this case, the goal is matching properties as already validated via various customer tests in their commercial battery systems. Achieving scale and performance targets on **Table 2** demonstrates that the project technology has been proven to work in its final form and under expected conditions consistent with technology readiness level (TRL) 9.

[7] "Development of High-Performance Lithium-Ion Cell Technology for Electric Vehicle Applications," Poster Presentation at the DOE Annual Merit Review Meeting, June 25, 2021.

Table 2. Summary of Material Properties/Performance Targets.

Property	Metric	Target
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]

[redacted] (b) (4) [redacted]

The critical success factors to achieve the project goal are:

- Readying the manufacturing site to facilitate permitting and allow necessary construction both inside battery limits (ISBL) and outside battery limits (OSBL)
- Constructing and installing process equipment within engineering design specifications
- Establishing supply of sufficient quantities of carbon and silicon precursor raw materials
- Confirming key process parameters and defining optimal operations at full scale
- Achieving sufficient control of key process parameters at full scale
- Project managing to maintain the timeline and budget, and risk mitigation planning
- Hiring, training, and retaining appropriately skilled employees to build/operate the plant
- Completing appropriate quality related programs: International Organization for Standardization (ISO), International Automotive Task Force (IATF), Production Part Approval Process (PPAP)

DOE Impact: Throughout the history of Group14, DOE funding has made a profound positive impact to accelerate the commercial development of SCC55™ as a key component in the U.S. battery supply chain. With prior DOE support, Group14 advanced SCC55™ from the lab to multi kg scale production. This capability allowed for production and shipping of SCC55™ in quantities to support preliminary customer evaluations. Building upon this success, Group14 subsequently designed a production process and scaled it to the current commercial pilot scale designed for 120 t/y production. In turn, this capability has culminated today in [redacted] Current experience at commercial pilot scale manufacturing has provided the engineering design blueprint for modular manufacturing at the next level in scale, i.e., 2,000 t/y. [redacted] (b) (4) [redacted] While this approach allows for a foothold for strengthening the U.S. battery supply chain, it is not sufficient to rapidly achieve the step change in the U.S. battery economy as elucidated in the current FOA.

As shown in **Figure 1**, the projected demand for SCC55™ from U.S. automakers alone outstrips the current module deployment plan based on Group14's current funding level. When the projected demand of auto makers outside the U.S. is added, the gap is even larger. It is important to note that **Figure 1** only presents demand that has been provided to Group14 in writing. Furthermore, an extremely conservative 20% probably weighting has been applied, i.e., the actual demand in writing is five times higher than shown in **Figure 1**. To date, Group14 has shipped SCC55™ to [redacted] and 100% of those customers have SCC55™ in at least one active battery qualification program. Therefore, the 20% probably weighting seems extremely conservative.

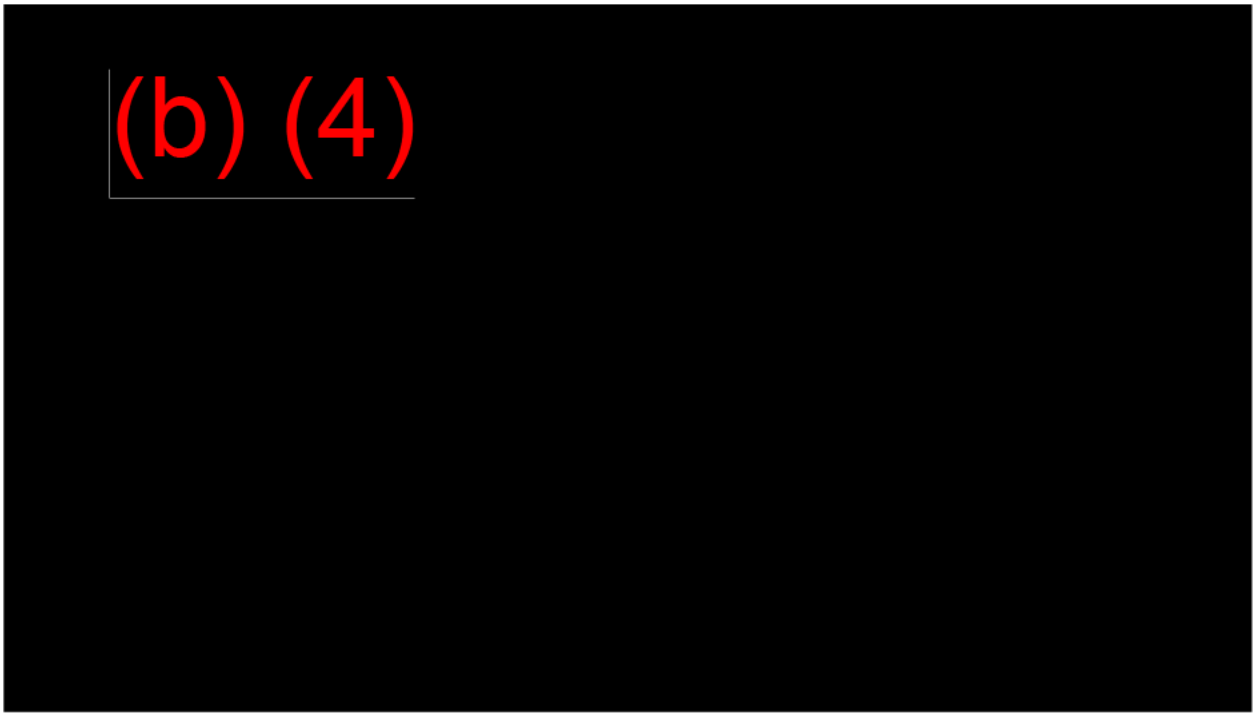

Figure 1. Impact of current DOE funding on bridging the gap between SCC55™ production capability and documented customer demand.

In any case, there is an urgent demand for SCC55™ that currently exceeds the rate at which Group14 can ramp production given the Company's current funding level. Closing this gap is a critical step in establishing a resilient U.S. battery supply chain. DOE funding for the current proposal will accelerate early module deployment and thus bridge the gap between active material supply and demand. Such funding will allow for pushing forward on a more rapid, robust, and lower-risk commercialization path that will quickly establish the U.S. as the world's leader in silicon-based anode materials and solidify a strong domestic battery supply chain.

In terms of DOE spending leverage, support of the current project translates to an annual production of 1,000,000 EVs.[8]

[8] Calculation based on current SCC55™ silicon content for anode powder, and 20% battery anode loading.

Equity Plan: Group14 embraces the project requirement for an Equity Plan, which reflects our shared vision of fostering equal opportunity across the full spectrum of cultures and people that shape and define our local communities. Equity Plan principles are part of Group14's corporate philosophy: sustainable community economic development and prosperity, community worker engagement, job quality, diversity, equity, inclusion, accessibility, and investments in clean energy to benefit disadvantaged communities. There are numerous SMART goals associated with diversity, equity, inclusion, and accessibility (DEI&A) aspects of the Equity Plan (**Table 5**).

Anticipated Benefits to the Local Community and Disadvantaged Communities (DACs)

Numerous anticipated benefits will accrue to the local community and disadvantaged communities (DACs) surrounding the project. These key benefits include:

- Creation of about **300** skilled trade workers for constructing the facility
- [redacted] of vendors and subcontractors for supplies, services, and equipment related to constructing the facility will be represented by Disadvantaged Business Enterprises (DBEs) such as Minority Business Enterprises, Minority-owned businesses, woman-owned Businesses, or veteran-owned Businesses
- Creation and retention of about **200** well-paid technical jobs to operate the facility
- [redacted] of technical jobs to operate the plant will be drawn from displaced fossil fuel energy jobs (oil, coal, etc.)
- [redacted] of vendors and subcontractors for supplies and services related to operating the facility will be represented by DBEs such as Minority Business Enterprises, minority-owned businesses, woman owned-businesses, or veteran-owned businesses
- Sponsored internship programs
- Sponsored scholarship programs at local academic institutions
- Sponsored development and training programs at local academic institutions
- Creation of a local Project Advisory Council (PAC) to discuss/address project opportunities/challenges
- Creation of a local Youth Advisory Council (YAC) to develop creative science, technology, engineering, and mathematics (STEM) programming to educate about the benefits of a more accessible mobility environment
- Creation of an interactive Youth Education Campaign in collaboration with local school districts and/or local youth organizations

(b) (4)

According to the DOE Energy Justice Dashboard,[9] two of the four census tracts (2010 Census) within the City of Moses Lake, Washington, where the project will occur, are considered disadvantaged communities. Furthermore, according to the Climate and Economic Justice Screening tool, Census Tracts 25010902 and 25011100 in Grant County are disadvantaged in the area of clean energy and energy efficiency as the area is in the 93rd percentile for fine particulate matter in the air and the 73rd percentile for low-income households. Many of the surrounding areas are also disadvantaged in clean energy and energy efficiency.

[9] https://www.energy.gov/diversity/energy-justice-dashboard-beta

The proposed project will further aid these DACs and other vulnerable populations by increasing access to non-fossil fuel energy options and accelerating adoption across the state. One such specific example of a DAC that would benefit from the acceleration in non-fossil fuel energy storage would be Region 9 on the eastern part of Washington State, which comprises seven counties and three tribal areas which see a disproportionate effect from climate-related disasters such as wildfires and droughts. The disasters are becoming more severe every year. While Group14's technology will not directly reduce climate-related disasters in this area, it would drive non-fossil fuel electric infrastructure adoption over the tipping point.

TECHNICAL DESCRIPTION, INNOVATION, AND IMPACT

Relevance and Outcomes

Technology: The transition from traditional lithium ion batteries based on graphite anodes to batteries powered by silicon-based anodes, i.e., silicon batteries, has emerged as the leading technology for improving battery performance and lowering cost on a per energy basis.[10] Silicon has 10-fold higher gravimetric capacity than conventional graphite. However, silicon exhibits large volume change during cycling, in turn leading to potential for electrode deterioration and solid-electrolyte interphase (SEI) instability. To address these challenges, a variety of approaches are being explored, including complex silicon architectures such as nanowires to complex anode architectures to constrain silicon particles. Such approaches, while technically feasible to varying degrees, pose significant manufacturing scale-up challenges and/or lack drop-in flexibility with existing anode electrode and battery manufacturing equipment.

To meet the need for a high performing, rapidly scalable, and drop-in capable silicon-based anode material, Group14 has developed SCC55™. Group14 holds patents directed at SCC55™ composition of matter and manufacturing, all developed in the U.S.[11] The basis for high performance is [redacted] (**Figure 2**):

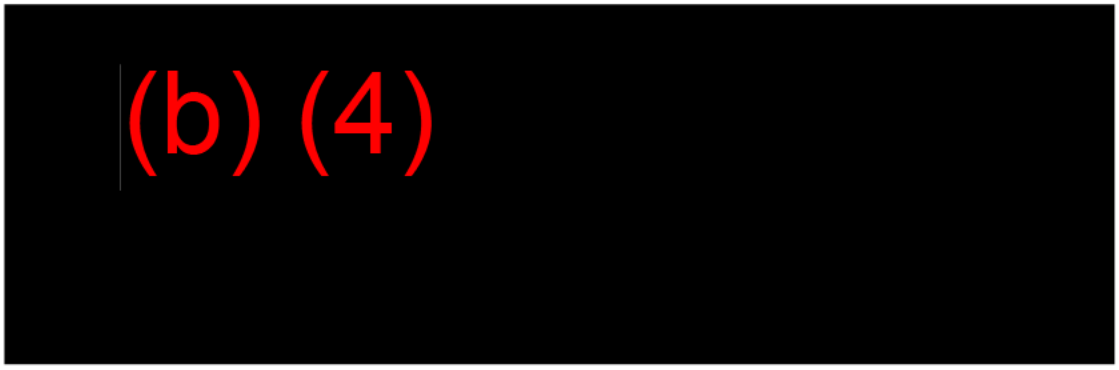

Figure 2. Schematic of SCC55™ structure, [redacted]

[10] "Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-Based Growth," A Report by the White House under Executive Order 14017, pp. 131-132, June 2021.

[11] Key U.S. issued patents include US11,335,903, US10,711,140, US10,590,277, US10,454,103, US10,814,304, US10,763,501, US10,756,347, US10,784,512, US10,923,722, US10,147,950, US11,174,167, US11,335,903, numerous other patents are issued or pending in the U.S. and worldwide.

- [redacted]
- [redacted]
- [redacted]

[redacted] (b) (4) [redacted]

With the goal to create the ideal fusion of amorphous silicon and hard carbon, Group14 developed SCC55™. This product is the result of three generations of developing silicon-carbon composites leading to [redacted]

- [redacted]
- [redacted]
- [redacted] (b) (4) [redacted]

To achieve the desired [redacted] for SCC55™, Group14 has innovated [redacted] Group14's approach confers numerous advantages over competing technologies. [redacted]

[redacted]

[redacted] Under a previous DOE project, the nano-size and amorphous nature of silicon was confirmed via selected area electron diffraction.[14] [redacted] This system provides a high-rate-capable, solid-state lithium diffusion pathway that directly delivers lithium ions to the nano-scale silicon interface with high first cycle efficiency (**Figure 3A**). Another benefit of [redacted] is the inhibition of formation of undesirable crystalline $Li_{15}Si_4$ phase (**Figure 3B**). [redacted]

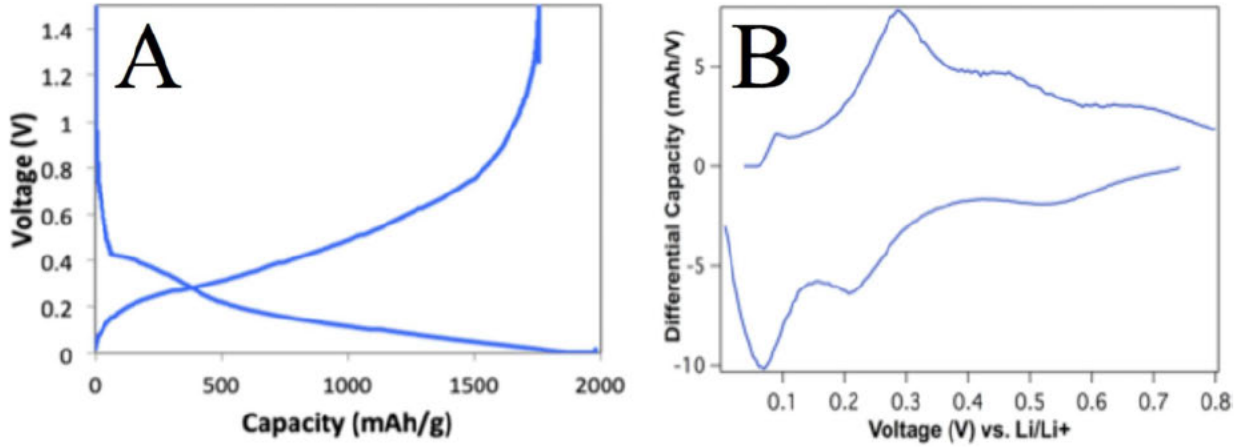

Figure 3. Voltage profile for SCC55™. (**A**) First cycle voltage profile of SCC55™ composite material demonstrating ~90% first cycle efficiency. (**B**) Differential capacity plot showing the lack of any crystalline phases. Data were measured with half-cells between 0.005 V and 1.5 V at C/10 rate.

While it is important to have a solid scientific foundation for material design, the successful integration of a battery material into the supply chain depends on manufacturing scalability. To this end, Group14's scientists and engineers have leveraged prior experience with commercializing carbon battery materials towards SCC55™. Group14's unique manufacturing platform to produce SCC55™ is [redacted]

[14] "Low Cost Manufacturing of Advanced Silicon-Based Anode Materials," Poster Presentation at the DOE Annual Merit Review Meeting, June 8, 2017.

[redacted] All process steps are designed for automated, continuous, and [redacted]

[redacted]

(b) (4)

[redacted] **4.** Process Flow Diagram (PFD) for [redacted] The steps shown are representative of a single module capable of producing 2,000 t/y of SCC55™.

The Process Flow Diagram provides more details of [redacted] Utilities are required to be connected to the process at the physical wall of the process. The advantage to this is placing the required support facilities in place for the number of modules desired in a location. The process train is designed for continuous and automated (hands-free) operation.

The carbon process initiates via [redacted] (b) (4) [redacted] Additionally, Group14 has qualified more than five other suppliers for each of these materials each with sufficient capacity to support our volumes. All of these supplies have been qualified to meet Group14's specifications.

(b) (4)

Additionally, Group14 has established a JV and strategic cooperation with SK materials, a global commercial producer of silane, providing for strategic secondary sourcing. Both manufacturers produce silane for the solar market (to produce polysilicon) and this grade of silane is qualified to meet Group14's specifications.

(b) (4) The filled bags are then loaded on pallets at the module building for shipment to customers.

Environmental Considerations: The manufacturing of silicon anode powder presents a chance to improve the greenhouse gas emissions in the electric vehicle supply chain. [15]

The project location was strategically located in Grant County, Washington in order to use the abundant, low CO_2e hydroelectric power available in the region. The hydroelectric facilities in Grant County have not reached their generation capacity resulting in water traveling through spillways without generating low carbon emissions electricity. Group14 would take advantage of this source and keep from adding generation capacity in the form of coal or natural gas.

All processes for producing SCC55™ are (b) (4)

In silicon battery anode manufacturing, typically less than 100% of silane is consumed to produce silicon. The proposed facility will have It is important to note that Group14 has developed patent protected, scaled manufacturing processes that include a best-in-class utilization of silane gas

[15] Q Dai, JC Kelly, L Gaines, M Wang, Batteries 2019, 5(2), 48; Energy Consumption and Carbon Emission Analysis of Natural Graphite Anode Material for Lithium Batteries, SW Gao, XZ Gong, Y Liu, QQ Zhang, Materials Science Forum 2018, Volume 913, 985-990; https://www.northerngraphite.com/media/news-releases/display/northern-graphite-charts-path-to-carb on-neutral-project-at-bissett-creek (2022).

during its Siligenesis™ process (the "'903 patent"[16]). [redacted] (b) (4) [redacted]

Relevance: The current proposed project is in excellent alignment with the overarching objective of the FOA, and uniquely relevant to the specific objective for Area of Interest 9 (AOI9). Furthermore, the proposed project will establish large commercial-scale manufacturing of a silicon-based anode active material that boosts battery performance consistent with targets described by the DOE Vehicle Technology Office (VTO). The proposed project represents a critical component to build a resilient U.S. battery supply chain and enhance national security as directed in the FOA. With the DOE's support, Group14 will rapidly establish large-scale commercial manufacturing of a next generation silicon-based anode product that - evidenced by extremely high demand - is already linking up key U.S. battery producers, automotive original equipment manufacturers (OEMs), and other customers. As discussed in the DOE impact section above, **Figure 1** illustrates the high demand for SCC55™ as communicated to Group14 by U.S. and worldwide automakers. Based on feedback [redacted] (b) (4) [redacted] SCC55™ produced in the proposed facility will broadly improve customers' battery energy in terms of per unit mass, volume, and cost. No other silicon battery material can compare to the demonstrated scalability and proven market traction of SCC55™; this project will be the centerpiece of a more sustainable, resilient, and equitable U.S. energy economy.

Further relevant to FOA principles, the proposed project will create roughly 300 well-paying skilled trade jobs to construct the proposed plant, and 200 well-paying technical jobs to commission, ramp up, and sustain production going forward. To this end, Group14 commits to maintaining its high standards for a free and fair workplace, free from discrimination and harassment, embracing diversity and establishing meaningful engagement with local communities, particularly those who are undeserved, underrepresented, or disadvantaged.

Regarding specific AOI 9 objectives, the current project is uniquely suitable to the task. Consistent with AOI 9 objectives, the proposed project will establish new facilities for 4,000 t/y U.S. production of a next generation silicon-based anode active material. Also consistent with AOI 9 objectives, the produced material has drop-in capability with current electrode and cell manufacturing and is thus highly suitable for use in a module, pack, or system, and can be used in electric vehicles and/or electric grid energy storage applications. The manufacturing technology is already proven at commercial pilot scale; tonnes of product have been shipped to customers in the U.S. and worldwide. These customers are already using the material in a wide variety of relevant battery systems. No other silicon-based anode material has such strong and

[16] U.S. patent 11,335,903, Highly efficient manufacturing of silicon-carbon composites materials comprising ultra low z (the "'903 patent")

proven alignment with AIO 9 objectives.

(b) (4) [redacted]

In addition to relevance to overall FOA and specific AOI 9 objectives, the proposed project will establish large commercial-scale manufacturing of a silicon-based anode active material that boosts battery performance consistent with DOE VTO targets. These battery targets include lowering cost on a per energy basis [redacted] supporting fast charging capability (e.g., <15 min), and boosting energy density for increasing driving range (e.g., >300 miles).[17] Relevant to these targets, in a prior DOE VTO project Group14 modeled the potential for SCC55™ to lower battery cost.[18] Furthermore, the aforementioned 82 Ah batteries comprising SCC55™ in the anode produced by Farasis exhibited 25% energy boost aligning with the increased driving range goal.[6] Regarding fast charge, another Group14's customer has demonstrated the ability to fast charge in as low as 5-10 min.[19,20]

Expected Outcomes: The proposed project will establish by 2025 the construction, commissioning, and ramp up to production for two commercial-scale modules for SCC55™, each capable of 2,000 t/y, for a total capacity of 4,000 t/y. Achievement of this project goal will have several profound outcomes:

- Creation of 300 jobs in the contracting sector related to site preparation, building construction, and commercial module construction.
- Creation and retention of an additional 200 jobs related to commissioning, ramp up, and sustained manufacturing of SCC55™.
- Group14 will be able to meet the current demand for delivering products to U.S. automakers and their battery suppliers (**Figure 1**).
- There will be at least hundreds of thousands of EVs produced annually in the U.S. with 25% or more boosted driving range.
- The U.S. will establish a resilient battery supply chain and worldwide leadership in commercial manufacturing of next generation silicon-based anode active material.

Feasibility: There are three key components related to demonstrating feasibility of the current project: (i) feasibility of SCC55™ to boost customers' battery performance to meet EV and other customers' requirements; (ii) feasibility of SCC55™ manufacturing to achieve the proposed commercial scale and thus accelerate EV adoption and the electrification of everything; (iii) feasibility of the proposed team led by Group14 to successfully execute the project plan to establish a resilient U.S. battery supply chain. For all three components, the feasibility is well-established with an overall technology readiness level of TRL7.

Previous Work and Prior Results - Product Performance: Unlike any other silicon-based anode material, the industry-leading performance of Group14's SCC55™ has been published and

[17] https://www.energy.gov/eere/vehicles/batteries-charging-and-electric-vehicles.
[18] "Low Cost Manufacturing of Advanced Silicon-Based Anode Materials," Poster Presentation at the DOE Annual Merit Review Meeting, June 1, 2020.
[19] "StoreDot and Group14 Technologies Partner to Enhance Extreme Fast Charging Battery Technology with Lithium-silicon," press release, November 18, 2021.
[20] https://www.prnewswire.com/il/news-releases/storedot-hits-world-leading-target-of-1200-cycles-for-its-extreme-fast-charging-cells-destined-for-future-electric-vehicles-301508810.html

verified in automotive batteries tested under conditions relevant for EVs. Exemplary data have been generated as part of a USABC project[6] for 82 Ah pouch batteries comprising SCC55™. Silicon batteries comprising SCC55™ have demonstrated industry-leading performance in terms of key metrics such as boosted energy density, stable cycle life and calendar life, and fast charging capability. Specifics of the cell configuration are presented in **Table 3**.

Table 3. Cell Configuration for 82 Ah Batteries Comprising SCC55™.

Property	Metric	Value
Capacity	Ah	82
Cycle Life (to 80% capacity)	Cycles	> 1500
Energy Density, Gravimetric	Wh/kg	330
Energy Density, Volumetric	Wh/L	804
Voltage Range	Min to Max V	2.5 to 4.2
Temperature Operating Range	°C	-20 to 55
Dimensions	mm (L x W x Thickness)	294.4 x 103.9 x 13.5
DCIR, 50% SOC, 30s, 3C	Ohm	1.57
DCIR, 50% SOC, 10s, 1C	Ohm	1.01

The cycle life and calendar life data for the 82 Ah automotive batteries comprising SCC55™ are depicted in **Figure 5** and **Figure 6**, respectively. As can be seen, for batteries cycled at 1C rate and 30 °C between 2,75 and 4.2 V, the projected cycle life is > 1,500 cycles. A similar cycle life was observed for batteries cycles at 2 C charge and 1 C discharge. This stability is sufficient to meet requirements for the USABC project and automotive customers.

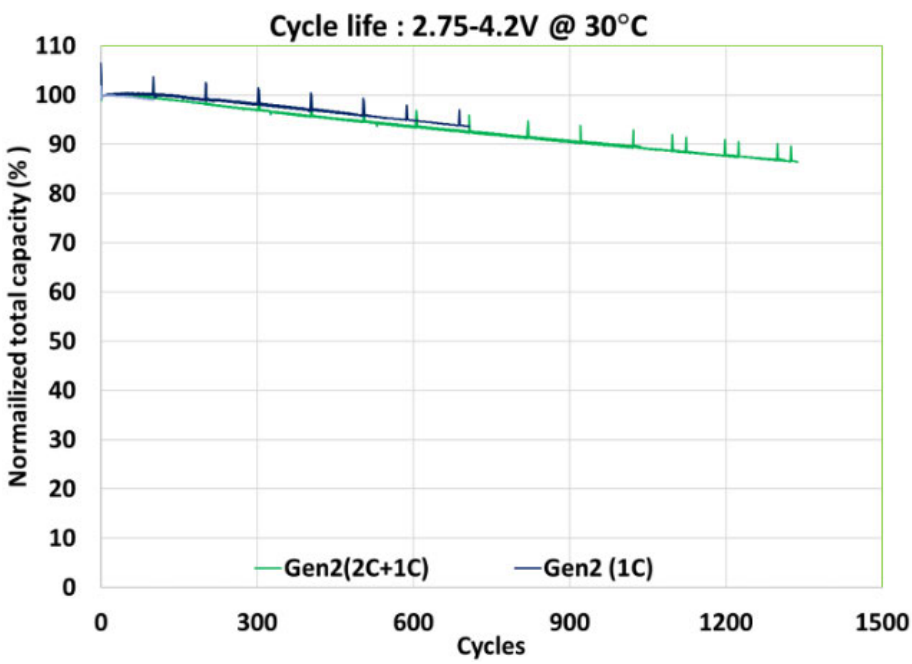

Figure 5. Cycle stability data for 82 Ah pouch cells (anode with [redacted]SSCC55™ blended with graphite).

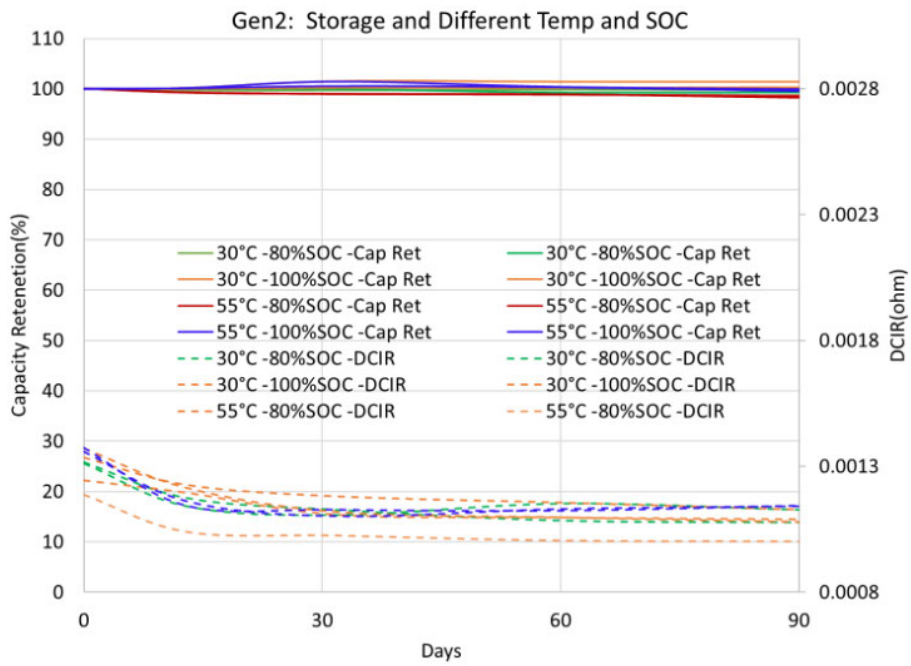

Figure 6. Calendar life for 82 Ah pouch cells (anode with [redacted] SSCC55™ blended with graphite).

(b) (4)

Similarly, the calendar life data also meets project requirements - the capacity and direct current internal resistance (DCIR) were very stable for batteries stored at 80-100% state-of-charge (SOC) and 30 to 55 °C. Combined with the measured capacity boost of 25% compared to traditional lithium ion batteries, these silicon batteries powered by SCC55™ demonstrate unparalleled high performance for a silicon-based anode material tested in automotive batteries under automotive industry relevant conditions.

While the aforementioned data are impressive, even further performance boosts are possible. For anodes with higher loading of SCC55™ in the anode, Group14 has been chosen by the DOE to lead a project targeting 350 Wh/kg energy density, 1,000 cycle stability, and 10-year calendar life.[21] To this end, 0.4 Ah pouch batteries were constructed with anodes loaded with 35% SSCC55™ blended with graphite. The anode also contained 4-5% PAA as binder, <1.5% C45 as conductive carbon, and <0.5% carbon nanostructures. The cathode was 811 nickel-manganese-cobalt (NMC). The anode density and areal capacity were 1.4-1.5 g/cm^3 and 4.5 mAh/cm^2, respectively. The electrolyte was 1.2M $LiPF_6$ in EC/EMC/DEC (1/1/1, v/v) + 1% VC + 10% FEC + 1% OS3. These cells were cycled at C/2 rate at 30 °C between 2.75 and 4.2 V and at C/3 rate every 50 cycles. The cycle data are depicted in **Figure 7**. For these full cells with 35% SCC55™ in the anode, the projected cycle life is projected to be ~ 1,000 cycles. This project is in year two of a three-year program, and further testing, including calendar life testing, is ongoing. The results to date are highly promising to stay on track to achieve project milestones.

[21] "Lithium SIlicon Batteries to Displace Internal Combustion Engines," BAT529 Preseted June 23, 2022 at the DOE Annual Merit Review Meeting.

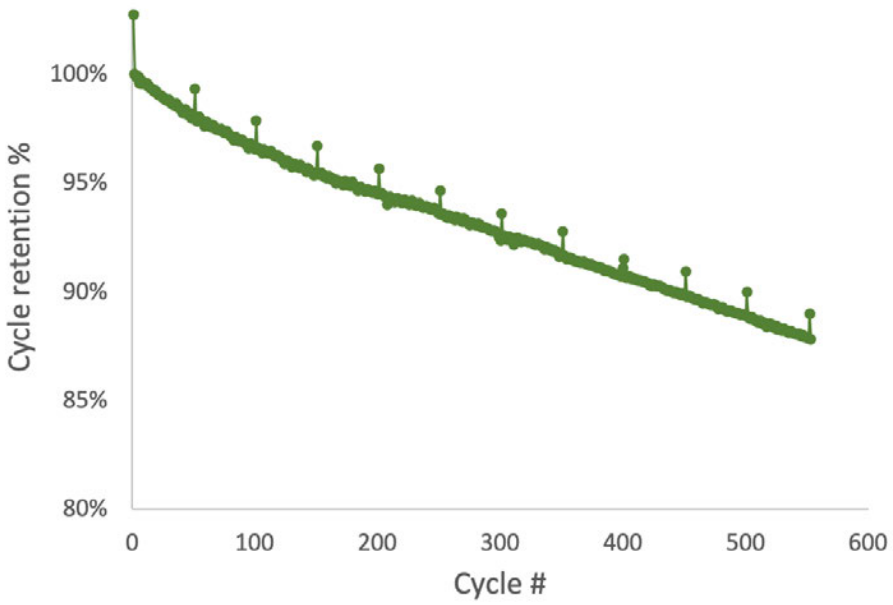

Figure 7. Cycle stability for 0.4 Ah full cell pouch cells (anode with 35% SSCC55™ blended with graphite).

Previous Work and Prior Results - Manufacturing Scale Up: No other silicon battery technology can match SCC55™ for proven feasibility for manufacturing at commercial scale.

A previously funded DOE project supported Group14 to advance SCC55™ from the lab to kg scale.[11] This achievement allowed Group14 to expand customer sampling which, in turn, facilitated the company to raise funding and establish commercial pilot manufacturing with a designed capacity of 120 t/y. This commercial pilot plant has validated the equipment and unit operations for the overall SCC55™ manufacturing line that is already being built for 2,000 t/y scale. The first module at this full commercial scale will be built in 2022-23 outside the U.S. under a joint venture with SK materials,[22] [redacted] The learnings during build and commissioning for these initial 2,000 t/y SCC55™ manufacturing modules will provide further confirmation on feasibility to establish the additional two modules proposed in the current project.

Process scalability by design is key to Group14's product development philosophy. The overall SCC55™ manufacturing process involves [redacted]

[22] https://www.prnewswire.com/news-releases/group14-technologies-announces-joint-venture-with-sk-materials-to-accelerate-global-dual-sourcing-for-lithium-silicon-battery-materials-301336806.html

(b) (4) Thus, the feasibility of commercial manufacturing SCC55™ is well established.

Previous Work and Prior Results - Proven Commercial Manufacturing Experience: Unique for its technology space, Group14's executive, scientific, and engineering leadership has teamed together for over a decade and established a successful commercialization track record, dating to scaling-up U.S. manufacturing of carbon-based battery materials to 1,000 t/y capability under a $28.7M project meeting all milestones on-time and in-budget.[23] This same team has further extended their successful track record by scaling SCC55™ from the lab to commercial pilot manufacturing at 120 t/y capacity.

Secure and/or Retain Trained and Qualified Workers: To achieve our ambitious goals and establish U.S. dominance in the clean energy economy, we at Group14 know that our people are core to our success. Group14 fosters an employee-first culture for every individual on our staff. This approach is fundamental to our values and always will be. We believe that maintaining a working environment geared towards employee retention bolsters employee satisfaction and our capability to recruit talented people.

Employees receive a warm onboarding and orientation process, competitive compensation, perks such as insurance for health care (both physical and mental), and support of a healthy work-life balance through ample paid time off for vacation and public holidays. Additionally, employees have access to training and personal development programs (such as lean six sigma), mentorship programs (such as leadership coaching, and P.E. engineer in training mentorship), receive frequent supportive and constructive feedback from supervisors, and complete dedication to employee health and safety. Finally, at Group14, we value and acknowledge employees' successes, both big and small. Recognition ranges from catered celebrations for group victories to employee bonuses, and even pay increases for achieving major goals.

It is expected that the new facility will employ a total of 300 skilled trade workers to construct and 200 individuals to operate the facility in various positions, including engineers, process operators, and laboratory technicians. Some of these roles require technical expertise that can be learned through training programs and on the job training. The emerging clean energy sector

[23] "Recovery Act: Nanoengineered Ultracapacitor Material Surpasses the $/kW Threshold for Use in EDV's," Presentation at DOE annual Merit Review Meeting, May 16, 2012.

does not have a built-in pipeline of qualified or expert workers, so it is important for Group14 to participate in the development of these qualified individuals, starting with providing opportunities in the local community.

In Moses Lake, WA, Group14 has developed a strong relationship with the Big Bend Community College (BBCC) and we are dedicated to working together with the college to develop and implement training programs tailored specifically for our growing high-tech manufacturing industry. BBCC is a comprehensive, publicly funded college serving the rural communities in Grant, Adams, and Lincoln counties with a student body that is 39% Hispanic and 17% multiracial. Group14 and BBCC are dedicated to bolstering equity and inclusion in these areas where high numbers of students experience intergenerational poverty and historically low educational attainment rates. Fostering this relationship and participating in the formation of training programs will help create a local pipeline of skilled workers and provide opportunities that do not currently exist.

Beyond the local strategy, Group14 can deploy recruitment strategies to secure employees from around the U.S. Group14 plans to continue offering competitive benefits and focusing on employee training in an effort to retain employees well into the future to support continued growth. Additionally, all employees at Group14 are allowed the free and fair choice to join or form a union if they choose.

Innovation and Impacts: For decades, graphite has been the state-of-the-art (SOA) for LIB anodes. However, in recent years it has been stretched to its theoretical performance limits. Some producers have begun adding sparse amounts of silicon (<10%) to LIB anodes to gradually increase energy density,[24] but such strategies have not proven impactful and may lead to detriments in calendar life. Silicon has a theoretical capacity of 3,580 mAh/g, an order of magnitude greater than graphite. However, implementation of silicon-based anodes is hindered by large volume expansion upon lithiation leading to capacity loss via particle fracture and SEI instability. Furthermore, exposed silicon surfaces may react with the electrolyte in the battery limiting cycle and calendar life.

One approach to overcome the challenge of using silicon as an anode material is to encapsulate/disperse nano-sized particles in a conductive matrix. Current techniques for creating nano-silicon involve high-temperature oxide or inactive metal alloying, multi-step toxic etching techniques, and/or other cost-prohibitive processes. Likewise, common approaches involve expensive materials (e.g., graphene or nano-graphite), and/or require complex particle processing. Group14's SCC55™ addresses these issues using [redacted] (b) (4)

[24] http://www.emvalley.com/news/the-cells-in-teslas-90-kwh-model-s-that-partially-use-silicon-what-can-they-be/

(b) (4)

- **Innovative Structure with Low Expansion:** particle expansion as low as 19%.[11]
- **High First Cycle Efficiency (FCE) and Capacity:** ≥90% FCE and 1,700-1,900 mAh/g (hall cell, 5 mV - 1,5 V), low surface area stable SEI formation, and absence of detrimental $Li_{15}Si_4$ phase formation on cycling.[11,13]
- **Exceptional Cycle Life:** Numerous customer demonstrations >1,000 cycle stability[6,13,14] such as the data depicted in **Figure 5** and **Figure 7**.
- **Boosted Energy Density:** Even when used at a low loading of in the anode, battery energy for silicon batteries vs. traditional LIB is boosted by 25%;[6] unpublished data from customers employing high anode loadings support 50% or more boosted energy.
- **Extremely Fast Charge Capability:** Even when used at low loading in the anode, rapid charging can be achieved in less than 20 min,[6] and higher loadings support charge as fast as 5-10 min.[6,19,20]
- **Drop-In Useability**. Dozens of customers are conducting evaluations across a variety of battery designs and electrode and battery manufacturing platforms (for further evidence of excellent market traction, see Figure 1, Figure 11, and the attached Letters of Commitment).

The structure of Group14's SCC55™ was specifically nano-engineered for high performance, scalability, and low cost.

Dramatic evidence for this novel silicon structure has been uncovered by This unique structure represents the ideal fusion of silicon and carbon to maximize the performance of next generation silicon batteries.

(b) (4)

WORKPLAN AND MARKET TRANSFORMATION PLAN

Summary of Project Objectives: The overall project objective is to help establish and expand a sustainable, resilient, and equitable U.S. battery supply chain by establishing U.S. dominance as the premier world producer of advanced, next generation silicon anode powder. To this end, the proposed project will complete the construction, commissioning, and ramp to full production of two commercial-scale modules for Group14's high-performing silicon-based anode powder, SCC55™. Each production module will be capable of 2,000 t/y, for a total capacity of 4,000 t/y [redacted] (b) (4) [redacted]

Group14's expanding production capacity of SCC55™ will accelerate EV adoption and reduce emissions by increasing EV driving ranges up to 50%, lowering battery costs to [redacted] and enabling fast charging times to 5-20 min. Additionally, this project will bolster the rural eastern Washington economy and employ a skilled and diverse workforce to construct, commission, and operate the silicon anode production facility. This project will not involve the construction, alteration, and/or repair of infrastructure in the United States.

Technical Scope Summary: The project will be divided into two main scopes, inside battery limits (ISBL) and outside battery limits (OSBL). The ISBL scope comprises [redacted] The OSBL scope comprises [redacted] (b) (4) [redacted] The ISBL scope will be provided by [redacted]

The OSBL scope will be provided by [redacted] ***Note that at the time of this application Group14 is already underway with engineering and procurement for two identical anode production facilities, and thus, the engineering portion of this work plan is relatively short because much of this engineering can be utilized from the ongoing projects.*** The project will be conducted in two (2) budget periods:

Budget Period 1: Engineering, Procurement, Mobilization, and Module Construction. Budget period 1 includes engineering, procurement, mobilization, and module construction. For ISBL activities, this includes [redacted] (b) (4) [redacted]

Budget Period 2: Module Construction, Equipment Installation, Commissioning, Module Startup, and Demonstration. Budget period 2 consists of module construction, equipment installation, commissioning, module startup, and demonstration. ISBL activities at this phase include [redacted]

[redacted] OSBL activities at this phase include [redacted] (b) (4) [redacted] testing, utility commissioning, confirmation of substantial completion, and regulatory approval.

End of Project Goal. The completion of this project will result in two SCC55™ production facilities each capable of 2,000 t/y [redacted] and meeting all specifications required for SCC55™ as listed in **Table 2**.

Overall Project Management and Planning: The recipient will perform project management activities to include project planning and control, subcontractor control, financial management, data management, management of supplies and/or equipment, risk management, and reporting as required to successfully achieve the overall objectives of the project.

Task 0.0 – Project Management and Planning:

The Recipient shall develop and maintain the Project Management Plan (PMP).

Task 0.1- Kick-Off Meeting:

The Recipient will participate in a project kickoff meeting with the DOE within 30 days of project initiation.

Budget Period 1: Engineering, Procurement, Mobilization, and Module Construction

Task 1.1 – Issue Scope of Work and Contracting:

Subtask 1.1.1 – The recipient will [redacted]

Subtask 1.1.2 – The recipient will [redacted] (b) (4) [redacted]

Task 1.2 – Engineering:

Subtask 1.2.1 – The recipient will host an engineering kickoff workshop [redacted]

Subtask 1.2.2 – The recipient will [redacted]

Subtask 1.2.3 – The recipient will [redacted]

Subtask 1.2.4 – The recipient will [redacted]

Task 1.3 – Utility Coordination:

Subtask 1.3.1 – The recipient will coordinate with the local utilities to coordinate on the impacts of facility expansion.

Task 1.4 – Procurement:

Subtask 1.4.1 – The recipient will [redacted]

Subtask 1.4.2 – The recipient will [redacted]

Subtask 1.4.3 – The recipient will [redacted]

Task 1.5 – Permitting:

Subtask 1.5.1 – The recipient will [redacted]

Subtask 1.5.2 – The recipient will [redacted]

Subtask 1.5.3 – The recipient will [redacted]

Subtask 1.5.4 – The recipient will [redacted]

(b) (4)

Task 1.6 – Shop-Fab Equipment Inspection:

Subtask 1.6.1 – The recipient will [redacted]

Subtask 1.6.2 – The recipient will [redacted]

Task 1.7 – Mobilization & Modules #3 and #4 Prep Work:

Subtask 1.7.1 – The recipient will confirm that building permits have been approved and give notice to proceed to [redacted]

Subtask 1.7.2 – The recipient will provide construct management oversight of [redacted]

Continuation: The recipient is **NOT** authorized to initiate any scope in the next budget period without the DOE Contracting Officer's prior written approval in accordance with the award terms and conditions.

Budget Period 2: Module Construction, Equipment Installation, Commissioning, Startup and Demonstration:

Task 2.1 – OSBL Steel Receipt & Erection:

Subtask 2.1.1 – The recipient will oversee the [redacted]

Subtask 2.1.2 – The recipient will oversee the [redacted]

Subtask 2.1.3 – The recipient will oversee the [redacted]

Subtask 2.1.4 – The recipient will perform [redacted]

(b) (4)

Task 2.2 – OSBL Module Building Outfitting & General Construction:

Subtask 2.2.1 – The recipient will [redacted]

Subtask 2.2.2 – The recipient will [redacted]

Subtask 2.2.3 – The recipient will [redacted]

(b) (4)

Task 2.3 – ISBL Receipt of Equipment Onsite:

Subtask 2.3.1 – The recipient will [redacted]

Subtask 2.3.2 – The recipient will [redacted]

Subtask 2.3.3 – The recipient will [redacted]

Task 2.4 – Installation of ISBL Equipment in the Module Buildings:

Subtask 2.4.1 – The recipient will [redacted]

Subtask 2.4.2 – The recipient will [redacted]

Subtask 2.4.3 – The recipient will [redacted]

Task 2.5 – Initial Testing of Systems:

Subtask 2.5.1 – The recipient will [redacted]

Subtask 2.5.2 – The recipient will [redacted]

Task 2.6 – Pre-Commissioning Kick-Off Meeting:

Subtask 2.6.1 – The recipient will [redacted]

Task 2.7 – Cold Commissioning:

Subtask 2.7.1 – The recipient will [redacted]

(b) (4)

Subtask 2.7.2 – The recipient will [redacted]

Subtask 2.7.3 – The recipient will [redacted]

Subtask 2.7.4 – The recipient will [redacted]

Task 2.8 – Hot Commissioning:

Subtask 2.8.1 – The recipient will [redacted]

Subtask 2.8.2 – The recipient will [redacted]

Subtask 2.8.3 – The recipient will [redacted]

Subtask 2.8.4 – The recipient will [redacted]

Task 2.9 – Substantial Completion:

Subtask 2.9.1 – The recipient will [redacted]

Subtask 2.9.2 – The recipient will [redacted]

Task 2.10 – Punch list:

Subtask 2.10.1 – The recipient will [redacted]

Task 2.11 – Final Completion:

Subtask 2.11.1 – The recipient will [redacted]

Task 2.12 – Facility Startup & Demonstration:

Subtask 2.12.1 – The recipient will [redacted]

Subtask 2.12.2 – The recipient will demonstrate that the facility meets quality requirements and meets the output requirements associated with full production.

Milestone Summary and Go/No-Go Decision Points: Milestone summary for technical aspects of the project and Equity Plan related tasks are listed in **Table 4** and **Table 5**.

Table 4. Technical Milestone Summary and Go/No-Go Decision Points.

Milestone	Type	Description
Budget Period 1		
M1.1. Contracts in Place [redacted]	Technical	[redacted] are agreed upon and contracts are negotiated and executed.
M1.2. Approval of Engineering for Procurement and Fabrication	Technical	ISBL and OSBL Engineering is reviewed and approved [redacted]
M1.3. Long Lead Procurement Orders Placed	Technical	Orders are placed for long lead equipment and materials.
M1.4. [redacted]	Technical	[redacted]
M1.5. [redacted]	Technical	[redacted]

Milestone	Type	Description
M1.6. ISBL and OSBL Design Reviewed and Approved for Procurement of all Equipment and Materials and Release for Shipment	Technical, SMART, Go/No Go	Issued final ISBL design review report, wherein 100% of engineering plans for individual ISBL components have been reviewed against project basis of design and specifications. Issued final OSBL design review report, wherein 100% of engineering plans for individual OSBL components have been reviewed against project basis of design and specifications Approval of the ISBL and OSBL design review reports triggers procurement of all equipment and materials and release for shipment.
Budget Period 2		
M2.1. [redacted]	Technical	[redacted]
M2.2. [redacted]	Technical	[redacted] (b) (4)
M2.3. [redacted]	Technical	[redacted]
M2.4. [redacted]	Technical, SMART	[redacted] All the ISBL equipment is installed in the Module Buildings and ready for testing.
M2.5. [redacted]	Technical	[redacted]
M2.6. [redacted]	Technical	[redacted]
M2.7. [redacted]	Technical	[redacted]
M2.8 Final Completion	Technical, SMART	Issued EPC close out report that documents 100% of punch list items associated with the project are complete and accepted by the recipient. EPC portion of the project is complete.
M2.9. Facility Startup	Technical	The project is complete and [redacted]
M2.10. Achievement of Final Project Objective: Demonstration of Full Production for Both SCC55™ Facilities at Total Plant Capacity	Technical, SMART, End of Project	Issued facility start up report documenting the facility is confirmed to produce product that meets quality requirements (**Table 2**) and meets output requirements associated with full production as defined by the process specifications and guarantees [redacted]

Table 5. Equity Plan Milestone Summary.

Milestone	BP	M	Type	Description
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

(b) (4)

Milestone	BP	M	Type	Description
[redacted]	[redacted]	[redacted]	[redacted]	[redacted] (b) (4)
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

KEY: *P = progress, S = SMART, M= month (Note the BP1 is 12 months duration and BP2 is 18 months duration), BP = budget period*

End of Project Goal: The facility is confirmed to meet the output and quality requirements associated with full production as defined by the process specifications and guarantees: 2,000 t/y at [redacted]

Buy American Requirements for Infrastructure Projects: This project does NOT include applicable infrastructure work. However, Group14 is dedicated to purchasing materials and supplies from American sources to the greatest extent practicable, which is inextricably tied to our commitment to the economic growth of the U.S. via fortification and expansion of American manufacturing. This commitment will flow down to all subawards including all contracts, subcontracts, and purchase orders for work performed under the proposed project.

Project Schedule

The project schedule below (**Figure 9**) represents a simplified roll-up of the subtasks and key milestones. The schedule that will be used to manage the project contains a detailed breakdown of all subtasks and uses schedule logic to manage the links and key interdependencies between engineering, procurement, construction, and permitting.

[redacted]
(b) (4)

Figure 9. Project schedule presented as a roll-up of project subtasks and key milestones.

Project Management

Overall Approach: As the proposed project will be performed as an expansion of Group14's ongoing SCC55™ production scale-up project, the existing project management team currently executing that work will retain their roles to oversee the proposed project. The proposed project will benefit greatly by using an existing integrated project management team where the key personnel will have been working together closely for several years prior to beginning the proposed project, and the primary tools and processes for executing the project will have already been implemented.

In addition to Group14's direct staff, the primary external entities involved in the project execution are listed below.

- [redacted]
- [redacted] (b) (4)
- [redacted]

The project will be overseen by Group14's CTO and co-Founder, PI of this project, Henry R Costantino, who will be responsible for leadership of the overall project and for project finance. As a part of his leadership responsibilities, Dr. Costantino will oversee Group14's direct staff involved in the project, including Group14's Project Manager, Engineering Manager, Environmental Manager, Quality Manager, and Operations Manager who will also serve as Commissioning Manager. Dr. Costantino will also oversee contracts held with the external entities listed above, each of whom will have a dedicated project manager serving as a single point of contact for their associated scope of work.

[redacted] (b) (4) [redacted] HDR's Engineering Manager, Construction Manager, and Project Controls Manager (PCM).

[redacted]

As noted above, for execution of the proposed project, the project managers from Group14, [redacted] At present, a complete Project Execution Plan, Communications Management Plan, Document Controls Plan, Project Controls Plan, Quality Management Plan, Risk Management Plan, and Health and Safety Management Plan have already been generated for each of the key scopes of work for the facilities project. These plans serve as a basis and define the execution strategies that will be used to deliver the proposed project.

Roles of Each Project Team Members (**Table 6**)

Table 6. Project Team by Function and Responsibilities.

Job Title	Function/Responsibility
Principal Investigator (Group14)	• Key leadership of the overall program and project finance.
Project Manager (Group14 [redacted]	• Oversee all aspects of project delivery, including project management, project controls, environmental, engineering, construction management, procurement, and regulatory compliance.
[redacted]	• [redacted]
[redacted]	• [redacted] (b) (4) [redacted]

Job Title	Function/Responsibility
Engineering Manager (Group14 [redacted]	• Coordinates engineering review of engineering submittals including design calculations and proposed design changes. • Assists the Project Managers with monitoring the performance of third-party engineering, with an emphasis on the technical aspects of the work.
Safety, Health, and Environmental (SH&E) Manager (Group14)	• Develops, maintains, and updates the project SH&E plan that includes Group14's specific requirements and expectations for SH&E. • Verifies that [redacted] adhere to a project-specific SH&E plan.
Project Controls Manager [redacted]	• [redacted] (b) (4) [redacted]
Permitting Manager (Group14)	• Manages adherence to the permitting schedule and preparation of applications. • Holds [redacted] accountable for adherence to permit requirements. • Oversees compliance and timely execution permitting done by subconsultants
Construction Manager [redacted]	• Provides constructability reviews throughout engineering and provides construction oversight during construction activities. • Oversees coordination between [redacted] verifies contractor reporting and invoicing, and enforces SH&E requirements.
Commissioning Manager (Group14)	• Responsible for the development, maintenance, and adherence to the project cold and hot commissioning plans. • Manages adherence to the commissioning schedule and on-time delivery of raw materials needed for hot commissioning.
Community Outreach Manager (Group14)	• Responsible for project messaging, public outreach, and press releases. • Provide guidance regarding the branding and general aesthetics of the facility.

Critical Handoffs/Interdependencies Among Team Members: Controlled and efficient information flow [redacted] is critical to project design development and subsequently field coordination during construction. As a primary measure to promote successful coordination, the recipient will [redacted] Additionally, the recipient's strategy to manage critical handoffs and interdependencies among project team members is detailed below in the Communications section of the Technical and Management Aspects.

Technical and Management Aspects of the Management Plan

Project Controls: The dedicated Project Controls Manager (PCM) will be responsible for [redacted] (b) (4) [redacted]

The PCM will [redacted]

[redacted]

A master project schedule will be developed [redacted]

(b) (4)

The PCM will [redacted]

The project monthly report will contain a section on earned value reporting metrics including ***cost variance***, where the budgeted cost of the work performed will be measured against the planned cost of the work performed to quantify the dollar value of the variance, and ***schedule variance***, where a status variance will also be performed on specific milestones and critical events with impacts to be included in the schedule delay log and the risk register when applicable. **Table 6** presents the strategy for calculating the weighted values per discipline.

Table 6. Weighted values per engineering, procurement and construction disciplines.

	Engineering	Procurement	Construction
Work Stage	[redacted]	[redacted]	[redacted]
Weighting Factor	[redacted]	[redacted]	[redacted]
Recognition of Status	[redacted]	[redacted]	[redacted]

(b) (4)

Project Risk Management

The list below contains a few of the key risks and associated mitigations that have been identified for the proposed project based on both anticipated site-specific challenges and general market conditions.

[25] https://hbr.org/1963/09/the-abcs-of-the-critical-path-method

[redacted]

- [redacted]
- [redacted]

[redacted]

- [redacted]
- [redacted]

(b) (4)

[redacted]

- [redacted]
- [redacted]

[redacted]

- [redacted]
- [redacted]

[redacted]

- [redacted]
- [redacted]

[redacted]

- [redacted]
- [redacted] and budgets, exploring alternate methods of supplying utilities or reducing utility usage.

While the risks above represent current real-life challenges, the project risk register will be the primary tool used to manage these risks as well as formally identify, quantify, and monitor other risks throughout the life of the project beginning during the initial planning stages. The risk register will be developed with inputs from project team members and stakeholders and will include a brief description of the risk, risk impact (cost or schedule), and the likelihood of

occurrence. The recipient will maintain a master risk register for the project which will include both direct risks to the recipient as well as [redacted]

The following steps will be used to identify project risks: [redacted] (b) (4) [redacted] After identifying risks, an assessment of the probability that the risk will occur will be defined by the following: [redacted] Subsequently, scope and schedule risk impacts will be [redacted] to determine the percentage impact. Percentage impacts are defined by the following: [redacted]

Quantitative assessment of the risks will allow for risk prioritization and subsequent risk mitigation. Risk mitigation strategies will be determined and implemented on a per risk basis and with a specific team member being named risk champion and held responsible by the project manager for managing and routinely reporting on the risk and mitigation strategy being implemented during risk register reviews at the weekly project management meetings.

Project Changes

The recipient's Project Manager will be responsible for managing project change associated with any modification of the approved contract scope, cost, and/or schedule. To aid in change management, the PMIS described in the Project Controls section above will be used to track original contracts, approved change orders (COs), and all pending changes to maintain current approved budgets and forecasts.

Approval of COs will follow the formal process identified in the project execution plan. [redacted] (b) (4) [redacted]

Quality Assurance/Control

The recipient Project Manager will be responsible for communicating the quality management process and procedures described in the Quality Management Plan (QMP) to the Project Team

and [redacted] The QMP provides guidance on quality management requirements and specific quality management activities to be implemented on the project and its purpose is to assure and control the quality of project work products and deliverables. [redacted] Requirements of the QMP include:

- [redacted]

(b) (4)

Communication

With the large number of stakeholders required to support successful execution of the proposed project, efficient and controlled communication will be a critical component of that success. The communications processes and procedures and chain of command for the project will be detailed in the project Communication Management Plan (CMP) and managed by the recipient's project manager. [redacted]

Emails, phone calls, and in-person and virtual meetings will be the primary communication tools used for the project. To memorialize and distribute the information discussed and decisions made through these communications vehicles, formalized project management documentation will be developed and routinely distributed. This documentation includes, at a minimum, meeting agendas and minutes, action items list, decision log, and communication log. [redacted]

(b) (4)

Market Transformation Plan

<u>Target Market, Overcoming Barriers to Market Penetration, and Distribution Channels</u>

The LIB market continues to grow at an extremely rapid rate (see **Figure 9**). This market is divided into a variety of end user applications, cathode chemistries, electrolyte type, and battery form factors. To overcome the barriers to market penetration, besides providing compelling performance and value, a new battery material should also be flexible, easy to use, and not require any significant changes to existing expensive battery production lines. To this end, Group14 has specifically designed SCC55™ as a powder product that easily drops into

existing electrode and LIB manufacturing lines and can address needs across the entire LIB market. SCC55™ is compatible with the full range of anode loading (from ~10% to full graphite displacement in the anode), cathode chemistries (nickel manganese cobalt (NMC), lithium cobalt oxide (LCO), lithium iron phosphate (LFP), etc.), electrolyte type (liquid, solid state), and battery form factors (pouch, cylindrical, prismatic, etc.) and, as a "drop-in" material, it does not require any capital-intensive changes to the customer's existing production infrastructure.

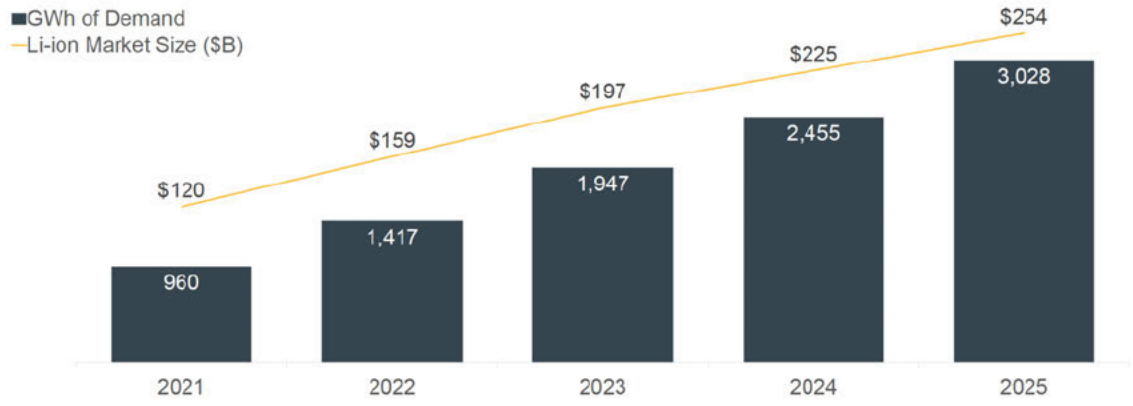

Figure 9. Projected lithium ion battery market growth.[26]

[redacted] (b) (4) [redacted]

Competitors

The market for advanced battery materials, particularly silicon-based anodes, is highly competitive. Regarding competitors, Group14 has identified three whose technologies are promising, and they are considered as particularly close U.S.-based competitors, namely Enovix, Enevate, and Sila Nanotechnologies. **Figure 10** presents a comparison of these competitors' silicon-based technologies in comparison to Group14's SCC55™. The filled symbols indicate that a particular attribute is superior, while an open symbol indicates inferiority. All three competitors' technology appears to provide cycle life and fast charge capability that is at least close to the range of data reported by Group14's customers using SCC55™. Enovix is developing a proprietary 3D Silicon™ lithium-ion battery, with the key component being an anode architecture that constrains silicon active material. While the technology is reported to boost energy density to 350 Wh/kg[27] and and a low volume launch has been announced for smartwatch applications,[28] the technology is not a drop in, and poses significant challenges for

[26]Source: Wood Mackenzie (Formerly Roskill), BloombergNEF
[27]https://www.enovix.com/wp-content/uploads/2022/06/Ashok-Lahiri_Enovix-AABC-Europe-Final-Stand-Alone.pdf
[28]https://www.globenewswire.com/en/news-release/2022/05/03/2434433/0/en/Enovix-Announces-Initial-Smartwatch-Battery-Order-from-Leading-Global-Consumer-Electronics-Company.html

scale up and cost. Enevate's XFC-Energy™ technology[29] is also not a true drop in, and also appears to pose scalability and cost challenges. Sila Nanotechnologies' silicon anode technology may have performance and drop in capability closest to Group14's technology. While all three competitor's technologies have some promise, none can match SCC55™'s combination of high value (i.e., low $/kWh), superior drop-in ability, unparalleled manufacturing scalability, energy density improvement, and robust customer pipeline.

	SCC55™	Enovix	Enevate	SILA
$ / kWh	●	◔	◔	◔
Drop-in Ability	●	◔	◔	●
Scalability	●	◔	◑	◔
Energy Density	●	◑	◑	◑
Customer Pipeline	●	◑	◑	◑

Figure 10. SCC55™ compared with other silicon anode technologies.

Commercialization Timeline

As a result of combined performance and ease of use, SCC55™ has gained excellent market traction across the spectrum of LIB applications such as consumer electronics (CE), electric vehicles (EV), alternative electric vehicles, such as e-aircraft and e-VTOL, and grid energy storage. The Letters of Commitment provide ample evidence of SCC55™ robust customer pipeline and include U.S. and worldwide automakers and battery producers supplying automakers, including [redacted] (b) (4) The Letters of Commitment also include written demand for SCC55™ that totals [redacted] (see **Figure 11**).

[29] https://pushevs.com/2021/06/11/enevate-silicon-dominant-anode-battery-to-arrive-next-year/

(b) (4)

Figure 11. SCC55™ demand according to the Letters of Commitment attached to this proposal.

It should be stressed that Letters of Commitment attached to this proposal, while impressive in their breadth and depth, only represent a small fraction of Group14's customers. Group14 is now in battery qualification with [redacted] and 100% of those customers continue to qualify the product and move towards production (**Figure 12**). Group14's market share projections come from actual engagements with current customers, such as [redacted] and others. We believe that this is, by far, the most reasonable and accurate way to estimate our future market share for the near term (5 years), mid-term (5 to 10 years), and long term (greater than 10 years). As we have a much greater demand than our production capacity can accommodate, our market share will be limited to how much production capacity we can build.

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KEY: CE : 1 = Coin half cell, 2 = Full cell, PQ = Production Qualification, P = Production, EV : 1 = Coin half cell, 2 = Full cell, A = OEM Program A sample, B = OEM Program B sample, C = OEM Program C sample, D = Pre-production vehicles.

Figure 12. Customer pipeline for SCC55™. This table only includes customer commitments in writing, such as MOU (or similar written agreements) and other written communications with the company.

It should also be noted that Group14's customers include [redacted] StoreDot, [redacted] and Microvast. The latter company has chosen Group14 as the silicon anode powder material of choice for boosting energy density, achieving high cycle and calendar life, and achieving rapid charging in a solid-state battery system for the purpose of a USABC project.[30] As another example of synergy of SCC55™ in solid-state systems, Group14 [redacted] Washington State Clean Energy Fund project.[31]

Mitigation Plan

Excellent customer traction notwithstanding, it is part of Group14's product development strategy to monitor risks to commercial development and incorporate a Mitigation Plan. Among the potential commercialization risks are those associated with the supply chain (both upstream and downstream), non-optimal performance with customer's incumbent battery systems, and maintaining properties and performance metrics within customer requirements with increasing manufacturing scale.

Group14 mitigates the battery supply risk by very early engagement with upstream, as well as parallel and downstream partners. [redacted]

(b) (4)

Regarding the scaling risk, according to the Mitigation Plan, we have engineered SCC55™ specifically for elegant manufacturing that can easily scale. [redacted]

[30] "Low-Cost, High Safety Fast Charge Automotive Cells," USABC Project on Development of Advanced Low-Cost/Fast-Charge (LC/FC) Batteries for Electric Vehicle (EV) Applications.

[31] https://www.commerce.wa.gov/growing-the-economy/energy/clean-energy-fund/energy-rdd-clean-energy-fund/

[redacted] (b) (4) [redacted] These efforts provide high confidence that the 2000 t/y module will produce SCC55™ with performance that is equivalent, and possibly even superior, to material currently manufactured at commercial pilot scale.

As a final note on the Mitigation Plan, SCC55™ material design and process design has been engineered for flexibility. [redacted]

Product Development Plan, Service Plan, and Data Dissemination

Group14 deploys [redacted]

The entire Process is controlled as a Product Department Policy document, written and approved by the Product Manager and company Executives comprising the Approval Committee to ISO 9001 standards. The Process involves input from representatives of every department at Group14, with the responsibilities described here:

[redacted] (b) (4) [redacted]

(b) (4)

Committee Members: CEO, CTO, VP of Operations, VP Business, VP Marketing

The entire process is contained within ISO 9001-compliant controlled document systems and processes.

As part of a broader Service Team discussed in the previous section, Group14's Product, Business Development and Field Application Engineering teams work very closely with customers at all stages of product qualification.

(b) (4)

All data generated during the execution of the Product Development Plan and Service Plan, involving both internally and externally generated information, is kept highly controlled according to Group14's Data Management Systems and Intellectual Property Policy and individual Confidentiality Agreements with customers. Group14 employs a holistic approach to controlling the dissemination of data, including

The success of the Product Development Plan and Service Plan is reflected in the very robust and aggressive advancement of SCC55™ with all Group14's customer (see **Figure 1**, **Figure 10**, and the attached Letters of Commitment).

Customer evaluation timelines are highly variable depending on the application. In general, consumer electronics application qualifications require the following stages:

Electric vehicle applications require the following stages: [redacted] (b) (4) [redacted]

These are standard evaluation stages within the Production Part Approval Process (PPAP) framework standard for the lithium battery industry. Group14 qualifies for each customer's PPAP requirements based on their direct requests.

Financing: To date, Group14 has raised over $440 million to invest in the development, scale-up and commercialization of its SCC55™material. Our capital has been provided by 1) leading companies in the battery industry spanning the entire value chain from materials companies to automotive OEMs, 2) leading global financial investors and 3) grants from the DOE and other state and federal funding sources. Our previous rounds of financing include:

- Series A: $18.1 million from ATL (Amperex Technology Limited), BASF, Cabot Corporation, Showa Denko, OVP Venture Partners, WRF Capital
- Series B: $17.0 million from SK Inc., OVP Venture Partners
- Series C: $400.0 million from Porsche AG, OMERS, Decarbonization Partners (Blackrock and Temasek partnership), Riverstone, Moore Capital
- Grant funding from the U.S. DOE and WA CEF

Group14 currently has over [redacted] and believes it will be able to secure future funding from a variety of sources. [redacted] (b) (4) [redacted]

Besides securing capital via either debt or equity, Group14 will also be securing inbound cash flows through our joint venture with SK Inc. The joint venture is building out silicon-anode production plants in Korea. The joint venture has entered into a technology license agreement with Group14 to [redacted]

Cost Structure and Break-Even Analysis:

The bill of materials for SCC55 includes [redacted] (b) (4) [redacted]

[redacted] The plant proposed in this application is expected to produce SCC55 at a cost of approximately [redacted] Once the project is operational, the pricing for SCC55 is targeted to be approximately [redacted] At this price Group14 will realize a [redacted] gross profit margin. **At this sales price and based on our expected cost structure as well as overhead costs, the project is expected to generate [redacted] in gross profit per year. The total cost for this project will be approximately [redacted] therefore the break-even for the full project (as calculated by the number of years for the project's profit to payback the capital invested to fund the project) will be [redacted] Taking into consideration the cash match requested from the DOE, Group14's break-even will be [redacted]**

Product Marketing: Group14's product marketing efforts will continue throughout all phases of the project. These efforts will focus on [redacted]

Regulatory Considerations: The proposed project site will involve new construction of a chemical facility. In addition to general construction permits, additional known and anticipated permits include: [redacted] The office sites will not require permits.

Intellectual Property: The entirety of Group14 intellectual property portfolio is exclusively owned and controlled by Group14; all of which will be deployed in connection with this project. Group14's broad patent and technology portfolio reflects our head start in the development and deployment of commercial-scale, next generation silicon anode powder.

Group14's intellectual technology portfolio of patents, trade secrets, and know-how provides a foundation to grow the business and protect future U.S.-based innovation and manufacturing. Specifically, our SCC55™ material builds on [redacted]

Group14's issued patents include claims protecting the entire life cycle of our products, including key intermediates in our manufacturing process: from anode material manufacture to the use of SCC55™ in a battery[32]. This strategy protects not only our process and products, but also our U.S.-based customers deploying SCC55™ in their batteries. At the start of the life cycle, Group14 has patented our novel process, protecting our Dryolysis™ and Siligenesis™ process. Additionally, the U.S. and international patent portfolio includes composition of matter claims protecting our SCC55™ product. We have also filed claims directed towards [redacted] Finally, Group14 owns claims directed broadly at [redacted]

(b) (4)

Group14 will continue to harvest patentable inventions related to new products and processes to protect our first-mover advantage in the next generation silicon anode powder space and preserve our freedom to operate in the U.S. and abroad far into the future.

Infrastructure Considerations: Group14 has selected Moses Lake, WA as the ideal location for our BAM-2 facilities due to the existing renewable electricity infrastructure and commercial transportation infrastructure, including railways. Moses Lake will serve as both the central production and distribution center for Group14's SCC55™.

Product Distribution: SCC55™ is currently distributed via standard domestic and international freight and package carriers. It is non-hazardous. SCC55™ produced at BAM-2 will be distributed primarily on contract with domestic and international freight carriers via truck, rail, and air.

TECHNICAL QUALIFICATIONS AND RESOURCES

The Project Team's Unique Qualifications: A detailed description of key team members' roles and specific qualifications and experience is presented in **Table 7**. Led by an experienced PI with a successful leadership track record, the Group14 team is a passionate group of diversely talented experts covering disciplines of materials science, chemical engineering, electrochemistry, mechanical engineering, manufacturing operations, and process development. This qualified team possesses the unique combination of creativity, technical expertise, and manufacturing know-how to achieve the ambitious goals laid out for the proposed project.

Group14 Team: The staff at Group14 supporting this project are uniquely qualified to design, build, and operate a silane plant. Six of the key team members listed below in Table 7 have substantial prior experience in engineering and operation of the largest silane plant in the world located at REC Silicon in Moses, Lake. This team has a combined total of 75 years of experience in operation of silane gas manufacturing. Additionally, the principal investigator and technical, business, and operations leadership at Group14 have decades of experience managing capital projects to scale and deliver battery materials and products for the automotive industry.

[redacted] is a U.S. based full-service, turnkey real estate, architecture, engineering, design-build and construction firm that delivers clients across North America [redacted]

(b) (4)

[32] See also FN 10 above listing some key issued patents owned and controlled exclusively by Group14.

[redacted] is one of the nation's largest privately-owned real estate, architecture, engineering, design-build and construction firms. [redacted] allows the company to provide fast-track, efficient solutions in North America for commercial, institutional, and industrial projects, accompanied by [redacted] (b) (4) [redacted] is [redacted] that specializes in meeting the infrastructure needs of clients across the United States and globally. [redacted] professionals represent hundreds of disciplines and work on diverse teams specializing in strategic integrated engineering, regulatory, construction and support services for the development and operation of industrial infrastructure. [redacted] dedicated to supporting local projects.

Table 7. List of Project Team Members' Qualifications, Expertise and Efforts for Budget Period (BP) 1-2.

Team Member	Qualifications & Experience
Henry "Rick" Costantino, Ph.D. [redacted] BP1/BP2 Time Commitment)	Dr. Costantino is an M.I.T. Ph.D. Chemical Engineer with 20+ years product development experience across biotech and energy storage materials. A proven innovator, Dr. Costantino has 60 issued/allowed U.S. patents and 50+ scientific publications. Dr. Costantino has the technical breadth to support the project. Prior to Group14, Dr. Costantino led EnerG2's R&D efforts to advance carbon materials from the lab to commercial manufacturing. Moreover, Dr. Costantino has a proven track record as a PI, with successful experience leading two DOE EERE VTO projects.
Christopher Timmons [redacted] BP1/BP2 Time Commitment)	With two decades of experience in clean energy manufacturing, Christopher drives new innovations for the development and commercial implementation of manufacturing processes. After spearheading the buildout of Group14's first commercial manufacturing factory in Woodinville, WA, Christopher is now leading the development of Group14's hydro-powered factory in Moses Lake, which will be capable of producing enough of Group14's material to meet demand from EV customers. Previously, he led the design, build, and commissioning for a commercial-scale battery materials manufacturing facility for EnerG2. Mr. Timmons accomplished this highly complex $26M project on schedule and within 3% of projected budget.
[redacted] BP1/BP2 Time Commitment)	[redacted] is a professional engineer with 10+ years of experience in industrial chemical process engineering, including commercial-scale silane manufacturing and safe handling. Previously, [redacted] led process engineering efforts at [redacted] managing process control, safety, and environmental compliance for two commercial-scale silane production units. Because silane is a critical raw material for the current project, [redacted] set is invaluable for enabling a fast, effective, and safe scale-up.
[redacted] (10%/10% BP1/BP2 Time Commitment)	[redacted] (b) (4) [redacted]
[redacted]	[redacted]

(10%/10% BP1/BP2 Time Commitment)	[redacted] (b) (4) [redacted]
[redacted] (10%/10% BP1/BP2 Time Commitment)	[redacted]
[redacted] (50%/50% BP1/BP2 Time Commitment)	[redacted]
[redacted] BP1/BP2 Time Commitment)	[redacted] is a Chemical Engineer with 5+ years of R&D experience on silicon-based composite anodes, including materials innovation and scale-up. He also is deeply experienced with chemical deposition-based processes. He spent 3+ years at [redacted] as a Post Doctoral Fellow mentored within the prestigious laboratories of [redacted] In this role, [redacted] studied silicon-based anode materials as sponsored by a Fortune 500 company.
[redacted] BP1/BP2 Time Commitment)	A skilled electrochemist experienced in silicon-containing anode materials for lithium ion batteries, [redacted] is the primary driver for all electrochemical testing and battery development at Group14. Her breadth of knowledge in battery testing and materials science enabling fast and effective materials and testing optimization. [redacted] has a proven track record of proving robust electrochemical testing to successfully guide product and process development, as well as providing critical customer support.
[redacted] BP1/BP2 Time Commitment)	An innovative materials scientist, [redacted] pioneered the design, development, and testing of silicon-carbon based anode materials for Li-ion batteries leading to our previous DOE EERE VTO project. With expertise in materials science, and electrochemical characterization techniques, he established the synthesis and full characterization methods for Group14's anode materials, and is [redacted]
[redacted] BP1/BP2 Time Commitment)	[redacted] holds a B.S. in Chemical Engineering and a Ph.D. in Energy Science and Engineering. With over 4 years of battery development experience, Dr. Philips is highly experienced with a wide range of hands-on physicochemical and electrochemical characterizations. He also has diverse training in anode, cathode, and battery fabrication, including dry room and clean room operations. For his Ph.D., he jointly held

	a position at [redacted]
[redacted] BP1/BP2 commitment) (b) (4)	[redacted] is an EHS Professional with 30+ years' experience in chemical plant operations, EHS, Emergency Response and Security. Mr. Stoerner has successfully led efforts for 3 global organizations in the development and implementation of health, safety, emergency response and security management systems and processes both at the site and organization levels. [redacted] background and skill set ensures compliance in the development, implementation and continuous improvement of Group14's entire EHS Management and Emergency Response systems, as well as the establishment of best management practices for Group14.
[redacted] BP1/BP2 commitment)	Driven environmental & safety leader with 20+ years of experience as an environmental, safety, and health leader in national and international roles, leading complex environmental projects, HSE illness and injury prevention programs, and performing coaching and staff development. Outstanding performance record of project successes through excellent attention to detail, with demonstrated cost savings through strong ownership and responsibility. Excellent communicator building and maintaining relationships and demonstrating the ability to draw consensus-based decisions from various stakeholders, including during conflict resolution.
[redacted] BP1/BP2 commitment)	[redacted] a quality manager with 10 years of experience in ensuring the highest quality products and outcomes across multiple industries. She has lent her experience to both established large-scale manufacturing plants and smaller firms as they developed their own production process. [redacted] in building new quality systems, assessing problems, and bringing solutions is invaluable to maintaining success as Group14 continues to grow.
[redacted] BP1/BP2 commitment)	[redacted] career has focused on the production, characterization, and deployment of bulk solids and powdered materials. Following a doctoral thesis on characterizing adsorbents for gas separations, he took a role with [redacted] deploying catalyst technologies in a variety of petrochemical plants around the world. Staying with [redacted] he was appointed as a senior leader role at a ceramic powder manufacturing facility. Here, he developed a strong leadership acumen turning around a culture and improving safety, quality, and reliability to world class metrics. Now at Group14, [redacted] prior experience leading and improving a manufacturing facility will be useful in growing the organization into an industrial scale operation.
[redacted] BP1/BP2 commitment)	[redacted] at Group14, where he coordinates services of engineering firms in support of green-field plant construction projects. He previously worked at [redacted] and was responsible for planning and implementation of improvement projects in the facility.

Equipment and Facilities

Group14 designed, engineered, constructed, and operates a 27,000 ft^2 commercial pilot silicon anode facility located in Woodinville, WA. This facility is capable of producing 120 t/y of silicon dominant SCC55™. The technology and equipment in this facility have operated for over a year and prove the commercial production feasibility of SCC55™. Group14 also has a state-of-the-art R&D center in this facility, including a new expansion under construction with full pouch cell build capabilities. It is scheduled for completion within 2022. Group14 also has a battery production (coin cells, pouch cells) and testing center in a separate 5,000 ft^2 R&D facility in Woodinville WA at a separate location.

Group14 also has existing research facilities in [redacted]. [redacted]

The full commercial design for a 2,000 t/y facility is based on the same technology with scaling factors that do not introduce risk given the same process conditions will be met at full commercial scale. A significant increase in building and equipment sizing will be required to account for [redacted] **Table 8** identifies both the ISBL and OSBL proposed equipment required for the full commercial scale.

Table 8. Summary and Justification of Requested Facilities and Equipment.

Scope	Equipment/Facility	Justification	Scope	Equipment/Facility	Justification
ISBL	[redacted]	Required for [redacted]	ISBL	[redacted]	Required to [redacted]
ISBL	[redacted]	Required for [redacted]	ISBL	[redacted]	Required to [redacted]
ISBL	[redacted]	Required for [redacted]	ISBL	[redacted]	Required to [redacted]
ISBL	[redacted]	Required for [redacted]	ISBL	[redacted]	Required for [redacted]
ISBL	[redacted]	Required for [redacted]	ISBL	[redacted]	Required for [redacted]
ISBL	[redacted]	Required for [redacted]	ISBL	[redacted]	Required for [redacted]
ISBL	[redacted]	Required to [redacted]	ISBL	[redacted]	Required to [redacted]
ISBL	[redacted]	Required for [redacted]	ISBL	[redacted]	Required to [redacted]
ISBL	[redacted]	Required for [redacted]	ISBL	[redacted]	Required to [redacted]
ISBL	[redacted]	Required for [redacted]	ISBL	[redacted]	Required to [redacted]
ISBL	Packaging Machine	Required to package the silicon carbon per the customers unique requirements			
ISBL	[redacted]	Required for	OSBL	Module Building	Required to house the

	[redacted] (b) (4)	[redacted]			equipment in the optimized layout with the required materials of construction
ISBL	[redacted]	Required for [redacted]	OSBL	Utility Connections to Module Building	Required to supply the off module utility sources to the equipment in the ISBL module
ISBL	[redacted]	Required to [redacted]	OSBL	[redacted]	[redacted]
ISBL	[redacted]	Required to [redacted]	OSBL	[redacted]	Required for [redacted]
OSBL	Emergency UPS & Generators	Required for the event of a power loss			

Previous Work: Group14's previous work includes several DOE funded projects.[1-3] Group14 has developed two advanced manufacturing approaches; [redacted] Group14's employees are veterans of the commercial scale-up of EnerG2's energy storage carbons, including a 2009 DOE grant to construct an ISO 9001/ISO 14001 certified manufacturing plant that has produced hundreds of tonnes of products for customers worldwide.

[redacted]. The Group focuses its activities on three target markets: battery materials, carbon fiber, and advanced materials. In addition, there is a strong focus on research and development. Not only for advancing their own thermal processing equipment, but also as a process development partner for their customers. [redacted]

Group14 worked with [redacted] of its commercial pilot manufacturing plant in Woodinville, WA.

Group14 is currently working [redacted] facilities in Moses Lake, WA. [redacted] has an impressive, successful track record of executing highly complex projects safely with an experience modifier rate (EMR) of 0.50. [redacted] They also have extensive experience in the proposed site region with knowledge of the regulations, labor availability and permitting requirements.

Technical Services: For this project, there are no technical services to be provided by DOE/NNSA FFRDCs.

Exports: Group14 does not work with any foreign entities of concern as defined in 42 U.S.C. 18741 (a)(5). Group14 and the project team commit to not use nor supply any battery material from or to any foreign entity of concern whatsoever.

*PI/co-PI/Senior Personnel Name: Eric (Rick) Luebbe

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source, irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. This includes, for example, Federal, State, local, foreign, public or private foundations, non-profit organizations, industrial or other commercial organizations, or internal funds allocated toward specific projects. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[2]

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Commercial Manufacturing of a Stable Silicon Anode Material towards Fostering a Strong U.S. Battery Supply Chain

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available): 2678-1765

*Source of Support: US Department of Energy

*Primary Place of Performance : Group14 Technologies

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $ 100,000,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives : Secure the U.S. battery supply chain by expanding manufacturing capacity of stable silicon anode battery material by 4,000 tonnes annual by 2025

*Statement of Potential Overlap : No overlap

Projects/Proposals

[redacted]

(b) (4)

Projects/Proposals

3. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

4. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

5. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

6. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

7.*Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

8. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

9. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

10. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

11. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

12. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

13. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

14. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

15. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

*Required fields

In-Kind Contribution Section:

Current and Pending Support also includes in-kind contributions (such as office/laboratory space, equipment, supplies, employees, students). If the in-kind contributions are intended for use on the project being proposed to NSF, the information must be included as part of the Facilities, Equipment and Other Resources section of the proposal and need not be replicated in the individual's Current and Pending Support submission. In-kind contributions not intended for use on the project/proposal being proposed that have associated time obligations must be reported below. If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current to Pending from top to bottom

In Kind Contributions

1.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

2.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

3.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

4.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

5.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

6.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

7.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

8.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

9.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

10.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

*PI/co-PI/Senior Personnel Name: Brett Kilcup

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source, irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. This includes, for example, Federal, State, local, foreign, public or private foundations, non-profit organizations, industrial or other commercial organizations, or internal funds allocated toward specific projects. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[2]

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Commercial Manufacturing of a Stable Silicon Anode Material towards Fostering a Strong U.S. Battery Supply Chain

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available): 2678-1765

*Source of Support: US Department of Energy

*Primary Place of Performance : Group14 Technologies

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $ 100,000,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2023	3.60	4.	
2. 2024	4.80	5.	
3. 2025	3.60		

*Overall Objectives : Secure the U.S. battery supply chain by expanding manufacturing capacity of stable silicon anode battery material by 4,000 tonnes annual by 2025

*Statement of Potential Overlap : No overlap

Projects/Proposals

[redacted]

Projects/Proposals

3. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

4. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

5. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

6. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

7.*Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

8. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

9. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

10. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

11. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

12. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

13. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

14. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

15. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

*Required fields

In-Kind Contribution Section:

Current and Pending Support also includes in-kind contributions (such as office/laboratory space, equipment, supplies, employees, students). If the in-kind contributions are intended for use on the project being proposed to NSF, the information must be included as part of the Facilities, Equipment and Other Resources section of the proposal and need not be replicated in the individual's Current and Pending Support submission. In-kind contributions not intended for use on the project/proposal being proposed that have associated time obligations must be reported below. If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current to Pending from top to bottom

In Kind Contributions

1.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

2.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

3.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

4.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

5.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

6.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

7.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

8.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

9.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

10.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

*PI/co-PI/Senior Personnel Name: Henry R Costantino

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source, irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. This includes, for example, Federal, State, local, foreign, public or private foundations, non-profit organizations, industrial or other commercial organizations, or internal funds allocated toward specific projects. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[2]

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Commercial Manufacturing of a Stable Silicon Anode Material towards Fostering a Strong U.S. Battery Supply Chain

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available): 2678-1765

*Source of Support: US Department of Energy

*Primary Place of Performance : Group14 Technologies

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $ 100,000,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2023	0.90	4.	
2. 2024	1.20	5.	
3. 2025	0.90		

*Overall Objectives : Secure the U.S. battery supply chain by expanding manufacturing capacity of stable silicon anode battery material by 4,000 tonnes annual by 2025

*Statement of Potential Overlap : No overlap

Projects/Proposals

[redacted]

Projects/Proposals

3. *Project/Proposal Title : Rationally Designed Lithium-Ion Batteries Towards Displacing Internal Combustion Engines

*Status of Support : ◉ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available): DE-EE0009187

*Source of Support: DOE

*Primary Place of Performance : Group14 Technologies

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $ 3,761,695

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2022	1.20	4.	
2. 2023	1.20	5.	
3.			

*Overall Objectives : Develop lithium batteries with >30% silicon content and achieve cell performance metrics with commerically available cathode technology

*Statement of Potential Overlap : No overlap

Projects/Proposals

4. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

5. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

6. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

7.*Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

8. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

9. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

10. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

11. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

12. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

13. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

14. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

15. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

*Required fields

In-Kind Contribution Section:

Current and Pending Support also includes in-kind contributions (such as office/laboratory space, equipment, supplies, employees, students). If the in-kind contributions are intended for use on the project being proposed to NSF, the information must be included as part of the Facilities, Equipment and Other Resources section of the proposal and need not be replicated in the individual's Current and Pending Support submission. In-kind contributions not intended for use on the project/proposal being proposed that have associated time obligations must be reported below. If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current to Pending from top to bottom

In Kind Contributions

1.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

2.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

3.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

4.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

5.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

6.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

7.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

8.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

9.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

10.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

*PI/co-PI/Senior Personnel Name: Christopher Timmons

***Required fields**

Note: NSF has provided 15 project/proposal and 10 in-kind contribution entries for users to populate. Please leave any unused entries blank.

Project/Proposal Section:

Current and Pending Support includes all resources made available to an individual in support of and/or related to all of his/her research efforts, regardless of whether or not they have monetary value.[1] Information must be provided about all current and pending support, including this project, for ongoing projects, and for any proposals currently under consideration from whatever source, irrespective of whether such support is provided through the proposing organization or is provided directly to the individual. This includes, for example, Federal, State, local, foreign, public or private foundations, non-profit organizations, industrial or other commercial organizations, or internal funds allocated toward specific projects. Concurrent submission of a proposal to other organizations will not prejudice its review by NSF, if disclosed.[2]

[1] If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.
[2] The Biological Sciences Directorate exception to this policy is delineated in PAPPG Chapter II.D.2.

Projects/Proposals

1. *Project/Proposal Title : Commercial Manufacturing of a Stable Silicon Anode Material towards Fostering a Strong U.S. Battery Supply Chain

*Status of Support : ○ Current ◉ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available): 2678-1765

*Source of Support: US Department of Energy

*Primary Place of Performance : Group14 Technologies

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $ 100,000,000

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1. 2023	2.70	4.	
2. 2024	3.60	5.	
3. 2025	2.70		

*Overall Objectives : Secure the U.S. battery supply chain by expanding manufacturing capacity of stable silicon anode battery material by 4,000 tonnes annual by 2025

*Statement of Potential Overlap : No overlap

Projects/Proposals

[redacted]

Projects/Proposals

3. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

4. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

5. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

6. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

7.*Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

8. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

9. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

10. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

11. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

12. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

13. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

14. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

Projects/Proposals

15. *Project/Proposal Title :

*Status of Support : ○ Current ○ Pending ○ Submission Planned ○ Transfer of Support

Proposal/Award Number (if available):

*Source of Support:

*Primary Place of Performance :

Project/Proposal Start Date (MM/YYYY) (if available) :

Project/Proposal End Date (MM/YYYY) (if available) :

*Total Award Amount (including Indirect Costs): $

*Person-Month(s) (or Partial Person-Months) Per Year Committed to the Project

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

*Required fields

In-Kind Contribution Section:

Current and Pending Support also includes in-kind contributions (such as office/laboratory space, equipment, supplies, employees, students). If the in-kind contributions are intended for use on the project being proposed to NSF, the information must be included as part of the Facilities, Equipment and Other Resources section of the proposal and need not be replicated in the individual's Current and Pending Support submission. In-kind contributions not intended for use on the project/proposal being proposed that have associated time obligations must be reported below. If the time commitment or dollar value is not readily ascertainable, reasonable estimates should be provided.

Please enter your support entries so they are grouped together based on the "Status of Support" and are in the order of Current to Pending from top to bottom

In Kind Contributions

1.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

2.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

3.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

4.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

5.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

6.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

7.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

8.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

9.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)	Year (YYYY)	Person Months (##.##)
1.		4.	
2.		5.	
3.			

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :

In Kind Contributions

10.*Status of Support : ○ Current ○ Pending

*Source of Support :

*Primary Place of Performance :

*Summary of In-Kind Contributions :

Time Commitment - Month(s) (or Partial Person-Months) Committed Per Year

If the time commitment is not readily ascertainable, reasonable estimates should be provided.

*Year (YYYY)	*Person Months (##.##)
1.	
2.	
3.	

Year (YYYY)	Person Months (##.##)
4.	
5.	

*Dollar Value of In-Kind Contribution: $

*Overall Objectives :

*Statement of
Potential Overlap :