

Minutes
NIST Technology Innovation Program (TIP)
Advisory Board Meeting
December 8, 2009

Executive Summary (Full Minutes Follow)

The results of two recent Technology Innovation Program (TIP) competitions are expected to be announced next week. TIP reviewed 138 proposals, involving 244 participants. More than 200 white papers have been received, suggesting additional technology areas that TIP might pursue.

Dr. Patrick Gallagher, Director, NIST, announced recently that Marc Stanley is to be Acting Deputy Director of NIST pending a more extensive reorganization, and Mr. Stanley has asked Dr. Lorel Wisniewski to function as TIP Director during this period.

Dr. Robert Atkinson, President of the Information Technology and Innovation Foundation, spoke on the topic of innovation economics. Dr. Atkinson believes that long term investments in innovation would likely have led to a more stable and prosperous economy for the nation than investments in real estate and financial instruments, which led to the severe recession. Atkinson's conclusion is that the United States faces significant challenges with regard to innovation. The Board members generally agreed with Atkinson's conclusions (although several questioned the appropriateness of his aggregating diverse metrics into an overall score used to compare countries). The Board was sympathetic with his admonition that policy makers should give innovation a higher priority than it has had in recent years. They also noted that educating the U.S. workforce is a requirement for success. The Board supports increased Federal funding for basic research and for TIP. The Board agreed that better alignment of Federal and state technology-based economic development (TBED) programs is needed.

Rebecca Bagley, President and CEO of the Northeast Ohio Technology Coalition (Nortech), spoke on fostering regional high-tech economic development. TIP is exploring ways to work more closely with state TBED programs. Beginning in 2002, Ohio funded a 10-year "Third Frontier" program (\$1.6 billion) that is now beginning to create jobs. Ms. Bagley's data show that the decline in employment in traditional Ohio industries is being at least partially offset by recent growth in high-tech industries. Coordination of activities among the concerned parties is probably the most valuable Nortech function. The Board concurred that TIP should interface effectively with regional clusters, but that TIP would be spread too thin if it tried to help in the creation of new regional clusters.

Dr. Lorel Wisniewski (Deputy Director, TIP) reported that about a year ago, TIP and NIST's Hollings Manufacturing Extension Partnership (MEP) began collaboration. (MEP's mission is "to act as a strategic advisor to promote business growth and connect manufacturers to public and private resources essential for increased competitiveness and profitability.") To date, MEP and TIP have held four joint regional workshops around the country, reaching 260 attendees, which has helped publicize TIP to small and medium sized manufacturers with a potential interest in proposing to TIP. To ensure that truly innovative projects are conceived and proposed, TIP must engage in outreach. The reaction of the Board to TIP/MEP collaboration was positive. Information on critical national needs that TIP gathers can help align the states and the Federal government on issues of technology development.

Stephen Campbell (Group Leader, TIP Impact Analysis Group) discussed TIP's evaluation strategy. TIP is committed to analyzing objectively the impact of its projects as well as the effectiveness of the overall program. TIP carries out systematic evaluation for several reasons:

1. It is required by law.
2. Congress, the Administration, and program participants will inevitably ask how well the program is working.
3. Impact evaluation data can be used as a management tool to improve operations.
4. It leads to a better understanding of the innovation process and how TIP contributes to it.

In addition to studying individual projects as well as the overall impact of the program, TIP must evaluate operational aspects of the program, including the selection process, project management, and overall customer satisfaction. A survey was completed recently for the 2008 competition. Responses were solicited from those on the TIP mailing list, those who submitted proposals but did not receive funding, and those who received funding. TIP reviewed 701 responses and the data were carefully analyzed. The Board considers it appropriate that TIP is devoting significant effort to evaluation.

Mr. Stanley stressed that fact that TIP is still a young program, and hence the Advisory Board has a real opportunity to shape its future course. The annual report of the Board is the appropriate vehicle. It is due thirty days after the President's budget goes to Congress.

Summary of 2009 competition statistics: Approximately twenty awards are about to be announced (versus nine in 2008). There were 138 applicants. This year proposals were limited to two critical national needs areas: civil infrastructure and manufacturing. Winning proposals were in areas such as sensors for assessing the structural integrity of bridges, water and waste water piping, and manufacturing for nanomaterials, super alloys, and composites. Funding of approximately \$25 million has been allocated for new awards in 2009. Over the life of the projects, the total TIP investment plus matching funds will amount to about \$146 million if all projects continue on to completion. Projects are funded through a financial assistance award called a cooperative agreement. Awardees must submit quarterly technical and impact progress reports as well as quarterly financial reports. Milestones and decision points are officially part of the awards and based on the R&D plans in the original proposals. Awards can be terminated early for a variety of situations including at the request of the award recipient, or for material non-compliance with the award terms and conditions.

The Board feels that some of the most important things TIP can do to advance the Administration's innovation strategy include allocating funding to the areas of greatest need, addressing disconnects (e.g., lack of coordination between state and Federal programs), and emphasizing new areas of technology rather than well-established technologies.

The Board believes that TIP can help to keep healthcare costs down by encouraging the adoption of smart technology such as electronic medical records. But the Board believes that healthcare R&D resources should not all go into healthcare IT. There are other important healthcare technology opportunities, e.g., cheaper diagnostics. The comment was made that if healthcare costs can be reduced; manufacturing firms may be more likely to keep factories in the U.S. rather than move them offshore. (Providing new sources of cheap energy can also keep factories here.) Personalized medicine is a promising area. A clear standards role for NIST in the healthcare area was also mentioned.

The Board stated that cheaper energy storage is critical to utilities, and the energy white paper should stress that storage technologies other than batteries or other electrochemical devices should be explored. More attention could be paid to renewable energy.

Full Minutes

Attendees:

Board Members

Jeffrey Andrews, Atlas Venture
Luis Proenza, University of Akron
William Peter Teagan, Consultant
James E. Reeb, Caterpillar
Mauro Ferrari, University of Texas

NIST

Marc Stanley, TIP
Lorel Wisniewski, TIP
Claire Allocca
Gary Anderson
Brian Belanger
Jason Boehm
Steve Campbell, TIP
Mrunal Chapekar, TIP
Karen Lellock
Kathleen McTigue, TIP
Linda Beth Schilling, TIP
Robert Sienkiewicz, TIP
Richard Spivack, TIP
Christopher White
Gary Yakimov

OTHER

Robert D. Atkinson, The Information Technology & Innovation Foundation
Rebecca Bagley, NorTech
Mary J. Bailey, Thompson Advisory Group
Neil MacDonald, Federal Technology Watch
Kazuyuki Takada, NEDO

(Note: in the discussion sections, “Q” refers to a question from the Board, and “A” represents the answer given.)

Welcome and Introduction (Marc Stanley, TIP Director)

Mr. Stanley called the meeting to order at 8:35 a.m. Dr. Patrick Gallagher (who was recently confirmed by the Senate as NIST’s new director) was scheduled to welcome the Board, but was called away. Instead Mr. Stanley welcomed the attendees, thanked his staff for making the meeting arrangements, and alerted the attendees to safety procedures.

The results of two recent TIP competitions are expected to be announced next week. Manufacturing and civil infrastructure were the critical national need focus areas for these competitions. TIP received 138 proposals involving 244 participants. Mr. Stanley noted the positive response of the technical community

to the program. Popular magazines such as *Forbes*, *The Economist*, and *Popular Science* have published articles about TIP projects.

TIP is looking into additional critical national need areas as potential candidates for future competitions. More than 200 white papers have been received, suggesting societal challenges in areas of critical national need that TIP might pursue.

TIP strives to work closely with the NIST laboratories and NIST's other extramural programs. During the past year TIP partnered with NIST's Hollings Manufacturing Extension Partnership, MEP (to be discussed in a subsequent agenda item) and sought feedback on TIP white papers from the NIST laboratories. Dr. Gallagher is urging NIST to work more closely with universities. As universities become more aware of opportunities to partner with industry and receive TIP funding, their interest in the program has grown dramatically.

The TIP 2008 Annual Report was distributed to the Board.

Mr. Stanley praised TIP employees Felix Wu and Terri Talbott, both of whom recently received special awards for their achievements. Dr. Wu received the Hans-Juergen Schmidt award from the International Workshop on Structural Health Monitoring, and Ms. Talbott was part of a team that won the first NIST Director's Award for Excellence in Administration. Robert Sienkiewicz completed a Senior Executive Service management training program, and will be detailed part time to the Department of Commerce's Office of Innovation and Entrepreneurship. Mr. Stanley also thanked Thomas Wiggins and Linda Beth Schilling for their exemplary performance in TIP selection management and project management, respectively.

Dr. Patrick Gallagher, Director, NIST, announced recently that Marc Stanley is to be Acting Deputy Director of NIST pending a more extensive reorganization, and Mr. Stanley has asked Dr. Lorel Wisniewski to function as TIP Director during this period.

Robert Atkinson, President, Information Technology and Innovation Foundation (ITIF)

Dr. Atkinson had been invited to speak on the topic of innovation economics. ITIF is a public policy think tank committed to articulating and advancing a pro-productivity, pro-innovation, and pro-technology public policy agenda.

Dr. Atkinson argued that many Americans (including many prominent economists) put too much faith in the premise that wealth can inevitably be created via real estate investments. He showed data that tracked the housing bubble, which, when it burst, caused the current economic turmoil. He rejects the arguments of some that it does not matter whether the U.S. produces potato chips or computer chips. Atkinson believes that investments in innovative high-tech R&D and new product development will generally produce stronger economic growth than investments in real estate and/or financial instruments of questionable value that have been so popular in the U.S. in recent years. He rejects the argument of some that Federal investments in technology development through programs like TIP can inappropriately distort the allocation of capital, and also rejects arguments that government can never be effective at fostering innovation. Atkinson is a fan of Schumpeter rather than neo-classical economists.

He showed charts comparing innovation investments and infrastructure in various countries (e.g., R&D expenditures, number of scientists and engineers per capita, availability of venture capital). His data indicate that the U.S. today is not the world leader in innovation. Also, trend data suggest that the U.S. may be losing ground relative to the countries where technology innovation is a higher priority.

Australia now has the most generous R&D tax credit in the world. China has built its economy by currency manipulation and emphasizing exports, but also emphasizes achieving world class technology.

Atkinson's conclusion is that the United States faces significant challenges with regard to innovation. The nation cannot afford to be complacent.

Discussion of Dr. Atkinson's Presentation

The Board members generally agreed with Dr. Atkinson's conclusions (although several questioned the appropriateness of his aggregating diverse metrics into an overall score used to compare countries). The Board was sympathetic with his admonition that policy makers should give innovation a higher priority than it has had in recent years. They also noted that educating the U.S. workforce is a requirement for success. Too many students drop out of high school or college. Efforts by Federal, state, and local governments to create jobs too often do not recognize that all jobs are not equal. Creating a high-paying job in a technology industry boosts the economy more than creating a low-wage job.

A rising number of top-notch graduating engineers are taking jobs in Wall Street financial industry firms where salaries are high, rather than in technology-based firms. Or, they are going to law school rather than engineering graduate school, because that's where the money is. The controversy over issuing H1B visas has meant that highly educated immigrants who might become technology entrepreneurs are deterred from coming to the United States.

The Board supports increased Federal funding for basic research and for TIP. The venture capital community can help form new high-tech companies, but only when the pipeline contains sufficient innovative ideas arising from basic research. A concern is that as a result of cutbacks in Federal research funding, the pipeline is not being refilled adequately. (There have been increases in biomedical funding for NIH, but funding for physics and engineering disciplines have lagged.)

The Board agreed that better alignment of Federal and state technology-based economic development (TBED) programs is needed. No one at the Federal level is taking responsibility for fostering collaboration among state programs or striving to achieve synergy between individual state programs and Federal programs. Improved communication and coordination could pay dividends. Another problem is that state TBED programs tend to start and stop, either due to instability in funding or redirection in emphasis by a new Administration.

In earlier decades innovations tended to come from premier research laboratories (e.g., Bell Labs and Xerox PARC). The old Bell Labs is gone, and its counterparts today are few. Today, innovation more often arises from collaboration among some combination of companies, universities, and government laboratories. Government policies should encourage collaboration.

DARPA's efforts to work with the semiconductor industry (e.g., through Sematech) have been successful in establishing "roadmaps" to define gaps where stepped-up research would be likely to have the biggest payoff. Such roadmaps can help to allocate research dollars more intelligently.

Rebecca Bagley (President and CEO of Nortech)

Nortech, the Northeast Ohio Technology Coalition, is a 501(c)(3) organization formed to foster high-tech economic growth in Northeastern Ohio. Mr. Stanley invited Ms. Bagley to address the Board because TIP is exploring ways to work more closely with state TBED programs.

This part of Ohio once had a robust manufacturing base in traditional industries such as steelmaking, autos, and tires. As these industries decline and jobs are lost, Nortech is working to find ways to grow new high-tech industries. Nortech has done careful surveys to identify existing strengths at individual companies and at universities in the region. Beginning in 2002, Ohio funded a 10-year “Third Frontier” program (\$1.6 billion) that is now beginning to create jobs. Examples of technical areas with the potential for growth in this region: photovoltaics, flexible displays, biomedical imaging, and fuel cells.

Ms. Bagley’s data show that the decline in employment in traditional industries is being at least partially offset by recent growth in high-tech industries. In addition to providing data to help Ohioans understand the situation in their region, and what the opportunities might be for improving the climate for TBED, the most valuable service Nortech provides could well be bringing together the key players—companies, lawmakers, funding agencies, the financial community, and others, and getting them to all pull in the same direction. Nortech makes companies aware of programs like TIP that are potential sources of funding.

Discussion of Ms. Bagley’s Presentation

Q: Please elaborate on what Nortech does with its funds.

A: Coordination of activities among the concerned parties is the most important function. The State of Ohio’s Third Frontier Program provides funding for individual companies, but Nortech brings them together for networking and makes companies aware of resources that they may tap into.

Q: The figure of \$55,000 expended for each job created—do you consider that successful?

A: Our efforts in Ohio are relatively new. Like any new program, there is a time lag before tangible results begin to appear. I am confident that the figure quoted will improve (decrease) as the program continues.

Q: Are your clients exclusively in northeast Ohio?

A: Yes. However, Nortech may reach outside Ohio to create partnerships. There may well be opportunities for cooperation across state boundaries.

Q: How do you identify companies to participate?

A: All interested companies in northeastern Ohio that want to participate in our coordination activities are encouraged to do so. For projects involving funding to individual companies, the approach is to look for innovative firms in those technology areas identified as having high potential for growth. For example, for a recent Department of Energy (DOE) solicitation, Nortech made sure that interested companies were aware of the opportunity. Nortech served as a catalyst to encourage companies to respond to the solicitation and partner where appropriate.

Q: Does Nortech get involved in recruiting companies to move to Ohio?

A: Another agency has that responsibility, but we partner with it. Nortech helps in making the strong case for why a high-tech company should consider moving to Ohio. (A Board member commented that, in his opinion, Ohio has already demonstrated success in getting companies to move there.)

Q: What about partnering with the Federal government?

A: There has been a lot of discussion about that. Nortech is in touch with many Federal agencies (e.g., TIP) and serves as a point of contact for companies wishing to explore Federal funding opportunities.

Mr. Stanley commented that the new Administration is enthusiastic about promoting regional high-tech clusters. NIST Director Patrick Gallagher is thinking about how NIST's extramural programs can serve as a conduit to state technology programs, and how NIST might serve in a convener role. Commerce's Economic Development Agency is another Federal agency that could have a role in promoting regional clusters.

The Board noted that interest in high-tech clusters is not new. Both the Council on Competitiveness and the National Academies of Science have studied clusters and called attention to their significance.

Loel Wisniewski (TIP Deputy Director)

NIST's Director puts a high priority on NIST's operating units working together. Dr. Wisniewski reported that about a year ago, TIP and NIST's Hollings Manufacturing Extension Partnership (MEP) began collaboration. MEP's mission is "to act as a strategic advisor to promote business growth and connect manufacturers to public and private resources essential for increased competitiveness and profitability."

MEP works through a network of non-profit centers, of which there is at least one in every state. These centers reach 32,000 manufacturing firms every year, hence the MEP is well connected to states and to manufacturers. To date, the MEP and TIP have held four joint regional workshops around the country, reaching 260 attendees, and this has helped publicize TIP to small and medium sized manufacturers with a potential interest in proposing to TIP. The State Science and Technology Institute (SSTI) has been a facilitator for these meetings. As a result of this collaboration, TIP is now better linked to state and local technology networks and to regional clusters.

The information resulting from TIP's white paper process helps states and individual companies achieve a better understanding of technical areas that appear particularly important today, and such information can guide decisions on R&D funding allocations at all levels.

Discussion of Dr. Wisniewski's Presentation

Q: Does the role of TIP include making connections? Is this a new responsibility?

A: The statutory mission of TIP is to fund R&D, but making connections can be part of being pro-active. To ensure that truly innovative projects are conceived and proposed, TIP must engage in outreach. The program has a responsibility to share broadly with the U.S. technical community the insight it acquires about where technology is headed. The new Administration insists on transparency in government, and NIST seeks to engage industry, universities, and states. The NIST laboratories are involved in many of the areas identified as critical national needs, and when TIP and MEP foster multi-party communication, NIST can share knowledge from the NIST laboratories while helping the laboratories better understand the evolving measurement and standards needs of industry.

In the emerging area of nano medicine, the NIST laboratories can help with things like characterization of tiny particles and the development of standardized test methods.

The Board noted that with so much emphasis on partnering today, TIP should remember that many innovative ideas still come from individual small firms. Dr. Wisniewski agreed, and noted that while TIP

encourages partnerships where they make sense, many of the proposals funded are from single companies.

The reaction of the Board to TIP/MEP collaboration was positive. MEP can identify manufacturing firms that might otherwise be unaware of opportunities to obtain funding from TIP. MEP strengthens the “innovation ecosystem.” Some states do much more for TBED than others. MEP and TIP can help to level the playing field, and perhaps even help reduce Congressional earmarks.

Since there is no longer an Office of Technology Assessment or a Technology Administration in the Commerce Department, the information on critical national needs gathered by TIP can help align the states and the Federal government in their efforts regarding technology development.

Stephen Campbell, Group Leader, TIP Impact Analysis

TIP is committed to analyzing objectively the impact of its projects as well as the effectiveness of the overall program.

TIP continues to monitor new approaches to program evaluation and learn from them. The National Science Foundation (NSF) has been charged with evaluating the impact of the stimulus funding, and TIP is in contact with the appropriate NSF staff. TIP also studies best practices in program evaluation from other nations.

TIP carries out systematic evaluation for several reasons:

1. It is required by law.
2. Congress, the Administration, and program participants will inevitably ask how well the program is working.
3. Impact evaluation data can be used as a management tool to improve operations.
4. It leads to a better understanding of the innovation process and how TIP contributes to it.

Impact information will be shared with all those interested. In addition to studying individual projects as well as the overall impact of the program, TIP must also evaluate other aspects of the program, including the selection process, project management, and customer satisfaction.

A survey was recently completed for the 2008 competition. Responses were solicited from those on the TIP mailing list, those who submitted proposals but did not receive funding, and those who received funding. TIP received 701 responses and carefully analyzed the data.

The survey included customer satisfaction questions such as why those who did not apply chose not to, whether people found the TIP proposal preparation kit user-friendly, and whether TIP staff members were responsive. Other questions dealt with the respondents’ views regarding critical national needs. Mr. Campbell’s charts detailed the results. (One example: energy ranked high as a critical national need.)

The Board considers it appropriate that TIP is devoting significant effort to evaluation.

Discussion of the 2009 Competition

Mr. Stanley stressed that fact that TIP is still a young program, and hence the Advisory Board has a real opportunity to shape its future course. The annual report of the Board is the appropriate vehicle. It is due thirty days after the president’s budget goes to Congress.

Q: Please summarize the results of this year's competition.

A: Approximately twenty awards are about to be announced (versus nine in 2008). There were 138 applicants. This year, proposals were limited to two critical national needs areas: civil infrastructure and manufacturing. Winning proposals were in areas such as sensors for assessing the structural integrity of bridges, water and waste water piping, and manufacturing for nanomaterials, super alloys, and composites.

Q: Aren't other Federal agencies funding some of the same areas?

A: Yes, but TIP has coordinated with them to ensure no duplication. The gap analysis in the white papers addresses that issue.

Q: What is the dollar amount?

A: Approximately \$25 million for new awards in 2009. Over the life of the projects, the total TIP investment plus matching funds will amount to about \$146 million if all projects continue to completion.

Q: Can TIP terminate an unsuccessful project?

A: Of course. The funding vehicle is a cooperative agreement, which requires substantial involvement by TIP (e.g., milestones, decision points, etc.) rather than a grant with less technical monitoring. Awardees must submit quarterly technical and impact progress reports, as well as quarterly financial reports. Milestones and decision points are officially part of the awards and are based on the R&D plans in the original proposals. Awards can be terminated early for a variety of reasons, including at the request of the award recipient, or for material non-compliance with the award terms and conditions. Sometimes a company will request termination if the technical challenge proves to be more daunting than anticipated. Financial problems or even an acquisition or merger can sometimes result in a project's early end. Mr. Stanley noted that funding stability is a continuing problem for TIP.

Q: Please elaborate on the stage of technical development that TIP funds.

A: TIP projects can extend farther upstream into the basic research realm than those of its predecessor, ATP. However, TIP funding is not directed at discovery science. On the other end of the spectrum, projects can continue through the prototype stage—but may not include product development. The key is that the projects must be characterized as high-risk, high-reward, as defined under the TIP statute.

Discussion of Questions Posed by TIP

1. What are the most important things that TIP can do to advance the Administration's innovation strategy?

Alignment: Allocate funding to the greatest needs.

Address disconnects (e.g., lack of coordination between state and Federal programs).

Emphasize new areas such as nanotechnology and personalized medicine rather than well-established technologies.

Because improving healthcare is a national priority, TIP can help to keep healthcare costs down by encouraging the adoption of smart technology (e.g., electronic medical records, along with the necessary

standards so that records can be exchanged between platforms). If massive amounts of individual health data can be aggregated because of standardized records, it will be easier to compare the efficacy of various treatment options and determine which are best, leading to cost savings. But healthcare R&D resources should not all go into healthcare IT. There are other important healthcare technology opportunities, e.g., cheaper diagnostics.

Other areas that might be investigated include:

- Technology for education (e.g., web-based learning to upgrade job skills)
- Technology for objective climate change metrics
- Technology for protection and enhancement of individual freedoms
- Technology for reducing the deficit
- Technology for reducing the tax burden

Technology can play a role in things like reducing the deficit and lowering taxes. For example, the current healthcare industry is inefficient, so if the cost of healthcare can be reduced through adoption of new technology, the deficit will shrink and taxes can be kept in line. By reducing healthcare costs, manufacturing firms may be more likely to keep factories in the U.S. rather than move them offshore. Government's motivation for funding R&D is intrinsically different from that of private firms. Maximizing return to shareholders is a motivating factor in individual company decisions. Lowering costs incurred by the Federal government is typically *not* a motivating factor in an individual company's decisions. Given the choice of working on an R&D project that might lead to an expensive medical device with a high profit margin, or working on a project that might result in a cheaper medical device to replace existing devices, the company priority might be project one, whereas the government would prefer to see project two pursued. When government funds are available to supplement private R&D dollars, it can encourage companies to pursue projects like the second example.

2. What role, if any, should TIP have in regional clusters?

Teaming with the MEP is a good approach. Linking TIP to state TBED programs makes sense (although this can be complex and time consuming).

TIP should encourage states to strive for stability in their programs. Political winds that result in start/stop situations are damaging.

The Board concurred that TIP should interface effectively with regional clusters, but that TIP would be spread too thin if it tried to lead the creation of new regional clusters. To create a successful regional cluster, one needs more than just willing technology companies. Other components of an innovation ecosystem include sources of investment capital, legal and banking services accustomed to dealing with high-tech companies, an appropriately experienced workforce, and appropriate university programs. To create clusters, many of these ingredients must be present.

Mr. Stanley mentioned that NIST's laboratories can also contribute to the success of a cluster. He cited the example of a program involving California, New York, and Texas, called the Nano-electronic Research Initiative, in which the NIST laboratories worked with the state governments, companies, and universities to identify and address the associated measurement and standards needs.

3. What are effective strategies for program evaluation?

Caterpillar defines a "strategic filter." Long term goals are defined, and every new R&D initiative passes through that filter to ensure that it is aligned with the company's goals. The analog for TIP is to ensure

that every project selected for funding is aligned with national needs. (The white paper process and the scope of an associated competition are designed to do precisely that.)

Project management sometimes leads to the conclusion that a project should be terminated, but that invariably can be difficult. TIP should strive for “termination without recrimination.” The high level of cost sharing in TIP is good, because if a project gets into trouble, both parties have an incentive to consider termination.

The ultimate test of whether TIP is successful is whether the new technologies developed are deployed.

Due diligence in proposal review is important. Venture capitalists usually have proposals reviewed by several experts in the field, because it is not uncommon to have widely differing opinions.

Mr. Stanley noted that potential TIP proposers sometimes initially do not understand the aims of the program. It may take a couple of iterations before a proposer develops a proposal appropriate for TIP. A common problem is that proposed budgets do not always track consistently with the technical objectives or R&D tasks proposed.

Additional Comments on the White Papers

Healthcare White Paper: Personalized medicine is a promising area. There is clearly a standards role for NIST in the healthcare area. TIP staff noted that comments on the healthcare white paper received from NIH were consistent with the views of the Board.

Energy White Paper: The Board considered this a well-researched paper. An Electric Power Research Institute workshop concluded that cheaper energy storage is critical to utilities, and deserves more R&D funding. The electrical grid is rarely stressed except on hot summer days. Generating facilities are also underutilized much of the time, so dispersed energy storage (e.g., in office buildings) could lead to avoidance of new power plants and transmission facilities. R&D on energy storage tends to emphasize small batteries for laptop computers and portable electronics as opposed to batteries for grid storage. Storage technologies other than batteries or other electrochemical devices should be explored. The draft white paper on energy may need more attention paid to renewable energy, although photovoltaics is a well-trod area. If the use of electric or plug-in hybrid autos were to increase dramatically, and if metering and control systems could be designed such that electrical energy could flow in or out of electric vehicles as needed, that could provide a degree of distributed storage. For applications such as that, R&D on power electronics, e.g., SiC devices, could have payoff.

Civil Infrastructure White Paper: While U.S. infrastructure has deficiencies that need attention, infrastructure in the U. S. is better than in many other parts of the world.

The meeting was adjourned at 2:40 p.m.