NIST GCR 07-908

Findings from the Advanced Technology Program's Survey of ATP Applicants 2004

Jeffrey Kerwin
Westat

Stephen Campbell
Economic Assessment Office
Advanced Technology Program

NIST
National Institute of Standards and Technology
Technology Administration, U.S. Department of Commerce

ATP
ADVANCED TECHNOLOGY PROGRAM

About ATP's Economic Assessment Office

The Advanced Technology Program (ATP) is a partnership between government and private industry to conduct high-risk research to develop enabling technologies that promise significant commercial payoffs and widespread benefits for the economy.

Since the inception of ATP in 1990, ATP's Economic Assessment Office (EAO) has performed rigorous and multifaceted evaluations to assess the impact of the program and estimate the returns to the taxpayer. To evaluate whether the program is meeting its stated objectives, EAO employs statistical analyses and other methodological approaches to measure program effectiveness in terms of:

- Inputs (program funding and staffing necessary to carry out the ATP mission)
- Outputs (research outputs from ATP supported projects)
- Outcomes (innovation in products, processes, and services from ATP supported projects)
- Impacts (long term impacts on U.S. industry, society, and economy)

Key features of ATP's evaluation program include:

- Business Reporting System, a unique online survey of ATP project participants that gathers regular data on indicators of business progress and estimated economic impact of ATP projects
- Special Surveys, including the Survey of Applicants and the Survey of Joint Ventures
- Status Reports, mini case studies that assess ATP projects several years after project completion, and rate projects on a scale of zero to four stars to represent a range of project outcomes
- Benefit-cost analysis studies, which identify and quantify the private, public, and social returns and benefits from ATP projects
- Economic and policy studies that assess the role and impact of the program in the U.S. innovation system
- Data Enclave to allow for analysis of innovation and entrepreneurship (Spring 2007)

EAO measures against ATP's mission. The findings from ATP surveys and reports demonstrate that ATP is meeting its mission:

- Nine out of 10 organizations indicate that ATP funding accelerated their R&D cycle
- An ATP award establishes or enhances the expected value in the eyes of potential investors, which is called a "Halo Effect"
- ATP stresses the importance of partnerships and collaborations in its projects. About 85 percent of project participants had collaborated with others in research on their ATP projects

Contact ATP's Economic Assessment Office for more information:

- **On the Internet:** www.atp.nist.gov/eao/eao_main.htm
- **By e-mail:** atp-eao@nist.gov
- **By phone:** 301-975-8978, Stephanie Shipp, Director, Economic Assessment Office, Advanced Technology Program
- **By writing:** Economic Assessment Office, Advanced Technology Program, National Institute of Standards and Technology, 100 Bureau Drive, Stop 4710, Gaithersburg, MD 20899-4710

NIST GCR 07-908

Findings from the Advanced Technology Program's Survey of ATP Applicants 2004

Prepared for
Economic Assessment Office
Advanced Technology Program
National Institute of Standards and Technology
Gaithersburg, MD 20899-4710

By

Jeffrey Kerwin
Westat

Stephen Campbell
Economic Assessment Office
Advanced Technology Program

July 2007

U.S. Department of Commerce
Carlos M. Gutierrez, Secretary

Technology Administration
Robert Cresanti, Under Secretary for Technology

National Institute of Standards and Technology
William A. Jeffrey, Director

Advanced Technology Program
Marc G. Stanley, Director

Table of Contents

Abstract

The Advanced Technology Program (ATP) accelerates the development of high risk and innovative research that has the potential to broadly affect the economy through partnerships with the private sector. Companies seeking to partner with the Advanced Technology Program submit proposals to the ATP. Proposals must be for the development of innovative technologies that could not obtain private funding due to the high technical risk and proposals must have the potential to produce widespread benefits to the economy and society. Proposals are evaluated for technical and economic merit in a rigorous competitive review process. The Survey of Applicants 2004, conducted in collaboration with Westat, asks all applicants, both awardees and nonawardees, to answer questions about the types of proposals submitted to ATP, the characteristics of companies who submit these proposals, and the satisfaction of applicants with respect to the proposal submission, review, and feedback that they receive during the process.

Altogether, 934 applicants were eligible to respond to the survey, including 40 companies that were selected for an ATP award and 894 companies that were not selected for funding. Data collection was carried out from January to May 2006. The response rate for Awardees was 100% and for Nonawardee applicants was 44%. Overall response was 46%. Most companies applying to ATP are small companies. More than two-thirds of applicants (69%) had fewer than 50 employees and only 15 percent had 500 employees or more.

Measuring Against Mission

Evidence from the Survey of Applicants 2004 shows that the ATP is successful in directing funding awards toward R&D projects that have higher technical risk and longer time horizons than *typical* R&D projects in their company. ATP applicants, on average, estimate the probability of not achieving maximal stretch goals to be 46%. In comparison, the average estimate for *typical* company R&D projects is 27%.

Nearly all ATP applicants report that their proposed project represented a new R&D direction for their company (84%) and for their industry or technology field (93%).

Most applicants not awarded ATP funding indicate that unavailability of internal company funding (86%), or dependence of internal funding on receiving external support (78%), are important factors in their decision to apply to ATP.

Two out of three ATP applicants proposed projects based on university research. Awardees were more likely than Nonawardees to propose projects based on university research (90% versus 64%).

More than half of ATP applicants do not expect revenues from their proposed technologies to cover the total cost of their award by two years after the project ends. However, almost all ATP applicants (94%) expect a positive net impact on annual revenues to occur within five years of project end. And importantly, almost all ATP applicants (96%) expect that downstream industry users or consumers of their proposed technologies will receive a net benefit within five years of project end.

In order to accelerate innovative technology for broad national benefit, the ATP seeks to fund projects that promote public benefits, knowledge creation, and knowledge dissemination. Almost three-fourths of applicants (71%) believe that critical research findings from their proposed projects would become known to others within two years after the ATP project ends. Another 24% believe it would occur between two and five years, and the remaining 5% believe it will be 5 years or longer.

Nearly all ATP applicants report that patent or copyright protection is important as a means of protecting intellectual property and capturing value from innovation. Biotechnology companies (84%) are more likely to view patent and copyright protections as extremely important, relative to other ATP technology areas.

Information Technology companies are less likely to do so (61%).

One of out three Nonawardee ATP applicants do not pursue their proposed project. The remaining Nonawardees carry out the research but on a much smaller scale, the majority at less than 40% of the proposed effort.

Applicant Satisfaction with Proposal Process

Most applicants contacting ATP staff were satisfied with the courtesy they received (93%), the promptness of their service (89%), and help in resolving issues or problems (85%).

Over two-thirds of ATP applicants devoted fewer than 240 hours of staff time to preparing their proposals and spent less than $20,000. However, ATP Awardees devoted more effort in preparing their proposals than Nonawardees. More Awardees than Nonawardees devoted at least 480 hours (18% versus 5%).

About three-quarters of all applicants (76%) report that the process of preparing a proposal is useful and almost the same percent (71%) report that the ATP review and decision process is fair.

During the proposal process, companies respond to questions from ATP in oral review regarding technical and business aspects of their project. In telephone debriefing of Nonawardees, companies receive feedback on the strengths and weaknesses of their proposal against ATP criteria. About two-thirds (64%) of all applicants regard this information received from ATP to be useful.

Acknowledgements

The Advanced Technology Program (ATP) conducts a Survey of Applicants on a regular basis to assess how the characteristics of firms that apply to ATP relate to the goals of the ATP program. ATP has collaborated with Westat, a survey research organization, to conduct these surveys of all applicants for the 2000, 2002, and 2004 ATP competitions. The findings presented in these factsheets are for the 2004 competition, with some comparisons to 2002.

There are many people involved in conducting a survey and analyzing the results. Jeffrey Kerwin, Westat, Stephen Campbell and Andrew Wang, ATP, designed the survey questionnaire. Kingsley Twum-Danso and Adrian Gordon of Westat programmed and administered the web survey.

Jeffrey Kerwin wrote the initial drafts of each factsheet and worked closely with Stephen Campbell to present the data in interesting and informative ways. Stephanie Shipp, Director of the Economic Assessment Office, ATP, reviewed all intermediate and final drafts. Lorel Wisniewski, ATP Deputy Director, and Kerry Levin at Westat reviewed the final versions of the factsheets.

1

Survey of ATP Applicants 2004: Methodology and Respondent Characteristics

This factsheet summarizes the methodology for the *Survey of ATP Applicants 2004*. Information is presented on survey development, data collection procedures, survey response rates, and characteristics of respondents. The 2004 survey provides a valuable update on similar data collected in the *Surveys of ATP Applicants 2000 and 2002*.

Survey Development

The survey methodology included web and mail surveys, followed by telephone prompting of those who did not initially respond. Nonawardees were asked to respond to a web survey, very similar to the data collection undertaken for the 2002 applicants. Awardees were asked to respond to a short mail survey on customer satisfaction issues.[1] ATP and Westat staff collaborated in developing the questionnaires. Virtually all companies applying for funding in the year 2004 award competition were included in the survey. A limited number of applicants were considered ineligible (e.g., companies that submitted incomplete proposals, companies that withdrew from awarded projects). Altogether, 934 applicants were eligible to respond to the survey, including 40 companies that were selected for an ATP award and 894 companies that were not selected for funding. The number of company applicants exceeds the number of project proposals submitted to ATP (873) because some ATP projects are joint ventures.

Data Collection

Data collection was carried out from January to May, 2006, about 15 to 18 months after awards from the 2004 ATP competition were announced. Following standard survey procedures, multiple contact attempts were made in order to maximize survey response rates. Advance letters describing the purpose of the survey were mailed to company contact persons identified in ATP records as the Principle Investigator for the 2004 ATP project proposal. For the web survey of Nonawardees, emails containing a link to the survey web site and unique login credentials were sent about one week after the advance letter. Additional emails were sent to nonresponding applicants about one, three, and five weeks after the initial email. For the mail survey of Awardees, questionnaires were mailed about one week after the advance letter, with a second mailing of the questionnaire to nonrespondents three weeks after the initial questionnaire mailing. For both Awardees and

[1] Additional data from Awardees shown in the factsheets were collected through ATP's Business Reporting System.

Nonawardees, Westat tried to contact nonresponding applicants by telephone to encourage response. Three Nonawardees ultimately responded to the survey over the telephone, rather than through the website. ATP staff did additional telephone follow-up for several nonresponding Awardees.

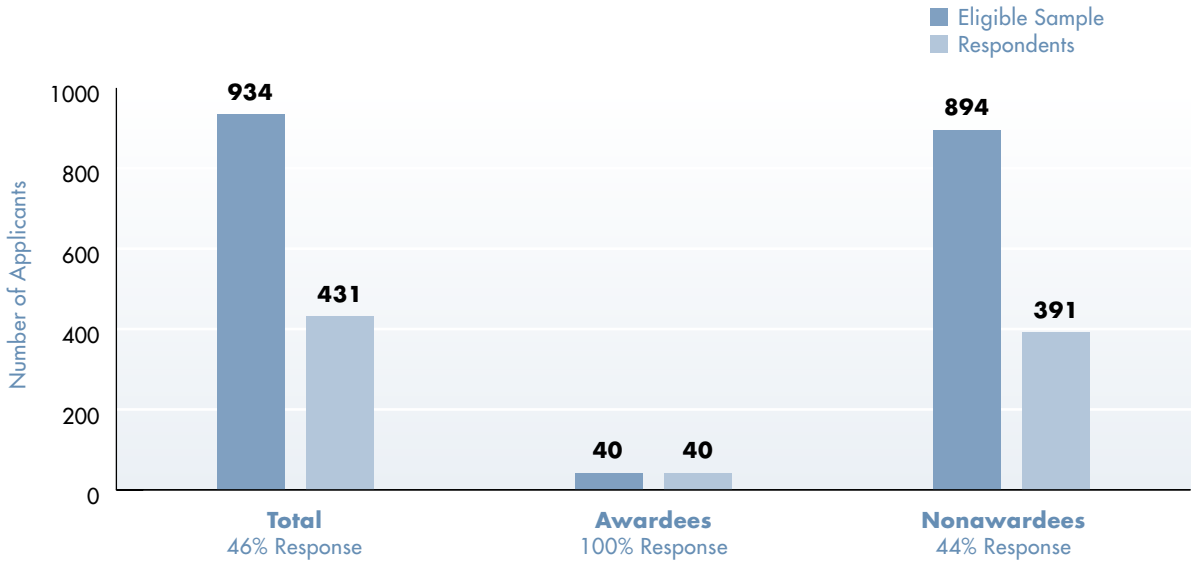
Survey Response Rates

Of 934 applicants eligible to respond, a total of 431 responses were received, for an overall response rate of 46%. Among the 40 ATP awardees invited to respond, 40 responses were received for a response rate of 100%. Of the 894 nonawardees, 391 responses were received, yielding a response rate of 44%. Figure 1 shows the number of eligible sample applicants and the number of survey respondents.

FIGURE 1

Number of ATP Applicants: Eligible Sample and Survey Respondents

Source: Survey of ATP Applicants 2004



Response Rate Comparisons

If companies that responded to the survey differed in some way from those that did not respond, these differences might create misleading survey results. To evaluate the possibility of nonresponse bias, response rates were compared for applicants in terms of the following characteristics:

- Single Company versus Joint Venture
- Company Size (small, medium, large)
- Technology Area (materials/chemistry, biotechnology, electronics, information technology)

These comparisons showed only small differences in response rates, suggesting little or no nonresponse bias in survey results related to the above characteristics.

Characteristics of Survey Respondents: Single Company versus Joint Venture

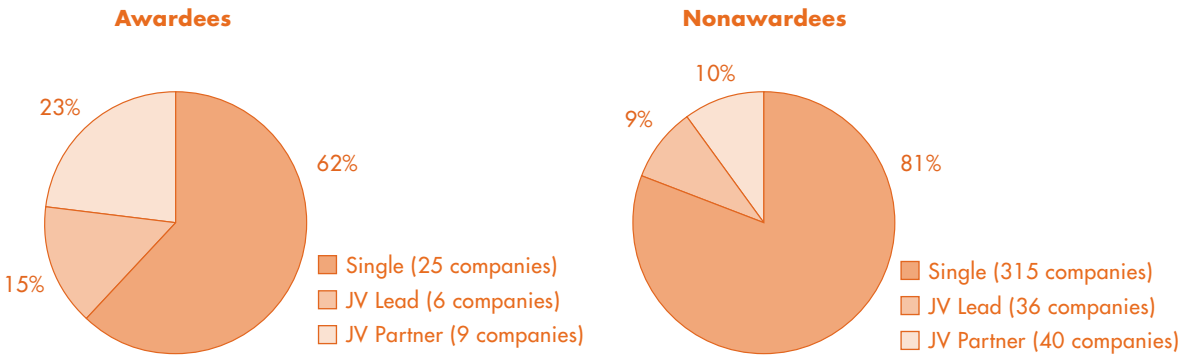
Figure 2 shows the distribution of survey respondents, for Awardees and Nonawardees, by Single Company versus Joint Venture applicant.

- Among Awardees, almost two-thirds were Single Company applicants and just over one-third were Joint Venture applicants. This distribution is very similar to Awardee respondents in the *Survey of ATP Applicants 2002*.
- Among Nonawardees, eight out of ten are Single Company applicants and two in ten is a Joint Venture applicant. A larger percent of Nonawardee respondents submitted Joint Venture proposals (19%) than was true for the year 2002 survey, when they constituted only one in ten Nonawardee respondents.

FIGURE 2

Distribution of Survey Respondents: Single Company versus Joint Venture Applicants

Source: Survey of ATP Applicants 2004



Characteristics of Survey Respondents: Company Size

Figure 3 shows the distribution of survey respondents, for Awardees and Nonawardees, by company size of applicant.[2]

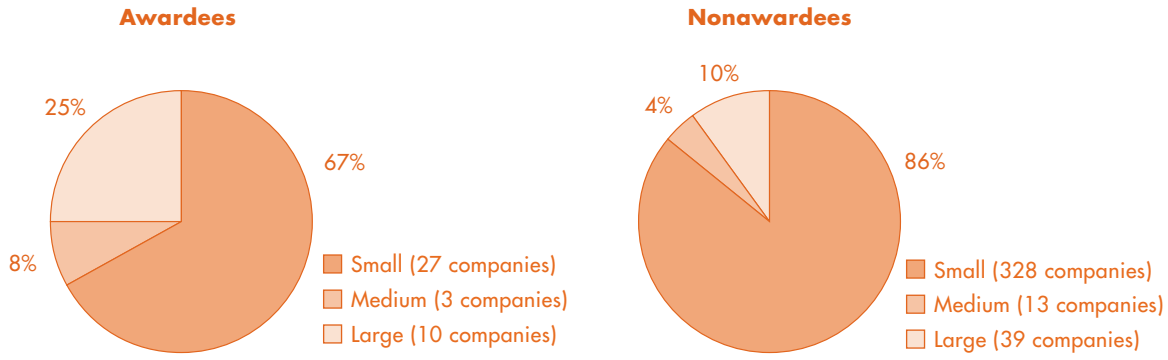
- Two-thirds of Awardees are Small Company applicants and one-third are either a Medium or Large Company applicant. This distribution is fairly similar to the Awardees in the year 2002 survey.
- Almost nine out of ten Nonawardees are Small Company applicants, and one in ten is a Medium or Large Company applicant. This distribution is fairly similar to the Nonawardees in the year 2002 survey.

[2] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium size companies are all others. Company size information was not available for 11 Nonawardees.

FIGURE 3

Distribution of Survey Respondents: Applicants by Company Size

Source: Survey of ATP Applicants 2004



Characteristics of Survey Respondents: ATP Technology Area

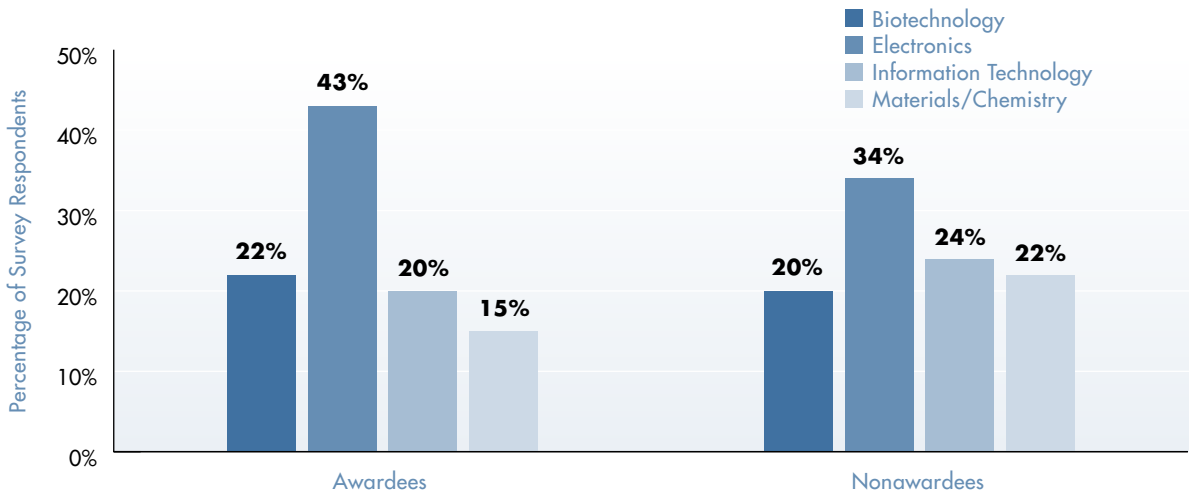
Figure 4 shows the distribution of survey respondents, for Awardees and Nonawardees, by technology area of applicant.

- Almost half of the Awardees (17 companies) were in Electronics, about one-quarter in Biotechnology (9 companies), one-fifth in Information Technology (8 companies), with the remaining 15% in Materials and Chemistry (6 companies). The distribution across technology areas is not significantly different from the year 2002 survey.
- Among Nonawardees, one-third (133 companies) were in Electronics, one-quarter (94 companies) in Information Technology, with slightly smaller proportions in Materials and Chemistry (86 companies) and Biotechnology (78 companies). The percentage of Nonawardee respondents in Electronics is greater than it was for the *Survey of ATP Applicants 2002*. The percentage of Nonawardees in the Materials/Chemistry area is lower than it was in the previous survey.

FIGURE 4

Distribution of Survey Respondents: Applicants by Technology Area

Source: Survey of ATP Applicants 2004



2

Descriptive Statistics for ATP Applicants: Company Size and R&D Effort

This factsheet presents data on company size and level of Research and Development (R&D) effort for applicants to the Advanced Technology Program (ATP) in the 2004 competition. The information is based on responses to the *Survey of ATP Applicants 2004*. The survey collected information on the number of employees and total revenues for the company, and the number of R&D employees and the R&D budget for the company unit applying to ATP.

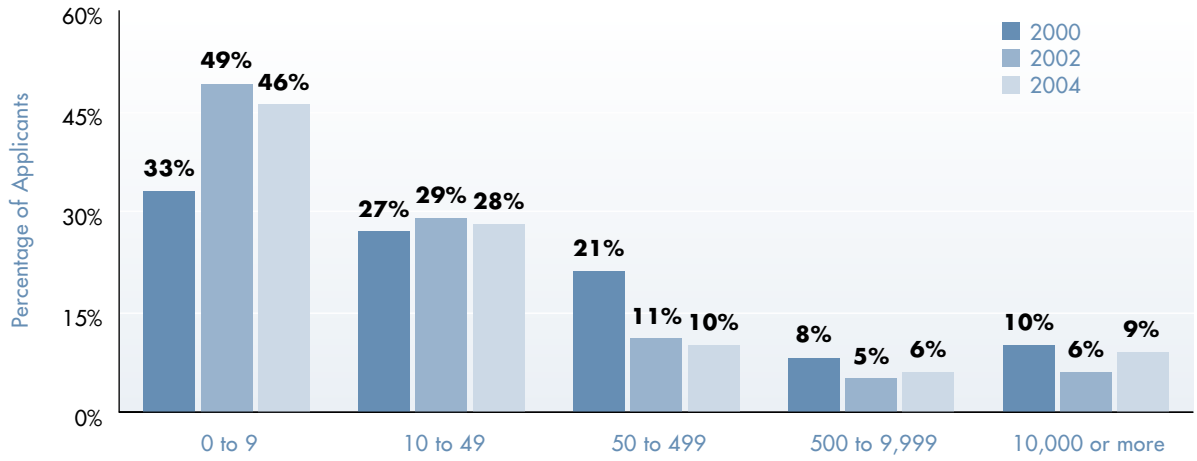
Total Number of Employees

- Most companies applying to ATP are small companies.[1] For 2004, 46% of the applicants had fewer than 10 employees, and another 28% had 10 to 49 employees. Only 15 percent had 500 employees or more (See Figure 1).
- More very small companies (0 to 9 employees) applied to ATP in 2002 and 2004 compared to 2000.

FIGURE 1

Number of Employees among Year 2000, 2002, and 2004 ATP Applicants

Source: Surveys of ATP Applicants 2000, 2002, 2004



[1] For ATP, small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium size companies are all others.

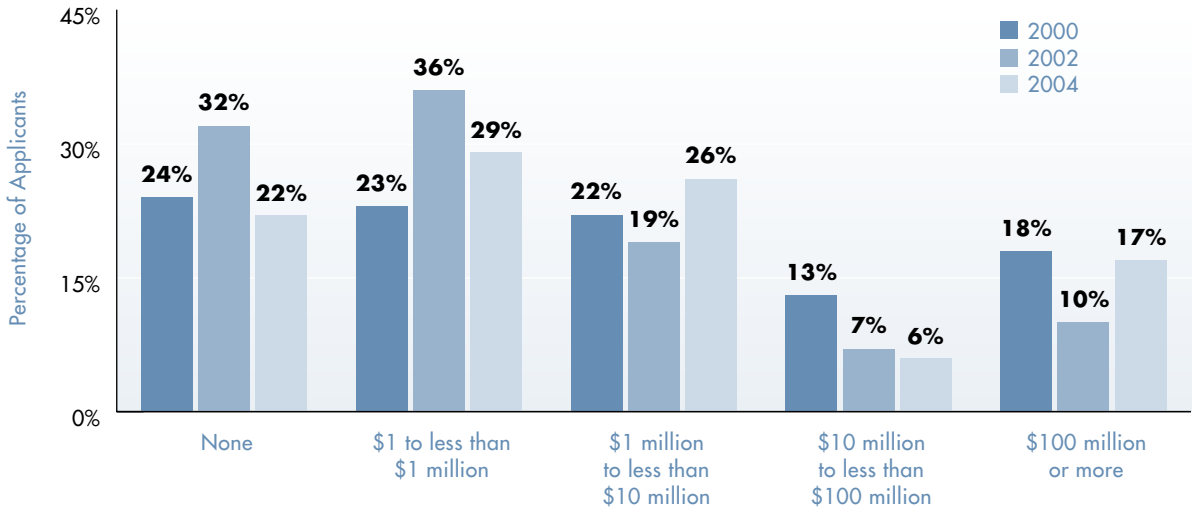
Total Company Revenues

- Compared with applicants in 2002, the share of ATP applicants in 2004 with no company revenue was smaller (32 vs. 22%, respectively), and the share with company revenue of $100 million or more was larger (10% vs. 17%, respectively). See Figure 2.

FIGURE 2

Company Revenue among Year 2000, 2002, and 2004 ATP Applicants

Source: Surveys of ATP Applicants 2000, 2002, 2004



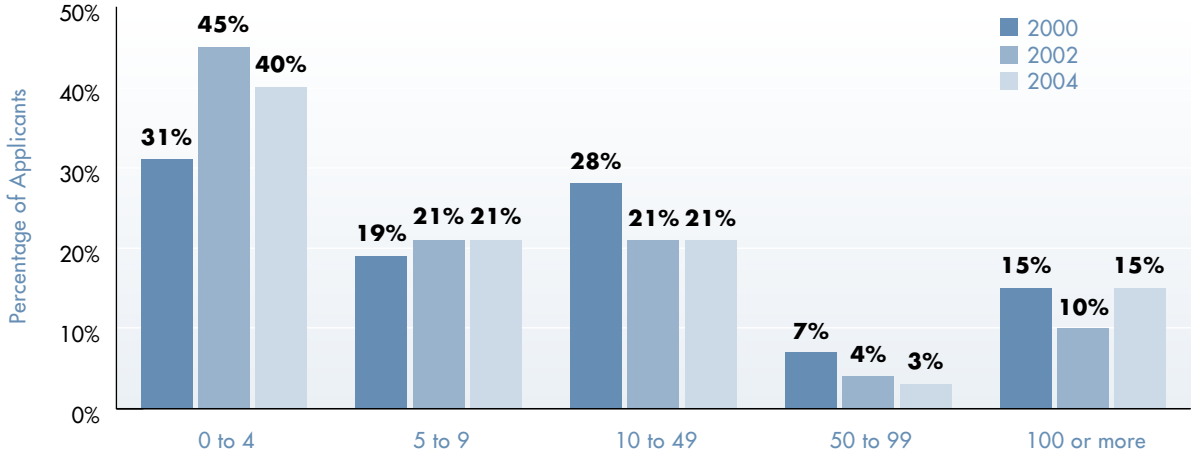
R&D Employees

- The distributions of ATP applicants with the smallest and largest number of employees changed between 2002 and 2004. The share of ATP applicants with fewer than 5 employees working in R&D (at the survey respondent's location) declined from 45% to 40%, while the share of applicants with 100 or more R&D employees rose from 10% to 15% (See Figure 3).

FIGURE 3

Number of R&D Employees among Year 2000, 2002, and 2004 Applicants

Source: Surveys of ATP Applicants 2000, 2002, 2004



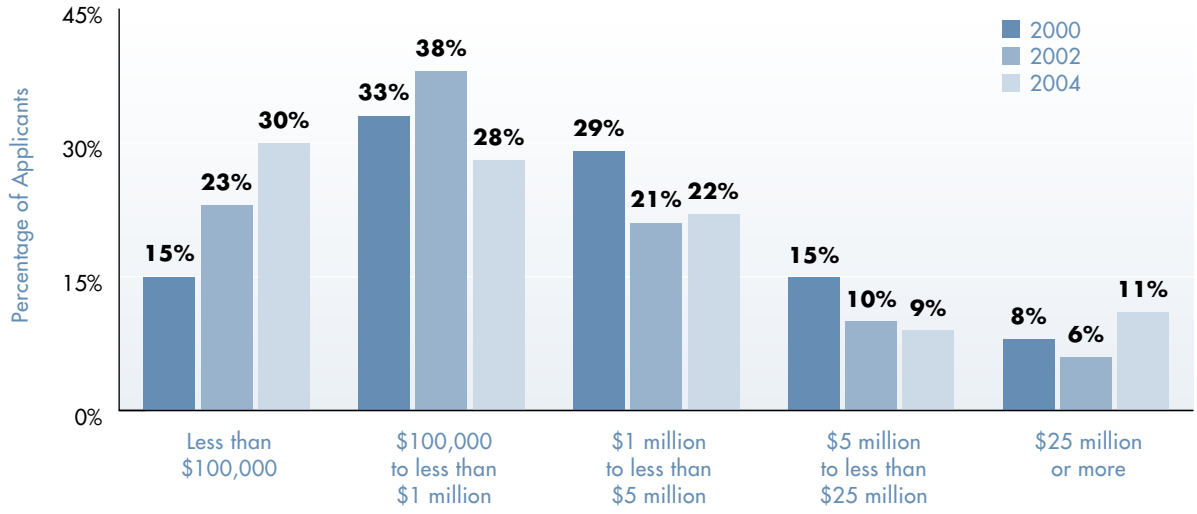
R&D Budget

- Almost 6 in 10 applicants (58%) in the year 2004 competition had R&D budgets of less than $1 million. The shares of ATP applicants with very small R&D budgets (less than $100,000) and very large R&D budgets ($25 million or more) increased from 2002 to 2004 (See Figure 4).

FIGURE 4

R&D Budget among Year 2000, 2002, and 2004 ATP Applicants

Source: Surveys of ATP Applicants 2000, 2002, 2004



3

ATP Funds High Risk and Long Term R&D Projects

Innovative early-stage research and development (R&D) may carry high technical risk, with a long time horizon to potential commercial benefit. Companies may not be able to fund early-stage R&D on their own or through traditional sources of external funding. Through its cost-shared funding, the Advanced Technology Program (ATP) helps companies that meet the ATP selection criteria pursue high-risk long-term R&D.

Evidence from the *Survey of ATP Applicants 2004* shows that ATP is successful in directing funding awards to R&D projects that have higher technical risk and longer time horizons than "typical" R&D projects.

A measure of technical risk is the probability that a project will not fully achieve its technical goals. Respondents were asked to estimate this probability, both for minimal and maximal technical goals. They were also asked to estimate this probability for a "typical" R&D project in their company.

Technical Risk of Proposed ATP Projects and Typical Company Projects

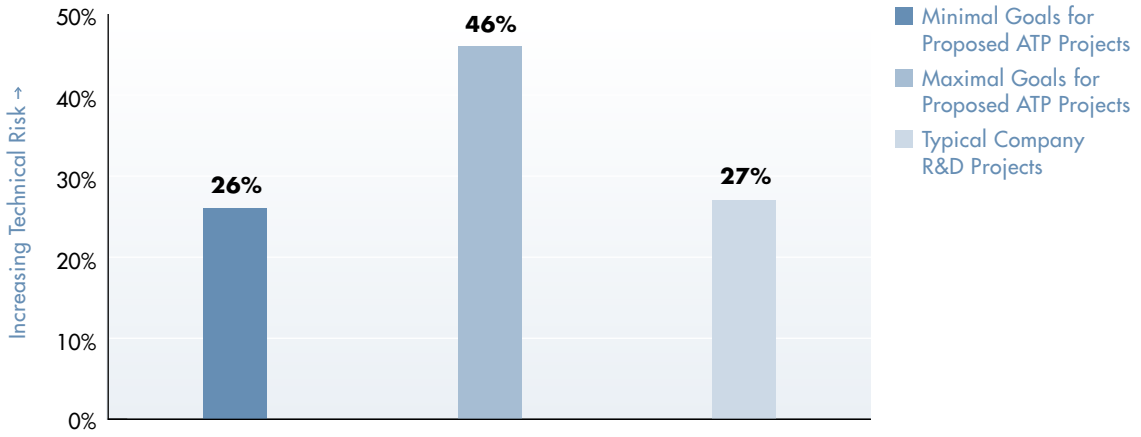
- ATP applicants, on average, estimate the probability of *not* fully achieving the minimal technical goals of their proposed projects to be 26%. The average estimate of risk for maximal "stretch" goals is 46%. For typical company projects, the average applicant estimates the risk of not achieving *all* of their technical goals to be 27% (See Figure 1).
- Awardees estimate a greater degree of risk than do Nonawardees for both the minimal and maximal goals of their proposed projects. The two groups also differ with respect to the technical risk of typical company R&D projects (See Table 1).
- Joint Venture applicants estimate higher levels of technical risk than do Single Company applicants. This is true for minimal and maximal goals of the projects they proposed to ATP, as well as their typical company R&D projects (See Table 1).

- Large and Medium size companies estimate greater technical risk than do Small companies.[1] This is true for minimal and maximal goals of proposed ATP projects, and their typical R&D projects (See Table 1).
- Biotechnology companies estimate higher levels of technical risk for the minimal and maximal goals of proposed projects, and Information Technology companies estimate lower levels, relative to companies in the Materials/Chemistry and Electronics areas. With respect to typical company R&D projects, Biotechnology and Materials/Chemistry companies estimate a greater degree of technical risk than do Electronics and Information Technology companies (See Table 1).

FIGURE 1

Mean Estimates of Technical Risk for Minimal Goals, Maximal Goals, and Typical Company R&D Projects

Source: Survey of ATP Applicants 2004



Note: Technical risk is the probability from 0 to 100%, that a project will not fully achieve technical goals. Data shown are mean levels of technical risk as estimated by survey respondents.

[1] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium size companies are all others.

TABLE 1

Estimates of Technical Risk for Minimal Goals, Maximal Goals, and Typical Company R&D Projects, By Applicant Type

Source: Survey of ATP Applicants 2004

	Applicants		Project Type		Company Size		Technology Area			
	Awardees	Nonawardees	Single Company Applicants	Joint Venture Applicants	Small Companies	Large/Medium Companies	Biotechnology	Materials & Chemistry	Electronics	Information Technology
Technical Risk of Proposed ATP Project: Minimal Technical Goals										
75th Percentile	50%	40%	40%	50%	40%	50%	50%	40%	40%	25%
Median	30%	20%	20%	25%	20%	25%	40%	20%	23%	15%
25th Percentile	20%	10%	10%	17%	10%	20%	10%	5%	10%	5%
Technical Risk of Proposed ATP Project: Maximal Technical Goals										
75th Percentile	75%	70%	70%	70%	70%	75%	78%	66%	70%	55%
Median	60%	50%	40%	50%	40%	55%	55%	50%	50%	40%
25th Percentile	40%	20%	20%	40%	20%	50%	30%	20%	25%	20%
Technical Risk of Typical R&D Project at Company										
75th Percentile	40%	40%	35%	50%	30%	50%	50%	50%	33%	30%
Median	25%	20%	20%	25%	20%	35%	25%	25%	20%	20%
25th Percentile	20%	10%	10%	20%	10%	20%	20%	10%	10%	10%

Note: Technical risk is the probability from 0 to 100%, that a project will not fully achieve technical goals. Data shown are mean levels of technical risk as estimated by survey respondents.

A measure of time horizon is the expected number of years from start of project to first impact on company revenues. Respondents were asked to estimate the time to first revenue impact, for both their proposed ATP project and a "typical" R&D project at their company.

Time Horizon of Proposed and Typical R&D Projects

- The anticipated time horizon for projects proposed to ATP tends to be longer than that for typical R&D projects. For example, only 9% of the projects proposed to ATP in 2004 have a time horizon of 1 year or less. This compares to 21% for the typical R&D projects at the applicant companies. In addition, 40% of proposed projects have time horizons of 4 years or more, compared to 30% of typical R&D projects (See Figure 2).
- The proposed projects of Awardees tend to have longer time horizons than those proposed by Nonawardees. However, the two groups do not vary significantly with respect to the time horizon of their typical R&D projects (See Table 2).
- Projects proposed as Joint Ventures generally have longer time horizons than do projects proposed by Single Company applicants. The two groups also vary with regard to the time horizon of their typical projects (See Table 2).
- The projects of Large and Medium size companies (both proposed and typical) generally have longer time horizons than do projects conducted by Small companies (See Table 2).
- The projects of Biotechnology companies (both proposed and typical) usually have longer time horizons than the projects of companies in other ATP technology areas (See Table 2).

FIGURE 2

Time Horizons for Projects Proposed to ATP and Typical R&D Projects

Source: Survey of ATP Applicants 2004

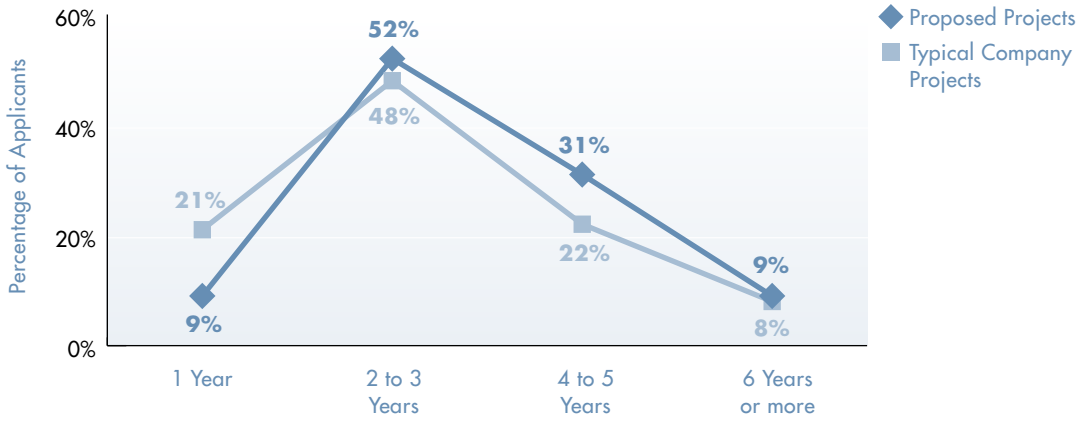


TABLE 2

Anticipated Time Horizons of Proposed and Typical Company R&D Projects, By Applicant Type

Source: Survey of ATP Applicants 2004

	Applicants		Project Type		Company Size		Technology Area			
	Awardees	Nonawardees	Single Company Applicants	Joint Venture Applicants	Small Companies	Large/Medium Companies	Biotechnology	Materials & Chemistry	Electronics	Information Technology
Time Horizon of Proposed ATP										
1 Year	7%	10%	2%	12%	4%	11%	9%	11%	7%	13%
2 - 3 Years	39%	53%	37%	56%	32%	56%	40%	48%	57%	58%
4 - 5 Years	39%	30%	45%	27%	44%	28%	33%	29%	31%	29%
6 Years or more	15%	7%	16%	6%	19%	5%	17%	12%	5%	0%
Time Horizon of Typical R&D										
1 Year	27%	20%	18%	22%	14%	23%	8%	19%	21%	34%
2 - 3 Years	32%	50%	39%	51%	42%	50%	49%	42%	51%	48%
4 - 5 Years	27%	22%	31%	20%	31%	20%	28%	33%	17%	17%
6 Years or more	15%	8%	11%	8%	14%	7%	15%	7%	10%	1%

4

Why Do Companies Apply for ATP Funding?

The Advanced Technology Program (ATP) fosters innovation in the United States by partnering with industry to support high-risk Research and Development (R&D) with great potential for broad-based economic benefit. ATP also encourages R&D collaboration among companies and other organizations. The *Survey of ATP Applicants 2004* collected information on factors that are important to companies in their decision to apply to ATP.

Nonawardee respondents were asked to indicate the importance of a number of factors in reaching their decision to apply for ATP funding.[1] The factors can be grouped as follows:

a. ATP helps overcome unavailability of internal company funding, or dependence of internal funding on external funding support

b. ATP funding provides external validation for the technological or commercial potential of the R&D project

c. ATP funding facilitates R&D collaboration among different organizations

Most applicants not awarded ATP funding indicate that unavailability of internal company funding, or dependence of internal funding on receiving external support, are important factors in their decision to apply to ATP

- **Internal company funding for high risk R&D is not available.** Almost 9 out of 10 Nonawardees indicate that this was important in their decision to apply to ATP[2] (See Figure 1). This is very similar to what was found for the year 2002 Nonawardees.
- **Internal company funding and company commitment to the project depend on receiving external funding.** Almost four out of five (78%) Nonawardees indicate this was important in their decision to apply, somewhat greater than what was found for the year 2002 Nonawardees, when 73% indicated this was important in the decision.

[1] In the 2000 and 2002 Surveys of ATP Applicants, these questions were asked of Awardees as well.

[2] We have combined the response categories "extremely important" and "very important" for ease of reporting.

Applicants not awarded funding generally indicate that external validation of the technological or commercial potential of the R&D project was an important factor in their decision to apply to ATP

- **ATP funding provides external validation of the *technological* potential of the project.** More than two out of three (67%) of Nonawardees indicate this was important in their decision to apply to ATP. This is higher than what was found for the year 2002 Nonawardees (56%).
- **ATP funding provides external validation of the *commercial* potential of the project.** Over half (52%) of Nonawardee applicants indicate this was important in their decision. This is about the same as was found for the 2002 Nonawardees.

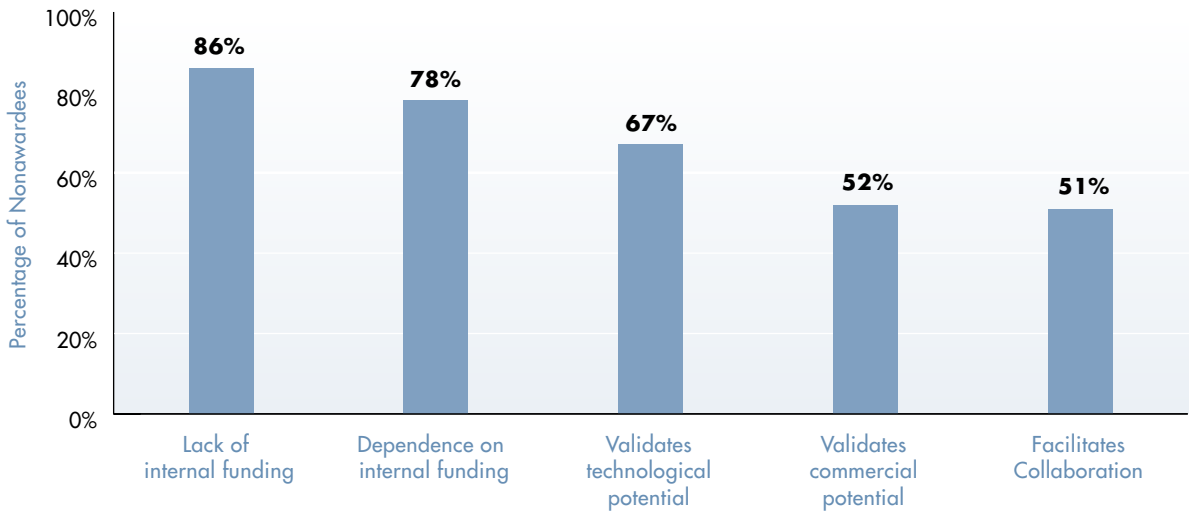
Half of the ATP applicants not awarded funding indicate fostering R&D collaboration among different organizations was an important factor in their decision to apply to ATP

- **ATP funding facilitates collaborations among different organizations.** Over half (51%) of Nonawardees indicate this was important in their decision to apply to ATP, a higher percentage than was found for the year 2002 Nonawardees.

FIGURE 1

Importance of Factors for Why Companies Apply to ATP

Source: Survey of ATP Applicants 2004. Data collected from Nonawardees only.



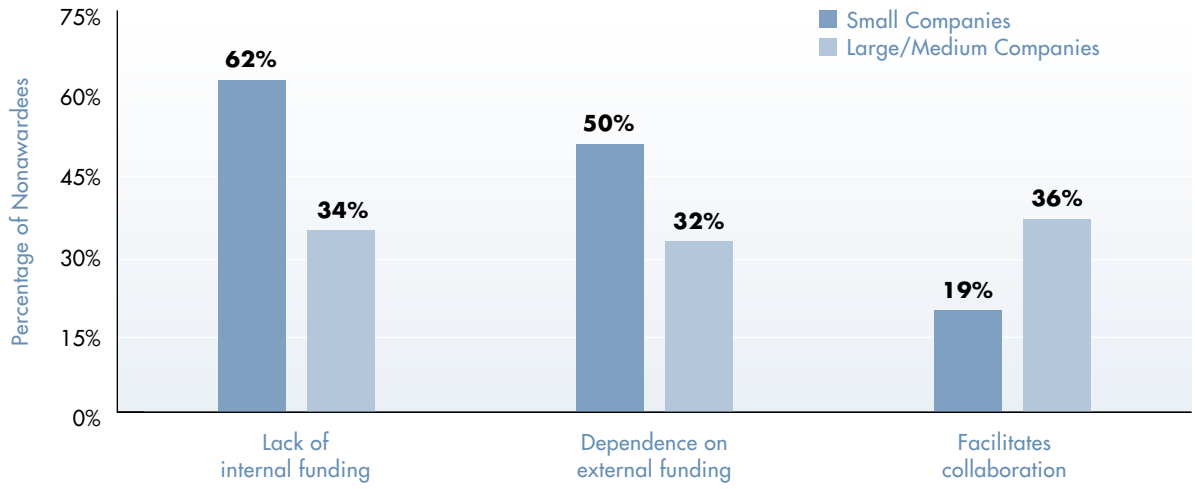
Small companies, relative to larger companies, are more likely to view the need for external R&D funding as an important factor in their decision to apply to ATP. Large and medium companies are more likely to view the ATP's facilitation of collaboration as being important.

- Small companies are almost twice as likely as larger companies to point to the lack of available internal funding as being "extremely important" in their decision to apply to ATP[3] (See Figure 2).
- Small companies are also much more likely than larger companies to indicate that external funding was an "extremely important" factor for obtaining internal company funding and commitment to the project (See Figure 2).
- Large and Medium companies are much more likely than smaller companies to indicate that ATP funding was an "extremely important" factor for facilitating collaboration among different organizations (See Figure 2).

FIGURE 2

Importance of Factors for Why Companies Apply to ATP: Small versus Larger Companies

Source: Survey of ATP Applicants 2004. Data collected from Nonawardees only.



Note: Data shown represent percentages of groups reporting each factor as being "extremely important" in their decision to apply for ATP funding.

[3] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium size companies are all others.

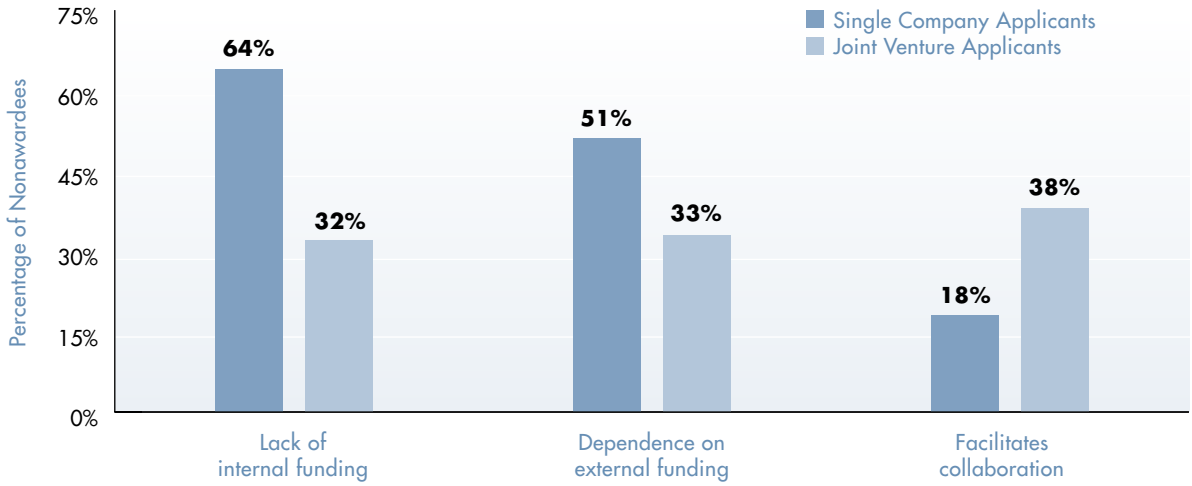
Among Nonawardees, single Company applicants are more likely to emphasize the need for external R&D funding as a factor for applying to ATP, while Joint Venture[4] applicants are more likely to emphasize the facilitation of collaboration among organizations.

- About two-thirds of Single Company applicants indicate that unavailability of internal company funding was "extremely important" in their decision to apply to ATP, compared to about one-third of Joint Venture applicants (See Figure 3).
- Single company applicants are also much more likely than Joint Venture applicants to indicate that an "extremely important" factor in their decision was that external funding was needed in order to obtain internal company funding and commitment to the project (See Figure 3).
- About two out of five (38%) of Joint Venture applicants indicate that facilitating collaboration among different organizations was "extremely important" in their decision to apply, compared to 18% of Single Company applicants (See Figure 3).

FIGURE 3

Importance of Factors for Why Companies Apply to ATP: Single Company versus Joint Venture Applicants[4]

Source: Survey of ATP Applicants 2004. Data collected from Nonawardees only.



Note: Data shown represent percentages of groups reporting each factor as being "extremely important" in their decision to apply for ATP funding.

[4] A joint venture is a project with at least two for-profit companies who lead the project. Other companies, universities, or federal labs may be part of the joint venture as partners or subcontractors. Joint ventures are required to contribute at least 50% of the total project costs.

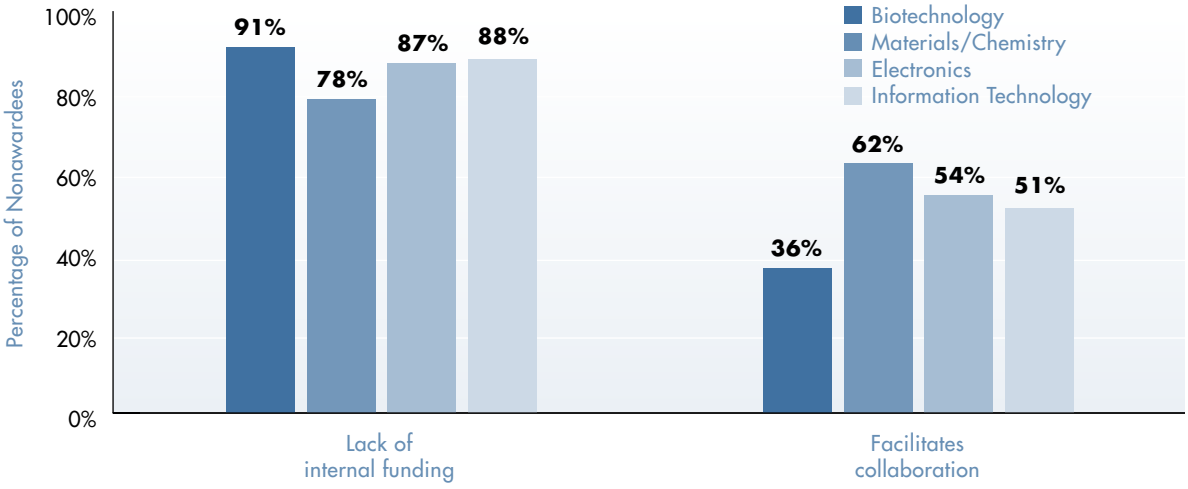
Nonawardee companies in the Materials and Chemistry technology area are less likely than companies in other technical areas to emphasize the lack of internal funding. Biotechnology companies are less likely to emphasize the facilitation of collaboration.

- Almost four out of five (78%) of Materials/Chemistry companies indicate that a lack of internal funding was important in the decision to apply for ATP funding – compared to 87% to 91% of companies in other ATP technology areas (See Figure 4).
- More than one out of three (36%) of Biotechnology companies indicate that facilitation of collaboration among organizations was important in their decision to apply to ATP – compared to 51% to 62% of companies in other ATP technology areas (See Figure 4).

FIGURE 4

Importance of Factors for Why Companies Apply to ATP: By ATP Technology Area

Source: Survey of ATP Applicants 2004. Data collected from Nonawardees only.



Note: Data shown represent percentages of groups reporting each factor as being either "extremely important" or "very important."

5

ATP Fosters New R&D Directions and Partnerships

Through its cost-shared funding, the Advanced Technology Program (ATP) encourages companies to pursue new research directions that have the potential to lead to path-breaking technologies. ATP also encourages Research and Development (R&D) collaborations among companies and with other organizations to encourage infrastructural technical change across an industry and to address technology challenges that are larger than one company could address alone. Evidence from the *Survey of ATP Applicants 2004* shows that ATP is successfully fostering new directions and partnerships.

Respondents were asked to estimate the extent to which their proposed project represented a new R&D direction for:

a. their company

b. their industry or technology field

Respondents were asked to estimate the extent to which their proposed project fostered:

a. new research ties or contacts with individuals at other organizations

b. new company research partnerships with other organizations

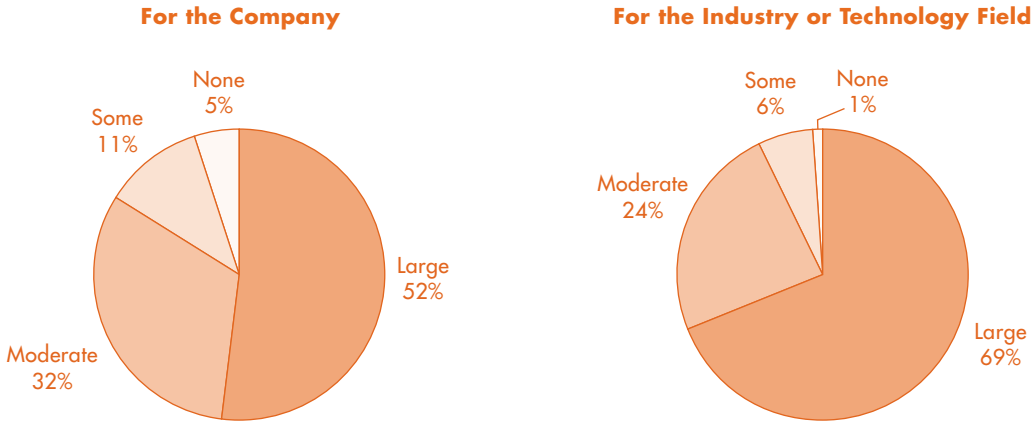
Nearly all ATP applicants report their proposed project represented a new R&D direction for their industry or technology field

- 84% of applicants say their project was a new direction for their company (See Figure 1).[1] This is similar to what was found for the year 2002 applicants.
- 93% of applicants say their project was a new direction for their industry or technology field, with three-fourths of them saying to a large extent. This is also similar to what was reported for the year 2002 applicants.

[1] We have combined the response categories "large extent" and "moderate extent" for ease of reporting.

FIGURE 1

Extent to which Proposed ATP Project Represents a New R&D Direction:
Source: Survey of ATP Applicants 2004

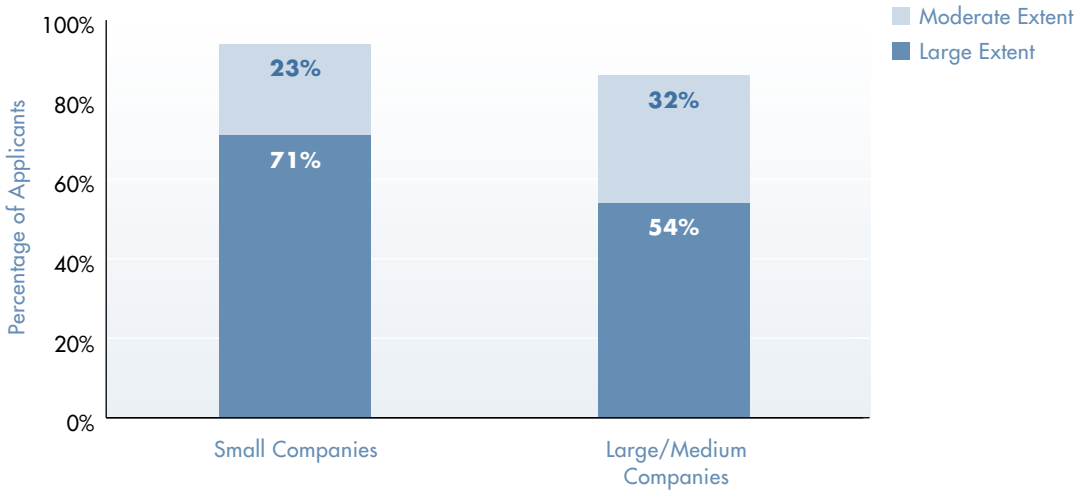


Small companies are more likely than larger companies to view their proposed ATP project as a new R&D direction for their industry or technology field[2]

- 94% of Small company applicants say their project was a new direction for their industry or technology field, compared to 86% for Large and Medium size companies (See Figure 2). Small companies are more likely to report that the proposed ATP project was a new direction "to a large extent."

FIGURE 2

Extent to which Proposed ATP Project Represents a New R&D Direction for the Industry or Technology Field: Small Companies versus Large/Medium Companies
Source: Survey of ATP Applicants 2004



[2] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium size companies are all others.

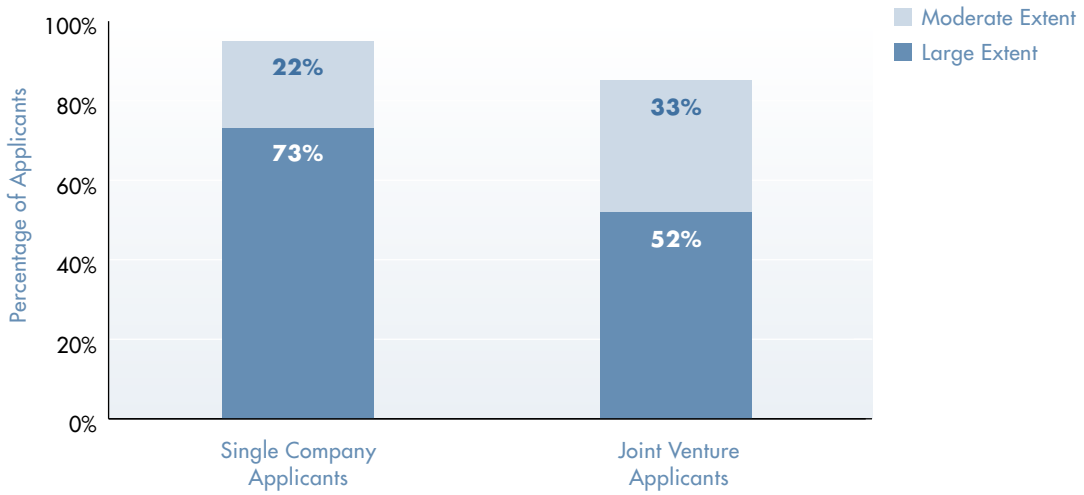
Single company applicants are more likely than Joint Venture applicants to view their proposed ATP project as a new R&D direction for their industry or technology field

- 95% of Single company applicants say their project was a new direction for their industry or technology field, compared to 85% for Joint Venture applicants (See Figure 3). Single companies are more likely to report that the proposed ATP project was a new direction "to a large extent."

FIGURE 3

Extent to which Proposed ATP Project Represents a New R&D Direction for the Industry or Technology Field: Single Company versus Joint Venture Applicants

Source: Survey of ATP Applicants 2004

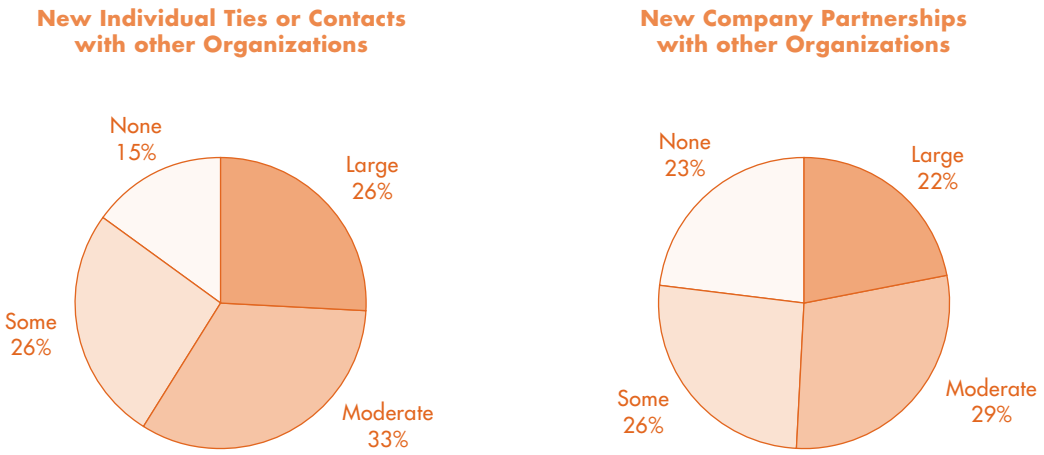


Over half of ATP applicants report their project proposal fostered new research ties with individuals in other organizations or new company partnerships

- 59% of ATP applicants say their project proposal fostered new individual ties or contacts to a moderate or large extent (See Figure 4).
- 51% of ATP applicants say their project proposal fostered new company partnerships with other organizations to a moderate or large extent.
- Both findings are lower than the levels found for the year 2002 ATP applicants. In 2002, 68% of the applicants reported that their proposal fostered new individual ties, and 57% reported it fostered new company partnerships.

FIGURE 4

Extent to which ATP Project Proposal Fostered:
Source: Survey of ATP Applicants 2004



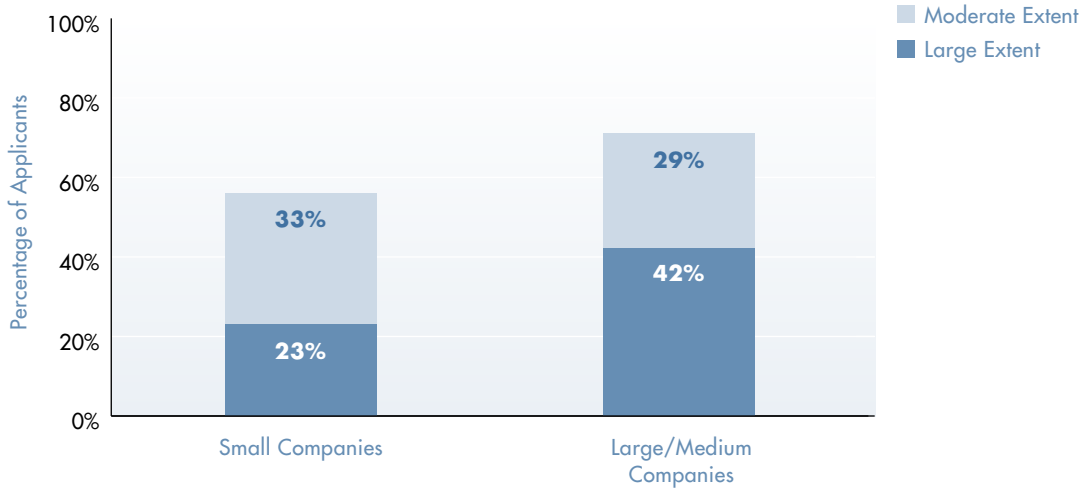
Large/Medium sized companies are more likely than small companies to report their ATP project proposal fostered new research ties with individuals in other organizations

- 71% of applicants in Large and Medium companies say their project proposal fostered new individual research ties or contacts, compared to 56% for Small company applicants (See Figure 5). Large/Medium companies are almost twice as likely as small companies to view their proposal as having fostered these research ties "to a large extent."

FIGURE 5

Extent to which Proposed ATP Project Proposal Fostered New Individual Ties or Contacts: Small Companies versus Large/Medium Companies

Source: Survey of ATP Applicants 2004



Joint Venture applicants are more likely than Single companies to report their ATP project proposal fostered new research ties with individuals in other organizations and new company research partnerships

- 77% of Joint Venture applicants say their project proposal fostered new individual research ties or contacts, compared to 54% of Single company applicants (See Figure 6). Joint Venture companies are almost twice as likely to report their proposal fostered these research ties "to a large extent."
- 68% of Joint Venture applicants say their project proposal fostered new company research partnerships, compared to 47% of Single company applicants (See Figure 7). Joint Venture companies more often report their proposal fostered these partnerships "to a large extent."

FIGURE 6

Extent to which Proposed ATP Project Proposal Fostered New Individual Ties or Contacts: Single Company versus Joint Venture Applicants

Source: Survey of ATP Applicants 2004

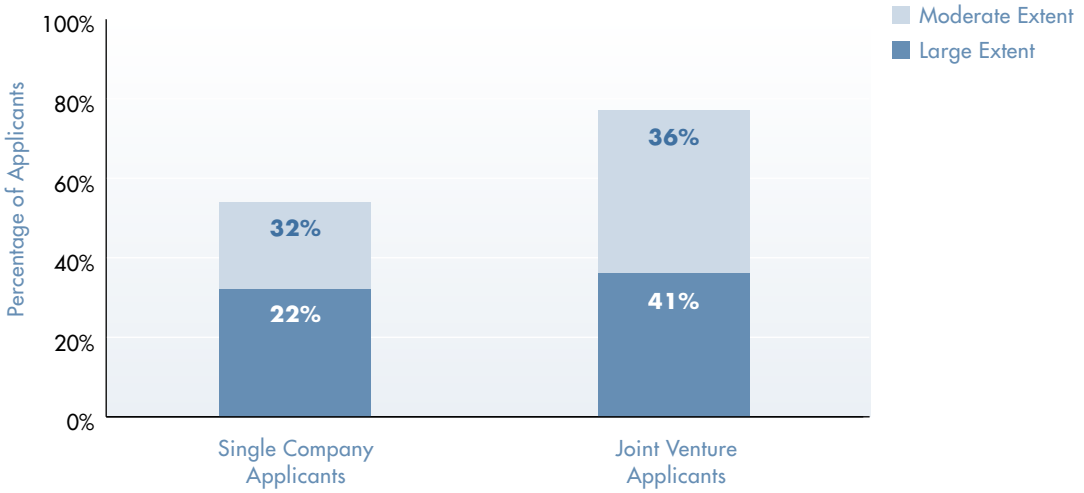
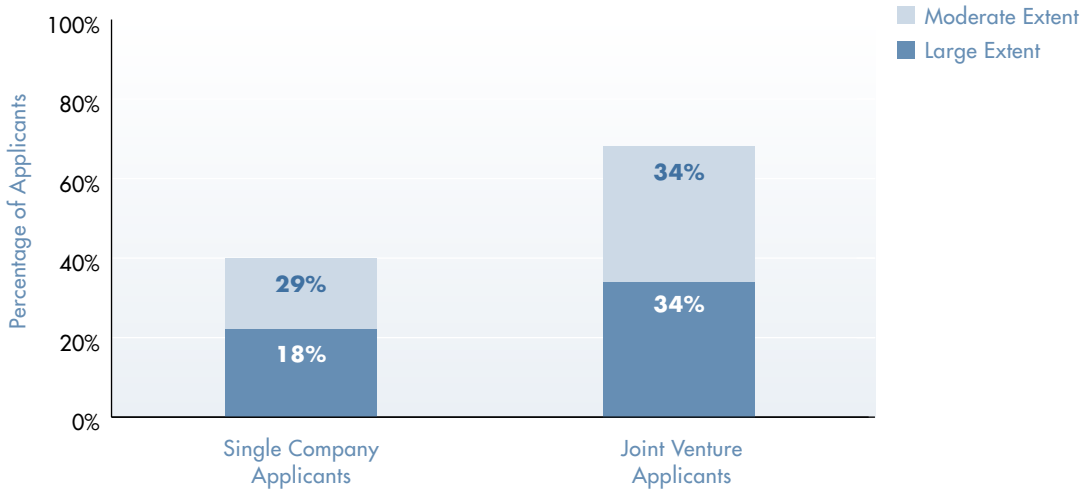


FIGURE 7

Extent to which Proposed ATP Project Proposal Fostered New Company Partnerships: Single Company versus Joint Venture Applicants

Source: Survey of ATP Applicants 2004



6

ATP Helps Companies Work with Universities

Research collaboration benefits both companies and universities. Universities contribute new ideas as well as fundamental research understanding. Companies provide an opportunity to shape innovative ideas into practical industrial applications. Through its cost-shared funding, the Advanced Technology Program (ATP) encourages research and development (R&D) collaboration among companies, and with other organizations such as universities, as a means to achieve broader or more complex R&D goals. Evidence from the *Survey of ATP Applicants 2004* shows that ATP fosters collaboration between companies and universities.

Respondents were asked to estimate:

a. to what extent their project was based on university research

b. to what extent they proposed project technology licensed from universities

Two-thirds of ATP applicants proposed projects that were based on university research.

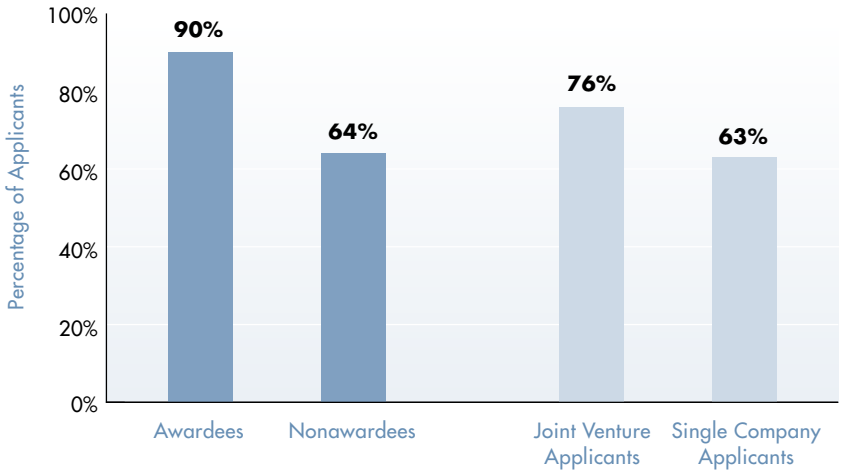
- Two out of three applicants proposed projects that were based on university research to at least some extent.[1] This distribution is similar to the distribution found for the year 2002 applicants.
- Awardees were more likely than Nonawardees to propose projects that were based on university research (See Figure 1).
- Joint Venture applicants were more likely than Single Company applicants to propose projects that were based on university research (See Figure 1).

[1] We have combined the response categories "Large extent," "Moderate extent," and "Some extent" for ease of reporting

FIGURE 1

ATP Applicants with Proposed Projects Based on University Research, by Awardee Status and Project Type

Source: Survey of ATP Applicants 2004



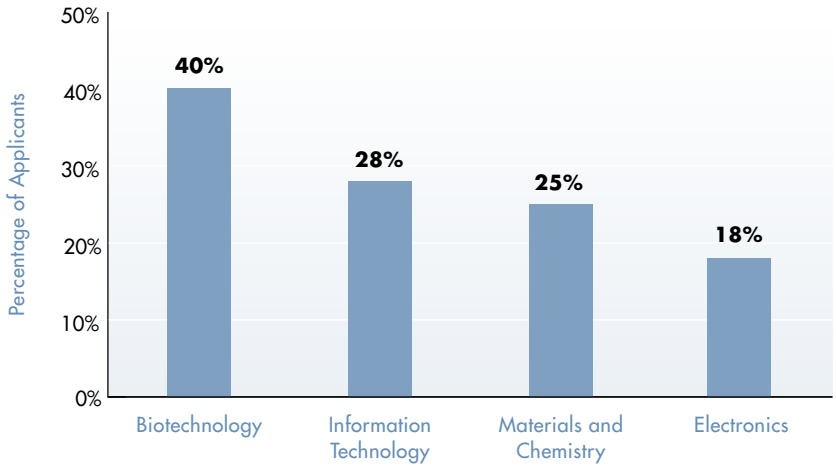
More than one in four ATP applicants proposed project technology licensed from universities.

- 27% of ATP applicants proposed project technology licensed from universities.
- Awardees (48%) were more likely than Nonawardees (25%) to propose project technology licensed from universities.
- Companies in the Biotechnology field were more likely than companies in other technology areas to propose project technology licensed from universities (See Figure 2).

FIGURE 2

ATP Applicants with Proposed Project Technology Licensed from Universities, by Technology Area

Source: Survey of ATP Applicants 2004



7

ATP Promotes Knowledge Dissemination

In order to accelerate innovative technology for broad national benefit, the Advanced Technology Program (ATP) seeks to fund projects that promote public benefits, knowledge creation, and knowledge dissemination. Evidence from the *Survey of ATP Applicants 2004* indicates that ATP fosters proposals with strong potential for broad diffusion of knowledge.

ATP applicants were asked to indicate how quickly they expected the following to become known to others outside their companies:[1]

a. Critical research findings from their proposed ATP project

b. Critical research "know-how" (i.e., knowledge gained from experience and practice) from the project

Most ATP applicants indicate that findings from their proposed project would be shared with others soon after the ATP project ends

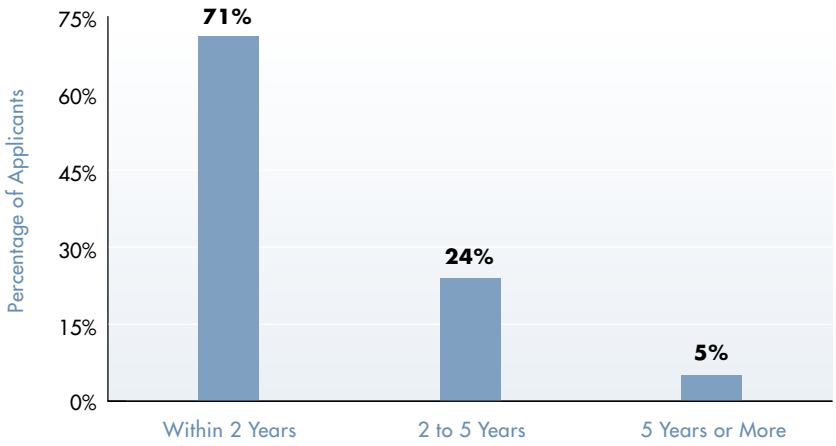
- 71% of applicants believe that critical research findings from their proposed projects would become known to others within two years after the ATP project ends. Another 24% believe it would occur between two and five years after the ATP project ends. The rest (5%) believe it will be five years or longer (See Figure 1).

[1] New questions asked starting in 2004.

FIGURE 1

Applicant Beliefs Regarding How Quickly After Project End Critical Research Findings Would Become Known to Others

Source: Survey of ATP Applicants 2004



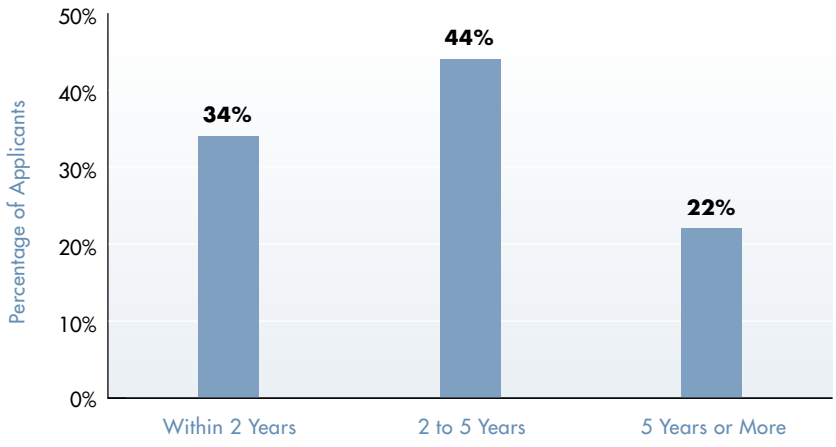
ATP considers research "know-how" to be knowledge gained from experience and practice that is less easily communicated than findings. Most ATP applicants indicate that this knowledge from their proposed project would be shared with others within five years after the project ends

- One-third of applicants believe that critical research "know-how" would become known to others within two years of project end. 44% say this information would become known between two and five years, while 22% say it would be 5 years or longer (See Figure 2).
- Research findings are disseminated more quickly than research know-how (Figure 1 versus Figure 2). Multivariate analysis indicated that ATP Awardees and projects with longer time horizons are more likely to have know-how disseminate more slowly than findings.

FIGURE 2

Applicant Beliefs Regarding How Quickly After Project End Critical Research "Know-how" Would Become Known to Others

Source: Survey of ATP Applicants 2004



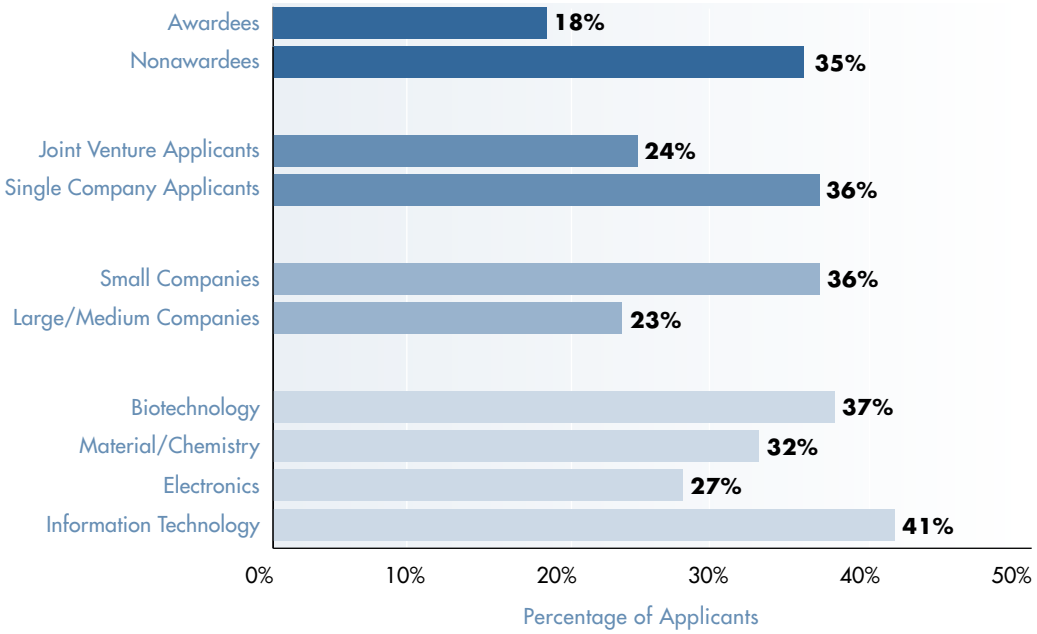
ATP Applicant groups vary in the extent to which they believe critical research "know-how" would be shared with others within two years of project end

- Nonawardees indicate that critical research "know-how" would be disseminated within two years of project end to a greater extent than do ATP Awardees (See Figure 3). Further analysis indicates that the speed of know-how diffusion is negatively correlated with time horizon and project risk. To the extent that ATP Awardees reflect projects with greater risk and longer times horizons, it is not surprising that Awardees will also reflect slower rates of know-how diffusion.
- More Single Company applicants believe that this knowledge would be shared within two years, as compared to Joint Venture applicants (See Figure 3).
- Small company applicants believe such knowledge would be shared within two years to a greater extent than applicants in Large/Medium size companies[2] (See Figure 3).
- Applicants in the Information Technology area are relatively likely to say this knowledge will be shared within two years. Applicants in the Electronics area are less likely to do so (See Figure 3).

FIGURE 3

Percentage Reporting that Critical Research "Know-how" Would be Disseminated Within Two Years of Project End, By Applicant Type

Source: Survey of ATP Applicants 2004



[2] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium size companies are all others.

8

Anticipated Impact of Technologies Proposed to ATP

The Advanced Technology Program (ATP) encourages companies to pursue early-stage high-risk research. In particular, ATP helps to fund research the program believes to have the potential for broad-based economic benefit, in addition to the benefits expected for the company. The *Survey of ATP Applicants 2004* shows that project technologies proposed to ATP are believed by applicants to have high potential benefits to the users or consumers of these technologies, relative to the anticipated company benefits.

Respondents were asked to estimate:

a. The additional investment their company would need to make in order to commercialize their proposed ATP project technology

b. The net effect of this technology on their company's annual revenues (two years and five years after proposed project end)

c. The gross profit margin on product sales expected to result from the proposed technology

d. The annual company cost savings anticipated from process improvements resulting from the technology (two years and five years after proposed project end)

e. The annual royalties anticipated from licensing the technology to others (two years and five years after proposed project end)

f. The net benefits to downstream industry users or consumers that would result from the proposed technology (two years and five years after proposed project end)

Applicants' Expectations of Benefits from their Proposed ATP Technologies

- Almost all (94%) of the year 2004 ATP applicants expect a positive net impact on annual revenues to occur from their proposed technologies within five years of project end.
- Almost (44%) of the applicants anticipate cost savings to occur from their proposed technologies within five years of project end.
- Just over two-thirds (69%) of the applicants expect annual royalties from their proposed technologies to benefit the company within five years of project end.
- Almost all (96%) of the applicants expect that downstream industry users or consumers of their proposed technologies will receive a net benefit within five years of project end.

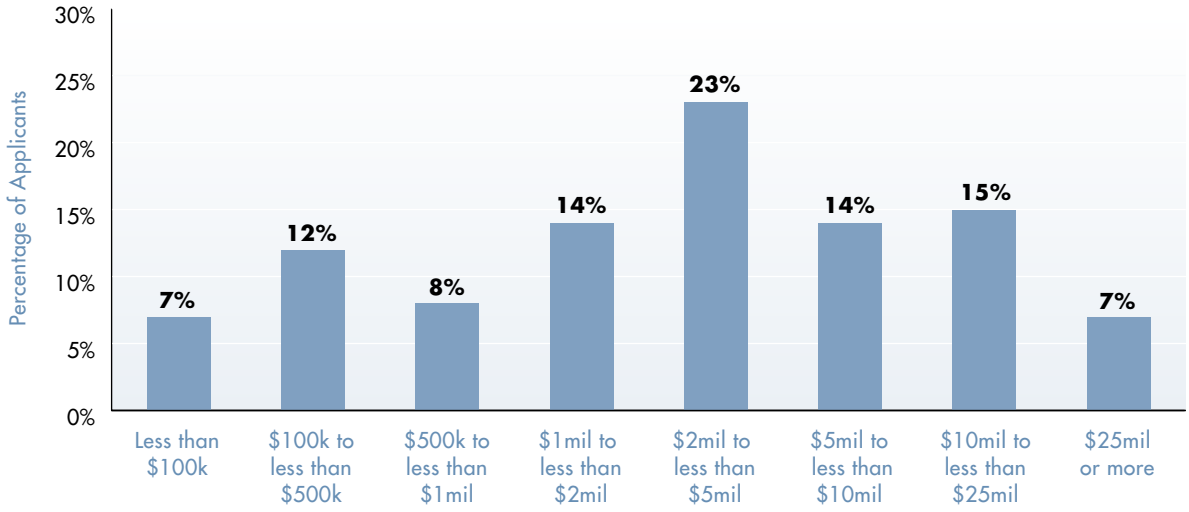
Additional Investment Needed for Commercialization of Proposed ATP Project Technologies

- The median ATP applicant anticipates an additional investment of $2 million would be needed in order for their company to commercialize the technology proposed to ATP.
- Figure 1 shows the distribution of additional investment needed, as estimated by applicants. About a quarter of applicants estimate they would need $1 million or less. Over one-third estimate that $5 million or more would be necessary.
- Awardees estimate higher levels of additional investment would be needed, relative to Nonawardees (See Table 1). Large and Medium size companies expect higher levels than Small companies.[1] Biotechnology companies estimate more additional investment, relative to companies in other ATP technology areas.

FIGURE 1

Estimated Additional Investment Needed for Commercialization of Proposed ATP Project Technology

Source: Survey of ATP Applicants 2004



[1] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium size companies are all others.

TABLE 1

Estimated Additional Investment Needed for Commercialization of Proposed ATP Project Technology, By Applicant Type

Source: Survey of ATP Applicants 2004

	Applicants		Project Type		Company Size		Technology Area			
	Awardees	Nonawardees	Single Company Applicants	Joint Venture Applicants	Small Companies	Large/Medium Companies	Biotechnology	Materials & Chemistry	Electronics	Information Technology
75th Percentile	$15m	$5m	$5m	$10m	$5m	$10m	$10m	$5m	$8m	$4m
Median	$5m	$2m	$2m	$2m	$2m	$5m	$5m	$2m	$3m	$1m
25th Percentile	$2m	$550k	$750k	$500k	$600k	$1.5m	$2m	$500k	$1m	$500k

Anticipated Net Effect on Annual Company Revenues

- The median ATP applicant anticipates that two years after the proposed project ends, the technology would have a net effect of $1 million on their company's annual revenues. The median applicant estimates this effect would be $12 million after five years.
- Figures 2 and 3 show the distribution of the estimated net effect on annual revenues, for two years and five years after the proposed project end, respectively. Most applicants expect the effect would be less than $2.5 million after two years, but more than $10 million after five years.
- Awardees, relative to Nonawardees, anticipate a higher net effect on annual revenues two years after the proposed project end (See Table 2). Single company applicants expect a larger net effect within this timeframe than do companies proposing Joint Venture projects. In addition, Information Technology and Electronics companies expect a higher impact within these two years, compared to Biotechnology and Materials/Chemistry companies.
- With respect to the longer timeframe of five years after project end, Information Technology and Electronics companies again expect a higher impact on revenues, compared to Biotechnology and Materials/Chemistry companies (See Table 2).

FIGURE 2

Estimated Net Effect of Proposed ATP Technology on Annual Company Revenues: Two Years After Proposed Project End

Source: Survey of ATP Applicants 2004

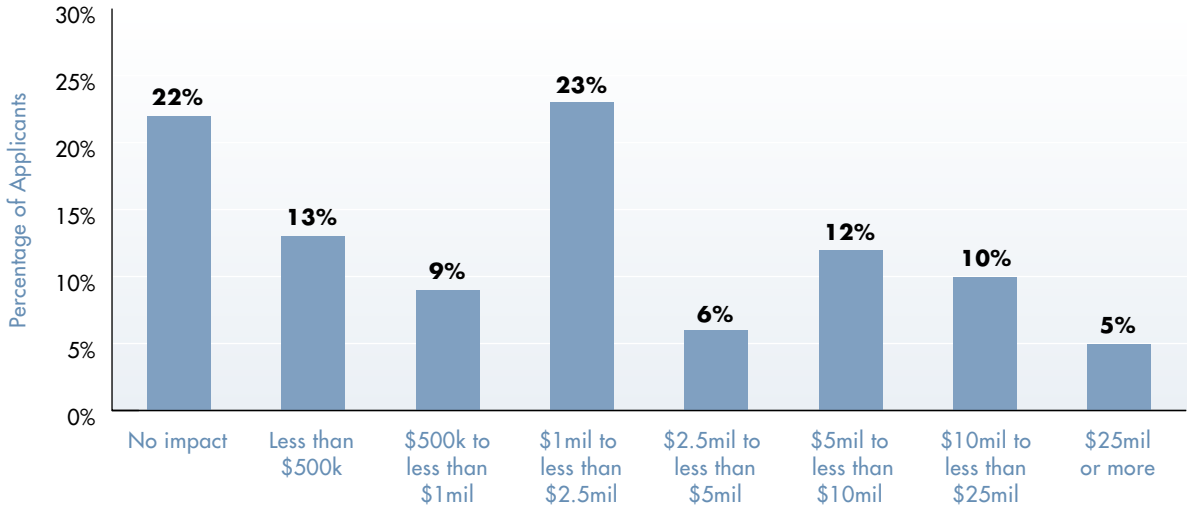


FIGURE 3

Estimated Net Effect of Proposed ATP Technology on Annual Company Revenues: Five Years After Proposed Project End

Source: Survey of ATP Applicants 2004

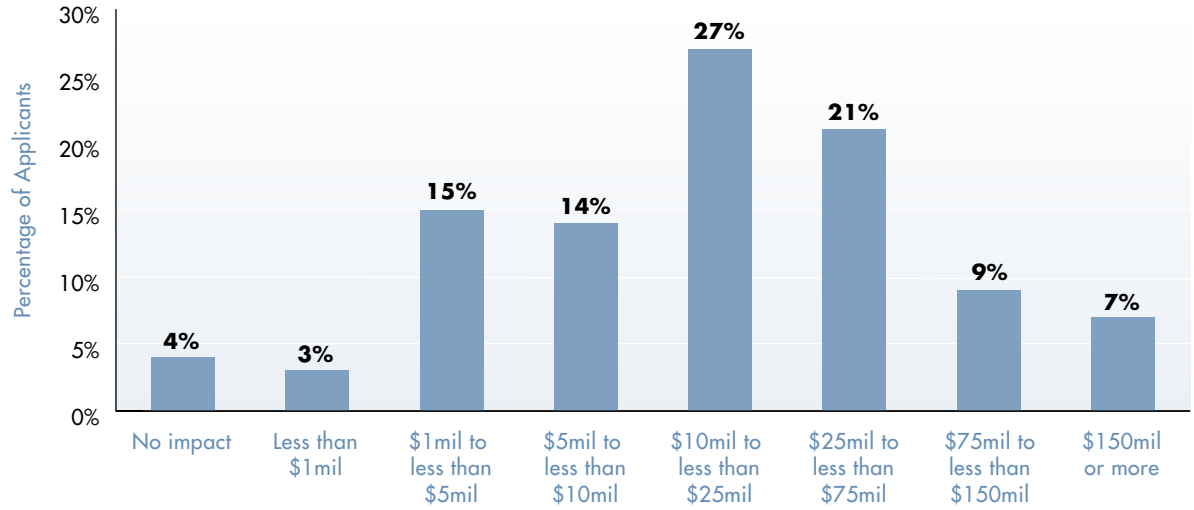


TABLE 2

Estimated Net Effect of Proposed ATP Technology on Annual Company Revenues, by Applicant Type

Source: Survey of ATP Applicants 2004

	Applicants		Project Type		Company Size		Technology Area			
	Awardees	Nonawardees	Single Company Applicants	Joint Venture Applicants	Small Companies	Large/Medium Companies	Biotechnology	Materials & Chemistry	Electronics	Information Technology
Two Years after Proposed Project End										
75th Percentile	$10m	$4m	$5m	$5m	$5m	$5m	$2m	$3m	$5m	$5m
Median	$5m	$1m	$1m	$500k	$1m	$500k	$500k	$500k	$1.5m	$2m
25th Percentile	$1m	$50k	$100k	$0	$100k	$0	$0	$0	$100k	$500k
Five Years after Proposed Project End										
75th Percentile	$100m	$50m	$50m	$50m	$50m	$50m	$50m	$25m	$50m	$50m
Median	$25m	$10m	$15m	$10m	$12m	$15m	$10m	$10m	$20m	$15m
25th Percentile	$10m	$5m	$5m	$4m	$5m	$3m	$5m	$2m	$5m	$9m

Anticipated Gross Profit Margin

- The median ATP applicant anticipates a 40% gross profit margin on future product sales to result from their proposed ATP technology. Almost one-quarter of applicants expect a margin of 25% or less. Almost one-third anticipate margins of 60% or higher (See Figure 4).
- Single Company applicants anticipate higher gross profit margins from their proposed technologies, compared to Joint Venture applicants (See Table 3). Small companies expect higher gross profit margins than Large and Medium size companies. With respect to technology area, Biotechnology companies anticipate higher margins, while Materials/Chemistry companies expect lower margins.

FIGURE 4

Anticipated Gross Profit Margin on Product Sales Resulting the Proposed ATP Technology

Source: Survey of ATP Applicants 2004

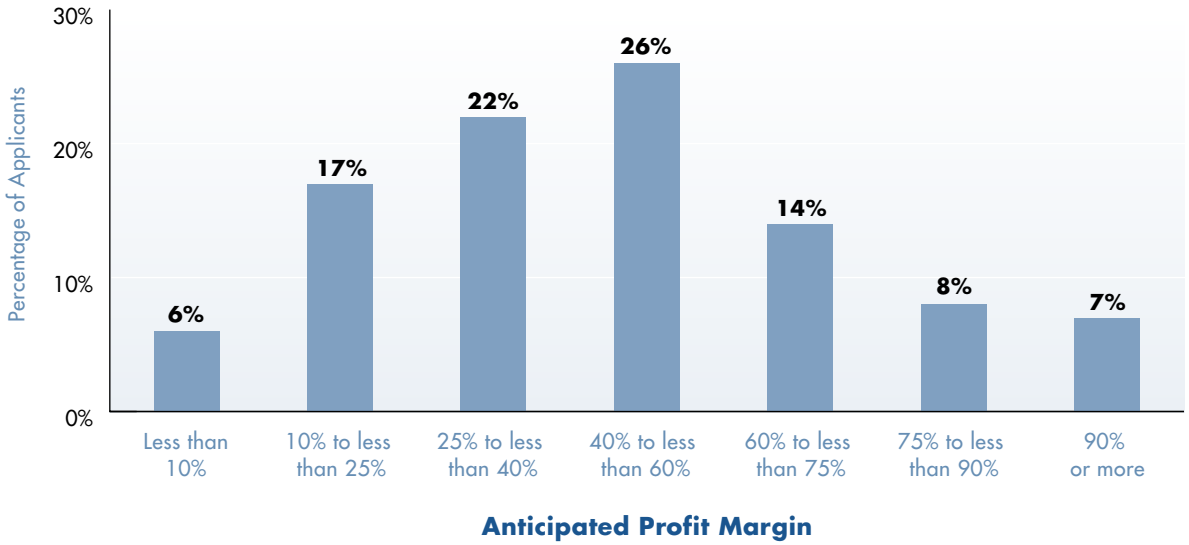


TABLE 3

Anticipated Gross Profit Margin on Product Sales Resulting from Proposed ATP Project Technology, By Applicant Type

Source: Survey of ATP Applicants 2004

	Applicants		Project Type		Company Size		Technology Area			
	Awardees	Nonawardees	Single Company Applicants	Joint Venture Applicants	Small Companies	Large/Medium Companies	Biotechnology	Materials & Chemistry	Electronics	Information Technology
75th Percentile	60%	60%	60%	50%	60%	48%	75%	50%	60%	65%
Median	50%	40%	50%	25%	50%	20%	50%	33%	40%	40%
25th Percentile	28%	25%	25%	11%	27%	10%	30%	20%	20%	25%

Anticipated Cost Savings

- Most ATP applicants do not anticipate annual cost savings for their company to result from their proposed ATP technology because most ATP projects involve R&D that will be commercialized as a new product. This applies to both two years and five years after the proposed project end (See Figures 5 and 6). About one-fifth of applicants expect $1 million or more in annual cost savings after two years. The same proportion expect annual savings of $5 million or more after five years.
- Single company applicants expect annual cost savings two years after their proposed project to a greater extent than Joint Venture applicants. Small companies anticipate greater cost savings in this timeframe compared to Large and Medium companies (See Table 4). No significant differences were found with respect to cost savings for the five year timeframe.

FIGURE 5

Anticipated Annual Cost Savings from Proposed ATP Technologies: Two Years After Proposed Project End

Source: Survey of ATP Applicants 2004

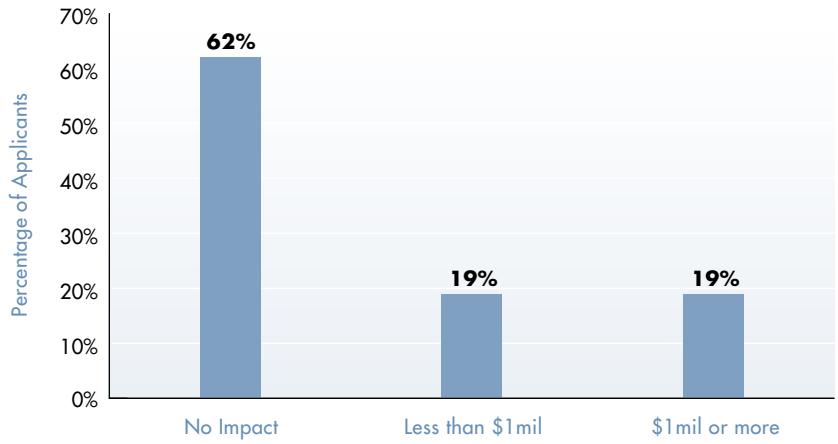


FIGURE 6

Anticipated Annual Cost Savings from Proposed ATP Technologies: Five Years After Proposed Project End

Source: Survey of ATP Applicants 2004

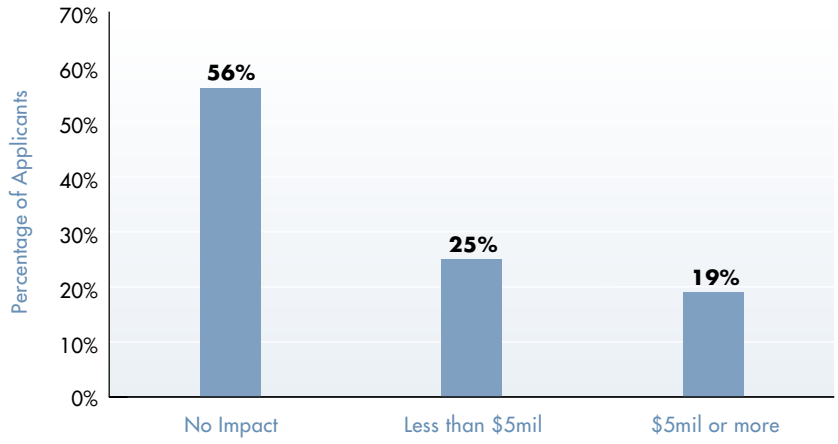


TABLE 4

Anticipated Annual Cost Savings from Proposed ATP Technologies, by Applicant Type

Source: Survey of ATP Applicants 2004

	Applicants		Project Type		Company Size		Technology Area			
	Awardees	Nonawardees	Single Company Applicants	Joint Venture Applicants	Small Companies	Large/Medium Companies	Biotechnology	Materials & Chemistry	Electronics	Information Technology
Two Years after Proposed Project End										
75th Percentile	$100k	$300k	$500k	$25k	$500k	$0	$250k	$135k	$500k	$500k
Median	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
25th Percentile	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Five Years after Proposed Project End										
75th Percentile	$800k	$2m	$2m	$2m	$2m	$2m	$1m	$2m	$2m	$2m
Median	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
25th Percentile	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Anticipated Royalties From Licensing

- Most ATP applicants do not expect annual royalties to result from licensing their proposed ATP technologies within two years after the project ends (See Figure 7). However, most applicants do expect such royalties within a five year timeframe (See Figure 8). The median applicant anticipates $1.5 million in annual royalties after five years.
- Single Company applicants anticipate more licensing royalties within two years after the proposed project ends, relative to Joint Venture applicants (See Table 5). Within this same timeframe, Small companies expect more licensing royalties than do Large and Medium size companies. Finally, companies in the Materials and Chemicals area expect lower royalties within two years, compared to other ATP technology areas.
- For the five year timeframe, Nonawardees anticipate more licensing royalties from their proposed technologies, relative to Awardees (See Table 5). Furthermore, Single Company applicants and Small companies both have higher expectations for licensing royalties, compared to their counterparts (Joint Venture companies and Large/Medium companies, respectively).

FIGURE 7

Anticipated Annual Royalties from Licensing Proposed ATP Technologies: Two Years After Proposed Project End

Source: Survey of ATP Applicants 2004

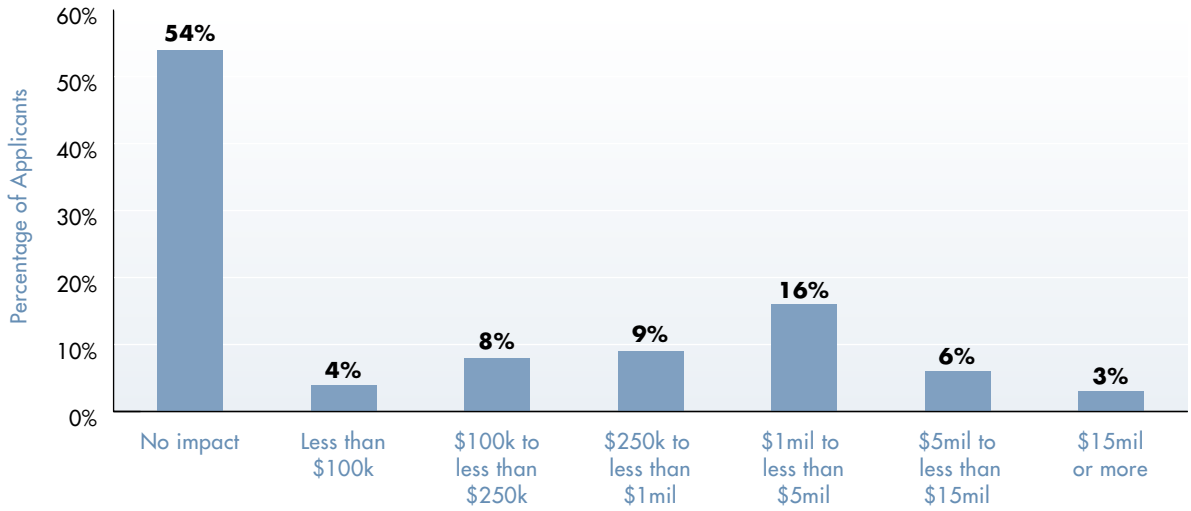


FIGURE 8

Anticipated Annual Royalties from Licensing Proposed ATP Technologies: Five Years After Proposed Project End

Source: Survey of ATP Applicants 2004

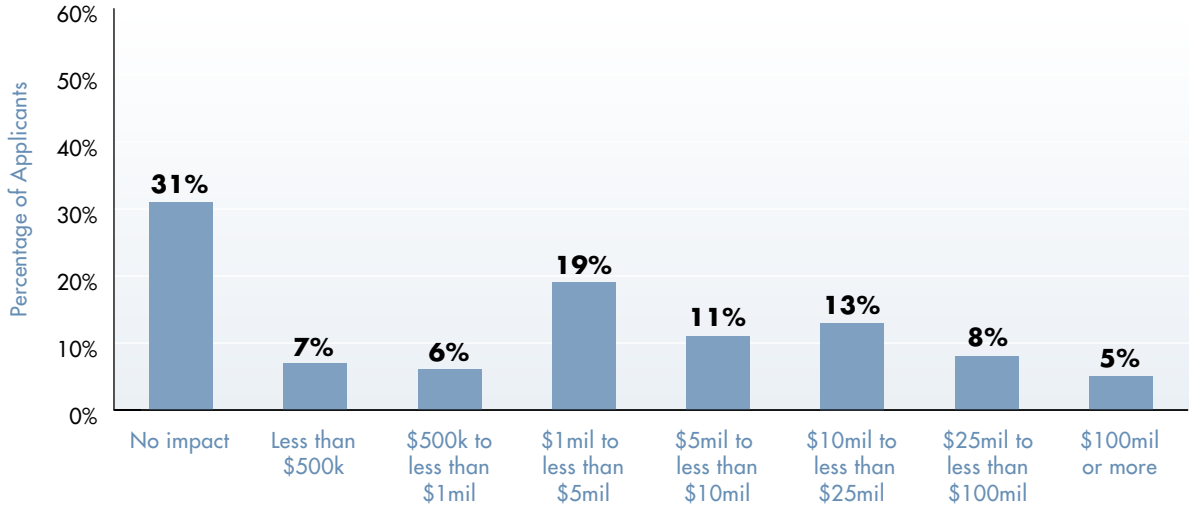


TABLE 5

Anticipated Annual Royalties from Licensing Proposed ATP Technologies by Applicant Type

Source: Survey of ATP Applicants 2004

	Applicants		Project Type		Company Size		Technology Area			
	Awardees	Nonawardees	Single Company Applicants	Joint Venture Applicants	Small Companies	Large/Medium Companies	Biotechnology	Materials & Chemistry	Electronics	Information Technology
Two Years after Proposed Project End										
75th Percentile	$600k	$1m	$1m	$150k	$1m	$25k	$1m	$250k	$1m	$1m
Median	$0	$0	$0	$0	$1k	$0	$0	$0	$0	$100k
25th Percentile	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Five Years after Proposed Project End										
75th Percentile	$2m	$10m	$10m	$5m	$10m	$2m	$10m	$5m	$10m	$10m
Median	$200k	$2m	$2m	$250k	$2m	$0	$2.3m	$1m	$1m	$2m
25th Percentile	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0

Net Benefits to Downstream Industry Users or Consumers

- The median ATP applicant estimates $5 million in benefits to downstream industry users or consumers of their proposed technologies two years after the project ends. The median applicant estimate is a much greater benefit within a 5 year timeframe: $100 million.
- For the two year timeframe, Awardees estimate more benefits to downstream users or consumers from their proposed technology than do Nonawardees (See Table 6). Single Company applicants expect more benefits to occur, relative to Joint Venture applicants. Information Technology companies estimate a relatively higher level of benefits to downstream users or consumers, whereas Biotechnology companies estimate a relatively lower degree of benefits.
- For the five year timeframe, Information Technology companies estimate more benefits to downstream users or consumers, relative to companies in other technology areas. Materials and Chemicals companies expect a relatively lower level of benefits to occur (SeeTable 6).

TABLE 6

Anticipated Net Benefits to Downstream Industry Users or Consumers of Proposed ATP Technologies, by Applicant Type

Source: Survey of ATP Applicants 2004

	Applicants		Project Type		Company Size		Technology Area			
	Awardees	Nonawardees	Single Company Applicants	Joint Venture Applicants	Small Companies	Large/Medium Companies	Biotechnology	Materials & Chemistry	Electronics	Information Technology
Two Years after Proposed Project End										
75th Percentile	$100m	$30m	$40m	$20m	$40m	$20m	$25m	$25m	$50m	$50m
Median	$20m	$5m	$5m	$10m	$5m	$2m	$1m	$2m	$5m	$10m
25th Percentile	$1m	$0	$5k	$0	$100k	$0	$0	$0	$150k	$2m
Five Years after Proposed Project End										
75th Percentile	$1.1b	$1b	$1b	$1b	$1b	$500m	$500m	$200m	$1b	$1b
Median	$225m	$100m	$100m	$100m	$100m	$100m	$100m	$50m	$175m	$250m
25th Percentile	$50m	$20m	$25m	$20m	$25m	$20m	$10m	$15m	$35m	$50m

9

Capturing Value from Innovation

In order to benefit from their innovations, many companies seek to protect the intellectual property that derives from their research and development (R&D). In addition, they may face pressure to be first to market with a product, or may seek to benefit from the use of complementary capabilities in R&D, manufacturing, distribution, or services. Findings from the *Survey of ATP Applicants 2004* indicate companies that apply to ATP have a variety of means for capturing value from their innovations.

Survey respondents were asked to indicate how important each of the following are for their company as a means of capturing value from innovation:

a. Maintaining intellectual property through trade secrecy
b. Maintaining intellectual property through patent or copyright protection
c. Being first to market
d. Using complementary R&D capabilities
e. Using complementary manufacturing, distribution, or service capabilities

Nearly all ATP applicants report that patent or copyright protection is important as a means of protecting intellectual property and capturing value from innovation

- The vast majority of applicants (92%) report that maintaining intellectual property through patent or copyright protection is important to their companies as a means for creating value from innovation[1] (See Figure 1.)
- Biotechnology companies are more likely to view patent and copyright protection as "extremely important" for capturing value from their innovation, relative to companies in other ATP technology areas. Information Technology companies are less likely to do so (See Figure 2).

[1] We have combined the response categories "extremely important" and "very important" for ease of reporting.

FIGURE 1

Importance of Maintaining Intellectual Property through Patent or Copyright Protection as a Means of Capturing Value from Innovation

Source: Survey of ATP Applicants 2004

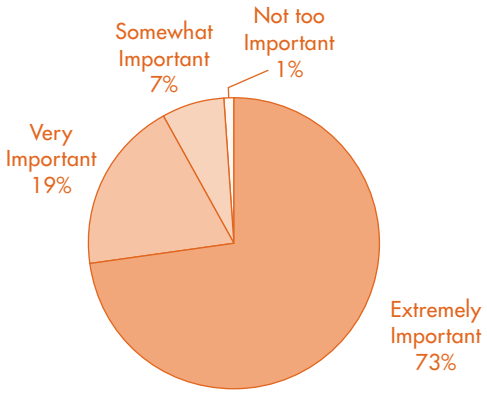
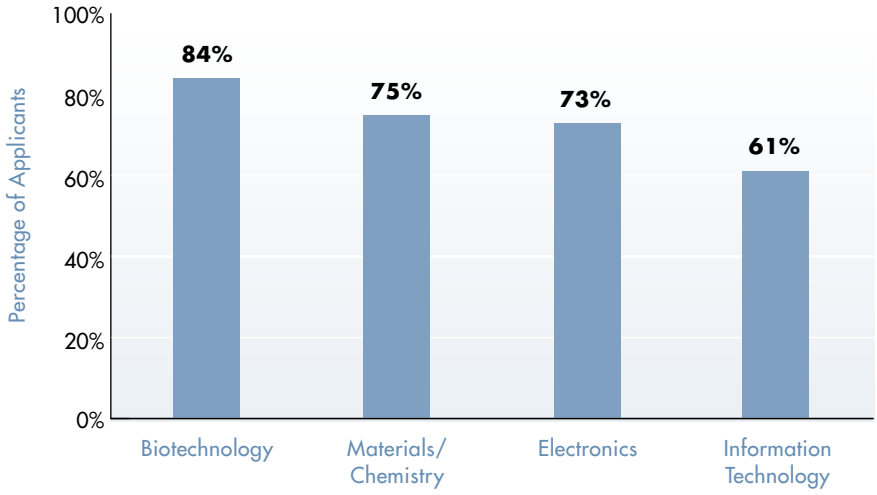


FIGURE 2

Applicant Beliefs that Patent or Copyright Protection is "Extremely Important" for Capturing Value from Innovation: By ATP Technology Area

Source: Survey of ATP Applicants 2004



Many ATP applicants also view trade secrecy and being first to market as important as important ways of capturing value from innovation

- Two-thirds (67%) of applicants view maintaining intellectual property through trade secrecy as being important to their companies as a means of creating value from innovation (See Figure 3).
- Just over four-fifths (83%) of applicants say that being first to market is an important way that their company captures value from innovation (See Figure 4).

FIGURE 3

Importance of Maintaining Intellectual Property through Trade Secrecy as a Means of Capturing Value from Innovation

Source: Survey of ATP Applicants 2004

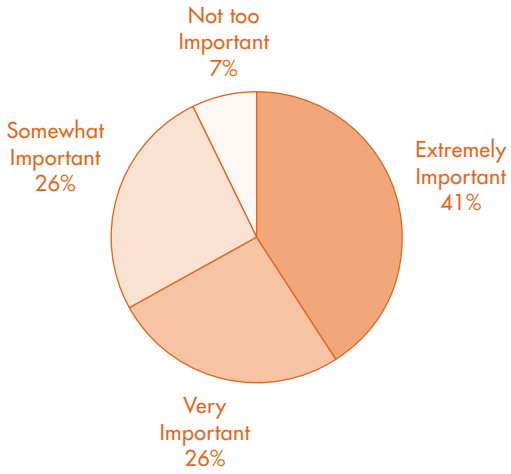
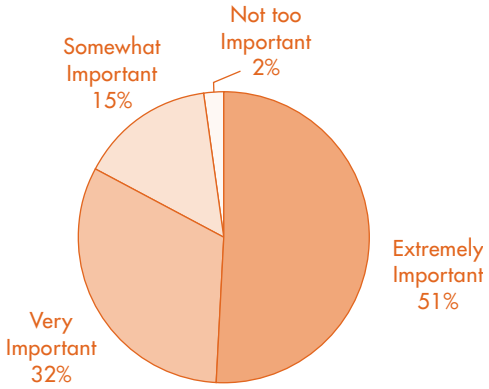


FIGURE 4

Importance of Being First to Market as a Means of Capturing Value from Innovation

Source: Survey of ATP Applicants 2004



Complementary capabilities are also an important means of capturing of capturing value from innovation for many applicant companies

- About three-quarters (77%) of applicants view the use of complementary R&D capabilities as an important means of capturing value from innovation (See Figure 5).
- Just under two-thirds (63%) of applicants say that using complementary manufacturing, distribution, or service capabilities is an important method of capturing value from innovation (See Figure 6).
- Awardees are more likely than Nonawardees to report that using complementary manufacturing, distribution, or service capabilities is an important method of capturing value for their companies (See Figure 7).
- Companies in the Materials/Chemistry or Electronics technology areas are more likely to view complementary manufacturing, distribution, or service capabilities is an important method of capturing value, relative to companies in the areas of Biotechnology or Information Technology (See Figure 7).

FIGURE 5

Importance of Using Complementary R&D Capabilities as a Means of Capturing Value from Innovation

Source: Survey of ATP Applicants 2004

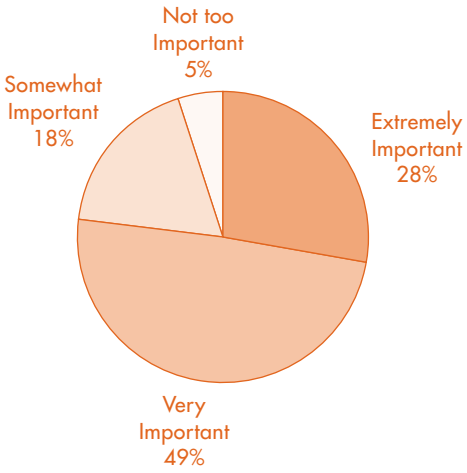


FIGURE 6

Importance of Using Complementary Manufacturing, Distribution, or Service Capabilities as a Means of Capturing Value from Innovation

Source: Survey of ATP Applicants 2004

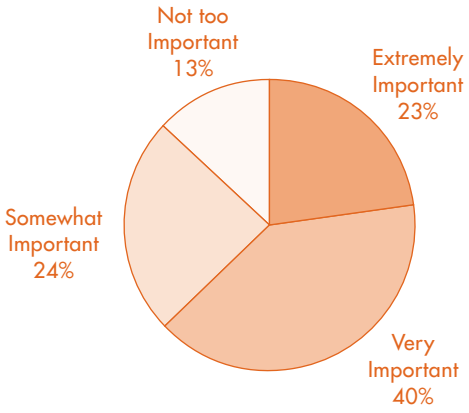
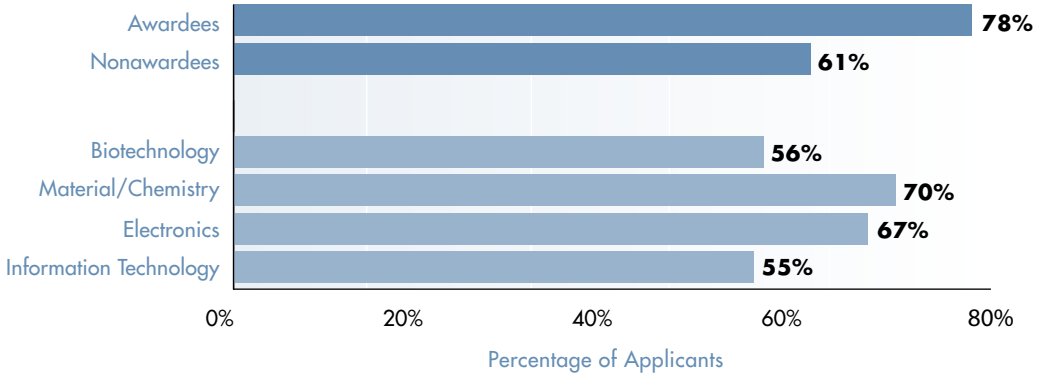


FIGURE 7

Applicant Beliefs that Using Complementary Manufacturing, Distribution, or Service Capabilities is "Extremely" or "Very" Important for Capturing Value from Innovation: By Award Status and ATP Technology Area

Source: Survey of ATP Applicants 2004



10

What Happens to Nonfunded Projects?

Through cost-shared funding awards, the Advanced Technology Program (ATP) helps companies pursue high-risk Research and Development (R&D) with great potential for broad-based economic benefit. To assess the funding impact of an ATP award, ATP follows up not only on Awardees' projects but also on Nonawardees' proposed projects. Findings from the *Survey of ATP Applicants 2004* indicates that without ATP support, projects not selected for an award are generally not carried out as originally proposed.

Nonawardees were asked to indicate whether they are currently carrying out any part of the ATP projects they proposed to ATP. If yes, they were asked to describe the scale of effort of the R&D project as it is now being carried out.[1]

Similarly, Awardees were asked if their company would be carrying out any part of the project had they not received ATP funding, and (if so) to describe the scale of effort.

Applicants were also asked if their companies have produced conference presentations, patent applications, or financial results from their proposed R&D projects.

An increasing percentage of Nonawardees are carrying out proposed ATP projects on their own, but the scale of effort of most of these R&D projects is much smaller than that proposed to ATP

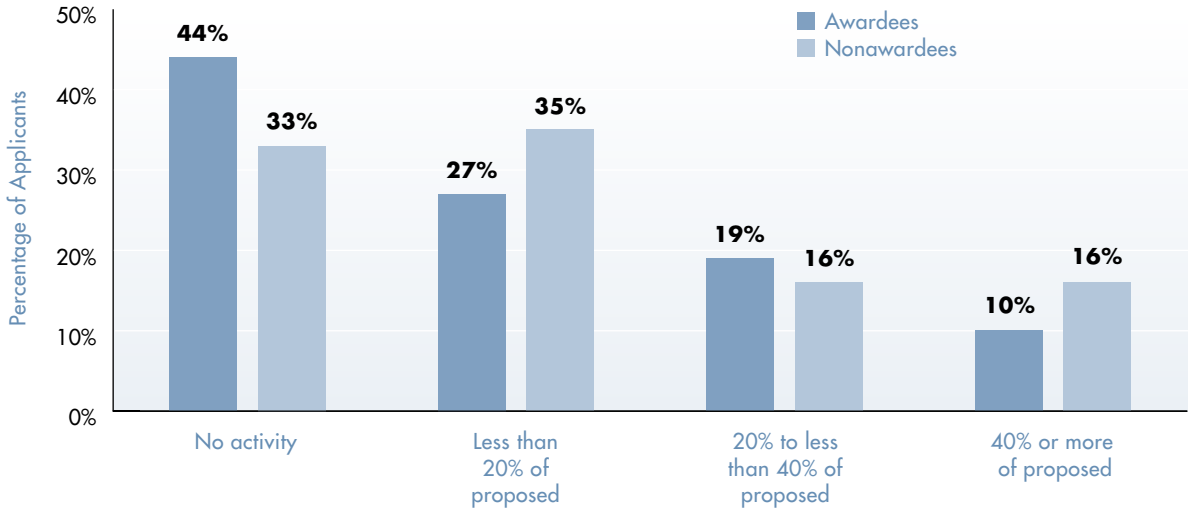
- When ATP decides not to fund a proposed project, some company applicants decide to carry out the work, or some part of it, on their own. Among 2004 Nonawardees, 67% report that their companies are pursuing at least some part of their proposed projects, up from 61% among 2002 ATP Nonawardees. Just over half (56%) of Awardees say that they would still be conducting their projects without ATP funding.
- Among all Nonawardees, only 16% said their current R&D project effort is at least 40% of their proposed ATP effort. Thus, for most Nonawardees, there is either no activity or the scale of effort of their R&D projects at the time of the survey was less than 40% of what they proposed to ATP. Similarly, most Awardees indicate that the scale of their proposed projects would been substantially smaller had they not received ATP funding (see Figure 1).
- Among 2004 Nonawardees, Single Company applicants (71%) are more likely than Joint Venture applicants (53%) to still be working on at least some part of their proposed projects on their own at the time of the survey. Small Companies (70%) are more likely than Large/Medium companies (52%) to still be conducting at least part of the their proposed projects.[2]

[1] The survey data were collected about 18 months after ATP's decision not to award funding to these projects in the 2004 competition.

FIGURE 1

Current Scale of Effort of Nonfunded Projects

Source: Survey of ATP Applicants 2004.



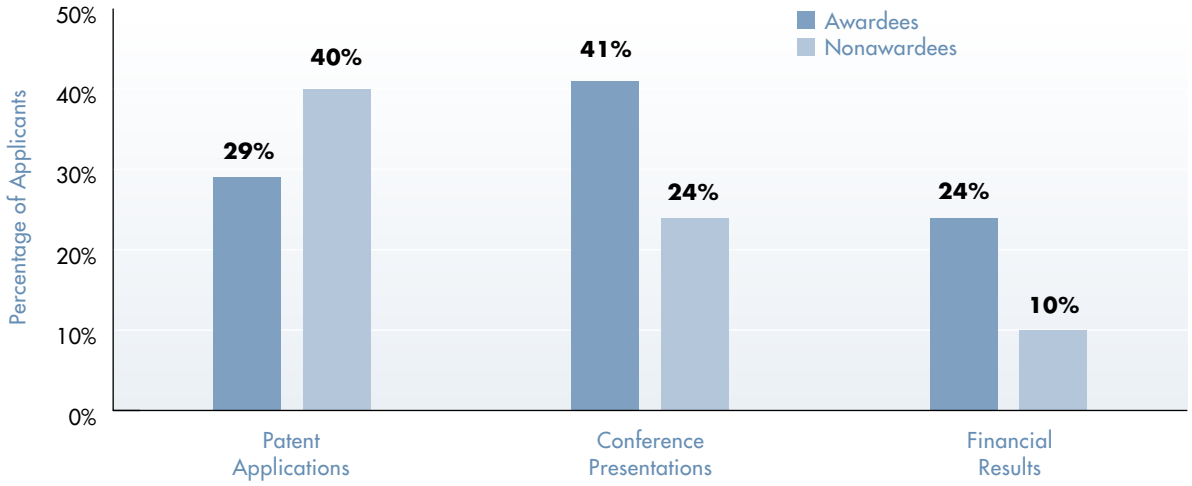
Some 2004 ATP Nonawardees have seen outcomes from their ATP-proposed R&D projects

- The percentages of all Nonawardees that have produced patent applications, conference presentations, or financial results (revenues, cost savings, etc.) from their R&D projects range from 10% to 40% (see Figure 2). Awardees are significantly more likely to have made conference presentations and achieved financial results from their proposed projects

FIGURE 2

Current Status of Products from R&D Projects Proposed to ATP

Source: Survey of ATP Applicants 2004.



[2] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium-size companies are all others.

11

Applicant Satisfaction with ATP Staff

The Advanced Technology Program (ATP) aims to make the proposal process a smooth one for applicants. Applicants can contact ATP staff with questions about the process. The Survey of ATP Applicants 2004 collected information about applicants' satisfaction with ATP staff responses to their questions.

Respondents were asked whether they had contacted ATP staff with questions about their application. Those who had contacted ATP were asked to indicate how satisfied they were with the:

a. courtesy of the staff

b. promptness of the service

c. help in resolving problems or issues

Almost two-thirds of the 2004 applicants contacted ATP staff with questions about their application[1]

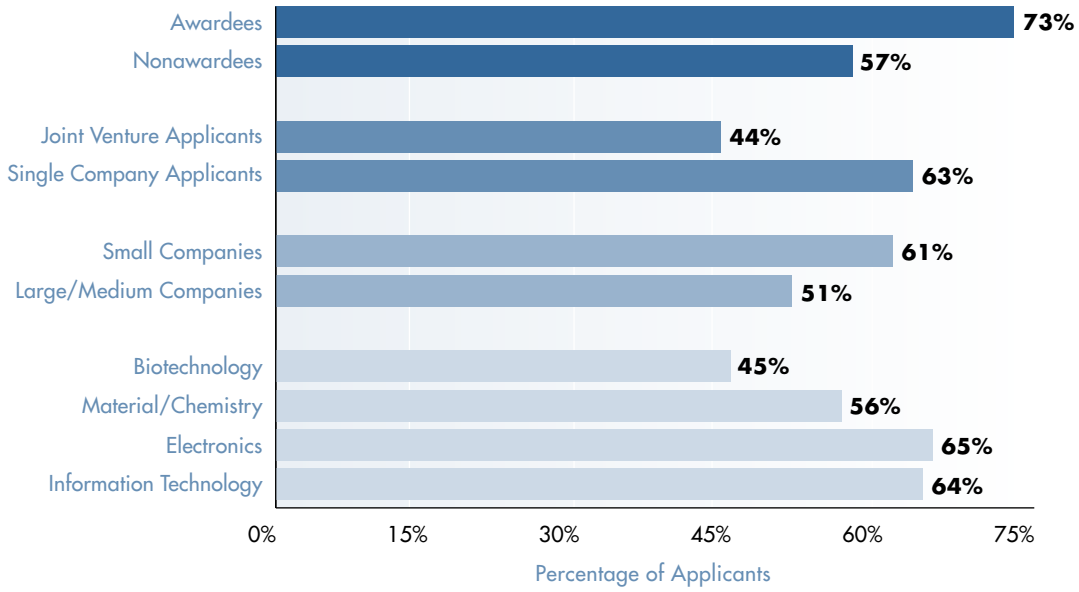
- Prior to a competition, companies may contact ATP staff for general information, selection criteria or the review process. Once the competition begins, companies may make only administrative inquiries or address ATP questions.
  - Almost two-thirds (59%) of applicants report having contacted ATP staff. The remaining applicants (41%) said they had not contacted the staff or could not remember if they had done so. This is very similar to the data from the 2002 applicants.
  - Awardees were more likely to have contacted ATP staff than were Nonawardees (See Figure 1).
  - Single Company Applicants were more likely to have contacted ATP staff than were Joint-Venture Applicants (See Figure 1).
  - Small companies were more likely to have contacted ATP staff than were Large/Medium companies (See Figure 1).[1]
  - Electronics and Information Technology companies were more likely to have contacted ATP staff than were Biotechnology and Material/Chemistry companies (See Figure 1).

[1] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium size companies are all others.

FIGURE 1

Percentages of ATP Applicant Groups Contacting ATP Staff

Source: Survey of ATP Applicants 2004



Most applicants contacting the ATP staff were satisfied with the courtesy they received

- 93% of the applicants who contacted ATP staff said they were satisfied with the courtesy of the staff (See Figure 2).[2] This figure is very similar to what was found for the 2002 ATP applicants.

Most applicants contacting the ATP were satisfied with the promptness of their service

- 89% of the applicants who contacted ATP staff said they were satisfied with the promptness of their service (See Figure 2). This figure is very similar to what was found for the 2002 ATP applicants.

[2] We have combined the response categories "very satisfied" and "somewhat satisfied" for ease of reporting.

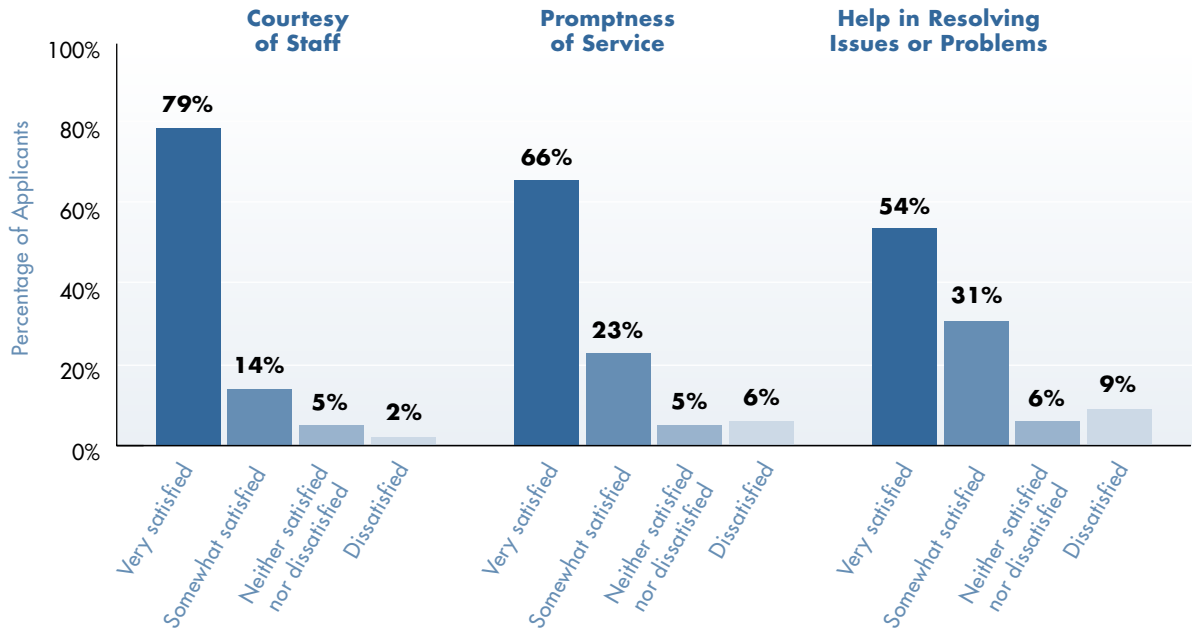
Most applicants contacting the ATP were satisfied with the help they received in resolving problems or issues

- 85% of the applicants who contacted ATP staff said they were satisfied with the help they received (See Figure 2). This is similar to the 2002 applicants. Awardees indicate a higher level of satisfaction on this measure (97%) than do Nonawardees (83%).

FIGURE 2

Satisfaction with ATP Staff (Among Applicants who Contacted ATP Staff)

Source: Survey of ATP Applicants 2004



12

Time and Cost for ATP Proposal Preparation

The *Survey of ATP Applicants 2004* collected information on the amount of time and cost companies expended to prepare a proposal for the Advanced Technology Program (ATP). ATP tries to make the proposal process as easy as possible for companies.

Respondents indicated:

a. the total number of staff hours used in preparing their ATP proposal

b. the total cost to their company in preparing the proposal

Companies applying for an ATP award devote varying levels of resources to proposal preparation

- Figure 1 shows the distribution of total staff hours devoted to ATP proposal preparation. Over two-thirds of all applicants devoted less than 240 hours of staff time to their proposal. The data reported on total staff hours is very similar to that found for the year 2002 applicants.
- Figure 2 shows the distribution of cost to companies in preparing their ATP proposal. About two-thirds of all applicants spent less than $20,000. Overall, the distribution is very similar to what was found for the year 2002 applicants. However, in 2004 a significantly smaller percentage of applicants spent less than $10,000 as compared to the 2002 applicants (36% versus 42%, respectively).

Companies seeking funding from the Advanced Technology Program (ATP) submit proposals to the ATP. Proposals must be for the development of innovative technologies that could not obtain private funding due to the high technical risk and that have the potential to produce widespread benefits to the economy and society. Proposals are evaluated for technical and economic merit in a rigorous competitive review process.

FIGURE 1

Total Staff Hours Used in Preparing ATP Proposal

Source: Survey of ATP Applicants 2004

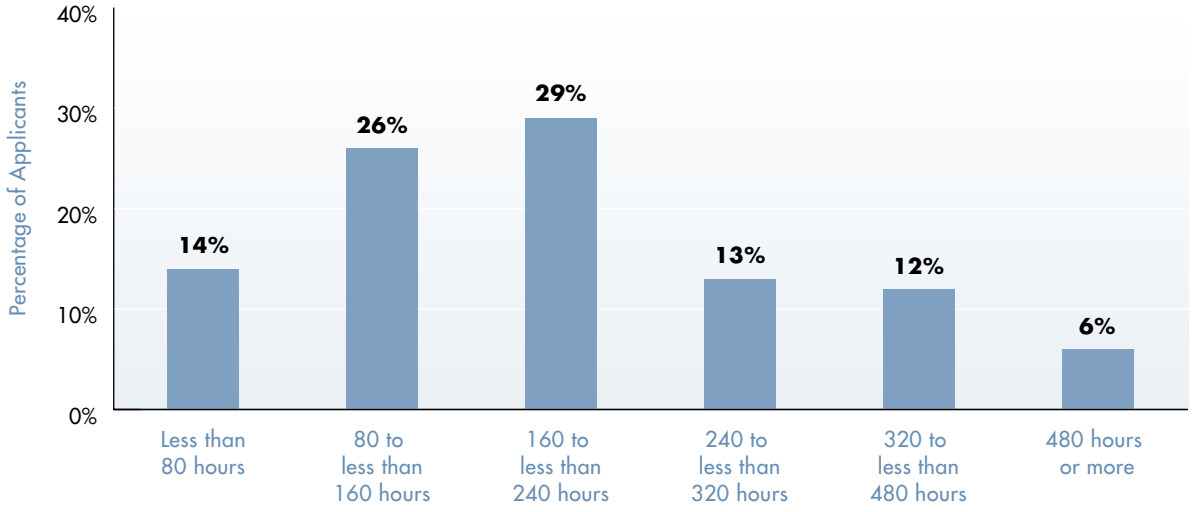


FIGURE 2

Total Cost of Preparing ATP Proposal

Source: Survey of ATP Applicants 2004

Time and cost for ATP proposal preparation differs by applicant type

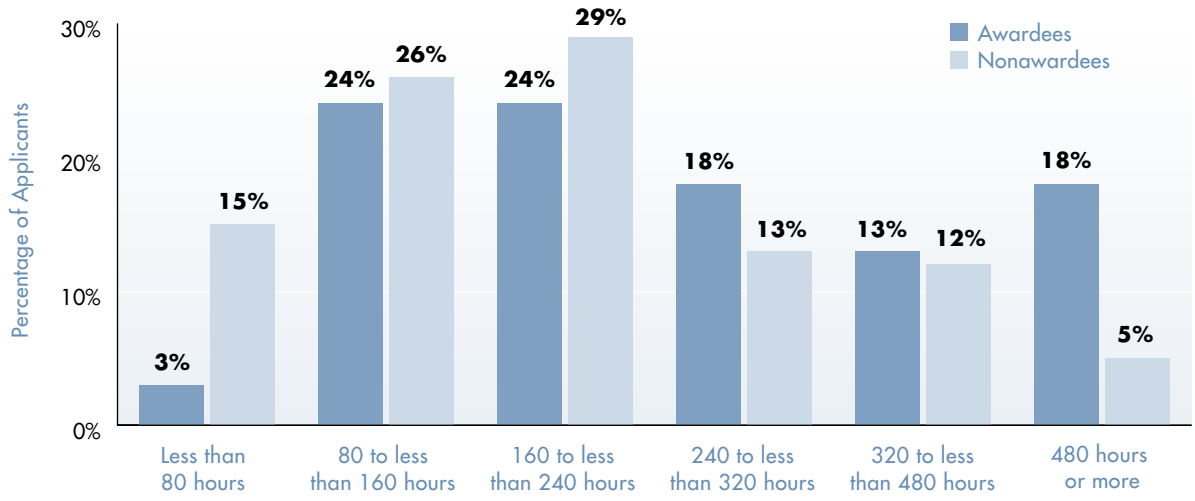
Awardees and Nonawardees

- ATP Awardees devoted more effort to preparing proposals than Nonawardees. More Awardees than Nonawardees devoted at least 480 staff hours to developing their proposal. More Nonawardees devoted less than 80 hours to this task (See Figure 3).

FIGURE 3

Total Staff Hours Used in Preparing ATP Proposal: Awardees and Nonawardees

Source: Survey of ATP Applicants 2004



Joint Ventures and Single Company Applicants

- Joint Venture lead companies devoted the largest amount of staff time to proposal preparation, followed by Single companies. Over half (52%) of Joint Venture leads spent 240 hours or more preparing their ATP proposal, compared to 30% of Single company applicants and 24% of Joint Venture partners (See Figure 4).
- Joint Venture lead companies also experienced higher total costs in preparing an ATP proposal, relative to Joint Venture partner companies and Single companies (See Figure 5). Almost half (46%) of Joint Venture leads spent $20,000 or more, compared to 36% of Joint Venture partners, and 30% of Single companies.

FIGURE 4

Total Staff Hours Used in Preparing ATP Proposal: Joint Venture Lead Companies, Joint Venture Partners, and Single Company Applicants

Source: Survey of ATP Applicants 2004

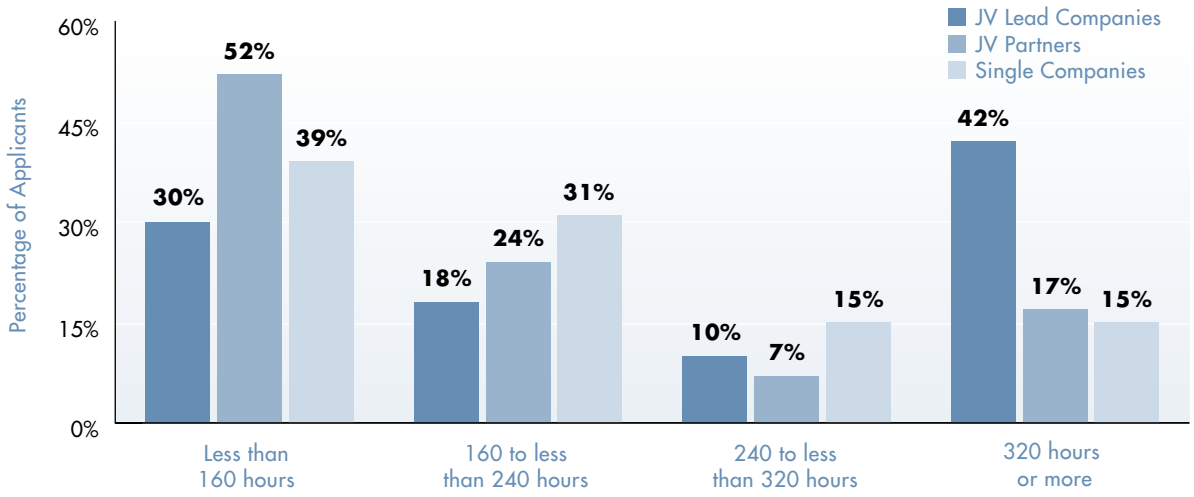
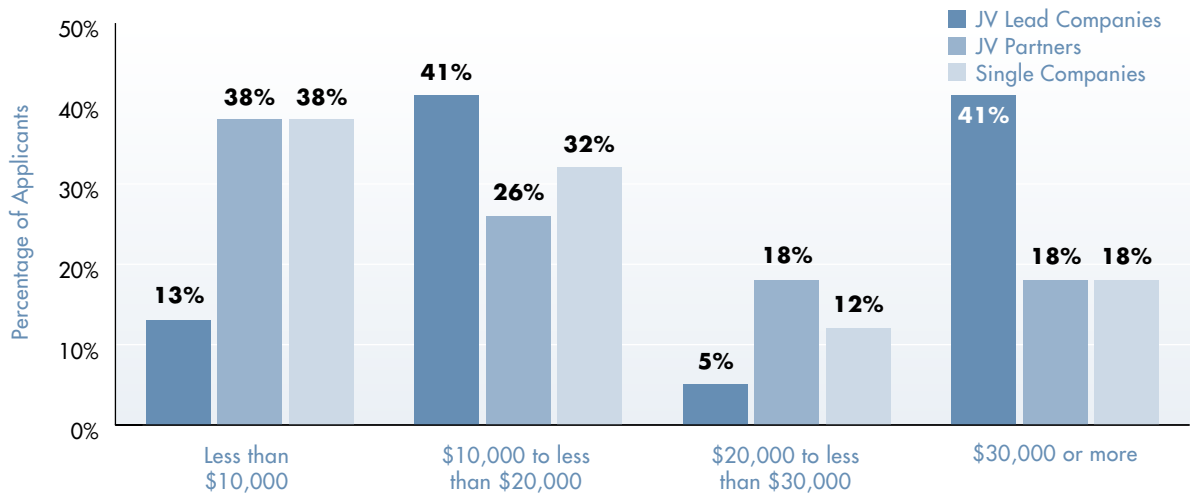


FIGURE 5

Total Cost of Preparing ATP Proposal: Joint Venture Lead Companies, Joint Venture Partners, and Single Company Applicants

Source: Survey of ATP Applicants 2004



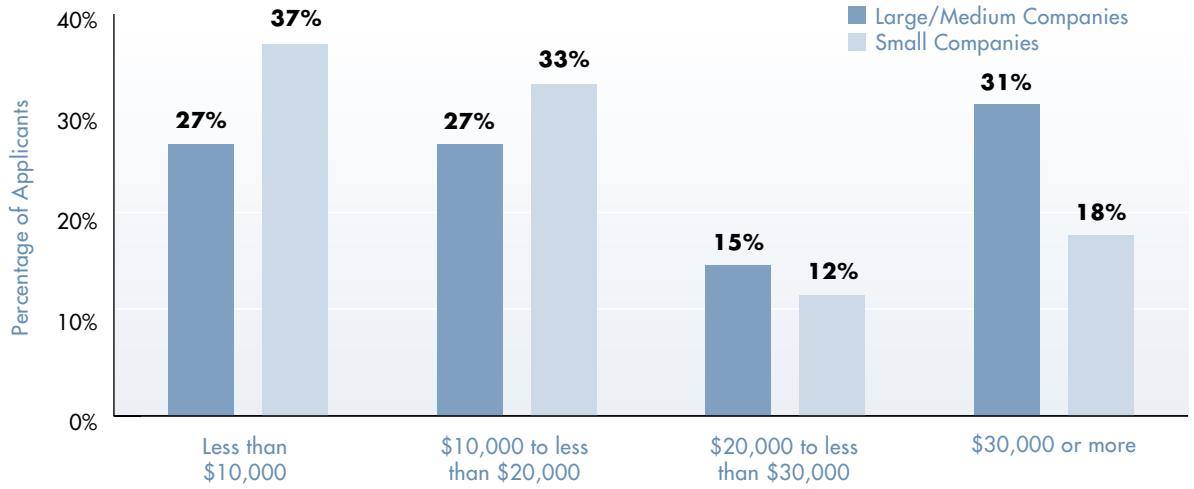
Large/Medium Companies and Small Companies

- Large/medium sized company applicants devoted more financial resources than Small company applicants to ATP proposal preparation[1] (See Figure 6). Almost three-fourths (70%) of Small companies spent less than $20,000 on ATP proposal preparation, compared to about half (54%) of Medium and Large companies.

FIGURE 6

Total Cost of Preparing ATP Proposal: Large/Medium and Small Company Applicants

Source: Survey of ATP Applicants 2004



[1] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium size companies are all others.

13

Applicant Perceptions of the ATP Proposal Process

The Advanced Technology Program (ATP) aims to make the proposal process useful to companies, and ensures fair and equal treatment of all applicants. The *Survey of ATP Applicants 2004* collected information about applicants' perceptions of the proposal process.

Respondents were asked to indicate:

a. how useful to their company was the process of preparing the ATP proposal

b. how useful to their company was information received from ATP during the review process

c. the extent to which they believed the ATP review and decision process was a fair process

d. their views of the length of time they waited to receive ATP's decision

e. the likelihood that they will apply for funding again from ATP

Most applicants view the ATP proposal process as useful

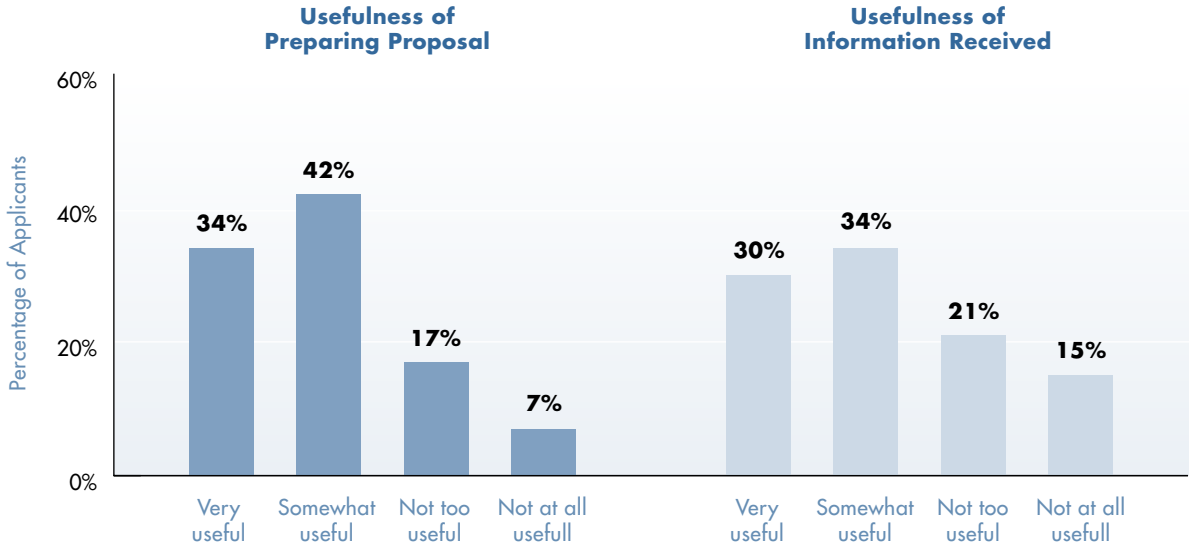
- During the proposal process, companies respond to questions from ATP in oral review regarding technical risk and business aspects of the project. In telephone debriefing of Nonawardees, companies receive feedback on the strengths and weaknesses of their proposal against ATP criteria.
- Preparing an ATP proposal may be useful to an applicant for a variety of reasons. It may catalyze discussion and planning, focus attention on specific R&D or business issues, or clarify management commitment.
  - About three-quarters (76%) of all applicants report that the process of preparing an ATP proposal is useful (See Figure 1).[1]
  - About two-thirds (64%) of all applicants regard the information received from ATP during the proposal process to be useful (See Figure 1).
  - The extent to which the 2004 applicants viewed the ATP proposal process as useful to their company is almost identical to that found for the 2002 applicants.

[1] We have combined the response categories "very useful" and "somewhat useful" for ease of reporting.

FIGURE 1

Usefulness to Company of the ATP Proposal Process

Source: Survey of ATP Applicants 2004



Most applicants view the ATP proposal process as fair

- ATP places great emphasis on ensuring the integrity and fairness of the proposal review and decision process. All proposals are peer-reviewed by technical and business specialists and evaluated according to clearly established criteria.[2]
  - Almost three-quarters (71%) of all applicants report that the ATP review and decision process is a fair process (See Figure 2).[3] However, the percentage of 2004 applicants reporting that the process is fair to a large extent (33%) is less than the percentage of 2002 applicants reporting that level of fairness (44%).
  - Joint-Venture applicants and applicants from Large/Medium companies are more likely to report the proposal process is fair (84% and 89%, respectively) than are Single company applicants and those from small companies (68% for both).[4]

[2] Technical reviewers are government employees and business reviewers are private sector business specialists. All reviewers sign a strict nondisclosure agreement to ensure confidentiality of the information in the proposals.

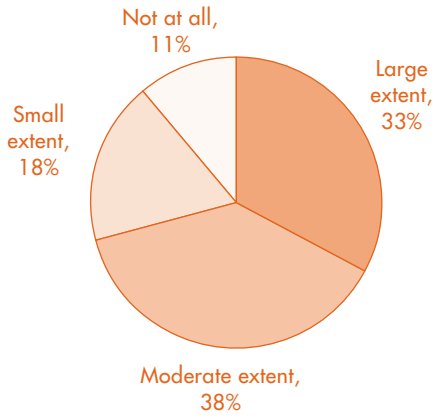
[3] We have combined the response categories "large extent" and "moderate" for ease of reporting.

[4] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium size companies are all others.

FIGURE 2

Beliefs that the ATP Review and Decision Process is Fair

Source: Survey of ATP Applicants 2004



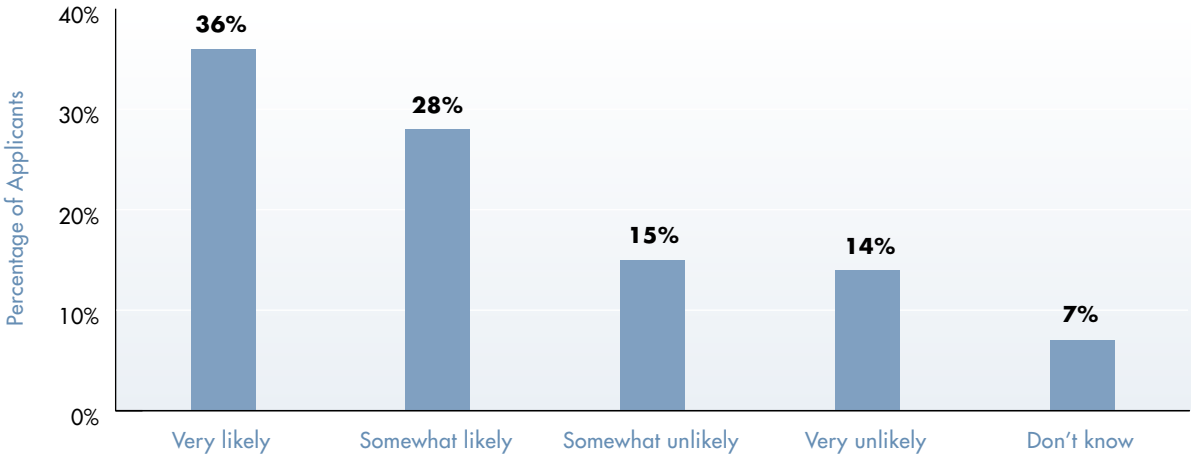
Many applicants believe they will apply for funding again

- Just under two-thirds of the 2004 applicants say that they will apply for funding again from ATP (See Figure 3).[5] This finding for the 2004 applicants is comparable to what was found for the 2002 applicants.

FIGURE 3

Likelihood of Applying for Funding Again from ATP

Source: Survey of ATP Applicants 2004



[5] We have combined the response categories "very likely" and "somewhat likely" for ease of reporting.

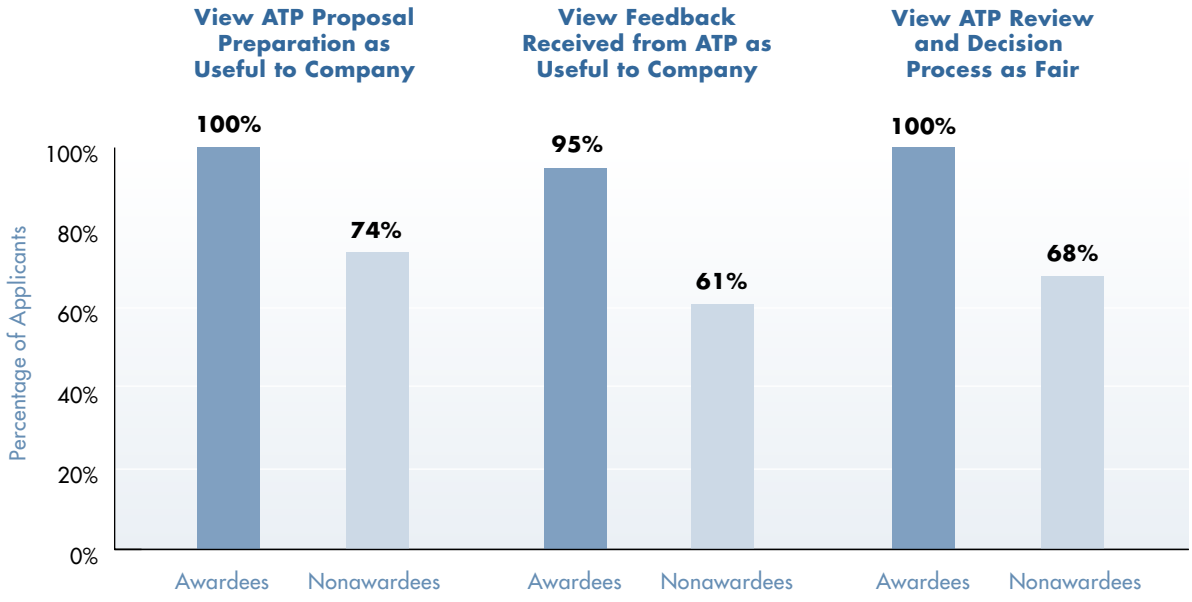
Both Awardees and Nonawardees view the ATP proposal process positively

- Not surprisingly, Awardees view the ATP proposal process more favorably than do Nonawardees (See Figure 4).

FIGURE 4

Awardee and Nonawardee Perceptions of the ATP Proposal Process

Source: Survey of ATP Applicants 2004



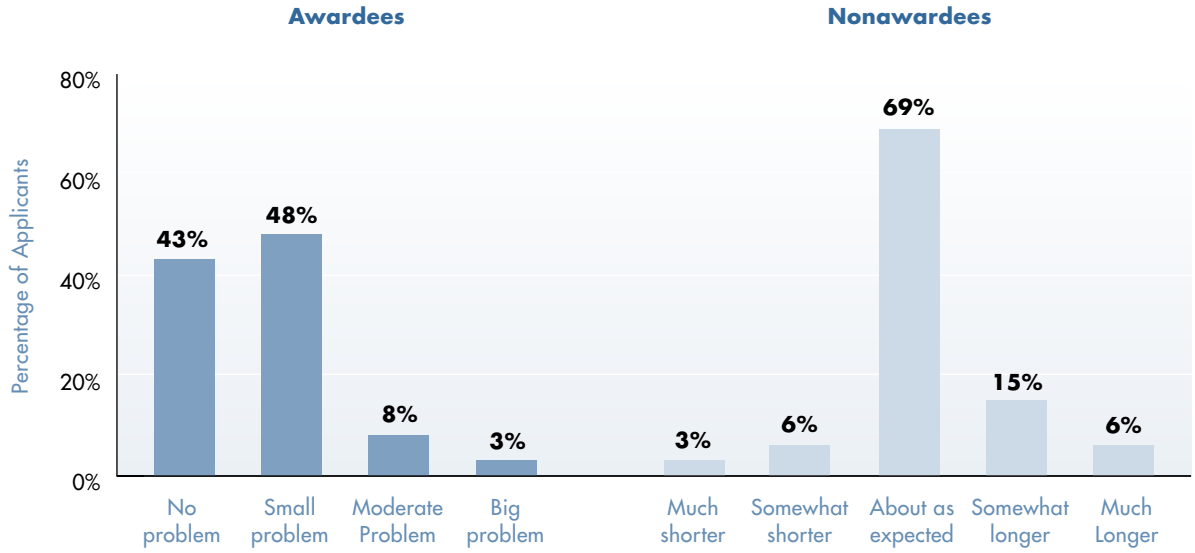
Most ATP applicants think the length of time to receive a decision about their proposals is about right

- In 2004, applicants were asked to rate the length of time it took them to receive a decision from ATP about their project proposals. Awardees were asked to indicate how much of a problem was this length of time. Nonawardees were asked how this length of time matched their expectations, ranging from "much shorter than expected" to "much longer than expected."
  - 43% of Awardees think the length of time to receive a decision is no problem and 48% think it is only a small problem (See Figure 5).
  - Most Nonawardees reported the length of time was about as they had expected (69%), but about one-fifth indicate the wait was longer than expected (See Figure 5).
  - Among Nonawardees, Single company applicants were more likely to report the decision took longer than expected (24%) than were Joint Venture applicants (15%).[6]

FIGURE 5

Perception of length of time to receive decision

Source: Survey of ATP Applicants 2004



[6] We have combined the response categories "much longer than expected" and "somewhat longer than expected" for ease of reporting.

14

Applicant Views of the ATP Proposal Preparation Kit and Electronic Submission System (ESS)

The Advanced Technology Program (ATP) provides ATP applicants with an ATP Proposal Preparation Kit to facilitate the proposal process. Also, ATP encourages applicants to use ATP's Electronic Submission System (ESS), which allows them to submit their proposals securely over the Internet. The *Survey of ATP Applicants 2004* collected information about applicants' satisfaction with the proposal kit and use of the ESS.

Applicants were asked to rate their level of satisfaction with the following aspects of the ATP Proposal Preparation Kit:

a. Ease of use

b. Clarity of content

c. Comprehensiveness of content

They were also asked if they submitted their proposal electronically through the ESS, and to indicate how easy or difficult it was to use the ESS.

Most applicants expressed satisfaction with the ATP Proposal Preparation Kit

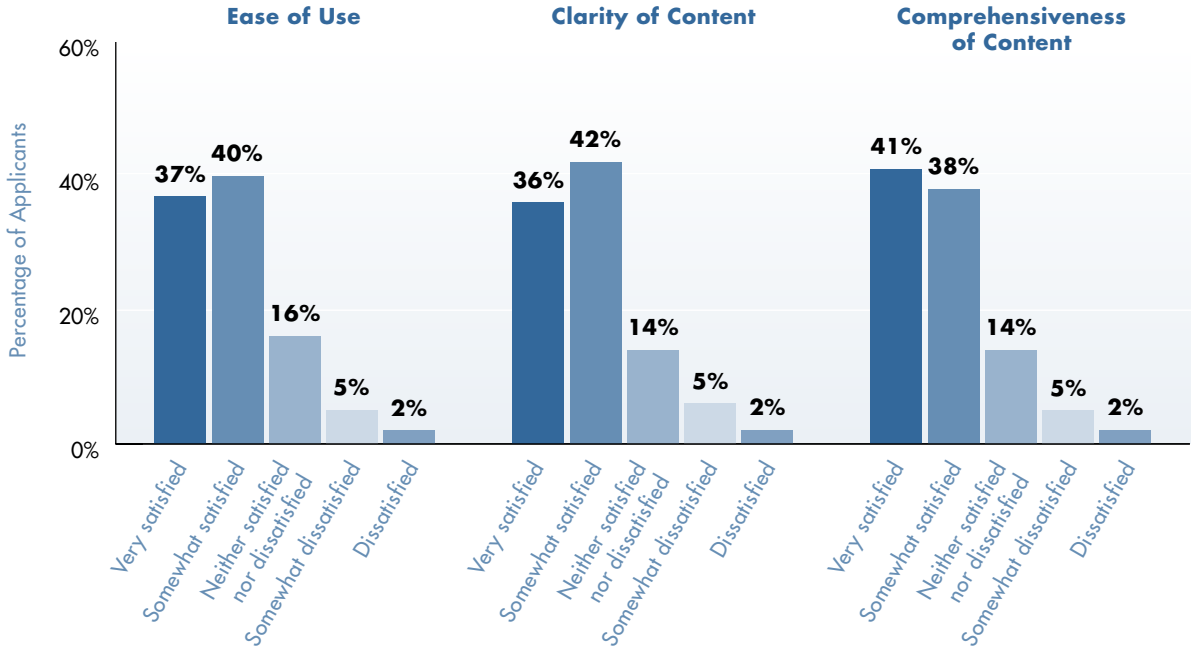
- In terms of its *ease of use*, 77% of applicants report being satisfied with the Kit. (See Figure 1).[1]
- With respect to the *clarity of content*, 78% say they are satisfied (See Figure 1).
- On the *comprehensiveness of content*, 79% are satisfied (See Figure 1).
- These satisfaction ratings are very similar to those expressed by the 2002 applicants.

[1] We have combined the response categories "very satisfied" and "somewhat satisfied" for ease of reporting.

FIGURE 1

Satisfaction with ATP Proposal Preparation Kit

Source: Survey of ATP Applicants 2004



The ATP Proposal Preparation Kit is rated positively by both Awardees and Nonawardees

- Awardees view the Kit more favorably than do Nonawardees. About nine out of ten Awardees indicate being satisfied with the Kit on all three measures (See Table 1).
- Nevertheless, most Nonawardees say they are satisfied with the Kit.

TABLE 1

Awardee and Nonawardee Satisfaction with ATP Proposal Preparation Kit

Source: Survey of ATP Applicants 2004

ATP Proposal Preparation Kit's...	Awardees	Nonawardees
Ease of Use		
Very satisfied	50%	36%
Somewhat satisfied	43%	40%
Clarity of Content		
Very satisfied	55%	34%
Somewhat satisfied	33%	43%
Comprehensiveness of Content		
Very satisfied	60%	39%
Somewhat satisfied	30%	39%

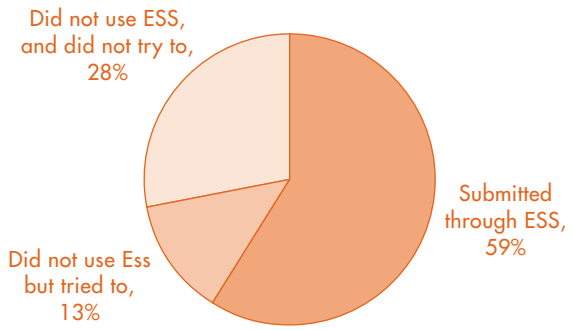
ATP applicants are increasingly likely to use the Electronic Submission System (ESS)

- 59% of applicants used the ESS to submit their proposals in 2004. Another 13% tried to use the system, but did not submit their proposals through the ESS (See Figure 2). The percentage of applicants using the ESS is up significantly from 41% for the 2002 applicants.
- Small companies (75%) were more likely than Large/Medium companies (60%) to at least try using the ESS in 2004.[2]
- Most applicants submitting proposals through the ESS found it easy to use, but almost one-third said it was difficult (See Figure 3). Those ratings are similar to the 2002 applicant ratings on ease of use.
- Applicants in the Electronics area were more likely than those in the Biotechnology, Materials and Chemistry, and Information Technology areas to submit through the ESS (See Figure 4).

FIGURE 2

ATP Proposal Submission through the ESS

Source: Survey of ATP Applicants 2004



[2] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium-size companies are all others.

FIGURE 3

Ease or Difficulty of Using the ESS

Source: Survey of ATP Applicants 2004

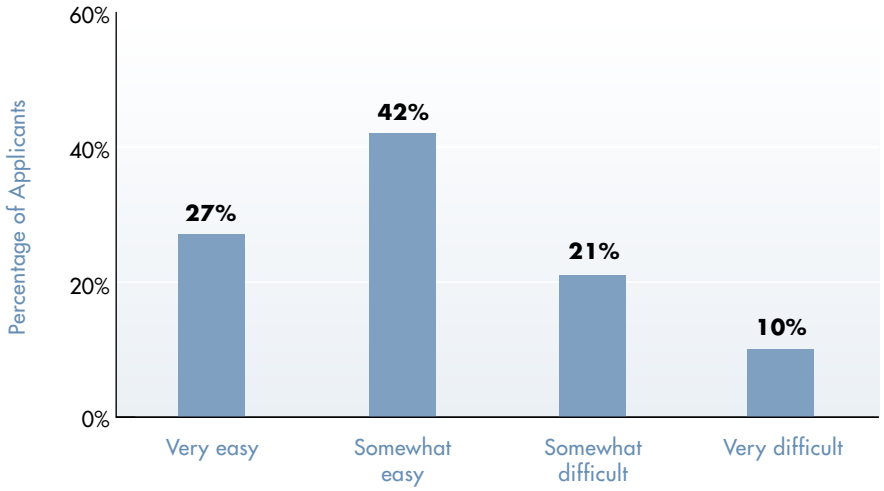
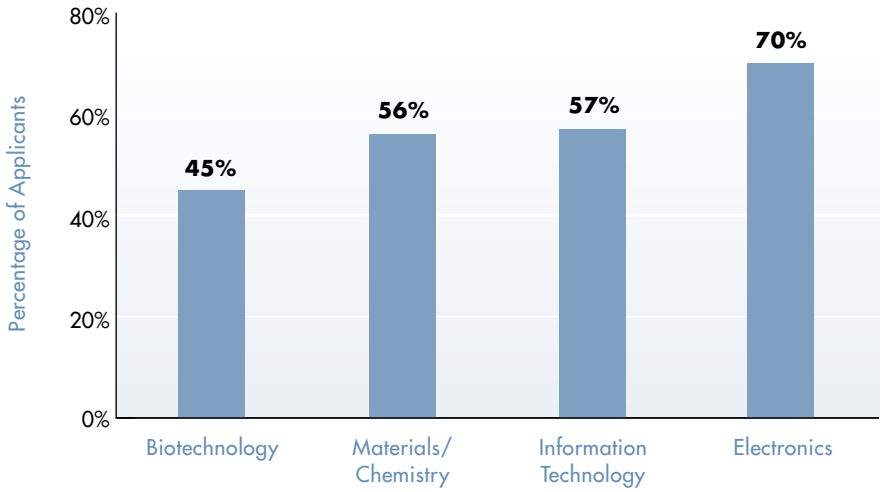


FIGURE 4

ATP Proposal Submission through ESS, by Technology Area

Source: Survey of ATP Applicants 2004



15

Applicant Views of the Usefulness of ATP Information Sources

The Advanced Technology Program (ATP) aims to make the proposal process a smooth one for applicants, and utilizes a variety of outreach efforts. For example, ATP sponsors a website with detailed information, holds conferences for potential proposers, and operates information booths at a variety of professional meetings. Information about ATP also travels by "word of mouth" among researchers. *The Survey of ATP Applicants 2004* asked applicants how useful they view these information sources.

Respondents were asked to indicate how useful each of the following have been for them as an information source about ATP:

a. ATP website
b. ATP Proposers Conference
c. ATP information booth at industry or trade association meetings
d. Industry or company colleagues
e. Interactions with ATP staff

Applicants find the information sources about ATP to be useful

- More than eight in ten applicants (84%) say that the ATP website is useful to them (See Figure 1).[1]
- Slightly less than half (43%) of applicants indicate that the Proposers Conferences are useful (See Figure 1); this represents over three-quarters of applicants who have experience with this source.
- The majority of applicants (70%) have no experience with the ATP information booths at professional meetings. However, over half who do have experience with this source rate it as useful (See Figure 1).
- Almost two-thirds of applicants view industry or company colleagues to be useful sources of information about ATP (See Figure 1).

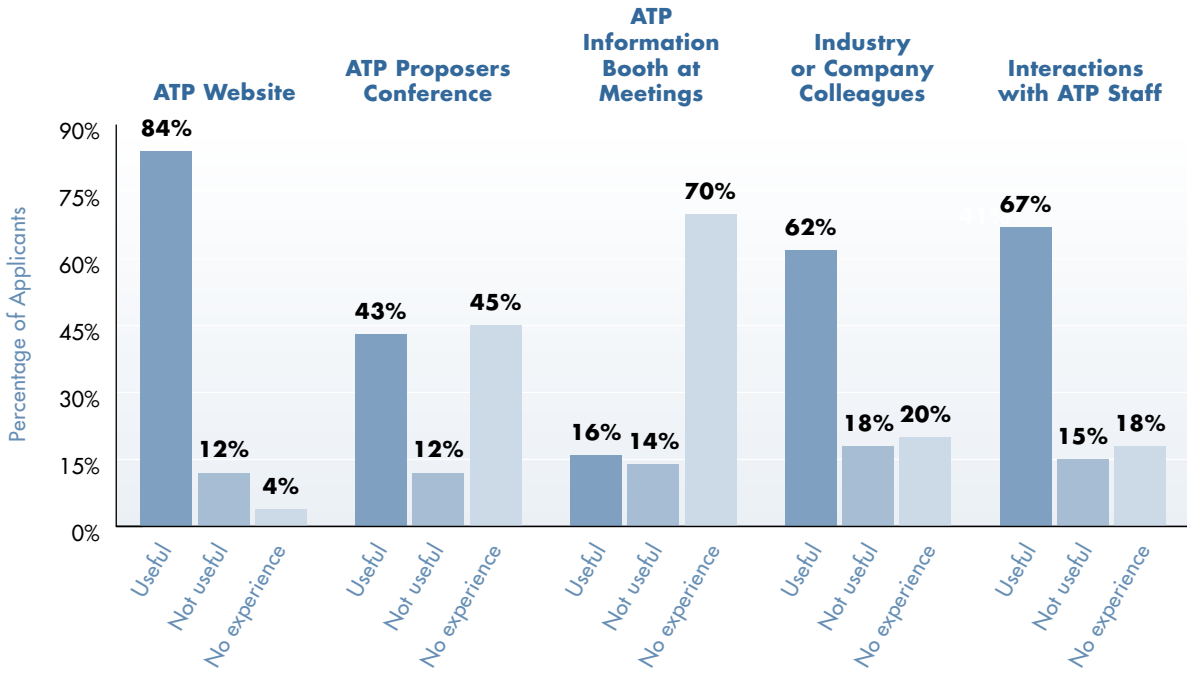
[1] We have combined the response categories "very useful" and "somewhat useful" for ease of reporting.

- Two-thirds of applicants report that interactions with ATP staff are useful sources of information (See Figure 1).
- These findings are very similar to findings from the year 2002 ATP applicants.

FIGURE 1

Applicant Views of the Usefulness of ATP Information Sources

Source: Survey of ATP Applicants 2004



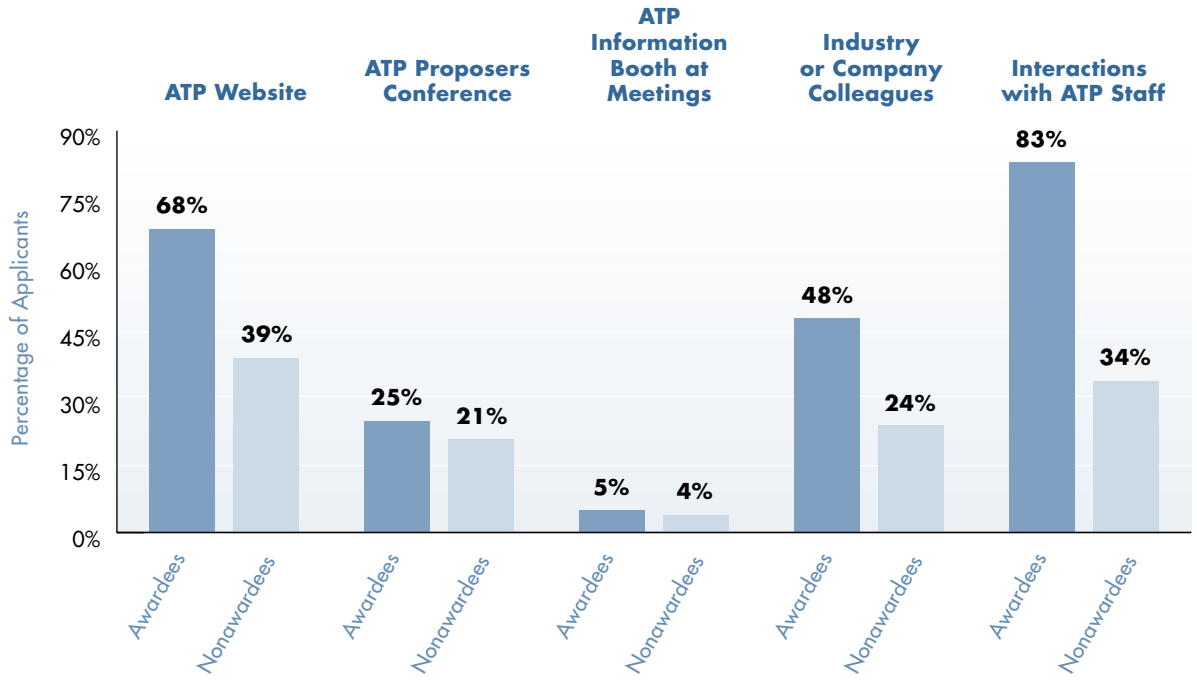
Awardees view the information sources as more useful than do Nonawardees

- Overall, Awardees were more likely than Nonawardees to say they found the ATP website to be a very useful source of information (See Figure 2).
- Awardees were also more likely than Nonawardees to report that industry or company colleagues were useful sources of information about ATP (See Figure 2).
- Awardees are more likely than Nonawardees to find interactions with ATP staff to be a very useful source of information (See Figure 2).

FIGURE 2

Awardee and Nonawardee Views of ATP Information Sources as Very Useful

Source: Survey of ATP Applicants 2004



Across ATP technology areas, applicants differ in how useful they view the ATP as an information source

- Applicants in the Information Technology and Electronic fields were most likely to view the ATP website as being very useful (See Table 1).
- Applicants in the Materials and Chemistry field were more likely than applicants in the other areas to report that they have no experience with the ATP website, although three-fourths of applications in this technology group still found the website to be useful (See Table 1).

TABLE 1

Applicant Views of the ATP Website, by Technology Area

Source: Survey of ATP Applicants 2004

	Biotechnology	Materials and Chemistry	Electronics	Information Technology
ATP Website				
Very useful	38%	33%	47%	46%
Somewhat useful	43%	40%	43%	44%
Not useful	16%	17%	8%	8%
No experience	3%	10%	2%	2%

Applicants on Joint Venture proposals were more likely to view colleagues as useful information sources about ATP

- Almost half of applicants (45%) submitting Joint Venture proposals report that industry or company colleagues have been useful sources of information about ATP, compared to 21% of Single Company applicants.

Applicants from small companies were less likely to view colleagues as useful information sources about ATP

- One out of five (22%) of applicants from Small Companies report that industry or company colleagues have been useful sources of information about ATP, compared to one out of two (47%) of applicants from Large/ Medium size companies.[2]

[2] For ATP, Small companies have fewer than 500 employees, Large companies are Fortune 500 companies, and Medium-size companies are all others.

A1

Appendix 1:

Survey of ATP Applicants 2004

Nonawardee Version

SECTION HEADING: Reasons for Applying to ATP

For each question in the survey, mark the selection that best represents your view.

1. Below are several reasons why a company might apply to ATP for funding. Please tell us how important each reason was in your decision to apply to ATP:

1a. Internal company funding is not available.

Extremely important
Very important
Somewhat important
Not too important

1b. Internal company funding and commitment to the project depends on receiving external funding.

Extremely important
Very important
Somewhat important
Not too important

1c. ATP funding provides external validation of the technological potential of the project.

Extremely important
Very important
Somewhat important
Not too important

1d. ATP funding provides external validation of the commercial potential of the project.

Extremely important
Very important
Somewhat important
Not too important

1e. ATP funding facilitates collaboration among different organizations.

Extremely important
Very important
Somewhat important
Not too important

SECTION HEADING: Comparing Your Proposed ATP Project to a Typical R&D Project

We would like to know how the project you proposed to ATP compares to a typical R&D project at your company.

First, think about technical risk.

2a. For your proposed ATP project, what would you say is the probability, from 0% to 100%, that your company could achieve the minimal technical goals required for project success?

(Try to answer based on how you thought about your project when you proposed it to ATP).

_____ %

2b. For your proposed ATP project, what would you say is the probability, from 0% to 100%, that your company could achieve the maximal "stretch" technical goals for this project?

(Try to answer based on how you thought about your project when you proposed it to ATP).

_____ %

3. What would you say is the probability, from 0% to 100%, that a typical R&D project at your company could achieve all of the technical goals required for project success?

_____ %

If your company has no other R&D projects, please check here → ☐

Now think about expected business impact.

4. Approximately how many years after the start of your proposed ATP project would you expect results to first have an impact on company revenues or costs?

(Try to answer based on how you thought about your project when you proposed it to ATP).

_____ years

5. Approximately how many years after the start of the typical R&D project at your company could you expect results to first have an impact on company revenues or cost?

_____ years

If your company has no other R&D projects, please check here → ☐

SECTION HEADING: Anticipated Value From Your Proposed ATP Project

The following items ask about the anticipated value from commercialization of your proposed ATP project technology.

6. Beyond the proposed ATP project, how much additional investment would your company need to make in order to commercialize the project technology?

$ _____

7. Consider the total impact of the proposed ATP technology on your company. What would be the net effect of this technology on your company's annual revenues? (Try to answer based on how you thought about your project when you proposed it to ATP).

7a. Two years after proposed project end

$ _____

7b. Five years after proposed project end

$ _____

8. What do you expect would be the gross profit margin on your company's product sales resulting from the proposed technology?

_____ %

9. How much annual cost savings would you expect your company to receive from process improvements resulting from your proposed ATP technology? (Try to answer based on how you thought about your project when you proposed it to ATP).

9a. Two years after proposed project end

$ _____

9b. Five years after proposed project end

$ _____

10. How much in annual royalties would you expect your company to receive from licensing your proposed ATP technology to others? (Try to answer based on how you thought about your project when you proposed it to ATP).

10a. Two years after proposed project end

$ _____

10b. Five years after proposed project end

$ _____

11. What is your estimate of net benefits to downstream industry users or consumers that would result from your proposed ATP technology?

11a. Two years after proposed project end

$ _____

11b. Five years after proposed project end

$ _____

SECTION HEADING: Other Characteristics of Your Proposed ATP Project

12a. To what extent was your proposed ATP project based on research from universities?

To a large extent
To a moderate extent
To some extent
Not at all

12b. To what extent was your proposed ATP project technology licensed from universities?

To a large extent
To a moderate extent
To some extent
Not at all

13. To what extent would you say your proposed ATP project represented a new R&D direction for….

13a. Your company?

To a large extent
To a moderate extent
To some extent
Not at all

13b. Your industry or technology field?

To a large extent
To a moderate extent
To some extent
Not at all

14. When developing your proposed ATP project….

14a. How quickly did you expect critical research findings from this project to become known to others outside your company?

Within 2 years of project end
2 to 5 years after project end
5 to 10 years after project end
10 or more years after project end
Never

14b. How quickly did you expect critical research "know-how" from this project to become known to others outside your company? (Consider research "know-how" to be knowledge gained from experience and practice that is less easily communicated than findings)

Within 2 years of project end
2 to 5 years after project end
5 to 10 years after project end
10 or more years after project end
Never

15. In developing your ATP proposed project, to what extent did…..

15a. Individuals in your company form new research ties or contacts with individuals at other organizations?

To a large extent
To a moderate extent
To some extent
Not at all

15b. Your company form new research partnerships or relationships with other organizations?

To a large extent
To a moderate extent
To some extent
Not at all

15c. Your company extend or strengthen existing research relationships with other organizations?

To a large extent
To a moderate extent
To some extent
Not at all

16. For your company, how important are each of the following means of capturing value from innovation?

16a. Maintaining intellectual property through trade secrecy.

Extremely important
Very important
Somewhat important
Not too important

16b. Maintaining intellectual property through patent or copyright protection.

Extremely important
Very important
Somewhat important
Not too important

16c. Being first to market.

Extremely important
Very important
Somewhat important
Not too important

16d. Using complementary R&D capabilities.

Extremely important
Very important
Somewhat important
Not too important

16e. Using complementary manufacturing, distribution, or service capabilities.

Extremely important
Very important
Somewhat important
Not too important

SECTION HEADING: Proposal Preparation and Review

Now we have some questions about your experience during the proposal preparation and review process.

17. How useful have each the following been for you as an information source about ATP?

17a. ATP website

Very useful
Somewhat useful
Not too useful
Not at all useful
No experience with this source

17b. ATP Proposers Conference

Very useful
Somewhat useful
Not too useful
Not at all useful
No experience with this source

17c. ATP information booth at industry or trade association meetings

Very useful
Somewhat useful
Not too useful
Not at all useful
No experience with this source

17d. Industry or company colleagues

Very useful
Somewhat useful
Not too useful
Not at all useful
No experience with this source

17e. Interactions with ATP staff

Very useful
Somewhat useful
Not too useful
Not at all useful
No experience with this source

18. Please rate your level of satisfaction with the ATP Proposal Preparation Kit in terms of:

18a. Ease of use

Very satisfied
Somewhat satisfied
Neither satisfied nor dissatisfied
Somewhat dissatisfied
Very dissatisfied

18b. Clarity of content

Very satisfied
Somewhat satisfied
Neither satisfied nor dissatisfied
Somewhat dissatisfied
Very dissatisfied

18c. Comprehensiveness of content

Very satisfied
Somewhat satisfied
Neither satisfied nor dissatisfied
Somewhat dissatisfied
Very dissatisfied

19a. Did you submit your proposal electronically through ATP's Electronic Submission System (ESS)?

Yes
No, but tried to do so
No, and did not try to (Go to #20)

19b. How easy or difficult to use was the Electronic Submission System (ESS)?

Very easy
Somewhat easy
Somewhat difficult
Very difficult

20. Did you contact ATP staff with questions regarding your application?

Yes
No
Don't remember

21. How satisfied were you with the following?

21a. Courtesy of the staff

Very satisfied
Somewhat satisfied
Neither satisfied nor dissatisfied
Somewhat dissatisfied
Very dissatisfied

21b. Promptness of the service

Very satisfied
Somewhat satisfied
Neither satisfied nor dissatisfied
Somewhat dissatisfied
Very dissatisfied

21c. Help in resolving problems or issues

Very satisfied
Somewhat satisfied
Neither satisfied nor dissatisfied
Somewhat dissatisfied
Very dissatisfied

22. How many total hours of staff time did your company use in preparing your ATP proposal?

None
Less than 40 hours
40 to less than 80 hours
80 to less than 160 hours
160 to less than 240 hours
240 to less than 320 hours
320 to less than 400 hours
400 to less than 480 hours
480 hours or more
Don't know

23. What was the total cost to your company in preparing the ATP proposal?

None
Less than $5,000
$5,000 to less than $10,000
$10,000 to less than $15,000
$15,000 to less than $20,000
$20,000 to less than $30,000
$30,000 to less than $40,000
$40,000 to less than $50,000
$50,000 to less than $75,000
$75,000 or more
Don't know

24. How useful was it for your company to go through the process of preparing the ATP proposal?

Very useful
Somewhat useful
Not too useful
Not at all useful

25. Overall, how useful to your company was evaluative feedback you received from ATP during the review process (i.e., oral review or proposal debriefing)?

Very useful
Somewhat useful
Not too useful
Not at all useful

26. How did your company view the length of time to receive a decision from ATP on the project proposal?

Much shorter than expected
Somewhat shorter than expected
About what was expected
Somewhat longer than expected
Much longer than expected

27. To what extent do you believe the ATP review and decision process was a fair process?

Large extent
Moderate extent
Small extent
Not at all

28. If you have any other comments about the ATP application and review process, please share them with us:

_____

_____

_____

29. How likely is it that you will apply again for funding from ATP?

Very likely
Somewhat likely
Somewhat unlikely
Very unlikely
Don't know

SECTION HEADING: Your Company's Expenditures for the Line of Research

Now we turn to questions about the amount of R&D expenditure devoted to the specific line of research represented by your proposed ATP project.

30. In the three years before submitting your ATP proposal, approximately how much R&D expenditure from – internal and external sources - did your company devote to this line of research?

Your best estimate is fine.

We consider internal expenditure to be money from any part of your company and external expenditure to be money from outside of your company for specific R&D, either from government sources or other companies.

30a. R&D expenditure from internal sources….

$ _____

30b. R&D expenditure from external sources….

$ _____

If your company did not devote any R&D expenditure from external sources in the three years before submitting your ATP proposal, then go #32a.

31. In the three years before submitting your ATP proposal, did your company receive funding from any of the following sources for this line of research?

31a. Federal government programs (other than ATP)

Yes
No
Don't know

If yes, specify agency and program (e.g. NIH/SBIR)

_____

_____

31b. State or local government programs

Yes
No
Don't know

31c. Other companies

Yes
No
Don't know

32a. Is your company currently carrying out any part of the R&D project that you proposed to ATP?

Yes
No (Go to #32)

32b. How would you describe the scale of effort of the R&D project as it is now being carried out?

Less than 20%
20% to 39%
40% to 59%
60 to 79%
80% or more

32c. Since submitting the ATP proposal, has your company produced any of the following results from the R&D project as it is now being carried out? (Check all that apply.)

Conference paper or presentation
New invention
Patent application
Financial results (revenues, cost savings, etc.)

Now think again about the line of research represented by your proposed ATP project.

33. Since submitting your ATP proposal, approximately how much R&D expenditure - from internal and external sources - has your company committed to this line of research?

Your best estimate is fine.

We consider internal expenditure to be money from any part of your company and external expenditure to be money from outside of your company for specific R&D, either from government sources or other companies.

33a. R&D expenditure from internal sources….

$ _____

33b. R&D expenditure from external sources….

$ _____

If your company did not devote any R&D expenditure from external sources since submitting your ATP proposal, then go to #35.

34. Since submitting your ATP proposal, has your company committed funds originating from any of the following sources to this line of research?

34a. Federal government programs (other than ATP)

Yes
No
Don't know

If yes, specify agency and program (e.g. NIH/SBIR)

_____

_____

34b. State or local government programs

Yes
No
Don't know

34c. Other companies

Yes
No
Don't know

SECTION HEADING: About Your Company

Finally, we have just a few more questions about your company.

35. Including full-time and part-time employees, how many employees did your company have at the end of 2004?

None
1 to 4
5 to 9
10 to 24
25 to 49
50 to 99
100 to 499
500 to 1,499
1,500 to 4,999
5,000 to 9,999
10,000 to 19,999
20,000 or more
Don't know

36. Including full-time and part-time employees, how many employees at your company worked in R&D at the end of 2004?

None
1 to 4
5 to 9
10 to 24
25 to 49
50 to 74
75 to 99
100 to 149
150 to 199
200 to 499
500 to 999
1,000 to 2,499
2,500 or more
Don't know

37. Including all sources of revenue (e.g., sales, licensing, research contracts, grants, etc.), what were total company revenues for the year 2004?

Your best estimate is fine.

$ _____

38. What were total R&D expenditures at your company in the year 2004?

$ _____

39. What percentage of the year 2004 R&D expenditures at your company would you say came from external funding sources?

_____% External Funding

40. What percentage of the year 2004 R&D expenditures at your company would you say was devoted to product development, as opposed to research (either basic or applied)?

_____% Product Development

41. Do you consider your company to be a start-up company?

Yes
No

42. At the time of submitting your ATP proposal, did any of the following entities have an ownership stake in your company….

42a. Individual investors (i.e., "angel" investors)?

Yes
No

42b. Venture capital?

Yes
No

42c. Other companies?

Yes
No

43. Since submitting your ATP proposal, did your company seek equity investment from individual investors (i.e., angel investors), venture capital, or other companies?

Yes
No

44. Since submitting your ATP proposal, did your company receive equity investment from individual investors, venture capital, or other companies?

Yes
No

45. Did you consult company records or any other people in order to answer any of the questions in this survey?

Yes
No

A2

Appendix 2:

Survey of ATP Applicants 2004

Awardee Version

Survey of ATP Applicants

Year 2004

Help shape the future of ATP

Advanced Technology Program
Economic Assessment Office

National Institute of Standards and Technology

Dear ATP Awardee,

Effective organizations monitor customer satisfaction, and the Advanced Technology Program (ATP) is no exception. So we ask you to help us assess ATP's proposal preparation and review process.

ATP aims to make this process a smooth one, to make it useful to companies, and to provide fair treatment to all applicants. By filling out this brief survey, you will give us a better view of how effectively ATP works with applicants, and how this process can be improved.

We consider all data you give us to be confidential. Westat, an independent research firm in Rockville, Maryland, is collecting the data for us. Westat is strictly required to protect the confidentiality of all information collected.

Please take just a few minutes to answer the questions. If another person in your company would be a better respondent for this survey, please forward these materials to that person. Customer input is important to us and will help shape the future of ATP.

This survey is authorized under the Paperwork Reduction Act. Public reporting for this collection of information is estimated to average 10 minutes per response, including the time of reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

If you have comments about this estimate or any other aspects of this collection of information, including suggestions for reducing the length of this questionnaire, send them to the National Institute of Standards and Technology, 100 Bureau Drive, Stop 3220, Gaithersburg, MD 20899-3220 and the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC, 20503

OMB NO: 0693-0033 Expires 08/31/2006

For each question, mark the answer choice that best represents your view.

1. How useful have each of the following been for you as an information source about ATP?

1a. ATP Website

- ☐ Very useful
- ☐ Somewhat useful
- ☐ Not too useful
- ☐ Not at all useful
- ☐ No experience with this source

1b. ATP Proposers Conference

- ☐ Very useful
- ☐ Somewhat useful
- ☐ Not too useful
- ☐ Not at all useful
- ☐ No experience with this source

1c. ATP information booth at industry or trade association meetings

- ☐ Very useful
- ☐ Somewhat useful
- ☐ Not too useful
- ☐ Not at all useful
- ☐ No experience with this source

1d. Industry or company colleagues

- ☐ Very useful
- ☐ Somewhat useful
- ☐ Not too useful
- ☐ Not at all useful
- ☐ No experience with this source

1e. Interactions with ATP staff

- ☐ Very useful
- ☐ Somewhat useful
- ☐ Not too useful
- ☐ Not at all useful
- ☐ No experience with this source

2. Please rate your level of satisfaction with the ATP Proposal Preparation Kit in terms of:

2a. Ease of use

- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat satisfied
- ☐ Very dissatisfied

2b. Clarity of content

- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat satisfied
- ☐ Very dissatisfied

2c. Comprehensiveness of content

- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat satisfied
- ☐ Very dissatisfied

3a. Did you submit your proposal electronically through ATP's Electronic Submission System (ESS)?

- ☐ Yes
- ☐ No, but tried to do so
- ☐ No, and did not try to (Go to #4)

3b. How easy or difficult to use was the Electronic Submission System (ESS)?

- ☐ Very easy
- ☐ Somewhat easy
- ☐ Somewhat difficult
- ☐ Very difficult

---

4. Did you contact ATP staff with questions regarding your application?

- ☐ Yes
- ☐ No (Go to #6)
- ☐ Don't remember (Go to #6)

5. When you contacted ATP staff, how satisfied were you with the following?

5a. Courtesy of the staff

- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat satisfied
- ☐ Very dissatisfied

5b. Promptness of the service

- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat satisfied
- ☐ Very dissatisfied

5c. Help in resolving problems or issues

- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither satisfied nor dissatisfied
- ☐ Somewhat satisfied
- ☐ Very dissatisfied

6. How many total hours of staff time did your company use in preparing your ATP proposal?

- ☐ None.
- ☐ Less than 40 hours
- ☐ 40 to less than 80 hours
- ☐ 80 to less than 160 hours
- ☐ 160 to less than 240 hours
- ☐ 240 to less than 320 hours
- ☐ 320 to less than 400 hours
- ☐ 400 to less than 480 hours
- ☐ 480 hours or more
- ☐ Don't know

7. What was the total cost to your company in preparing your ATP proposal?

- ☐ None.
- ☐ Less than $5,000
- ☐ $5,000 to less than $10,000
- ☐ $10,000 to less than $15,000
- ☐ $15,000 to less than $20,000
- ☐ $20,000 to less than $30,000
- ☐ $30,000 to less than $40,000
- ☐ $40,000 to less than $50,000
- ☐ $50,000 to less than $75,000
- ☐ $75,000 or more
- ☐ Don't know

---

8. Regardless of whether you received funding for the project, how useful was it for your company to go through the process of preparing the ATP proposal?

- ☐ Very useful
- ☐ Somewhat useful
- ☐ Not too useful
- ☐ Not at all useful

9. How much of a problem was the length of time you waited to receive ATP's decision on your proposal?

- ☐ No problem
- ☐ A small problem
- ☐ A moderate problem
- ☐ A big problem

---

10. Overall, how useful to your company was the evaluative feedback you received from ATP during the review process, for example in oral review or proposal debriefing?

- ☐ Very useful
- ☐ Somewhat useful
- ☐ Not too useful
- ☐ Not at all useful

11. Regardless of the outcome of your proposal, to what extent do you believe the ATP review and decision process was a fair process?

- ☐ Large extent
- ☐ Moderate extent
- ☐ Small extent
- ☐ Not at all

---

12. If you have any other comments about the ATP application and review process, please share them with us:

_____

_____

_____

_____

_____

13. How likely is it that you will apply for funding again from ATP?

- ☐ Very likely
- ☐ Somewhat likely
- ☐ Somewhat unlikely
- ☐ Very unlikely

Thank you very much for participating in this study. Please return your completed survey to us in the envelope provided. If the envelope has been misplaced, mail your survey to:

Jeffrey Kerwin
Westat, RE 132
1650 Research Blvd.
Rockville, MD 20850

About the Advanced Technology Program

The Advanced Technology Program (ATP) is a partnership between government and private industry to conduct high-risk research to develop enabling technologies that promise significant commercial payoffs and widespread benefits for the economy. ATP provides a mechanism for industry to extend its technological reach and push the envelope beyond what it otherwise would attempt

Promising future technologies are the domain of ATP:

- Enabling or platform technologies essential to development of future new products, processes, or services across diverse application areas
- Technologies where challenging technical issues stand in the way of success
- Technologies that involve complex "systems" problems requiring a collaborative effort by multiple organizations
- Technologies that will remain undeveloped, or proceed too slowly to be competitive in global markets, in the absence of ATP support

ATP funds technical research, but does not fund product development—that is the responsibility of the company participants. ATP is industry driven, and is grounded in real-world needs. Company participants conceive, propose, co-fund, and execute all of the projects cost-shared by ATP. Most projects also include participation by universities and other nonprofit organizations.

Each project has specific goals, funding allocations, and completion dates established at the outset. All projects are selected in rigorous competitions that use peer review to identify those that score highest on technical and economic criteria. Single-company projects can have duration up to three years; joint venture projects involving two or more companies can have duration up to five years.

Small firms on single-company projects cover at least all indirect costs associated with the project. Large firms on single-company projects cover at least 60 percent of total project costs. Participants in joint venture projects cover at least half of total project costs. Companies of all sizes participate in ATP-funded projects. To date, nearly two out of three ATP project awards have gone to individual small businesses or to joint ventures led by a small business.

Contact ATP for more information:

- **On the Internet:** www.atp.nist.gov
- **By e-mail:** atp@nist.gov
- **By phone:** 1-800-ATP-FUND (1-800-287-3863)
- **By writing:** Advanced Technology Program, National Institute of Standards and Technology, 100 Bureau Drive, Stop 4701, Gaithersburg, MD 20899-4701

21836.78850405.0507