From: Dr Charles Pratt [mailto:pmconsulting.pratt@gmail.com]
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To: amtech
Subject: Comments on Structure for Proposed Advanced Manufacturing Technology Consortia (AMTech) Program

Comments on "Request for Information on How to Structure Proposed New Program: Advanced Manufacturing Technology Consortia (AMTech)

Some comments on this proposed program follow. I am a retired corporate technology executive (VP for a division of Owens Corning) and currently have my own consulting practice (sole proprietorship). I have tried to address the interests of both large and small companies in my comments, and I have only added comments to those questions to which I felt I could add some value.

Some of the factors that small and large business would find important to consortia participation, or capabilities that they could bring to participation include:

Small business
- networking (broader industry exposure)
- growth
- leveraging of experience and expenses
- fast response
- tech management experience to lead programs

Small businesses have low (typically) low overhead, can gain advantage through exposure to other companies or researchers (networking), and have a very flat organizational structure that makes decision-making a faster process.

Large Corporations
- growth
- global competitive advantage
- prefer matching funds through manpower vs $$$
- typically slow
- not focused on next 5 years but next quarter
- need incentives to pursue long-term research

Large corporations have high overhead and must sell participation in consortia to upper management, which is trying to balance short-term profitability with laying the foundation for future growth. A clear perceived advantage in the industry - especially in tough economic times - is necessary to get corporate approval to apply resources to activities which might not have a quantifiable payoff for several years.

Response to questions published by NIST:

Question 1 – Should AMTech consortia focus on developments within a single existing or prospective industry, or should its focus be on broader system developments that must be supplied by multiple industries.

As a small business owner, I would prefer a broad system approach, since this would allow me the greatest opportunity to participate. My business focuses on materials that may impact multiple industries and processes, rather than apply to a single industry segment (like automotive or aerospace).

From a large corporation perspective, I would also prefer a broader focus. The more narrow the industry or industry segment, the more likely that there would be proprietary issues associated with sharing information with a collection of related companies (and potential competitors, even though the focus would be defined as pre-competitive). Currently, the State of Washington is trying to develop a more robust carbon fiber composite supply chain in the state, not, e.g., just growing the capability of molders who do the fabrication step of carbon fiber parts. This gives great flexibility to bring into the discussion a broad range of suppliers, such as precursor suppliers, spinners/weavers, molders and distributors.

Question 2 – Who should be eligible to participate as a member of an AMTech consortium?

Focus on US for-profit companies of all sizes, and US universities. I do not have a strong opinion on non-profits – while they could supply valuable information for a technology roadmap, I am concerned that they would have a lower sense or urgency in awarding grants and getting meaningful work started.

Question 3 – Should AMTech place restrictions on or limit consortium membership?

The global nature of today's business and education comes into play here. It is not unlikely that US divisions of off-shore corporations might want to be considered for membership in a consortium. If the intent is to increase the competitiveness of US-based manufacturing, AMTech would have to say no to these requests, even if the US arm of the company operates reasonably independently. However, since even small US companies often have global reach, would AMTech have to require that technology developed in a consortia not be translated to off-shore manufacturing locations? Protection of intellectual property and company-secret information is very difficult in some areas of the world (e.g., China).

Question 4 – Who should be eligible to receive research funding from an AMTech consortium?

US for-profit companies and US universities

Question 5 – What criteria should be used in evaluating proposals for AMTech funding?

A long-term manufacturing road map would by necessity have both evolutionary and revolutionary elements. Proposals would have to address gaps in the road map that were identified by the consortium. I would recommend that they involve at least one university, one large corporation and one small corporation for balance and perspective on the work.

Question 6 – What types of activities are suitable for consortia funding?

Research to address gaps in the consortium's manufacturing road map. This might involve studies to adapt new materials to existing processes (e.g., the use of thermoplastics in thermoset-type composite processes), new manufacturing processes to cut cycle times by 50% or double throughput, or new application development.

The carbon fiber composite industry is undergoing very exciting growth. Keys to further success involve higher production volumes and lower cost manufacturing (e.g., automation). Funding of these areas in a carbon fiber consortium would be very appropriate.

Question 7 – Should conditions be placed on research awards to ensure funded activities are directed toward assisting manufacturing in the US?

See Question 3. The answer has to be YES, but this would take some thought on how to strengthen US competitiveness but at the same time interest corporations who want to place manufacturing in low-cost locations like Asia and Mexico.

Question 8 – What are ways to facilitate the involvement of small businesses in AMTech consortia?

Require that each consortia have at least one small business (defined by number of employees or revenue). Liberal use of electronic meeting processes to minimize travel expenses.

Question 9 – What are best practices for facilitating the widest dissemination and adoption of knowledge and technology through consortia?

Liberal use of e-meeting processes for periodic updates (perhaps bi-monthly?). Set up of a (password-protected) web-site to allow members to access status reports.

Once/year face-to-face meeting/review hosted by AMTech or a consortium member.

Question 10 – What types of intellectual property arrangements would promote active engagement of industry in consortia that include the funding of university-based research and ensure that consortia efforts are realized by US manufacturers?

Large corporations will require royalty-free access to any intellectual property developed by the consortium. While these corporations might desire joint ownership, the US Government should be the ultimate owner of the IP. Any member corporation would have a royalty-free option to practice the IP if desired. Non-members would have to license the IP (if approved by the consortium).

As a small businessman, I am not interested in IP ownership, but would want the ability to practice the developed technology royalty-free.

Question 11 – Would planning grants provide sufficient incentive for industry to develop roadmaps and initiate the formation of consortia?

This would be sufficient for small businesses. Large corporations should also see this as a benefit – a mutli-year grant could provide incentive to hire new employees and use the consortia as a “training ground” and industry-networking opportunity for recent graduates.

Question 12 – Should each member of the consortium be required to provide cost sharing? What percentage?

Yes, cost sharing should be a requirement – every member must have an investment in the consortium to ensure active participation in the success of the endeavor. The percentage question is difficult to give a "blanket" answer to, but I would expect that companies should match funds.

Question 13 – What criteria should be used in evaluating research proposals submitted to an AMTech consortium?

Do they involve a good cross-section of industry and academia participants? Do they address gaps in the published consortia road maps(s)? Is the proposal open-ended, or does it have a more defined delivery statement and timing?

Question 14 – What management models are best suited for industry-led consortia?

A dynamic and communicative industry leader (or pair of leaders) is needed to drive the group forward, representing all interests equally, and being willing to draw out opinions from quieter or more private members. This person or persons should be the catalyst for communication and decision-making. This requires a lot of work, but I feel that this type of leadership is necessary to have a successful consortium.

Question 15 – Should the evaluation criteria include the assessment of leadership and managerial skills?

Yes, although this could be a touchy point. Small businesses have limited resources, and would expect that their leadership and managerial expertise is a given (since they run their own company). Larger businesses have more resources, but top talent will be focused on short-term profitability and operations – consortia leadership would likely be given to newer employees as a training experience. This is not necessarily a bad thing, since graduate school can provide outstanding leadership training.

Question 16 – Should limitations be placed on the duration of consortia?

Three years, with the possibility to renew for another three-year term.

Question 17 – How should an AMTech consortium's performance and impact be evaluated? What are appropriate success measures?

By definition, AMTech is focused on long-term needs and competitiveness. Given that, the impact of any one consortium may not be felt for many years. I have seen a number of industrial technology programs which were discontinued (no longer funded) because there were no quantifiable financial results in a 1-3 year time frame. However, some of these efforts provided the "seed" for technology growth, which germinated into profitable company platforms in a 5-10 year time frame.

With this financial-impact limitation in mind, the measures of consortia success should probably be focused on "softer" issues like 1) active participation of all consortium members, 2) confidential surveys to determine if the technology roadmaps and subsequent research programs are on target, 3) successful placement of university students into positions in industry, academia or government labs, 4) high level electronic media publicity for corporations that are dedicated to improving America's competitiveness (valuable for attracting new employees!).

Question 18 – What are the problems of measuring real-time performance of individual research awards issued by an industry-led consortium? Measures of success?

As above, large corporations will want a 1-2 year return on investment, and typical research grants in the AMTech context will have longer paybacks.

Question 19 – How should the NIST AMTech program be evaluated?

See Question 17

Question 20 – What are lessons learned from other successful and unsuccessful industry-led consortia?

I have had exposure to 1 successful and 1 unsuccessful consortium. In the successful consortium, there was a strong leader from industry that worked hard to co-ordinate the participation of other members. This person understood that success for the consortium would lead to success and value for the individual members (including his own company). The outcome of the consortium was a very valuable report that is an important reference document, available through the government agency that sponsored the consortium.

As might be expected, the unsuccessful consortium was dominated by members (both industrial and academic) that were more interested in selfish aspects like ownership of intellectual property, arguing consortium decisions, etc. The company that I represented in the consortium eventually minimized it's participation and got very little from the effort…there were better ways to spend our time.

I hope these comments are helpful.

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