

Successful Government-Industry Consortium

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The basic strategy of a consortium of industry working with government and how the parties benefited

Before I visit with you on the Consortium we set up, a few comments are in order. I recently left Midwest Research Institute for greater pastures at the Research & Technology Institute of West Michigan. Therefore, the remarks I make today are personal reflections and not representative of Midwest, its affiliates, the member companies of the Consortium, and of course the government.

Given the diverse interests of the members of LIS, the Consortium has interests for all of us: for technicians, for small and large business, for lawyers, for not-for-profits and consultants, and for the government. Of even more interest, the consortium was established with the clerical industry and relies largely on the faith and trust of the parties — not on the language of an agreement! This is a tribute to the individual companies, and more importantly, the people representing those companies. To all those people, you envy the lawyers who sometimes take the best, I want to say thank you.

In my presentation, I will briefly describe the technology, discuss the basic business strategy used to put together the consortium, review the benefits which encouraged industry to participate and the consortium's management plan, and examine some of the critical issues which had to be resolved including government technology regulations, R&D cost sharing, antitrust considerations, and rights to intellectual properties. If we have enough time, I will close with some remarks on the potential impact of new legislation on the transfer of govern-

ment technology to the private sector.

BACKGROUND

Since 1986, the U.S. Department of Energy's Office of Industrial Programs has funded the development of a biomass conversion program at the Solar Energy Research Institute (SERI), which has led to the development of a novel pyrolysis process to produce high yields of complex phenolics/terpenes (PT) oils from wood waste. The PT oil has been recovered by a novel separation process to retain the phenolics/terpene fraction from the oils. Additional research has defined a number of applications for these biomass-derived phenols in formulations for phenol-formaldehyde (PF) resins. The process was an R&D 100 award.

In 1989, the PF resin market worldwide totaled three billion pounds with plywood resins accounting for more than half of the market and the balance being for insulation and molding compounds. Based on preliminary cost projections of 18 to 27 cents per pound, it appears these SERI biomass-derived materials can be substituted for phenol costing 40 cents per pounds in PF resins.

In February 1988, an industrial review committee established by SERI to review the R&D and to suggest potential research objectives, recommended early industry involvement in commercializing the technology. At the SERI biomass program manager's invitation, the for-profit subsidiary of Midwest Research Institute, we met with the industrial review committee to discuss the possible ways in which government and industry might work together to commercialize the technology.

Given the high risk, the early-

stage nature of the technology, the need to tailor the process including the design of the fractionation scheme, and the need to evaluate the oils, adhesive formulations and the resin molding compounds, we determined that a multiple-partner concept was essential in lieu of a single (solely) approach. We selected a consortium as being the most efficient commercialization route. This partnership approach was evaluated by the industrial review committee, which recommended the consortium be promoted to industry-at-large.

APPLICABLE LAW

And now a little law. Under the prevailing Bayh Dole (P.L. 96-510) law, Midwest Research Institute, as the contractor for DOE's SERI facility, can elect title to inventions and the associated patents. In the case of this biomass technology, the basic patent rights were elected and transferred to MBI Ventures, its commercial subsidiary, for commercialization. Midwest further agreed to transfer its future rights under this government-funded R&D program to MBI Ventures as the R&D and the technology developed.

HOW WE CREATED INTEREST

Interest in participating in the consortium was sought from industry at large by a 500-plus direct mailing pool to selected companies and trade associations worldwide, together with worldwide news releases to all major technical publica-

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tions and newspapers. Given the scope of the technology from a U.S. Government standpoint, all interested companies were invited to participate in the consortium, but with a strong preference given to U.S. industry.

We designed the consortium to be driven by industry to ensure the practical application of the resulting technologies—a market-driven approach. The members of the consortium would share the results of a major R&D effort for a fraction of the total cost with incentives to develop additional technologies. R&D risk would be substantially reduced in cost and time because of the collective capabilities of the individual members.

■ Initial approach ■

Our initial approach was to invite DOE to be part of the consortium, but it was later determined that this was not the most advantageous format for the consortium, particularly from industry's point of view, for a number of reasons including confidentiality, patent and technical data rights. Subsequently, a memorandum of understanding was negotiated between DOE, MIRA, MBI and MBI Ventures in which DOE gave its blessing to the formation and establishment of the consortium. In turn, in a unique twist, the industry parties elected to go ahead on trust with the draft agreement.

WHAT DID WE WANT IN OUR MEMBERS

What did we look for in inviting companies to participate? We sought one or more of the following capabilities:

- U.S. companies.
- Commitment to adhesive-related businesses.
- In-house R&D in adhesive production or use.
- Master and application knowledge.
- Adhesive, resin or composite formulation know-how, process design and development capabilities.
- Production, marketing and distribution of related products.

In June 1988, we produced a business plan that outlined the formal structure of the consortium, its collaborative nature and the R&D mission. The plan also included an optional license agreement and a draft acceptance letter of intent. At the onset it was clearly recognized by government and business that the documents were on the leading edge and would be subject to review and revision. While the formal documents were spelled out in the agreements, certain management, patent, and financing issues remained to be negotiated.

This plan was forwarded to the approximately 30 companies who had responded expressing additional interest. In August 1988, invitations were mailed to 28 companies that possessed the requisite capabilities inviting them to attend a review meeting at SEMI that September. Coincidentally with the September meeting, individual technical presentations were made by MIRA's business technical director and research staff to many of the participants who expressed interest in the consortium. Additional information and updates were continuously mailed to companies in question, none raised during this period.

In May 1989, formal comments and approval of documents for establishment of the consortium were received from DOE. DOE's comments were reflected into a final proposal, which was circulated in early June 1989 to 23 companies that were still interested in actively participating in the consortium.

30 Members

On July 26, 1989, after some 16 months of effort, the following companies were invited to join the consortium:

Allied-Signal, Inc.
Aristech Chemical Corporation
Georgian/Park-Bison, Inc.
Phosco Engineering Company
Plymouth/Imperial Industries, Inc.
MBI Ventures, Inc.

In a unique situation, the private-sector companies joined the consortium largely on trust. At the time of final execution, the final documents were still in "the original" but draft form.

MBI Ventures is the licensee and serves as the consortium's managing partner and administrator for the other members. The membership of the consortium also were invited to participate were chosen so as to represent all aspects of the commercialization process, including: current phosor producers, resin manufacturers and users, companies interested in building and scaling up the technology, resin sellers and distributors, and companies experienced in development and management of patent portfolios.

Funding

To provide some idea of the funding involved in the consortium, the Department of Energy currently has expended about 50 million dollars and is projected to spend additional funds on the order of 20 million dollars over the remaining four years of the consortium. Such funding, of course, depends upon appropriations from the Office of Management and Budget. On the industrial side, member fees during the consortium's five-year term will total more than 2500,000 with additional technical industry funding in excess of the government's original funding.

In-Kind R&D

Each in-kind R&D includes the design and scale up of the pyrolysis reactor, the actual production and fractionation of the pyrolysis oils, the transportation of the oils into adhesive formulations and the application and development of products arising from the oils and the formulations themselves. In addition, the consortium is conducting in-kind research to evaluate alternative feedstocks beyond wood chips, including bagasse, as well as investigating the other fractions present after the PH oil is separated out. On the commercial side, in-kind contributions include market research of the products and their applications in industry, an implementation pilot, the technical evaluation and licensing of the technology, and general technical and business support.

Trust

The consortium's initial five-year

term and its continuation during this period is subject to addressing annual technical and business milestones as recommended by the industry members to MBI Ventures. Each of the milestones carries an associated performance standard.

Member Duties

Each member of the consortium is expected to:

- Provide a representative to serve as business and technical review committees to advise MBI Ventures.

- Develop commercial applications through direct and in-kind R&D of the type mentioned previously.

- Evaluate the technical and commercial feasibility of the technology and its application within industry.

- Suggest consortiums and sub-contractors if additional expertise outside its current membership is required to develop or commercialize the technology.

- Assist with management of the patents and intellectual properties to maximize member benefits and potential license returns.

- Propose suitable licensing policies based on industrial experience.

Given the novel nature of the technology and its multiple products and uses, MBI Ventures is relying heavily on recommendations from industry as to a fair and reasonable licensing policy.

Member Benefits

As part of the consortium documents, MBI Ventures agreed to contractually obligate itself to make the rights available only to the members of the consortium. Membership has its privileges — including participating in a major research effort at minimum risk and cost. Also, members play a key role in developing new technology that may have a significant impact on global production and downstream products such as adhesives and bonding resin compounds. They receive proprietary reports and findings on potential breakthrough technologies that may impact upon their industries.

At the same time, of course, they are receiving the impact of the technology on their current business

interests as well as potentially improving the economics of existing physical processes and the production of phenolic resin adhesives and laminations. In addition, the potential also exists to develop new products and markets because of the unique properties of the resin. Further, the consortium serves as a network that allows strategic relationships of mutual interest to be built. Each member of the consortium has an option to acquire a license to both the current and future patents, inventions and know-how surrounding the base technology. Also, members may invent new technologies and intellectual properties as a result of their own in-house and supplementary in-kind research.

MANAGEMENT

The consortium is not a legal entity in its own right and is designed as a unique hub and spoke. MBI Ventures serves as the hub, or managing member, while the other members serve as the spokes. MBI Ventures provides the common link between the business and the technology, while managing cooperative R&D effort between parties with divergent interests: the government, OEM, MBI and industry. This link allows industry to obtain simplified access to government-derived technology and is brought about because MBI Ventures is the sole repository of the intellectual property rights. As the owner of the technology and the licensor of the hub, patents and know-how rights to the other members, MBI Ventures serves as licensor and protector of the technology. Given the sensitive and competitive nature of several members of the consortium, MBI Ventures also serves as a conduit to disseminate R&D and business information to and between the members — protecting both individual and collective interests. The consortium is registered with the FTC and the Justice Department under the National Cooperative Research and Development Act. And, lastly, since the consortium is not a legal entity in itself, MBI Ventures serves as the contracting party

where it is necessary to retain contractors for and on behalf of the consortium.

BARRIERS TO COOPERATIVE R&D

In forming the consortium, we had to address a number of critical issues that will continue to impact on future government/industry R&D. These factors included: exchange of information, cost sharing, patent and technical data rights, intellectualization and maintenance of private and public sector relationships. In exchanging information, key questions were asked:

- To what extent can government and industry interact horizontally to discuss program details?

- How can industry protect proprietary information from Freedom of Information requests?

On one hand, the Freedom of government research is to engage in research that is either in the national interest or is of sufficiently high risk so as not to be of serious immediate interest to industry. On the other hand, industry's investment in developing and commercializing new government-derived technologies must be protected by restricting the dissemination of information to potential competitors.

The initial approach was to have DOE participate in the consortium. However, if DOE had been an actual member of the consortium, the potential existed for third parties (including potential competitors) to request information produced in-kind at the industry facilities. Clearly this was not in the best interest of the industry partners and was viewed as a disservice. Consequently, of course, it is necessary to provide reports demonstrating the proper use of government funds in performing R&D.

As a condition for providing continued cost-shared R&D funding for the biomass program, the Office of Management and Budget has required industry matching funds. While the desired effect of cost-shared funds with industry is not a problem, an indirect problem can result because of the effect of patent and intellectual data rights of the cost-shared research that was performed

at a government lab. If DOE/SERI shared any of the R&D costs with the consortium, under current law, SERI owns all intellectual data. Such technical data cannot be protected from a Freedom of Information Act request from a potential competitor.

This led to the creation of two separate R&D programs: the maintenance of the existing DOE program and the consortium program. The DOE/SERI program continues with the "E" — research; industry performs the "D" — developing the technology in key applications and product use tests. While the base technology is protected by patents (the first patent recently issued), the base SERI research technical information was not considered to be as valuable as the technical information in the applications and products developed by the members.

Hence, issuing patent and data rights (know-how) can be a major barrier to establishing industrial interest in government-funded R&D. Under current law, not-for-profits, small businesses and universities can elect title to inventions that become patents from government-funded programs. Big business requires a waiver to obtain such title. Technical data, except for a brief period of time during the patenting process, resides with the government and, hence, cannot be patented. The ownership of technical data for inventions developed at government labs resides within the government. Clearly, the commercialization of technology requires protection of the know-how that is developed as a part of the industrial manufacturing and scale-up processes.

An even greater barrier is philosophy and the relationship between the private and public sector. Government, with its mandate to act in the common interest of its constituency, and industry with a need to develop and protect markets, clearly have views which are very often at opposite ends of the spectrum. In many instances industry has refused to work directly with the government, fighting the potential competitor risk as being too great to justify the required business investment. Conversely, the Division government

agencies, including DOE, have developed an extensive library of intellectual properties that can and should be used to support industry and to improve the U.S. competitive position in world markets — the common goal. Under the current political and regulatory climate, a license is required by business to obtain the rights to such technology and the process is often lengthy and difficult.

LESSONS WE LEARNED

In putting together the consortium, we learned (and sometimes relearned) a lot of hard lessons along the way:

- Translate science and technology into terms easily understood by both business and government. Most business people are trained to place their faith in abstract numbers and to discuss large-tech visions. Conversely, government sometimes gets hung up in the beauty of technology, failing to realize the time and costs involved in commercializing an embryonic technology.

- To gain industry's interest, demonstrate solid applications for the technology in particular markets of interest. Industry sells products not dreams.

- Given the multi-disciplined approach that is often necessary to commercialize developing technologies, it is necessary to form a team. Your team should comprise strong management and good technical leadership, as well as a legal capability, to be able to perform the functions necessary to get the job done. Dr. Helmut Christ at SERI and I provided that leadership. Management and technical skills should be rounded off with a good dose of people skills to be able to communicate the opportunity. Mr. Kathy Hower, MBI Ventures' consortium administrator, supplied that impetus.

- Identify and encourage strong leadership from industry since industry is in the best position to drive the commercialization effort. It is essential to build early and formal relationships with industry and to deliver, deliver, deliver. We did. I and Jeff Meile as chairman of our Advisory committee and all our

other members did, too. And, lastly, a special mention to Bill Kaye, a fellow LES member and friend.

- It is absolutely essential to seek early involvement, comments, suggestions and concurrence from the government. Above all, extreme patience is necessary in working with the government funding, research program and legal services, since government has to reconcile a myriad of interests. We owe a lot to Dr. Paul Rasmus (DOE/SERI) and Dr. Alan Schroeder (DOE/Mashington) who supported our efforts and reconciled these interests from our earliest days. We also owe a lot to a bunch of DOE people in Chicago and Washington in several departments who did not let their initial skepticism sway their final judgment.

- Never work in a vacuum. Sometimes a lot smarter than you will find a way to overcome a specific technical, business or legal problem that will occur if a viable commercial opportunity exists. Our industry members often responded to this challenge.

- It is absolutely essential to know where you want to go, and what outcomes you desire, before you start to play the game. In this manner, you will not lose sight of the end result in objections and disappointments encountered you along the way, as they surely will. Plan your part as necessary but your emotions stay your judgment and your patience expires. However, Technology can change the rules of the game, and maybe even the government can help you!

WHAT IS A CRAD?

Since putting together the consortium, a law was passed — the National Competitive Technology Transfer Act of 1989. DOE and the other civilian agencies are writing policies to implement this law. The Act authorizes, with appropriate agency approval, the directors of government laboratories to enter into Cooperative Research and Development Agreements (CRADAs) — not to be confused with CRATERS, and to license intellectual properties developed under a CRADA.

Recall that previously under Bayh Dole, the contractor could elect title to intellectual properties developed as part of a government-funded research program. This partly drove our conversion.

The Act has two interesting twists: 1) it allows for the postposition of rights, and 2) provides for technical data produced as part of the research to be kept confidential for up to five years (as of President of In-

formation requests).

While the Act moves in the right direction, it fails to address the key issues of authority, patent and product liability and the need to put real power in the hands of its own constituency — industry. Witness the Japanese and European preoccupation with early industry involvement in developing major technologies. The government has always been good at the "R" (re-

search technology) and industry the "D" (the product that sells). Until the government puts industry in the driver's seat, the government's technology transfer programs will continue to be no more than the dissemination of information in reports and seminars, as it is now, except in isolated circumstances when enlightened industry people grab the lead. This is what made our contract work.