RFP-2 Wave 4 Webinar

SM Innovation Projects

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• All proposers are strongly encouraged to read the Technical Roadmap and the Request for Proposal (RFP) carefully and adhere to the stated submission requirements

• This presentation summarizes the RFP. Any inconsistencies between the RFP and this presentation or statements from CESMII personnel, default to the RFP

• CESMII website https://www.cesmii.org/questions-and-answers/

• If you believe there is an inconsistency, please contact CESMII at roadmapprojects.info@cesmii.org
Agenda

- CESMII Mission, Strategy, Role, Objectives
- CESMII Technical Roadmap Overview
- CESMII Projects (Roadmap & Application)
- RFP Process Overview & Timeline
- RFP-2 Wave 4 Technical Areas of Interest
- Award Information
- Eligibility Information
- Cost Sharing
- Proposal Templates
- Roadmap Project Evaluation Criteria
- CESMII Links & Questions
CESMII has an Integrated Strategy & Roadmap to Realize its Mission

Vision: Smart Manufacturing is manufacturing in 2030

**MISSION**
Radically accelerate advanced sensor, controls, modeling, simulation, and platform development and adoption in U.S. manufacturing through integrated, industry-led Smart Manufacturing technical, business, and educational methodologies.

**GOALS**
Demonstrate at least a **15% improvement in energy efficiency** in first-of-a-kind demonstrations at manufacturing plants or major processes **within five years** of Institute operation, supporting a goal of at least **50% improvement in energy productivity in 10 years**.

Develop tools and technologies to **reduce the cost of deploying Smart Manufacturing in existing processes by 50%** relative to the existing state of the art within five years.

Demonstrate **significant industry adoption of Smart Manufacturing technology** in each of the following topic areas within five years: advanced sensors; control systems and data analytics; high-fidelity modeling; and toolkits.

**Establish a portfolio for technology RD&D and workforce development** that directly replaces the initial Federal funding (i.e., $14 million per year), starting in the sixth year of operation.

**OBJECTIVES**
To enhance U.S. manufacturing productivity, global competitiveness, and reinvestment, significantly:

- **energy productivity**
- **economic performance**
- **environmental sustainability**
- **workforce capacity**

**Broad Deployment – “ALL Manufacturing”**
1. **Lead** a national effort to develop, research, test, and widely validate SM technologies and practices in a continuously evolving manner

2. Develop a roadmap for **SM technologies, practices, services, and training** and update the roadmap periodically as needed

3. Support SM Research & Development, to provide capabilities for and collaboration in **open, pre-competitive work** among multiple parties

4. Establish a technical education and **workforce development** program that leverages regional networks

5. Stimulate **growth of a SM** domestic supply chain

6. Demonstrate **participation of underrepresented groups** in CESMII

7. Be financially **self-sustaining** after the five-year period of federal funding
1. **Energy Productivity**: Energy productivity gains in U.S. manufacturing will be doubled in 10 years.

2. Energy Efficiency: **15% improvement in energy efficiency** in first-of-a-kind industrial testbeds will be achieved within 5 years.

3. Industry Deployment Costs: **Cost of deploying SM technologies** including hardware and software in existing manufacturing processes will be reduced 50% relative to state-of-the-art in 5 years.

4. **Adoption Costs**: Installed and operating cost for adoption of SM technologies including hardware and software will be recovered through energy savings and productivity improvements in 10 years.

5. Workforce: **SM workforce capacity** in U.S. will be increased two-fold by 2020 and five-fold by 2030.

6. Supply Chain: SM supply chain will increase value and participation 40% by 2030.
How CESMII Invests to Drive SM Innovation & Research @ Scale

Enabling R&D Projects:
- Close specific technology gaps, explore emerging technologies;
- Create apps and information models specific to use case

Innovation Projects:
- Solve specific manufacturing problem & develop information models & apps

Application Projects:
- Demonstrate platform capabilities through use cases & identify gaps

Platform Capability Projects:
- Develop core platform capabilities & tools

Education & Workforce Development Projects:
- Develop content, train, certify

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INNOVATION PROJECTS PROCESS OVERVIEW

**RFP DEVELOPMENT & ISSUEANCE/OPEN CALL FOR INNOVATION PROJECTS**
- Areas of Interest
- DOE Concurrence

**PROJECT REVIEW AND SELECTION**
- Full Proposals Preparation (SOPO & Budget) (6 Wks)
- CESMII Internal Evaluation & Selection (2 Wks)
- DOE Technical & Financial Reviews and Final Selection (2 Wks)

**CONTRACTING**
- DOE SOPO Modification & Approval (2 Wks)
- UCLA Contractual Review and SRAs (2Wks)

**PROJECT EXECUTION**
- Projects Kickoff Meetings
- Project Activities
- Project Deliverables Validation

8-10 Weeks from Proposal Submission to issuance of Contract

3-6 Months
## CESMII RFP-2 Wave 4 Timeline

<table>
<thead>
<tr>
<th>Activity: RFP-2 Wave 4 (SM Innovation Projects)</th>
<th>Schedule</th>
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<tbody>
<tr>
<td>Request for proposals issue date</td>
<td>May 12, 2020</td>
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<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; Information Webinar</td>
<td>May 14, 2020</td>
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<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Information Webinar</td>
<td>May 19, 2020</td>
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<tr>
<td>Submission deadline for full proposals</td>
<td>June 8, 2020</td>
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<tr>
<td>Selection Notifications Issued</td>
<td>July 10, 2020</td>
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<tr>
<td>Negotiation Meetings Completed</td>
<td>July 17, 2020</td>
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<tr>
<td>Projects Final SOPOs, EERE335s, etc Submitted to DOE</td>
<td>July 22, 2020</td>
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<tr>
<td>UCLA SRAs Issued</td>
<td>August 14, 2020</td>
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<tr>
<td>Expected project start date</td>
<td>August 17, 2020</td>
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Every effort will be made to shrink this timeline.
In order for SM solutions to be developed and implemented in a fashion that is secure, scalable, reusable and interoperable, the following three key capabilities are required:

- An environment (platform) that allows individual functional components to be able to interoperate, and for data to be orchestrated between these components
- Common information models that provide the ability to move “data-in-context” from source to consumption, and between components that consume the data to provide a solution
- A marketplace from where the information models, and functional components can be “serviced” to create solutions to manufacturing use cases
Agile Innovation Project Framework

- Manufacturer **defines a target asset/process** based on specific problem/need
- Form an **Integrated SM Innovation Project team**
- The team builds **SM profiles** of the assets and/or processes
- The SM IP Team develops the Application and/or **Predictive Models** that address the problem/need
- CESMII sanctions and **publishes** the profiles and apps on the **SM Marketplace™**

**SM Project Funding:**
- **Min:** $25K CESMII / $25K recipient cost share
- **Max:** $100K CESMII / $100K recipient cost share
Smart Manufacturing Innovation Projects

Pre-defined Areas of Value

Energy Consumption and/or Energy Productivity
Profiles and applications that address improvement in energy consumption and/or energy productivity for unit operations or process flow paths through use of Smart Manufacturing technologies

Precision, Productivity and Performance
Profiles and applications that address improvement in precision, performance and/or productivity for unit operations or process flow paths through use of Smart Manufacturing technologies

Asset Monitoring, Asset Management & Predictive Maintenance
Profiles and applications that enable real-time asset monitoring, management and predictive maintenance for unit operations or process flow paths through use of Smart Manufacturing technologies
AWARD INFORMATION:

Estimated Funding
$2,500,000* of federal funding available for new awards under Wave 4

Projects will also be required to provide 50% cost share.

<table>
<thead>
<tr>
<th>Technical Areas of Interest</th>
<th>Number of Awards Anticipated</th>
<th>Total Federal Funding Available (RFP-2 Wave-4 Only)</th>
<th>Member cost-share</th>
<th>Period of Performance</th>
</tr>
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<tbody>
<tr>
<td>SM Innovation Projects</td>
<td>~25</td>
<td>$2,500,000</td>
<td>$2,500,000</td>
<td>~ 6 Months</td>
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* Funding will be made available in multiple batches, initially beginning with $1M (total)
PERIOD OF PERFORMANCE

For this RFP, CESMII anticipates making awards with period of performance up to 6 months

- All projects are stage-gated
- Expected first phase of project is from August 2020 – January 31, 2021, with 1 Intermediate milestone.

UCLA will negotiate sub recipient agreement with lead organizations of each of the project teams.
Eligible Applicants...

MUST BE IN GOOD STANDING BY THE TIME THE PROJECT IS AWARDED TO CESMII

• Good standing means a completed membership agreement and are current with their annual dues
• Information regarding CESMII Membership can be found at the CESMII website, https://www.cesmii.org/membership-information/

• Approved CESMII members who are foreign entities may apply for project funding. If any project work will be done in a foreign country, CESMII will work with the project team to complete a Foreign Work Waiver (FWW) that will be submitted to DOE for review and approval.
• All work to be performed in the US unless a Foreign Work Waiver (FWW) is approved by the DOE
Non-Responsive Proposals

• The following types of proposals will be deemed nonresponsive and will not be reviewed or considered for an award:
  • Proposals that fall outside the technical parameters specified in the RFP
  • Proposals for technologies that are not based on sound scientific principles (e.g., violates the laws of thermodynamics)
Cost Share

• The cost share component must be at least 50% of the total allowable costs for the project (i.e., the sum of the CESMII share and the recipient share of allowable costs equals the total allowable cost of the project) and must come from non-Federal sources unless otherwise allowed by law.

• Each Project Team is free to determine how best to allocate the cost share requirement among the team members.

• The Team members may provide cost share in the form of cash or in-kind contributions.

• Upon selection for award negotiations, all Project Team Members are required to provide written assurance of their proposed cost share contributions in their final SOPOs. Each organization providing cost share in support of the Project must submit a Letter of Commitment.
What is Cost Share?

• Cost share are in-kind contributions ("donations") that the Project Recipient(s) will contribute towards achieving the Work Scope and Milestones of the project.

• These in-kind contributions are financially valued to quantify the Project Recipient(s) co-investment in the project along with the federal funding they receive from CESMII.

• For every $1 of Federal funding Project Recipient(s) receive they must also contribute $1 of cost share contribution.

• The Federal regulations on cost-share accounting can be found at 2 CFR 200, 2 CFR 200.29, and 2 CFR 200.306

• The cost-share contributions must be aligned to achieving the Project Work Scope and Milestones. Some examples are:
  ✓ Personnel costs
  ✓ Raw materials or laboratory supplies
  ✓ Hardware or software
  ✓ Facilities or administrative costs
  ✓ Rental/usage cost of facilities or equipment
  ✓ Value of a service, other resource, or third-party in-kind contribution.
$200K SM Innovation Project Example ($100k FS + $100k CS)
Improve energy productivity & reduce downtime and waste on a packaging line

- App Vendor will provide a 1 year $50k subscription and (for the first project) integration to the SM Platform (NRE)
  - $50k license contribution - 100% cost share
  - $25k NRE development support to integrate their application to the SM Platform API – 100% federal share
  - The vendor App is posted on the CESMII SM Marketplace™ as a sanctioned, SM Platform App

- Manufacturer will make the packaging line and engineering support available – and provide 100% dedicated CESMII project access for 4 months
  - $35k (350 hrs at fully burdened rate @ $100/hr) – 100% cost share

- The System Integrator will provide 4 man-months of engineering to provision and integrate the SM Platform™ with the packaging line, build 6 SM Profiles, and develop the App Vendor solution (which is where the analytics/value creation will happen);
  - $75k (500 hrs at fully burdened rate of $150/hr) – 80% federal share, 20% cost share
  - 6 SM Profiles (for the 6 assets on the packaging line) are posted on the CESMII SM Marketplace™
  - $5k edge device contribution – 100% federal share
  - $10k OPC connectivity for Edge-to-Asset(s) connectivity – 100% federal share

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<thead>
<tr>
<th></th>
<th>App Vendor</th>
<th>Manufacturer</th>
<th>SI</th>
<th>Totals</th>
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</thead>
<tbody>
<tr>
<td><strong>Federal Share:</strong></td>
<td>$25k</td>
<td>$0</td>
<td>$75k</td>
<td>$100k (50%)</td>
</tr>
<tr>
<td><strong>Cost Share:</strong></td>
<td>$50k</td>
<td>$35k</td>
<td>$15k</td>
<td>$100k (50%)</td>
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SELECTION Criteria
1. General Criteria
2. Technical evaluation Criteria
3. Portfolio Selection Criteria

<table>
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<tr>
<th>1- General Criteria</th>
<th>Metrics</th>
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| **Business Impact** | • % improvement in energy reductions % manufacturing productivity  
                      • Other financial savings  
                      • Alignment with CESMII goals |
| **Technical significance** | • Identification of key technical barrier(s) to be overcome  
                               • Reusable technologies and Components for Platform  
                               • Alignment with the CESMII technical roadmap |
| **Project Execution** | • Clear project objectives and scope statement  
                           • High-level project plan to meet milestone dates  
                           • Key resources identified and confirmation of availability.  
                           • Integration requirements defined  
                           • Project deliverables identified.  
                           • Complete cost breakdown including sub recipient budget  
                           • Measure of success  
                           • Project risks |
# Evaluation & SELECTION Criteria

1. **General Criteria**

2. **Technical evaluation Criteria**

3. **Portfolio Selection Criteria**

<table>
<thead>
<tr>
<th>2- Technical Evaluation Criteria</th>
<th>Description</th>
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<tr>
<td><strong>Technical Merit (Weight: 40%)</strong></td>
<td>The extent to which the project addresses the areas of interest stated in this RFP. The extent to which the project, if successfully carried out, will make a valuable contribution to the field of smart manufacturing, SM Platform, CESMII and its members. The project objectives are clearly stated, challenging, well-conceived, and technically feasible. The degree to which this project will provide valuable new tools, engineering processes, devices, or hardware/software/data to support adjacent Institute activities. Project will materially advance the mission of the Institute.</td>
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<tr>
<td><strong>Technical Approach (Weight: 35%)</strong></td>
<td>Adequacy and feasibility of the applicant’s approach to achieving the stated objectives of the project. The extent to which the project plan, methods, analysis, and technology are properly developed, well integrated, and appropriate to the objectives of the project. Appropriateness rationale, and completeness of the proposed Project Proposal. Degree to which the applicant has identified high risk challenges and presented reasonable mitigation strategies. There is a high degree of innovation, novelty or originality in the approach. Adequacy and appropriateness of the proposed schedule, staffing plan, and proposed travel.</td>
</tr>
<tr>
<td><strong>Technical and Management Capabilities (Weight: 25%)</strong></td>
<td>Likelihood that the proposed work can be accomplished within the proposed budget and performance period by the technical team, given their experience, expertise, past accomplishments, available resources, institutional commitment, and access to technologies. Clarity, completeness and appropriateness of the project plan and timeline. Clarity, logic, and effectiveness of the project organization, including sub awardees to successfully complete the project. Credentials, capabilities, experience of the key personnel. Adequacy and availability of personnel, facilities, and equipment (both hardware and software) to perform the proposed project within the budget specified.</td>
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### 1. General Criteria

### 2. Technical evaluation Criteria

### 3. Portfolio Selection Criteria

To create a balanced portfolio CESMII will select projects that are complementary and support the accomplishment of CESMII objectives. This will include but not limited to the following criteria:

<table>
<thead>
<tr>
<th>Criteria</th>
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<tbody>
<tr>
<td>1. Meets strategic goals of the Institute</td>
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<tr>
<td>2. Fit with current Budget Period (BP) funding profiles</td>
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<td>3. Cross-industry applicability and broad-based impact</td>
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<tr>
<td>4. Utilization and enhancement of the SM Platform core capabilities and SM Marketplace</td>
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<tr>
<td>5. Full compliance with DOE and CESMII requirements</td>
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<tr>
<td>6. Broader base application across other industries for reusability</td>
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<tr>
<td>7. High-level fit to create balance in the Institute’s project portfolio</td>
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<tr>
<td>8. Whether the proposed project will accelerate transformational technological advances in areas that industry by itself is not likely to undertake because of technical and financial uncertainty</td>
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CESMII LINKS AND FREQUENTLY ASKED QUESTIONS REGARDING RFP-2 WAVE 4

The application templates and instructions are available on the CESMII website: https://www.cesmii.org/resources

Questions can be submitted to roadmapprojects.info@cesmii.org

Questions & Answers can be found at www.cesmii.org/questions-and-answers/.

RFP 2 wave 4 related information can be found at www.cesmii.org/request-for-proposal

Membership eligibility can be found at https://www.cesmii.org/membership-information/

The documents regarding the model-sub agreement can be found at https://www.cesmii.org/model-subagreement/.
Join this Innovative, Smart Manufacturing Ecosystem

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>App Vendor</th>
<th>OT System Integrator</th>
<th>IT System Integrator</th>
<th>Device, Sensor, Robot, CNC, Machine Builder</th>
<th>Academia/Labs</th>
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<tbody>
<tr>
<td>Scalable, sustainable secure Mfg IT strategy for the enterprise (Plants &amp; Supply Chain)</td>
<td>Dramatically shorter Time to Value for developing Mfg Apps</td>
<td>Leverage their domain expertise to build SM Profiles</td>
<td>Their IIoT Practices can now effectively scale into OT (build credibility in Operations)</td>
<td>Leverage their domain expertise to build SM Profiles</td>
<td>Engage in and contribute to leading edge Mfg IT R&amp;D</td>
</tr>
<tr>
<td>Prioritize the development of Device, Machine &amp; Process Profiles</td>
<td>Dramatically shorter Time to Value for implementing Mfg Apps</td>
<td>Support the critical mass adoption of standards in the SM market</td>
<td>Can leverage their domain expertise to build apps (no longer required to build complex sw infrastructure)</td>
<td>Devices &amp; Machines differentiated - become ‘SMART’</td>
<td>Additional credibility with Industry (the entire ecosystem)</td>
</tr>
<tr>
<td>Funded POC/R&amp;D support for the most challenging Mfg IT challenges in Operations</td>
<td>Dramatically improve License $ : Implement $ (improve margin)</td>
<td>Build a certified, Smart Manufacturing competency</td>
<td>Build a sanctioned, Smart Manufacturing competency</td>
<td>Can offer new/better support services (SLA’s)</td>
<td>Create and offer officially sanctioned Manufacturing IT curriculum</td>
</tr>
<tr>
<td>Enable all employees to innovate &amp; create value - not spend time on data management infrastructure</td>
<td>Lower implementation complexity = lower risk = higher customer satisfaction</td>
<td>OT domain expertise much more relevant to IT SI’s and enterprise SM initiatives</td>
<td>Effective way for business model to scale down</td>
<td>Products that can be supported in an enterprise-wide Manufacturing-sanctioned Platform environment</td>
<td>Expanded relationships with manufacturing in new industries</td>
</tr>
<tr>
<td>Real time, data-driven collaboration with OEM, SI, Academia &amp; Device ecosystem</td>
<td>Rolling out and scaling solutions (beyond large plants) to medium &amp; small plants</td>
<td>Create and offer Apps &amp; services with recurring revenue streams (support SLA)</td>
<td>Drive Supply Chain optimization strategies based on real time access to Operations</td>
<td>Can leverage their domain expertise to build apps (no longer required to build complex sw infrastructure)</td>
<td>Enable students to innovate &amp; create value - not spend time on data management infrastructure</td>
</tr>
<tr>
<td>Plant AND Supply Chain optimization</td>
<td>Reduce investment in building data collection &amp; contextualization infrastructure</td>
<td>Can leverage their domain expertise to build apps (no longer required to build complex sw infrastructure)</td>
<td>Drive Enterprise Cybersecurity strategies that incorporate Operations</td>
<td>Vendor-specific Apps can sit on ‘Standard’ SMP infrastructure</td>
<td>Fund additional research (more, agile, smaller)</td>
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</table>
ENGAGE WITH US!

Democratizing
SMART MANUFACTURING

EDUCATED, DATA-DRIVEN CULTURE
SMART ASSETS
SMART DECISIONS
OPERATIONS & SUPPLY CHAIN VISIBILITY