



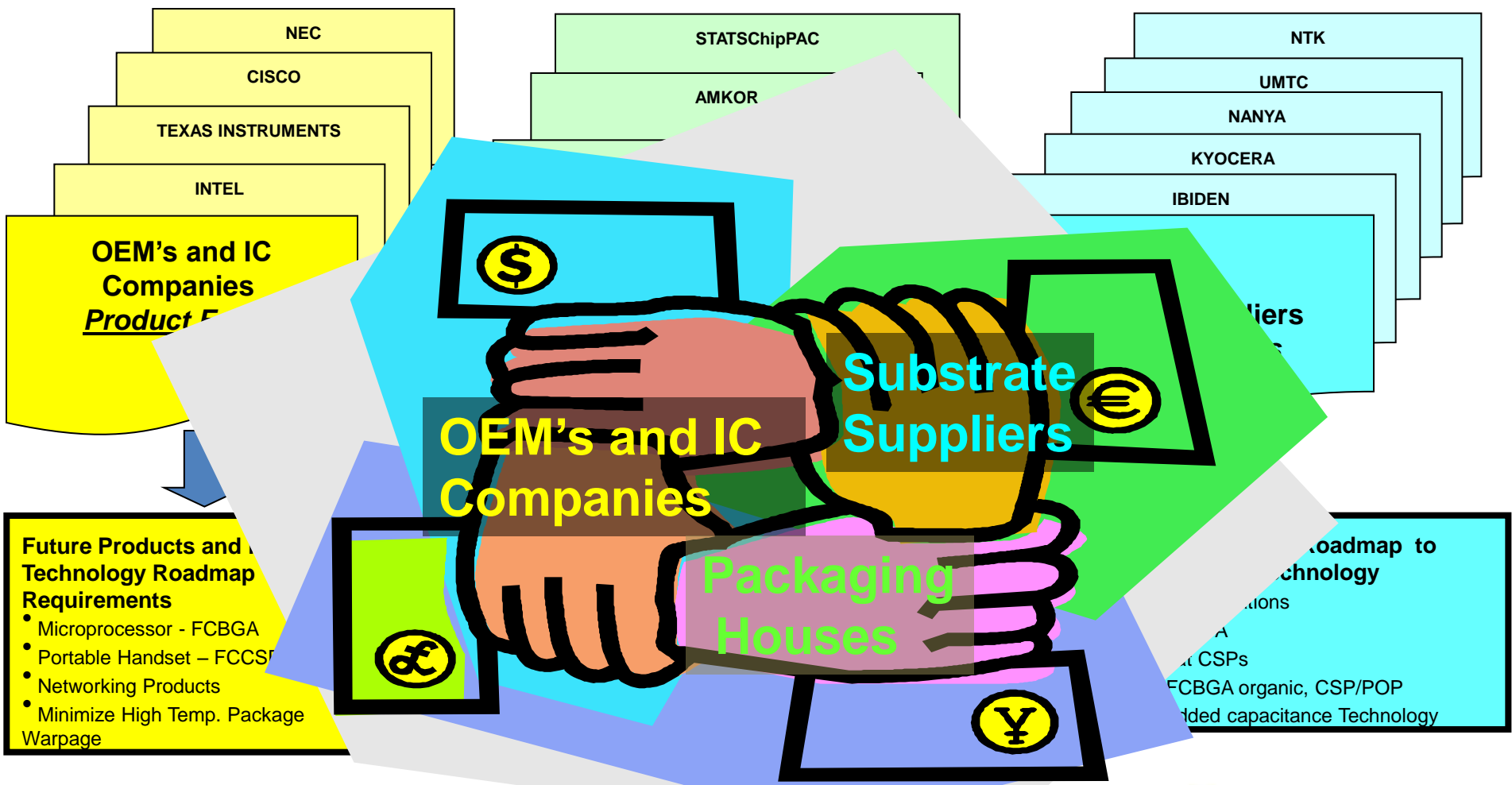
INEMI[®]
International Electronics Manufacturing Initiative

Statement of Work

Guidelines

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Six Initiatives from iNEMI Packaging Substrate Workshop (November, 2009, Japan)





INEMI
International Electronics Manufacturing Initiative

The Organization

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The iNEMI Organization

- **A Not-for-profit, highly efficient R&D consortia**
 - **Funded by Corporate membership**
 - **Staffed currently with 7 employees worldwide**
 - **Led by an international board with management depth that represents a cross section of the industry**
- **Includes leading industry companies/organizations as members:**
 - **OEM, ODM, EMS, and supplier companies**
 - **Government Labs**
 - **Academic Institutions**
- **Implements a full global agenda that is manifested through proven collaboration methods that deliver lasting results:**
 - **Close challenging technical gaps in the manufacturing infrastructure**
 - **Deliver proactive engineering solutions on key environmental challenges**

iNEMI Mission: Forecast and accelerate improvements in the Electronics Manufacturing Industry for a sustainable future.

We Accomplish This By:

- **Being the recognized leader at projecting future manufacturing technology needs and closing gaps for the global supply chain**
- **Effectively guiding and leveraging the strength of the consortium's industry leading international membership**
- **Driving high impact collaborative R&D results through constantly improving methodologies**
- **Becoming “the” recognized forum for addressing environmental gaps and setting the manufacturing electronics industry direction**
- **Defining and implementing science based sustainable solutions in high impact areas including the environment and health care**
- **Proactively leverage and gain impact from key government agencies and labs**





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Project Management

iNEMI's Role

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iNEMI's Project Management Role

- **Act as a catalyst in the identification and execution of viable programs and associated projects that fill technology gaps and contribute to progress throughout the industry**
- **Specifically, iNEMI is committed to*:**
 - **Guide the identification of programs to address industry needs**
 - **Coordinate the process of defining projects that fit into those programs**
 - **Ensure members are committed to support projects with all necessary resources**
 - **Facilitate use of project management**
 - **Provide training for program and project managers**
 - **Assist in solving problems that occur during project execution**
 - **Engage members to assume the duties of project management**

* Additional project involvement on the part of iNEMI requires review and approval by the iNEMI Technical Committee (TC)





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Project Management

*Project Selection
Process*

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Background

- **iNEMI helps organizes and facilitates projects**
- **Members define and execute projects**
- **Projects are aligned to the iNEMI roadmap**
- **Topics chosen have generated significant member interest**
- **iNEMI projects are typically separated into 3 basic categories**
 - **Research**
 - **Optimization**
 - **Specification**

Research Projects

- **Given an idea or concept, these projects explore and investigate new materials and processes.**
- **The outcome is materials and/or processes that could be used in a production environment if proven to be production worthy.**
- **These projects may include some preliminary reliability testing; however the main focus is on identifying and demonstrating the feasibility of a material or process.**

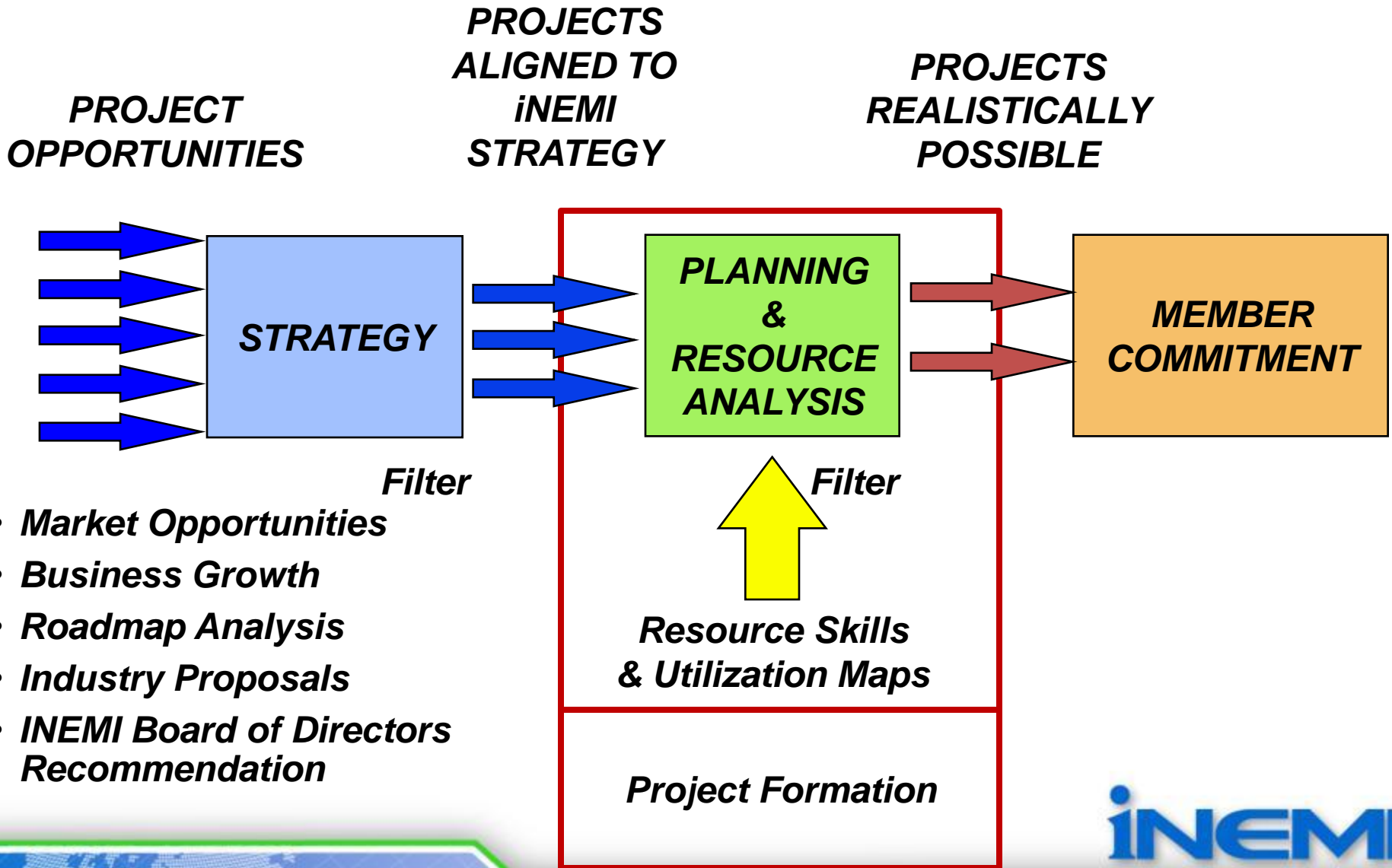
Optimization Projects

- **Given a set of materials and processes, these projects often include:**
 - “fine tuning” materials and/or processes
 - Identify and execute specific reliability tests
 - Show the processes and/or materials to be production worthy
 - Evaluate the readiness of the supply chain to provide materials
- **This often includes some level of reliability or accelerated life testing (ALT) when required to demonstrate production worthiness**

Specification Projects

- **Given a set of optimized materials and/or processes, these projects define a usable range for each set**
- **The projects would also identify an appropriate standards body to which a proposal could be submitted to make the sets part of the published standards**
- **The purpose of specification projects may also be to prepare “white papers” for industry distribution with the ultimate goal of making new specifications into de facto standards**

Project Selection Process



Questions to Ask:

- **VALUE:**
 - What is the value?
- **TEAM:**
 - Is the Project Leader the right person to lead this project?
 - Does the team have the right membership?
 - Does the team have the necessary experience and skills?
- **PRODUCTS / RESULTS:**
 - What are the essential specifications?
 - Is existing technology available and/or usable?
- **STRATEGIC ALIGNMENT:**
 - Why is the project strategic?
 - Is it identified as a key thrust?
 - Why must we do it now?
- **PROJECT SCHEDULE:**
 - Is the schedule achievable?
 - Has a detailed project plan been developed?
 - How does “time-to-market” compare with industry benchmarks?
- **RESOURCE REQUIREMENTS:**
 - Are all resources identified and committed for the schedule?
 - Will all of the skills needed be available when required?
- **RISK AND ISSUE MANAGEMENT:**
 - Are all risks regularly identified, monitored and managed?
 - Are the probability and impacts realistic?
 - Are clear action plans established for high risks?



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Project Management

*Project Leader
Guidance*

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Project Solicitation

- **The following issues should be evaluated during the formation phase before committing to go forward with a project**
 - **Is there enough interest in the project to ensure a critical mass?**
 - **Is there enough diversity of interest? (It is preferable to have suppliers, users, and customers all represented)**
 - **What redundancy is needed in resources of project needs, to ensure the project will still have enough support over the life of the project?**
 - **Does the project team have a willing and capable mentor who is either an iNEMI staff member or a member of the TC?**
 - **iNEMI membership is required for all participating companies. There are exceptions for companies who provide limited services and/or materials.**
 - **If non-members are to be included:**
 - **What level of participation will be required?**
 - **What will the benefits be to them?**
 - **How will they be solicited?**

Project Formation Teams

- **Formation Team (Phase 0)**
 - Does the team have a mentor who is either an iNEMI Staff member or a member of the TC?
 - Solicit interest from iNEMI membership and industry
 - Is there enough diversity of interest OEMS, EMS, Suppliers, ..?
 - Define project characteristics
 - Develop initial Statement of Work
 - Is there redundancy in resources for identified tasks?
 - Get agreement on details that become part of the Project Statement (i.e., cost sharing for projects that require acquisition of materials and/or services)
 - Address any issues and/or questions from Technical Committee
 - Will project include non-iNEMI members?

Formalizing the Project (1 of 3)

- **Create a set of goals and clearly define what will be done**
 - Goals and tasks will be included in the Statement of Work (SOW)
- **Develop a clearly defined set of tasks in the form of a formalized Project Plan**
 - iNEMI has developed a set of guidelines and templates to assist teams through the development of a Statement of Work (SOW) for every project proposed
- **The Project formation team will be responsible for making recommendations whether the project should be broken into multiple phases**
 - Each phase will require a separate SOW and PS

Formalizing the Project (2 of 3)

- **Evaluation of progress during each phase will determine the viability of the next phase. Examples of possible phases include:**
 - **Phase 1 – Literature search and review of previous work and current projects**
 - **Phase 2 – Preliminary work to further define the technology and procedures**
 - **Phase 3 – Evaluation of a limited set of technical issues defined in phase 2**
- **iNEMI Staff will work with the team to establish the SOW and with the Project Leader(s) to get iNEMI Technical Committee (TC) approval**

Formalizing the Project (3 of 3)

- **After the TC has approved the SOW, the Project will be advertised and participation will be open to all iNEMI members.**
 - Initial signup period is typically 45 days, at which point the project signup is closed.
 - Once a project is closed any requests to participate in the project will require approval from the Project's founding members
- **Progress on the Project formation discussions will be provided to the iNEMI Technical Committee.**



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Program Management

*Statement of Work
(SOW)*

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iNEMI Statement of Work – Basic Information

- **Scope of Work – define what is to be done**
 - Expected deliverables
 - Major project goals; does the project seed a global solution or is the purpose of the project to contribute one part of a solution to a complex problem?
 - If the project is complex, it should be divided into phases and a description of what comprises each phase should be provided
- **Purpose of Project**
 - Explanation of how the project addresses an industry need and how the project is aligned to the roadmap and technical plan
 - Discuss the approach to design of experiments that the project will use to ensure reliability, accuracy, and statistical significance of results (**Research and Optimization Projects**)
 - List all standards bodies considered for the project, explain how each was evaluated and justify the final choice of organization(s) (**Specification Projects**)

NOTE: All changes to SOW must be approved by the TC (version control)



iNEMI Statement of Work (SOW)

- **Previous Related Work**
 - Review any related research or development done within the industry
 - Summarize, briefly, directly related academic research, if any
- **Participants**
 - List all prospective participants
 - State role and expected contributions of each project team member
 - Advantages expected for participants, iNEMI members in general, and the industry as a whole
 - Specification Projects – Which team members will be responsible for determining what is to be included in the standard? (Task leaders must keep focused on the industry in general and not drift to individual company interests)

NOTE: All changes to SOW must be approved by the TC (version control)



iNEMI Statement of Work (SOW)

- **List any know background Intellectual Property (IP) for each participant**
 - **Research Projects should address both background and foreground IP due to exploratory nature of projects**
- **Anticipated time to completion, required to be 6 – 12 months, not including Accelerated Life Testing (ALT)**

NOTE: All changes to SOW must be approved by the TC (version control)



iNEMI Statement of Work – Project Planning

- The final Project Plan can be submitted after preliminary approval of the project, since it takes time to generate and revise the plan based on input from the Project Team
- Project Plan – a detailed description of what will be done including:
 - Resources
 - Materials and Processes
 - Testing Procedures (**Research and Optimization Projects**)
 - Schedules with milestones
 - Project monitoring plans
 - Outcome of the project

NOTE: All changes to SOW must be approved by the TC (version control)



Statement of Work – Resources

- **Detailed list of resource needs and expenditures expected for the project, including:**
 - Human resources
 - Equipment
 - Funding
- **List of committed resources from participating companies**
- **State source of funding for any components, assembly, design, and testing needs**
 - **Funding alternatives include**
 - Participant donations
 - Supplier donations

Statement of Work – Materials and Processes

- Identify materials to be used
- Describe any processes to be used, including applicable standards and specifications
- Identify specific suppliers or technologies required and reasons for the requirement
- When custom components are necessary, state which project participant(s) is responsible for assuming this cost
- Standard processes and materials should be used whenever possible to reduce costs, improve yields, and assure widest applicability of results within the industry
- Justification is needed if non-standard materials or processes are to be used
- Specify and describe any non-standard materials or processes
(Specification Projects)

Statement of Work – Testing Procedures

- **State anticipated number of parts to be tested**
- **Use IPC 9701 0-100°C as baseline ATC unless justification can be given for alternate test parameters**
- **For test vehicle design and fabrication, recommend using reference components that have been ATC tested on previous projects be used to provide a baseline and facilitate comparison of results**
- **Use standard design practices and commonly used software to reduce costs and widen applicability of results**
- **At what stages will testing be done along with time needed**

Statement of Work – Schedules With Milestones

- **Project plan with**
 - Identified tasks
 - Intermediate check points
 - End dates
- **A detailed timeline, including each project activity**
- **Content and dates for:**
 - Technical reviews
 - Progress reports

Statement of Work – Project Monitoring Plans

- **Plan to ensure open lines of communication among participants?**
 - Provide planned teleconference schedule
 - Request progress reports as tasks are completed
- **Practice risk analysis by anticipating problems and having alternate solutions ready**
- **Use opportunity analysis to identify new areas or topics that might be addressed in additional projects**
 - To prevent scope of the current project from expanding
 - Keep project focused on original goals
- **Review project requirements before the project begins**
- **Provide regular updates to iNEMI staff**
- **Provide information as needed to assist in completing Project Summary Chart**



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Project Management

Project Statement

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iNEMI Project Statement (PS)

The Project Statement (PS) is the official document, signed by each participant's senior management, committing their company to the agreed upon resource and time contributions. Without the PS, the project could flounder due to lack of participation or confusion as to where the project resources are coming from.

iNEMI Project Statement (PS)

- **The iNEMI Project requires iNEMI membership; according to iNEMI By-Laws, non-members who contribute to the project can only receive project results specific to their contribution**
 - **Results of the project will be available once iNEMI member project participants make them public**
 - **Non-member contributions will be acknowledged in publications**
 - **Non-member contributors' participation in project meetings is limited to subjects concerning their contribution with an approval for attendance by a majority vote of iNEMI members**
 - **The project will adhere to the terms of the iNEMI Intellectual Property Policy for declaring, identifying, and disclosing background (confidential) technical information and background intellectual property**

NOTE: All changes to PS must be approved by the TC (version control)



iNEMI Project Statement (PS)

- All iNEMI members will be eligible to receive a summary report at the end of the project
 - Summary report will not contain data that the participants determine [1] should only be shared within the project
- If iNEMI or any participant would like to present data or information gained in the project, in technical paper(s), or in article(s), every member of the project team must be informed and a majority is required for approval

NOTE: All changes to PS must be approved by the TC (version control)

[1] Data included in the summary report will be determined by majority vote of the participants



iNEMI Project Statement (PS)

- **Requirements of participants**
 - **iNEMI membership?**
 - **Committed contributions of each project member stated in detail and approved by senior management**
 - **Proprietary appendices containing any non-disclosable resource commitments**
- **References**
 - **iNEMI's Intellectual Property Policy**
 - **iNEMI by-laws**
 - **The project's Statement of Work**

NOTE: All changes to PS must be approved by the TC (version control)



iNEMI Project Statement (PS)

- **Information management policies and processes**
 - List applicable background IPR for each participant
 - Discuss how foreground IPR issues will be handled
 - Special terms and conditions, such as data sharing outside the project with other iNEMI members or with industry in general
 - Define participant publication approval process
 - Define regulations for data access
 - Provide a date for transfer of publication rights to iNEMI, preferably less than 18 months

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Project Management

*Final Evaluation for
Project Proposals*

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iNEMI Project Proposal – TC Final Evaluation

- **Does the project align to the roadmap, fill a gap, and contribute to the goals of iNEMI?**
- **Is the scope of the project reasonable or should it be broken into several phases?**
- **Is the timeline realistic?**
- **Are there management approved commitments for all necessary project resources?**
- **Are standard materials and processes used whenever possible?**
- **Is there a good plan for keeping communication open between team members?**



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Project Management

Questions?

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