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iNEMI PVC Alternatives - Meeting Minutes 18 December 2008

Actions

- **Jim Arnold to setup agenda for next call on 08 January 2009**
- **Jim Arnold to review iNEMI Statement of Work Template**
- **Next Meeting: Thursday 08 January 2009 2pm EST (1pm CST; 11am PST)**
 - **08 January 2009 Meeting Agenda:**
 - **Continued Discussion on Development of Project Statement of Work (SOW)**
 - **Setup schedule for Web Conference to allow PE International, EarthShift, and any other provider of LCA analyses the opportunity to demonstrate LCA tools**
- **Weekly meetings will be scheduled beginning 08 January 2009 until the SOW and PS are completed.**

12/18/08 Conference Call Participants*

Arjen Salemink (Alcatel-Lucent)
T.J. St. Romaine (Albemarle)
Mitch Willis (BASF)
Rachel Nolan (Bayer MS)
Matt Holman (BizLink)
Daniel Chau (Cisco)
Calvin Tong (Cisco)
Corinne Holmes (Cisco - M Squared)
Scott O'Connell (Dell)
Bill Olson (Motorola)
Lise Laurin (EarthShift)
Cathleen Hess (SABIC)
Erin Gately (HP)
Constantin Herrmann (PE International)
Mike Patel (Teknor Apex)
Michael J McLearn (Tyco-Madison Cable)
Andrew J Nowak (Tyco-Madison Cable)
Bud Hall (Vinyl Institute Consultant)
Curtis Robb (Volex)

Jim Arnold (iNEMI)
David Godlewski (iNEMI)

Potential Participants not on call*

Susan Landry (Albemarle)
Bill Reents (Alcatel-Lucent)
Joseph Wiesner (Alcatel-Lucent)
Tom Okrasinski (Alcatel-Lucent)
Brian Larin (BASF)
Guenter Kehr (BASF)
Ricardo Cuetos (BASF)
Sarah Westerdale (BASF)
Wayne Li (BizLink)
Shawn Meng (BizLink)
John Marshall (Dupont)
Jan Stouffer (DuPont)
Joe Johnson (Cisco)
D'Lane Wisner (D'Lane Wisner)
Bryce Busby (Dell)
Conrad Hovik (Dupont)
Leo Heiland (Intel)
Nancy Bolinger (Lenovo)
Marc Binder (PE Americas)
Peter Canepa (PE Americas)
Mike Newman (ReCellular)
Andrew Poslinski (SABIC)
Todd Washburn (SABIC)
Robert McKay (SABIC)
Robert Kinyanjui (Sanmina-SCI)
Dave Bender (Tyco)

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- * If you have additions and deletions for the distribution list or if you were on the call and are not listed as a Participant, please forward the information to Jim Arnold (jim.arnold@rissastudios.com). He will take the appropriate action to add or remove names.

18 December Meeting Agenda:

- **Review Minutes from the last call**
- **Team to review the reference document provided by PE International and distributed with meeting minutes (additional copy is enclosed with the meeting minutes)**
- **Discussion on Development of Project Statement of Work (SOW)**
 - Jim Arnold to review iNEMI Statement of Work Template
- **Review any new additions to materials matrix for PVC and PVC alternative materials**

- **The weekly meetings for 2009 will begin on 08 January 2009 at 2pm EST. A meeting notification will be sent with call-in numbers and agenda.**

Summary of Discussion, Suggestions and Recommendations – 18 December 2008

- Jim Arnold reviewed the minutes of the previous calls including an overview of the iNEMI Project process. iNEMI General and Administrative Guidelines are provided as a reference at the end of this document.
- PE International was provided the opportunity to review their list of PVC-Related projects. A copy of the document reviewed was provided prior to the call. An additional copy is provided with these notes for new attendees. Attendees were asked to review the material provided by PE International and prepare questions related to the LCA studies outlined.
- No additional information was provided on the Materials Matrix the group started to work on. The group is looking for similar information on PVC material systems
 - Bu Hall noted that formulators of PVC material systems have made significant changes to PVC based systems to reduce the environmental impact, one specific example was the fact that many cable manufacturers no longer use Pb (lead) based stabilizers.
 - Mike Patel from Teknor Apex indicated that many of the PVC formulations are considered proprietary and asked if their Intellectual Property would be protected
 - Jim Arnold indicated that at this stage of the process, the information discussed should be in the public domain. Once the project has been officially approved and companies have signed the Project Statement proprietary information properly disclosed to the Project team would be covered under iNEMI's IP Policy.
 - Jim Arnold asked if it was possible to provide a generic list of materials specifically related to focus of this project, i.e., consumer cabling such as power cords, SCSI cables, etc.
 - Bud Hall and Mike Patel indicated they would work together to see if a generic materials list for PVC could be generated for this project.
- There are over 350 LCA studies worldwide on PVC products, which make it important to clearly identify the product type and functional requirements in developing an evaluation process for the PVC alternatives.
- The question was raised on how to define a functional unit. The main purpose electrical cables is to provide a mechanism for transporting electrons; however there are additional functional aspects the need to be considered, such as electrical isolation, mechanical, environmental, and temperature protection. All of these are application specific and

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formulations, whether they are PVC based or an alternative to PVC must be clearly defined to provide a base for comparison purposes.

- Jim Arnold pointed out that the intent of this project was to attempt to develop a standardized way of assessing the Life Cycle impact of various alternatives to PVC as well as being able to provide a comparison of PVC and non-PVC based material systems.
- The group discussed the need to use at least two different LCA tools for the project to help identify differences and/or discrepancies in the results.
- Project should consider using at least two different end of life scenarios, since there are few studies to date that have taken in the end of life aspects of cable products.
- Scott O'Connell suggested that "given the large number of files we are exchanging via email in the PVC project, I am wondering if it would be possible to set-up some sort of share point site where we could post all of these documents into respective folders (PE documents, EPA LCA reports, material matrix, etc) that could then be accessible to the project team." Jim Arnold has established an folder on the iNEMI ftp site (see login information below).

Next Steps

- Next meeting: Thursday, 08 January 2009. Agenda for meeting will be sent out prior to call.
- Review the iNEMI SOW template and begin to identify the basic tasks (elements) of the project.
- **Jim Arnold to establish an iNEMI ftp folder for information sharing.**
 - **iNEMI folder has been established the following information can be used for access**
 - FTP Address: <ftp.inemi.org>
 - Folder Name: PVC Alternatives
 - Login Name: pvcalts
 - Password: alternat1ve2PVC (the "i" in alternative is the number one and PVC must be capitalized)
- Participants to continue discussion on determining which materials and tools to use for the initial LCA assessment

Notes from Previous Meetings

Summary of Discussion, Suggestions and Recommendations – 18 December

- Suggestions were made to contact:
 - Cathy Hart who ran the EPA LCA study; to identify specifics of what was and wasn't covered in the EPA's 2 year study
 - George Fechtman (george.j.fechtman@us.ul.com; Underwriters Laboratories Inc; 1285 Walt Whitman Rd; MELVILLE, NY 11747; Phone: 631-546-2858)
 - Susan Stene (Susan.L.Stene@us.ul.com; Principal Engineer for UL 62; Phone 408-876-2948)
- SOW should include identification of specifications, e.g. UL and IEC Standards, to assist in narrowing investigative options
- Thousands of application specific non-PVC and PVC formulations exist, it will be important to narrow the investigative field for the LCA process development effort.
- Studies with End of Life (EOL) are limited to date; need to identify studies that have included some of the EOL issues and investigate what was included

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- Start with EOL to help identify issues and use information to help narrow field for investigations
- Important to understand if new formulations will be a requirement of the Project.
 - Initially proposing new formulations is not the intention of the Project; however it is conceivable that requests for new formulations (including all of the requirements) could be an output of Phase 1.
- Limit initial investigations to “consumer” cabling (power, SCSI, ...) to narrow field
 - Investigation on riser and other “infrastructure” cabling could be an option for a follow-on Project as an output of the Phase 1 process development.
 - Follow-on Projects could be used to verify the process developed to compare LCA results
- After the call, Lise Laurin (EarthShift) provided the goal and scope requirements for an LCA study from ISO 14040, suggesting it might provide a good framework for our next steps in developing the SOW:

5.2 Goal and scope definition

5.2.1.1 The goal of an LCA states

- The intended application
- The reasons for carrying out the study
- The intended audience, i.e. to whom the results of the study are intended to be communicated
- Whether the results are intended to be used in comparative assertions intended to be disclosed to the public
- The scope should be sufficiently well defined to ensure that the breadth, depth and detail of the study are compatible and sufficient to address the stated goal

5.2.1.2 The scope includes the following items:

- The product system to be studied
- The functions of the product system or, in the case of comparative studies, the systems
- The functional unit
- The system boundary
- Allocation procedures
- Impact categories selected and methodology of impact assessment, and subsequent interpretation to be used
- Data requirements
- Assumptions
- Limitations
- Initial data quality requirements
- Type of critical review, if any
- Type and format of the report required for the study

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Initial Proposal from First Meeting (06 November)

Scott O'Connell presented an initial proposal on possible elements of an iNEMI PVC Alternatives Project. The presentation material will be sent to the general distribution for those who were not able to download the material from the iNEMI web site. The presentation material was intended to provide a baseline for the discussions. Anyone who has comments, questions, or issues they would like addressed, are encouraged to send a short note to either Jim Arnold (jim.arnold@rissastudios.com) or Scott O'Connell (scott_oconnell@dell.com) for review and redistribution to the participants. Any information provided will be sent to the general distribution and time during the conference calls will be scheduled for discussion.

Review of Past, Present, and Proposed Projects (P4)

- Some initial information is shown in the attached presentation materials (Slide #3)
- Bud Hall provided a link to the EPA final report on “Wire and Cable Insulation and Jacketing: Life-Cycle Assessments for Selected Applications”, and the summary document, “Wire and Cable Insulation and Jacketing: Life-Cycle Assessments for Selected Applications—Summary”. The link is: <http://www.epa.gov/dfepubs/wire-cable/lca.htm>

Brief Summary of Questions, Issues, and General Discussion

- What studies have been and are currently being done?
- Scott provided an initial listing in the initial presentation made at first meeting/
- One issue with current studies is the lack of adequate material information.
- Need information on the full life cycle and should not overlook the complexity of end of life scenarios

- Anyone wishing their comments or questions to be anonymous can send them to Jim Arnold who will distribute them accordingly.

Next Steps

- Next meeting: Thursday, 18 December. Agenda for meeting will be sent out approximately one week prior to call.
- Participants to continue discussion on determining which materials and tools to use for the initial LCA Assessment
 - Project should consider using two different end of life scenarios
- The LCA assessment should use at least two different tools to see what and if there are differences.
- Some of the variables discussed
 - Consider breaking the materials into categories, e.g.,
 - **Alternative Chlorinated Resins**
 - **Polyphenylene Oxides (PPO)**
 - **Polypropylene Homopolymers (PPU)**
 - **Nylons**
 - **Rubbers, e.g., neoprene**
 - ...
 - For PVC based materials
 - **Identify material formulations to possibly include in the initial LCA comparison**
 - **With and without phthalate Plasticizers**

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- Flame retardant technologies
 - **Br and Br-free materials**
- What applications should be targeted?
- Geography
 - **Where are the materials and products made?**
- Based on the discussion a new matrix was developed to begin to capture some of the information discussed.
 - The request was made for the participants to provide as much information to fill in the new matrix as possible.
 - Provide any additional information that should be included.
- Discussion of the input provided will be scheduled for the next call.

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General and Administrative Guidelines

Purpose of Calls

The purpose of conference calls is to define the elements (tasks) of a Project Plan. Below is a list of specific items to be addressed during these calls:

- Identify gaps in the technology that the project will address
- Establish a clearly defined set of goals for the project
- Clearly define schedule with interim milestones
- Identify resources needed to complete tasks
- Establish consensus on possible approaches to complete the project
- Develop widely applicable generic system and technology solutions
- Develop general processes and methodologies that can be used by iNEMI members for company-specific solutions

The intent is **not** to repeat past or present studies and/or projects; but to investigate the possibilities of developing a series of related tasks (a project or series of projects) that will add to the existing knowledge base. iNEMI is a member based organization and projects are normally restricted to iNEMI members only; however, to get a broader perspective from the industry, the Project formation process is open to anyone interested participating. Participation in the Project formation process will provide a forum in which participants can help establish the agenda for the electronics industry. The ultimate goal of the Project formation discussions is to develop a formalized Statement of Work (SOW) and Project Statement (PS) for the Project (the iNEMI SOW and PS templates will be used to assist in the development of the SOW and PS).

Formalizing the Project

- It is important to create a set of goals and clearly define what will be done. These goals and tasks will be included in the project plan.
- iNEMI recognizes the need to have a clearly defined set of tasks in the form of a formalized Project Plan, and has developed a set of guidelines and templates to assist teams through the development of a Statement of Work (SOW) and Project Statement (PS) for every project proposed.
- The Project formation team will be responsible for making recommendations as to whether the project should be broken into multiple phases. If so, each phase will require a separate SOW and PS. 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

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- The iNEMI Staff will work with the team to establish the SOW and with the Project Leader(s) (to be identified) to get iNEMI Technical Committee (TC) approval.
- After the TC has approved the SOW and PS, the Project will be advertised and participation will be open to all iNEMI members. The initial signup period is typically 30 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 of these Project formation discussions will be provided to the iNEMI Technical Committee.
- Note that we will eventually be running a multi-company project. For the project to fall under the "iNEMI umbrella" for working in a pre-competitive environment, we need a Statement of Work (SOW) and a signed Project Statement (PS) from each participating company.
- The iNEMI support staff will make arrangements to provide an overview of the project management process for any participants who have questions or would like additional information.

Sharing files

- Any information participants would like to share with the group can be forwarded to the appropriate iNEMI staff member for distribution to the rest of the participants.

Feedback

- Participants are encouraged to provide feedback to assist in iNEMI's efforts to improve the Project formation process.

International Electronics Manufacturing Initiative (iNEMI)

Protection from anti-trust action is a benefit of iNEMI membership, since iNEMI registers its members with the Department of Justice and the Commerce Department.

Pre-Competitive Research and Development (excerpts from iNEMI's "Antitrust Policy & Guidelines")

- The International Electronics Manufacturing Initiative, Inc. (iNEMI) is an industry-led consortium that performs pre-competitive research and development projects to improve the global electronics manufacturing infrastructure.
- iNEMI's primary objective is to facilitate research and development in connection with materials, components, manufacturing-related technologies and equipment for the manufacture of electronic information products.
- The essential principle that should guide the policies and activities of iNEMI to avoid antitrust violations is that not only must no illegal agreements be either reached or carried out through the association, but also iNEMI must avoid conduct that might give the appearance of an illegal agreement.
- Members can participate fully in iNEMI activities and projects with minimal possibility of antitrust problems by following a few ***simple do's and don'ts***:
 1. DO schedule and attend meetings only when there are proper items of substance to be discussed that justify your attendance.

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2. DO review the meeting notice or agenda in advance of every meeting. It should be specific, without broad topics, such as "marketing practices," that might look suspicious from an antitrust standpoint.
3. DO adhere strictly to the stated agenda. In general, subjects not included on the agenda should not be considered at the meeting.
4. DO ensure that no matter of doubtful legality is brought up for discussion. This, of course, is counsel's responsibility; but in his or her absence, iNEMI staff representative or any member present who becomes aware of legal implications of a discussion should attempt to halt the discussion.
5. DO make sure that minutes of all meetings are kept and that they accurately report what actions were taken.
6. DO use iNEMI as a vehicle for promoting research and the industry as a whole.
7. DO send copies of all iNEMI-related correspondence to the iNEMI Secretariat and advise the Secretariat of any inaccuracies in proposed statements to be made by iNEMI.
8. DO ensure that iNEMI counsel is in attendance at all meetings of the Initiative where legally sensitive subjects might be discussed.
9. DO check with iNEMI staff, who will likely contact counsel, if there is doubt about the legality of any iNEMI policy or program.
10. DO cooperate with iNEMI counsel in all matters, particularly when counsel has ruled adversely about a particular activity.
11. DON'T allow or participate in secret or "rump" meetings. At best, these meetings raise questions as to the propriety of what is discussed. They could seriously jeopardize legitimate iNEMI activities and create a risk that those activities will be investigated.
12. DON'T allow or participate in any discussions which discourage research or research projects by persons outside of iNEMI.
13. DON'T, without specific authorization, make public or private communications about policies or positions of iNEMI.

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