IP Management Plan

Version 04-01

Date	Version	Description
11/30/16	IP Management Plan 0-01	Mike Rinker Submitted draft of IP Plan
12/03/16	IP Management Plan 0-02	Addressed changes from internal CESMII Review
02/24/2017	IP Management Plan	Review & Updated submitted
04/19/2017	IP Management Plan (Revised) 01-02	For Review
04/28/2017	IP Management Plan Final 01-03	Clarified the project specific manufacturing and commercialization plans are intended to show how project teams will comply with the CESMII US Manufacturing Plan; changed reference to "Technical Projects" to "App Projects" to maintain consistency with the definitions; and, added a reference to "institute-generated software" aligning with the Membership Agreement.
09/17/2018	IP Management Plan Draft 02-01 for Novation	Modified for Novation CESMII from SMLC to UCLA. DOE comments 100318 CESMII comments 100718
10/25/2018	IP Management Plan modified Draft 02-02	Accepted previous redlines to have a clean foundation. Added in high-level IP model agreed on by Angela and Glen
12/10/2018	IP Management Plan Draft 03-01	Angela Kujak fresh start after agreements between Angie and Glen; new version using some of SMLC version 10/30/2018 DOE comments 110918 CESMII comments 111318 DOE final approval 121018 per Bill Prymak
3/13/2019	04-01	Howard Goldberg revision for the New Member model with IP democratization concept

Background, Operating Principles & Self-Sustainment Plan

A. Background

The Clean Energy Smart Manufacturing Innovation Institute ("**CESMII**" or "**Institute**") is committed to transforming the United States manufacturing market and increasing global competitiveness through the application of smart manufacturing technologies that are developed under the Cooperative Agreement. The mission of the Institute is to partner with private and public sector organizations to develop, test, and validate advanced sensors, controls, platforms and modeling for manufacturing, as well as to facilitate implementation of new manufacturing solutions and integration of operations technologies and information technologies (OT/IT).

The mission of the IP Management Plan is to:

(1) promote U.S. economic interests;

(2) promote members' economic interests; and

(3) provide members both basic access and membership-level access to Institute Technologies (defined below).

This IP Management Plan is intended to further CESMII's mission by promoting a simplified approach to the reporting, management, sharing, and disposition of IP among CESMII members. This IP Management Plan maximizes and optimizes the potential for deployment of data, tools, results and technologies developed through Institute projects or otherwise acquired by CESMII. CESMII's approach was developed specifically in response to industry's need to rapidly access suites of IP critical to their successful commercialization efforts and the need to efficiently and widely disseminate Institute Technologies to the larger research and development community.

A CESMII objective is to drive the efficiency, effectiveness, and value of the proven and open architecture SM Platform™ for accessing services, tools and resources for implementing real-time applications. This unique, industry-driven framework will be a core strength of CESMII and, to address the above objective, CESMII will acquire, develop, and harness critical IP to meet industry's growing demands for these technologies. Using existing and new SM Platform™ assets, the SM Platform™ will allow users to integrate the hardware and software components developed by members (technology providers) required to assemble customized SM systems, proliferate their availability in the commercial market, and train the workforce. This process is designed to be user accessible and affordable regardless of an organization's size or technical acumen.

CESMII's efforts in this regard will be tempered by the need to support our members' commercial interests and the protection of their Background IP and Foreground IP in accordance with the terms of the DOE Cooperative Agreement. It is anticipated that in the preparation for and negotiation of specific research projects (and other efforts) under the DOE Cooperative Agreement, CESMII will identify Background IP and Foreground IP that supports the above objectives with respect to both the development of technologies supported by the SM Platform™ and the continued development of the SM Platform™ itself. CESMII will negotiate appropriate rights with the project team for the benefit of all members and the further development of the SM Platform™. IP rights for the various Membership Levels are outlined in Section II below.

B. Operating Principles

To accomplish the objectives of the Institute, the following principles will guide IP management and commercialization activities:

- Sustained and dedicated IP management leadership, expertise, resources and a focused plan to ensure the priority of the IP management function and successful commercial outcomes
- Consistent, efficient mechanisms for all Institute Members to participate in creating, accessing, and implementing IP strategies and approaches
- Proactive and effective IP creation and management targeted at accelerated adoption of solutions for well-defined, widely applicable industry problems in Smart Manufacturing
- Process to assure protection of member proprietary information
- Rapid and broad dissemination of data and research tools that emerge from the Members with the broader research and Smart Manufacturing development community

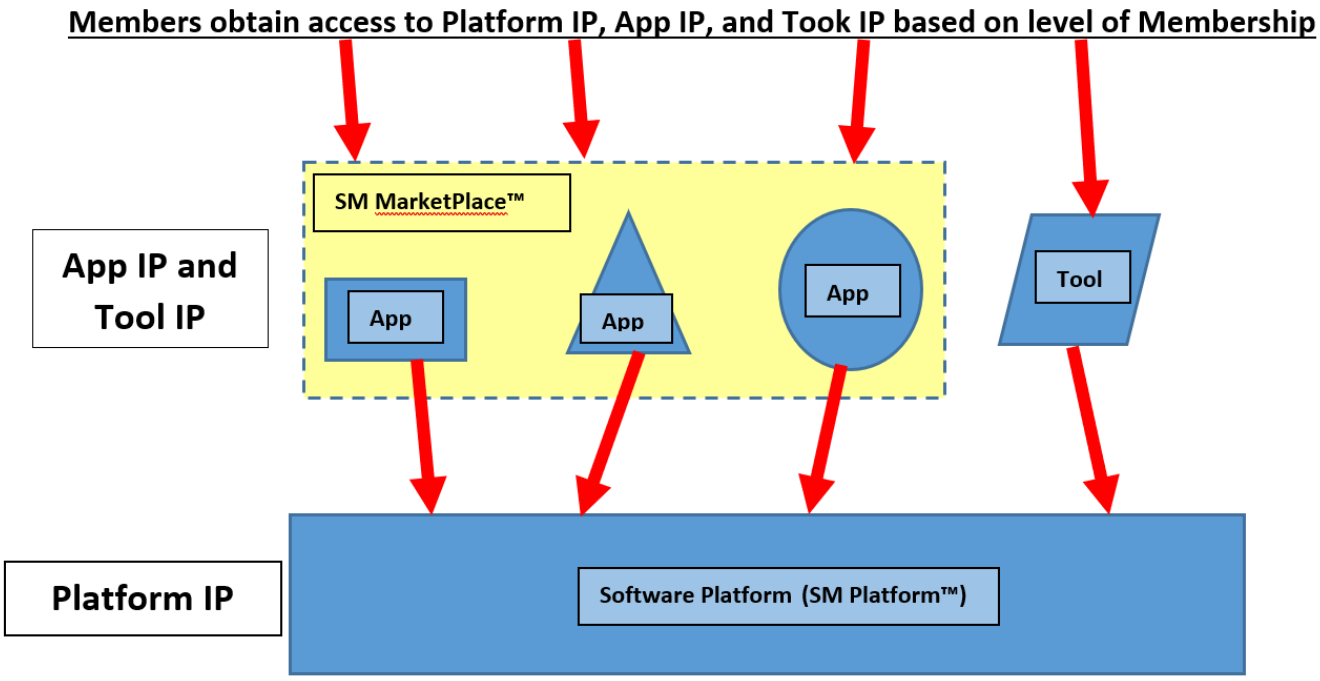
C. Self-Sustainment Plan

CESMII's current plan to become self-sustaining is to generate a revenue stream from memberships ("Membership Fees"), as well as from the out-licensing of Foreground IP and Background IP compiled from the various Project Participants and Members ("App and Tool Royalties"). Please note that, as detailed herein, CESMII may be required in certain circumstances to share App and Tool Royalties with the owners of the corresponding App IP and Tool IP owners, while in other cases CESMII may not be required to do so (e.g., the owner/Project Participant entered into a cost sharing arrangement wherein the Project Participant agreed to grant CESMII the right to keep the App and Tool Royalties resulting from out-licensing of such IP). Ultimately, all App and Tool IP will be bundled and out-licensed to a single commercial entity (licensee) that will make available the Platform and Apps/Tool IP available to Members, will collect fees in exchange for any commercial use of the Apps/Tools, and will pay to UCLA a portion of such fees (i.e., App and Tool Royalties), which UCLA will then share with the applicable owners of such IP to the extent required.

I. Membership Levels & Benefits

All members have access to the SM Platform™ and/or SM Marketplace™ in accordance with the terms of their membership agreement (and membership level), as summarized in the bulleted list below. Members have access to defined set of nationwide intellectual and resource capabilities. Access is in accordance with the commercial terms of the in-kind contribution agreement or acquisition agreement.

For all CESMII projects funded by CESMII or supported by CESMII under the DOE Cooperative Agreement, CESMII will negotiate, prior to granting the award, the scope of IP access and rights to defined and targeted IP (technical data, copyright, software and patentable inventions pertaining to Platform IP, App IP, and Tool IP). CESMII's objective in the negotiation of IP rights will be to balance the project teams' commercial interests with CESMII's needs and objectives to support (improve) the SM Platform™, and to provide members tools, products, software, and processes to support integration of smart manufacturing into their industrial operations.



CESMII's membership comprises of the following four levels (Platinum, Gold, Silver and Observer) and their access to the Platform IP, App IP, and Tool IP is as follows:

- **Platinum, Gold and Silver Levels:**
  - Free internal Use (R&D testing & evaluation) of the Platform IP & Apps IP and Tool IP.
  - Access, for a fee, to use the Platform IP for commercial (Production) purposes.
  - Access, for a fee, to use the Apps IP and Tool IP, for commercial (Production) purposes.

- **Observer Level:**
  - No access to Platform IP, App IP, or Tool IP. Upgrade to Platinum, Gold, or Siler level membership required for access to Platform IP, App IP, and Tool IP.

II. Definitions, CESMII Project Types & Institute Technology Management

A. Definitions:

1) **"App IP"** means the software applications, including the intellectual property rights (patent and copyright) contained therein, that will run on the SM Platform™ and will be made available via the SM Marketplace™.

2) **"Application Project IP"** means, the IP resulting from Application Projects, which can include Platform IP, App IP, and/or Tool IP Roadmap Projects are defined in Section III. B.2

3) **"Background IP"** means any and all IP developed before or independent of performance of work under a CESMII awarded project, except that in the case of an invention, such invention must have been conceived outside, and not first actually reduced to practice in the performance, of a CESMII-awarded project to qualify as Background IP.

4) **"CESMII"** means the Clean Energy Smart Manufacturing Innovation Institute (CESMII) hereafter referred to as CESMII or the "Institute." CESMII operates as a program within The Regents of the University of California, Los Angeles ("UCLA"), providing CESMII with the administrative and oversight capabilities of UCLA and The Regents of the University of California. UCLA is the prime recipient of the DOE Cooperative Agreement.

5) **"CESMII Technology"** means all IP acquired, controlled or managed by CESMII through purchase, subcontract, internal research, funded research and other agreements. CESMII Technology may be acquired from members who perform Roadmap or Application Projects under the DOE Cooperative Agreement. CESMII Technology may be acquired from members choosing to meet their membership agreement obligations for in-kind membership contributions by contributing IP.

6) **"DOE Cooperative Agreement"** means the Cooperative Agreement (DE-EE0007613) for which UCLA is named as the prime recipient. The primary purpose of the Cooperative Agreement is to establish and operate CESMII.

7) **"Foreground IP"** means any and all IP made, created, authored, invented or developed in the performance of a CESMII project under the DOE Cooperative Agreement.

8) **"Generated Information"** means information produced in the performance of work under the DOE Cooperative Agreement.

9) "**Institute Technologies**" means data, tools, results and technologies developed through Institute projects or otherwise acquired by CESMII, including Roadmap Project IP, Application Project IP, Platform IP, App IP, and Tool IP.

10) **"Intellectual Property" or "IP"** means technical information, Inventions, developments, discoveries, know-how, methods, techniques, configurations, profiles, formulae, algorithms, data, processes and other proprietary ideas (whether or not patentable or copyrightable). Intellectual Property also includes patent applications, patents, copyrights, trademarks, mask works, trade secrets, and any other legally protectable information, including computer software.

11) **"Invention"** means any discovery or a new device, method, or process developed from study and experimentation that is or may be patentable or otherwise protectable under Title 35 of the United States Code, or any novel variety of plant which is or may be protected under the Plant Variety Protection Act (7 U.S.C. 2321 et seq.).

12) **"IP Manager"** means the person or entity within the CESMII team responsible for acquiring, storing, and providing access (which may be accomplished through licensing to a third party) to CESMII Technologies. This role includes the strategic and tactic planning to maximize CESMII revenue from CESMII Technology. The IP Manager will work in conjunction with, and under policies administered by, the UCLA Technology Development Group on: disclosures of Foreground and Background IP, Institute patent application filings and office actions, and IP sharing/licensing/commercialization agreements. Additional duties of the IP Manager are listed in Section III.C.2.

13) **"IP Owner"** means a party, public or private, holding legal title to IP, consistent with Federal laws and regulations**.**

14) **"Members"** means the organizations that have executed membership agreements with CESMII and can refer to individual members the collective membership or a subset of the membership.

15) **"Platform Project IP" or "SM Platform"** means the software, including the intellectual property rights (copyright and patent) contained therein, that serves as the software platform upon which the CESMII Apps and Tools will run.

16) **"Roadmap Project IP**" means, the IP resulting from Roadmap Projects, which can include Platform IP, App IP, and/or Tool IP Roadmap Projects are defined in Section III.B.1

17) **"Tool IP"** means any software, methods, know how, or other technology created by a Project Participant that may enable CESMII Members to improve their use of the Apps.

18) **"UCLA Administration"** means the administrative support that UCLA provides the Institute for the management of extramural awards, legal, compliance and control, HR, finance, IP, technology licensing, IT infrastructure, purchasing, accounts payable and receivable, etc. The UCLA Administration includes the following groups:

- Office of Information Technology
- Office of Contracts and Grant Administration
- Office for Research Information System
- Office of External Fund Management
- Office of Research Policy and Compliance
- Technology Development Group

B. CESMII Project Types – Platform Projects & App Projects

1) Roadmap Projects

The focus of Roadmap Projects includes the following: (1) to further develop, improve and enhance the software platform (SM Platform™) upon which the App IP and Tool IP will run; (2) to further develop, improve and enhance the App IP; and/or (3) to further develop, improve and enhance the Tool IP. CESMII will enter into varying types of arrangements with Roadmap Project Participants depending on the particular Roadmap Project Participant. For example, CESMII may enter into an agreement with a large software development company wherein the software development company will substantially contribute to coding the software of the platform as part of its cost share contribution requirement. Note that some of the software will be compiled using open-source software. CESMII will maintain the specification of the platform and the rights to license the software that comprises the Platform IP.

At a minimum, the Roadmap Project Participants will be required to grant the Institute a paid-up, royalty-free non-exclusive license under their interest in any Roadmap IP to enable other members to use such Roadmap Project IP for solely for R&D testing, evaluation, and educational purposes. Additionally, Roadmap Project Participants will be expected to grant CESMII Members access to their respective ownership interests in the Roadmap Project IP through an IP Licensing Agreement. While such IP Licensing Agreement will provide that the Roadmap Project Participant will extend a free license to their copyrights in any such Roadmap Project IP, CESMII and such Roadmap Project Participant will negotiate in good faith reasonable consideration (which may include in-kind consideration) to be provided to the Roadmap Project Participant in exchange for the grant of a license to any patent rights contained in such Roadmap Project IP (e.g., Foreground or Background patent rights). The level of consideration to be returned to the Roadmap Project Participant will be based on their respective contributions to the Roadmap Project (e.g., if Roadmap Project Participant provides full cost share, then CESMII may negotiate a revenue-sharing arrangement with such Roadmap Project IP owner, whereas if a Roadmap Project Participant provides less than full cost share, then such Roadmap Project Participant may provide a free license to its patent rights in such Roadmap Project IP).

Roadmap Projects leverage federal funds to:

(1) Validate, demonstrate and ready new advanced sensors, controls, platforms and high performance and distributed computational modeling technologies and multi-provider application systems for production use, when appropriate through the use of testbeds;

(2) Develop toolkits (as specialized collections of composed hardware and software and information about their application) that comprise reusable application templates and configurations for extensive cross industry use;

(3) Develop systems engineering and computational modeling methods (for example, data analytics, optimization, mathematical modeling, simulation, visualization) and associated tools (including high performance computing) that support toolkits;

(4) Develop the SM Platform™ and SM Marketplace™ business and technical functionality and services (web accessible cloud services that are industry-defined to implement application systems; and

(5) Develop content for training programs, pilot delivery, and identify future requirements for the SM Platform™.

Roadmap Projects can either be Industry-Hosted or Research and Development (R&D) projects. Industry-Hosted Roadmap projects use real industry manufacturing processes and operations to develop, validate and contribute intra- and inter-industry reusable technologies, sensor-to-action application systems, and deployment practices. Industry-Hosted Roadmap Projects demonstrate and measure industry and cross industry sector operational extensibility and effectiveness in achieving specific Institute objectives. R&D Roadmap projects offer the potential for development of specific technologies that are intended to address an unmet need in the industry (e.g., controls, sensors, data analysis, toolkits, open standards, control algorithms, and high-performance computing models). Members may propose R&D Roadmap projects, which proposals CESMII will evaluate, and make a determination as to whether to support such project, based on whether such R&D Roadmap project has the ability to substantially contribute to CESMII's operating principles and objectives.

2) Application Projects

Application Projects are industry projects that use Institute developed hardware and software products and related services, training and SM Platform™ infrastructure. The projects rely on member funding, cost share (where applicable) and/or other revenue/fund sources. In using the SM Platform™ as enabling infrastructure, Application Projects also provide direction and scale up requirements on the functionality and enabling role of the SM Platform™ and SM Marketplace™. The energy, training and sustainability goals of the Institute are better addressed through these Application Projects as the Institute progresses. The focus of Application Projects includes the following: (1) to further develop, improve and enhance the software platform (SM Platform™) upon which the App IP and Tool IP will run; (2) to further develop, improve and enhance the App IP; and/or (3) to further develop, improve and enhance the Tool IP

At a minimum, the Application Project Participants will be required to grant the Institute a paid-up, royalty-free non-exclusive license under their interest in any Application Project IP to enable other members to use such Application Project IP solely for R&D testing, evaluation, and educational purposes. Additionally, Application Project Participants will be expected to grant CESMII Members access to their respective ownership interests in the Application Project IP through an IP Licensing Agreement or a Joint Commercialization Agreement. While such IP Licensing Agreement will provide that the Application Project Participant will extend a free license to their copyrights in any such Application Project IP, CESMII and such Application Project Participant will negotiate in good faith reasonable consideration to be provided to the Application Project Participant in exchange for the grant of a license to any patent rights contained in such Application Project IP (e.g., Foreground or Background patent rights). The level of consideration to be returned to the Application Project Participant will be based on their respective contributions to the Application Project (e.g., if Application Project Participant provides full cost share, then CESMII may negotiate a revenue sharing arrangement with such Application Project IP owner, while on the other hand if a Application Project Participant provides less than full cost share, then such Application Project Participant may provide a free license to its patent rights in such Application Project IP).

C. Institute Technology Development & Management

1) Sub-recipients

CESMII will directly manage the development, implementation, and validation of the SM Platform. Such activities will be handled by CESMII staff, as well as by Project Participants through the grant of Sub-recipient Agreements. Sub-recipient Agreements executed in relation to projects supported with DOE funds will be executed on a project-by-project basis and will flow down all terms and conditions, including those related to intellectual property, from

the DOE Cooperative Agreement. Furthermore, each sub-recipient agreement will be based on a full proposal including detailed budgets, a specific plan to implement this IP Plan and comply with CESMII's U.S. manufacturing plan, and a commercialization plan. Nothing in this IP Plan shall restrict project teams, contemplated in the preceding paragraph, from developing specific IP sharing agreements as they deem necessary, subject to such Project Participants assuring that the IP is commercialized consistent with the CESMII approved U.S. Manufacturing and Commercialization Plans and adheres to the provisions of this IP Management Plan.

2) IP Manager

The IP Manager reports to the Institute's Chief Technology Officer, and will provide leadership, expertise, and dedicated resources to all the Members. This function will integrate and coordinate the activities related to IP management to maximize the benefits and outcomes arising from the Institute's activities. In this IP portfolio management function, the CTO and IP Manager will be advised by an IP Advisory Committee (IPAC), which will be comprised of representatives appointed by the Institute's Governance Board.

Specific responsibilities of the IP Manager include:

- Lead the management of Institute IP, including storing, access, dissemination, and commercialization.
- Develop and implement relevant policies and procedures coordinate the Regional Manufacturing Centers and Institute Members.
- Educate Members directly and through the Regional Manufacturing Centers on their rights and obligations relative to IP distribution and protection within the membership, the CESMII organization, and the Federal Government.
- Organize and disseminate information on Institute-wide patenting and publication regarding Inventions and innovations to all the Regional Manufacturing Centers, the Institute Members, the DOE, and the public. Innovations includes technical data or commercial or financial data first produced in the performance of the award which, if it had been obtained from and first produced by a non-federal party, would be a trade secret or commercial or financial information that is privileged or confidential under the meaning of 5 U.S.C. 552(b)(4). (Protected Data under the DOE Cooperative Agreement)
- Support the Institute's sustainability by defining and then implementing marketing and commercialization strategies with participation from the Members.
- Ensure the dissemination of data and research tools to the broader research community.
- Work with the IPAC on the development of strategies related to Institute IP, its management and commercialization approaches.
- Develop and implement, and lead CESMII-wide efforts to assure (1) the consistent application of the use of the "Protected Data Rights" authorization set forth in the DOE Cooperative Agreement, and (2) assure that all project teams conducting research and development under CESMII authorization are cognizant of their rights and obligations under this IPMP and the DOE Cooperative Agreement.
- Assure that the classification of project data as "Protected Data" is done for two purposes: (1) to assure the objectives of the project-specific U.S. Manufacturing and Commercialization PLans are met; and (2) to facilitate each member's' economic interest in commercialization of technology.

- Work in conjunction with, and under policies administered by, the UCLA Technology Development Group managing the legal aspects of the IP portfolio. This includes: disclosures of Foreground and Background IP, Institute patent application filings and office actions, and IP sharing/licensing/commercialization agreements.

D. Intellectual Property

1) Foreground IP

Subject to the terms and conditions of the DOE Cooperative Agreement and the subrecipient agreements awarded under the DOE Cooperative Agreement, all sub-recipients shall retain title to IP invented or created solely by its employees and agents. Foreground IP must be disclosed to the IP Manager. IP Owner(s) shall provide a non-confidential title and abstract of any newly created Foreground IP to the IP Office within sixty (60) days after the author/inventor discloses it in writing to Member personnel responsible for the administration of IP. Such disclosures shall be restricted pursuant to the signed NDA, and distribution will be limited within each Member on a "need to know" basis.

Foreground IP in the form of non-patentable technical data will be disclosed in accordance with the requirements of the project specific reporting requirements checklist. Protection of the data may be claimed under the Protected Data provisions of the sub-recipient agreement. It is contemplated that all members and entities participating in a project will enter into further agreements to address the commercialization of any such Foreground IP and Background IP, subject to the rights and requirements of this IP Plan, the sub-recipient agreement and the DOE Cooperative Agreement.

2) Background IP

Members will be required to disclose existing Background IP to the IP Manager, to the extent such Background IP is reasonably relevant to the Institute's development and commercialization of its Platform IP, App IP, and Tool IP. Voluntarily disclosed Background IP should include details regarding the availability for licensing, including any limitations such as prior licenses in specified fields of use. During negotiations of specific project activities, CESMII may identify Background technical data or existing patents or trade secrets that would enhance the value of the SM Platform™ and SM MarketPlace™. CESMII may negotiate rights to Background data during negotiations of specific App and Application projects, when such rights to data support the defined CESMII objectives.

3) Technical Data

In the event that Members wish to exchange proprietary information, the membership non-disclosure agreement shall be used for such exchanges. The CESMII awarded Sub-recipient Agreements and the RMC awarded Sub-recipient Agreements will incorporate by reference the Non-Disclosure Agreement.

Consistent with the terms of the applicable Sub-recipient Agreement through which the Institute funds are distributed to the sub-recipients, the parties may assert copyright in any of their Generated Information, including computer software. Awardees will be required to grant to CESMII a royalty-free, fully paid up, irrevocable, perpetual, nonexclusive license under their copyright interests in any project results (e.g., Platform IP, App IP, and Tool IP), including the right to sublicense such rights to its Members to use the Platform IP, App IP, and Tool IP

for R&D and Production purposes. To facilitate the sharing of information and the appropriate use and protection of the Institute IP, the Members will agree, to the extent they are permitted to do so under their Sub-recipient Agreements, to disclose technical data, when such technical data is not identified as protected technical data. The management of Institute-generated data is described under the terms of the CESMII Data Management Plan. Authorization of publications shall be as set forth in the CESMII awarded Sub-recipient Agreements.

4) Dispute Resolution

Any dispute between particular Members relating to the management and disposition of Institute Technology shall be handled by those particular Members, per the Membership Agreement. Each involved member shall bear its own expenses incurred in connection with any attempt to resolve disputes.

Data Management Plan

Version 2-01

Date	Version	Description
	Data Management Plan 1-01	Final Approved Plan
11/1/2018	Data Management Plan Final 02-01 for Novation	Modified for Novation CESMII from SMLC to UCLA. Started 9/17/2018 and approved 11/1/2018

1. INTRODUCTION

This Data Management Plan (DMP) covers a range of data types which will be collected/and or managed under CESMII. This DMP is designed to be consistent with the Department of Energy's (DOE) Public Access Plan.

The Clean Energy Smart Manufacturing Innovation Institute ("CESMII" or "Institute") is committed to transforming the United States (U.S.) manufacturing market and increasing global competitiveness through the application of smart manufacturing technologies that are developed under the Cooperative Agreement. The mission of the Institute is to partner with private and public sector organizations to develop, test, and widely deploy to industry advanced sensors, controls, platforms and modeling for manufacturing, as well as to facilitate implementation of new manufacturing solutions and integration of operations technologies and information technologies (OT/IT).

The Institute operates as a program within University of California, Los Angeles ("UCLA"), providing CESMII with the administrative and oversight capabilities of UCLA and The Regents of the University of California. UCLA is the prime recipient of DOE Cooperative Agreement (DE-EE0007613). The primary purpose of the Cooperative Agreement is to establish and operate the Clean Energy Smart Manufacturing Innovation Institute for smart manufacturing.

2 RATIONALE

CESMII is an Institute for Manufacturing Innovation (IMI) and part of the Manufacturing USA network. By furthering smart manufacturing technologies with a broad base of industry applications, the Institute will also support the administration's effort to double U.S. energy productivity by 2030. CESMII is the third DOE-funded facility and is part of Manufacturing USA to scale up advanced manufacturing technologies and processes. New smart technologies that include advanced sensors, controls, platforms and modeling and new business data-based technology practices can help U.S. manufacturers capture, share and process data in real-time to achieve new levels of manufacturing productivity and performance, process improvement equipment reliability, and product precision at a reduced cost. More efficient processes also mean less waste and greenhouse gas emissions. The Smart Manufacturing Institute will support research and development efforts in these areas to reduce deployment costs for smart technologies by as much as 50%, in addition to helping train the next generation workforce on these advancements. The Institute will focus on Technology Readiness Levels (TRL) 3-7, defined in Table 1.

Table 1. Technology Readiness Levels

TRL1	Basic principles observed and reported
TRL 2	Technology concept and/or application formulated
TRL3	Analytical and experimental critical function and/or characteristic proof of concept
TRL4	Component and/or breadboard validation in a laboratory environment
TRL5	Component or breadboard validation in a relevant environment
TRL 6	System/subsystem model or prototype demonstration in a relevant environment
TRL7	System prototype demonstration in an operational environment
TRL8	Actual system completed and qualified through test and demonstrated
TRL9	Actual system proven through successful mission operations

3 DEFINITIONS

3.1 "**Generated Data and Information**" means data and information produced in the performance of the Cooperative Agreement between CESMII and DOE. Data is a reinterpretable representation of information in a formalized manner suitable for communication, interpretation, and/or processing.

3.2 "**Intellectual Property**" means patents, Trademarks, copyrights, Mask Works, Protected CRADA Information, data, information and other forms of comparable property rights protected by Federal law and foreign counterparts, except trade secrets.

3.3 "**Research, Development and Demonstration (RD&D) Data and Information**" means the recorded factual material, data information necessary to validate and/or reproduce findings or take operational action. Research data also do not include:

(A) Preliminary analyses, drafts of scientific papers, plans for future research, peer reviews, communications with colleagues or physical objects (e.g., laboratory samples).

(B) Trade secrets, commercial data and information, materials necessary to be held confidential by a researcher until they are published, or similar information which is protected under law; and

(C) Personally Identifiable Information (PII), Health Insurance Portability and Accountability (HIPAA) protected medical information and other personally sensitive information, the disclosure of which would constitute a clearly unwarranted invasion of personal privacy, such as information that could be used to identify a particular person in a research study.

3.4 "**Proprietary Information or Limited Rights Data**", disclosure of which would constitute a clearly unwarranted, (2) business sensitive and (3) commercial or financial information which is privileged or confidential under the Freedom of Information Act [5 U.S.C. 552 (b) (4)], any of which is developed at private expense outside of the Cooperative Agreement and which is marked as Proprietary Information.

3.5 "**Protected and Institute restricted and business sensitive**" means Generated data and information first produced in the performance of the award which, if it had been obtained from and first produced by a non-federal party, would be a trade secret or commercial or financial information that is privileged or confidential under the meaning of 5 U.S.C. 552(b) (4) and which data is marked as being "Protected Data" by a party to the project.

3.6 "**Validation**" means quantitative or qualitative corroboration, replication or reproduction of research findings. Validation of research findings could be accomplished by reproducing the original experiment or analyses; comparing and contrasting the results against those of a new experiment or analyses; modeling or algorithmic comparisons, or other.

4 DATA TYPES AND SOURCES

CESMII will conduct project activities that involve data about how industry products perform; standards and patterns about how different industry products come together, data about patterns of how software and systems are engineered and configured; benchmark data; data that are aggregated to form new data sets, algorithms and tools that embody proprietary but aggregated data sets. These data, information and algorithms are Institute protected and managed. Plans also include benchmark data about products, systems and applications: data about what and how standards are applied; data structures and configurations for analytics and modeling; and data for Institute metrics, assessments, reports and publications. General data and information examples include:

1. Source operational and test data generally streamed or collected over time from manufacturing plant or test facility; also used to establish network practices
2. Labeled, contextualized, interpreted data streams and standards for collection and contextualization; also used to build consensus on data standards and network practices
3. Data derived, merged and computed to assemble Smart Manufacturing sensor to action enterprise systems, i.e. SM systems, produce operational results and conduct performance analyses; also used to establish data aggregation, modeling and data derivation practices and standards.
4. Data about data, component and system configurations for SM systems that are used to build and update Toolkits, configurations and profiles
5. Benchmark data on common sensor, control, platform and modeling products, services and/or facilities used for manufacturing.
6. Benchmark data on energy consumption and clean energy impacts for a range of manufacturing use cases.
7. Benchmark data on the use, cost and operational impact of the SM Platform™
8. Benchmark data on product, use and transactions through the SM Marketplace™.

CESMII will collect data, manage source data between and among businesses; generate and manage derivative, de-identified (that is sensitizing for proprietary and related information), aggregated and/or merged data sets; manage data sets from models and analyses; publish data sets and data sets associated with published papers and reports. CESMII will also manage transaction data that are set up the agreements for shared use of these data sets. CESMII will collect and manage data that are the real-time operational outcomes and outcome analyses of Institute project activities, benchmarking, SM Platform™ use, technology and product use and energy and economic metrics. CESMII will collect and analyze workflow provenance, i.e. data across workflow executions. CESMII will combine data, models and applications to form Toolkits and systems engineering tools to be made available with managed access.

With reference to the above, because of the unique focus of the Manufacturing USA Institutes including CESMII to conduct research primarily in TRL 3-7 and to encourage U.S. Manufacturing, CESMII's Generated Data and Information will likely be protected as Intellectual Property or treated as Protected Data. Most of the research, development, and deployment (RD&D) will be a conducted in a collaborative manner with industry leading or involved in projects. New data and information sets resulting from collaboration will be protected and managed as Intellectual Property. Additionally, much of the information that forms the basis of the project will be industry's Proprietary Information or other protectable data.

This DMP applies to all Generated Data and Information that are published as Research Data in scholarly publications (i.e., final, peer-reviewed and accepted manuscripts or, for participating publishers, the corresponding published journal article), as Research Data sets, and/or publicly accessible Toolkits that contain data and information application and the supporting Research Data and Information where the publication describes unclassified and otherwise unrestricted research findings produced with complete or partial DOE funding, unless otherwise prohibited by law, regulation, or policy.

In accordance with the definitions of General Data and Information and Research Data this plan does not include preliminary analyses (including raw data), drafts of scientific papers, and plans for future research, peer reviews, or communications with colleagues. Furthermore, data to enable peer review and publication/dissemination and/or to protect intellectual property may be temporarily withheld

from distribution and other proposed data management. This plan will make certain that the data produced during the period of this project is appropriately managed to ensure its usability, access and preservation.

5 CONTENT AND FORMAT

The Generated Data and Information, supporting Research Data and metadata used for publicly available publication will be available in print from the publishers or electronically in that the public can read, download, and analyze.

6 SHARING AND PRESERVATION

CESMII depends on data dissemination in the form of Toolkits; reports, analyses and benchmarking; and technical publication to validate technology and business development. All members receiving DOE funding will be expected to publish results at various levels of institute access including public access to the extent possible.

Members will be required to submit metadata and a link to the full-text accepted manuscript (or the text itself) to DOE's Office of Scientific and Technical Information (OSTI) and other proposed data management. This plan will make certain that the data produced during the period of this project is appropriately managed and otherwise unrestricted manuscripts publicly accessible if there is no other publicly available version. Generated Data and Information supporting published or supporting a scholarly publication, which is not otherwise publicly available, will be submitted to the Open Energy Information Platform (OpenEI - http://en.openei.org/wiki/Main_Page), a centralized and secure resource for publicly accessible energy data managed by the National Renewable Energy Laboratory and/or maintained by CESMII on an open site. Research Data will be shared and preserved as supplementary information to the published article through OSTI, a CESMII hosted open site, and/or OpenEI.

7 PROTECTION

CESMII's publication policy requires review before submission of a publication for peer review. This review will identify and protect confidentiality, personal privacy, Personally Identifiable Information, and U.S. national, homeland, and economic security; recognize proprietary interests, Proprietary Information, and Intellectual Property rights; and avoid significant negative impact on innovation and U.S. competitiveness.

As part of the publication review, the authors in collaboration with CESMII will determine and document the plan for how and if the supporting Research Data and Information will be made publicly available using the guidance set forth in this document.