

GAO

United States General Accounting Office

Report to the Ranking Minority Member,  
Committee on Science, House of  
Representatives

January 1996

# MEASURING PERFORMANCE

## The Advanced Technology Program and Private-Sector Funding



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Abstract: ATP's mission is to stimulate economic growth in the United States through technology development. The program seeks to accomplish that mission by sharing the cost of industrial research and development projects. The projects selected by ATP for funding are characterized by "a potential broad-based economic impact but a relatively high technical risk and a long time horizon", according to ATP. ATP's guidance states that if the technical risk associated with a project is very low, federal funding should not be necessary. In addition, when submitting a research proposal, applicants must sign a form stating that "this proposal is not requesting funding for existing or planned research programs that would be conducted in the same time period in the absence of financial assistance under the ATP." This wording suggests that ATP should not fund projects that other sources would have funded or, when ATP does fund such projects, that ATP funds should enable applicants to complete their projects in a shorter time.

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United States  
General Accounting Office  
Washington, D.C. 20548

Resources, Community, and  
Economic Development Division

B-270551

January 11, 1996

The Honorable George E. Brown, Jr.  
Ranking Minority Member  
Committee on Science  
House of Representatives

Dear Mr. Brown:

This report responds to your request that we assess the impact of the Advanced Technology Program (ATP), which is administered by the National Institute of Standards and Technology within the Department of Commerce. ATP's purpose is to provide support on a cost-sharing basis for industrial research and development projects—projects that have a significant potential for stimulating economic growth and improving the competitiveness of U.S. industry. Federal funding for ATP has grown sharply, from \$68 million in fiscal year 1993 to \$341 million in fiscal year 1995. Recently, however, budget proposals have suggested eliminating ATP's funding for fiscal year 1996.

As agreed with your office, our objective was to examine, as one way to assess ATP's impact, whether research projects would have been funded by the private sector if they had not received funds from ATP. We also examined ATP's impact in terms of other goals of the program, such as aiding the formation of joint ventures. We agreed on this approach because of the difficulty of assessing the net impact of ATP's investments in technology on the economy. For example, it is difficult to establish a causal link between a successful project and government funding earlier in the project. Moreover, the impact of ATP should be measured not only by its effect on the firms that receive funding but also by its effect on other firms—a difficult undertaking that our approach avoids.

To meet our objective, we focused on two groups of ATP applicants, which we called "winners" and "near winners." Both groups submitted proposals that were rated highest during ATP's review, but the near winners did not ultimately receive ATP funding. We surveyed by telephone all applicants that qualified as winners or near winners during ATP's first 4 years (1990-93). We achieved a 100-percent response rate from the 123 respondents that we included in our analysis (89 winners and 34 near winners). We asked the near winners if they had continued their proposed projects using other funding sources after ATP declined to fund them. Given the similarity in the qualifications of the proposals submitted by the

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winners and near winners as determined by ATP, another purpose of this question was to determine whether the winners would have been likely to continue their projects without ATP funding. We also asked both groups if they had sought funding from other sources before applying to ATP. This question provided information on whether private-sector sources had the opportunity to fund proposed projects before an applicant sought ATP funding.

In our survey, we also collected information that provides an extensive profile of the respondents, which we used in some of our analyses; additional information from this profile is provided in appendix I. Appendix II contains our survey questions and an aggregate list of all the responses, and appendix III provides further detail about our objectives, scope, and methodology.

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## Results in Brief

ATP has funded research projects that would have been funded by the private sector as well as those that would not. Half of the near winners continued their projects without relying on ATP funding, while the other half discontinued their projects for various reasons. The winners were nearly evenly divided when asked if they would have pursued their projects even if they had not received ATP funding. Almost all the near winners that continued their projects did so on a modified schedule, meeting the projects' milestones later than scheduled in their proposals to ATP.

In most cases, private-sector sources did not have the opportunity to fund ATP projects. Of the 123 applicants we surveyed, 77,<sup>1</sup> or 63 percent, did not look for funding from other sources before requesting it from ATP. Those applicants that did look for funding looked for a long time and made many attempts to find funding, on average. Seven applicants turned down offers from private sources because they could not reach an acceptable funding arrangement.

Our survey also found that ATP had other effects. More than three-fourths of the joint-venture applicants indicated that they had come together solely to pursue an ATP project, thus satisfying ATP's goal of serving as a catalyst for the formation of joint ventures. Furthermore, of the 45 applicants that tried to find funding elsewhere before turning to ATP, about half were told by prospective funders that their projects were either too

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<sup>1</sup>One applicant did not know.

risky or "precompetitive"<sup>2</sup>—characteristics that fulfill the aims of ATP funding.

## Background

ATP's mission is to stimulate economic growth in the United States through technology development. The program seeks to accomplish that mission by sharing the cost of industrial research and development projects. The projects selected by ATP for funding are characterized by "a potential broad-based economic impact but a relatively high technical risk and a long time horizon," according to ATP.

ATP's guidance states that if the technical risk associated with a project is very low, federal funding should not be necessary. In addition, when submitting a research proposal, applicants must sign a form stating that "this proposal is not requesting funding for existing or planned research programs that would be conducted in the same time period in the absence of financial assistance under the ATP." This wording suggests that ATP should not fund projects that other sources would have funded or, when ATP does fund such projects, that ATP funds should enable applicants to complete their projects in a shorter time.

## Applicants' Actions and Intentions to Find Funding Before Applying to ATP

Most ATP applicants did not look for funding from other sources before requesting it from ATP. In addition, the applicants were about evenly divided when asked if they intended to pursue their projects whether or not they received ATP funding.

When asked if they had searched for funding from other sources before applying to ATP, 63 percent of the applicants (77 of 123; one applicant did not know) said that they had not. Considering the winners and near winners separately, we found that 65 percent (58 of 89) of the winners had not looked for funding before applying to ATP, along with 56 percent (19 of 34) of the near winners.

Of the 45 applicants that had looked for funding before applying to ATP, about 53 percent (24 of 45) sought it from private sources only, 9 percent (4) from public sources only, and 38 percent (17) from some combination of private and public sources. On average, 42 of these 45 respondents (3 did not respond) searched for funding for 18 months before applying to ATP and made eight separate attempts to find funding.

<sup>2</sup>"Precompetitive" refers to the stage during research and development at which a preliminary assessment of a technology's commercial potential can be made but before commercial prototypes are developed.

When asked what reasons the non-ATP sources gave for not providing funding, 54 percent of these applicants (22 of 41; 4 did not respond) said that their projects were viewed as either too risky or “precompetitive”—both outlined in Commerce’s regulations as reasons for ATP to fund projects. Sixteen percent (7 of 45) said they had turned down funding offers because they could not agree on terms with the prospective funder; 3 of these 7 eventually received ATP funding.

We asked the winners and near winners if they intended to pursue their projects whether or not they received ATP funding. When we considered the two groups together, 42 percent (52 of 123) said “yes” or “probably yes;” 41 percent (51) said “no” or “probably no;” and 16 percent (20) were uncertain. Of the respondents that said they intended to pursue the project, 94 percent (49 of 52) indicated that their projects’ schedules would be modified and that the milestones would be met later than scheduled in their proposals to ATP. When we considered the ATP winners’ answers alone, 40 percent (36 of 89) said “yes” or “probably yes;” 16 percent (14) were undecided; and 44 percent (39) said “no” or “probably no.”

Most of the joint-venture applicants came together to apply to ATP. Seventy-six percent (26 of 34) said they had formed a new group to pursue the projects described in their ATP proposals. The remaining joint-venture applicants had worked together before applying to ATP, pursuing either the projects that they proposed to ATP or other projects.

## Near Winners’ Actions After ATP Declined to Fund Their Proposals

After ATP declined to fund their proposals, half of the near winners continued their projects using other funding sources. The near winners with certain characteristics were more likely to continue their projects than others.<sup>3</sup>

## Half of Near Winners Continued Projects Using Other Funding Sources

Half of the near winners (14 of 28) continued their projects using other funding sources after ATP declined to fund them. These other funding sources included federal government programs other than ATP; state government agencies; and private funders, such as industry groups or trade associations, other private companies, venture capitalists, and the company itself. All 14 near winners used some private funding to continue

<sup>3</sup>In our findings for this section only, the total of near winners drops to 28 because 6 of the near winners were granted funding by ATP in a subsequent round of competition. Thus, we eliminated them from consideration here, focusing only on those that found funding from sources other than ATP.

their projects; 8 of these financed their projects using private funds only.<sup>4</sup> Ninety-three percent (13 of 14) of the projects that were continued were or are being carried out on a modified schedule, meeting their milestones later than scheduled in the proposals submitted to ATP.

**Some Groups of Applicants Were More Likely Than Others to Continue Their Projects Using Other Funding Sources**

Some near winners were more likely than others to continue their projects after ATP declined to fund them. For example, 86 percent (12 of 14) of the near winners whose projects were under way before they applied to ATP continued them, compared with 14 percent (2 of 14) of those whose projects were not under way. Similarly, 77 percent (10 of 13) of the near winners that had looked for funding from other sources before applying to ATP continued, compared with 27 percent (4 of 15) that had not looked for funding before applying. Table 1 groups the near winners according to different characteristics and shows odds ratios, which indicate the degree of association between the characteristics of these groups and the likelihood of their continuing their projects. Odds ratios measure the association between two variables through a single value. The closer the odds ratio is to 1.00, the weaker the association. For more information on odds ratios, see appendix III.

<sup>4</sup>Some of the near winners that continued their projects using other funding sources likely benefited, during their search for other funding, from having been rated highly by ATP. We did not evaluate the extent to which this "halo effect" may have occurred; however, we acknowledge that a high rating from ATP might have proved beneficial to some near winners.

**Table 1: Odds Ratios Showing Association Between Characteristics of Certain Near Winners and Continuation of Their Projects**

Characteristics of near winner A	Characteristics of near winner B	Odds ratio: How many times more likely was near winner A to continue the project than near winner B?
Project under way before near winner applied to ATP	Project not under way before near winner applied to ATP	36
Looked for funding from other sources before applying to ATP	Did not look for funding from other sources before applying to ATP	9.17
Funds 50 percent or more of research and development internally	Funds less than 50 percent of research and development internally	2.5 <sup>a</sup>
Single applicant	Joint venture	2.75
Company with more than 10 FTEs <sup>b</sup>	Company with 10 or fewer FTEs	1.6 <sup>c</sup>
Company with more than 50 FTEs	Company with 50 or fewer FTEs	1.6
Company with more than 100 FTEs	Company with 100 or fewer FTEs	1.39 <sup>d</sup>
Company with more than 500 FTEs	Company with 500 or fewer FTEs	1.05

<sup>a</sup>Nine companies did not indicate what percentage of their research and development they fund internally; therefore, they are not included in this calculation.

<sup>b</sup>FTE = full-time equivalent.

<sup>c</sup>Nine companies did not provide their number of FTEs; therefore, they are not included in this calculation.

<sup>d</sup>Because this odds ratio is close to 1.00, we can say that the odds of a company with 100 or more FTEs continuing its project are about the same as the odds of one with fewer than 100 FTEs continuing its project.

In addition, single applicants more often continued their projects than joint-venture applicants: 58 percent (11 of 19) of the single applicants continued their projects, while only 33 percent (3 of 9) of the joint-venture applicants continued theirs. Seventy-one percent (5 of 7) of the companies that generally fund 50 percent or more of their research and development from their own internal company funds continued their projects. In contrast, 50 percent (6 of 12) of the companies that generally fund less than 50 percent of their research and development from their own internal company funds continued their projects. (Nine companies did not indicate what percentage of their research and development budgets they fund internally.)

Finally, among the near winners, the smaller companies continued their projects somewhat less frequently than the larger companies.<sup>5</sup> For example, 50 percent (3 of 6) of the near-winner companies with 50 or fewer full-time equivalents (FTE)<sup>6</sup> continued their projects, while 62 percent (8 of 13) of the near-winner companies with more than 50 FTEs continued theirs. (Nine companies did not provide the number of FTEs for their companies.)

### Some Near Winners Did Not Continue Their Projects

Fourteen near winners did not continue their projects after ATP declined to fund the projects. The reason they most often gave for not continuing was lack of funding (cited by 11 near winners). Two near winners indicated that their projects were too long-term; one cited market changes; one said that the project was too risky; and one joint-venture near winner said that its newly formed partnership had not worked out. (The near winners could provide more than one reason.)

Of the near winners that did not continue their projects, 64 percent (9 of 14) searched for funding but did not find it. Eight of these nine reapplied for ATP funding during a subsequent round of competition. Six of the nine are no longer looking for funding to continue their projects.

### Status of Projects Funded by ATP and Other Sources

ATP funded 89 projects from 1990 to 1993, and 14 near winners carried out their projects using other funding sources during this time. Sixty-four percent of these projects (66 of 103) were still under way at the time of our survey. Twenty-seven percent of the projects (28 of 103) had been completed, while 5 had been discontinued. The respondents to our survey listed the status of the four remaining projects as either suspended or delayed. When we asked all the applicants that had carried out their projects how satisfied they were with either the projects' technical direction and progress (for ongoing projects) or outcome (for completed projects), 94 percent (84 of 89) of the winners and 79 percent (11 of 14) of the near winners whose projects were funded by other sources indicated that they were at least generally satisfied.

<sup>5</sup>Joint-venture applicants were not included in this comparison because they may include companies of different sizes.

<sup>6</sup>Measures of FTE indicate a company's size by estimating how many full-time employees are represented by all part-time and full-time employees considered together.

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## Conclusions

According to the results of our survey, ATP funds both projects that would have been funded in its absence and projects that would not have been funded. In addition, ATP achieves other goals, such as aiding the formation of joint ventures and helping companies achieve research milestones faster. These results should be considered together when assessing ATP's impact.

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## Agency Comments and Our Evaluation

We provided a draft of this report to the Department of Commerce for comment. Commerce found much of the report to be well done but recommended certain changes. For example, Commerce felt that the report needed to highlight our survey's results showing that those research projects of near winners that were continued with alternative funding continued at a slower pace than planned. We have revised the report as appropriate. Commerce's written comments, along with our detailed responses, are provided in appendix IV.

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We conducted our assessment from July 1994 through December 1995 in accordance with generally accepted government auditing standards. As arranged with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to the Secretary of Commerce; the Director, National Institute of Standards and Technology; the Director, ATP; the Inspector General, Department of Commerce; the Director, Office of Management and Budget; and other interested parties. We will also make copies available to others on request.

Please call me at (202) 512-3841 if you or your staff have any questions. Major contributors to this report are listed in appendix V.

Sincerely yours,



Victor S. Rezendes  
Director, Energy and  
Science Issues



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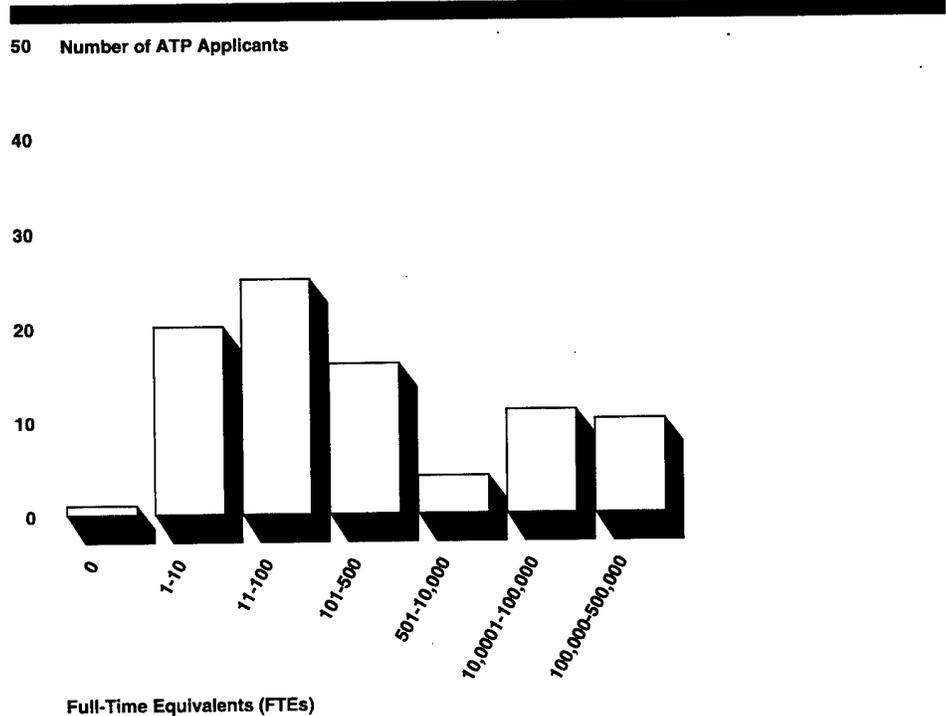
**Abbreviations**

ATP	Advanced Technology Program
FTE	full-time equivalent
GAO	General Accounting Office
NIST	National Institute of Standards and Technology
R&D	research and development

# Profile Information for Single-Applicant Companies

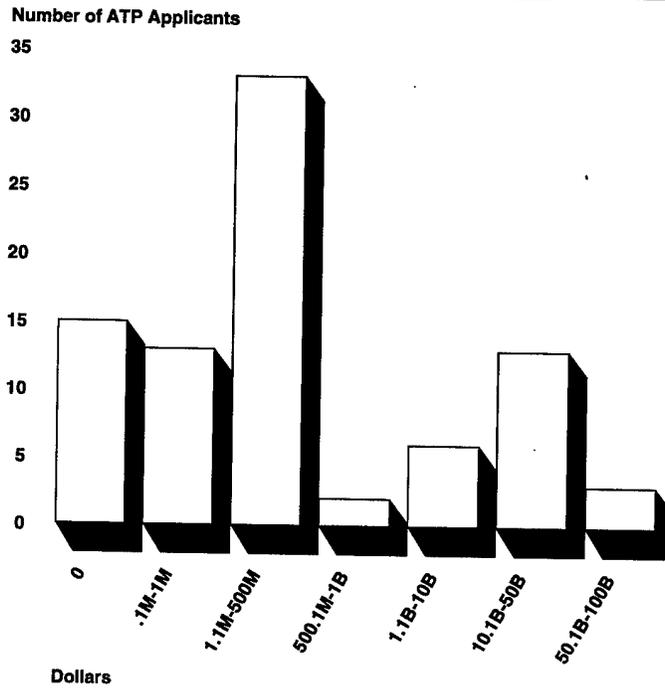
In our survey, we asked individual applicants for general information which, taken together, provides a profile of their companies. We used some of this information for the analysis summarized in table 1 of this report. We include here supplemental profile information that provides an overall picture of the coverage provided by the Advanced Technology Program (ATP). This information includes the size of the companies based on the number of employees as well as on gross sales. We requested these figures for the fiscal year completed before the company applied to ATP. We also asked for the year the company made its first sale as an indicator of the age of the applicant company. Included also are figures for the sources that each company relies on for its overall research budget. We again asked companies, in answering this question, to base their responses on the fiscal year completed before they applied to ATP.

**Figure I.1: Number of Full-Time Equivalent Employees, Including Both Outsourced and Permanent Employees**



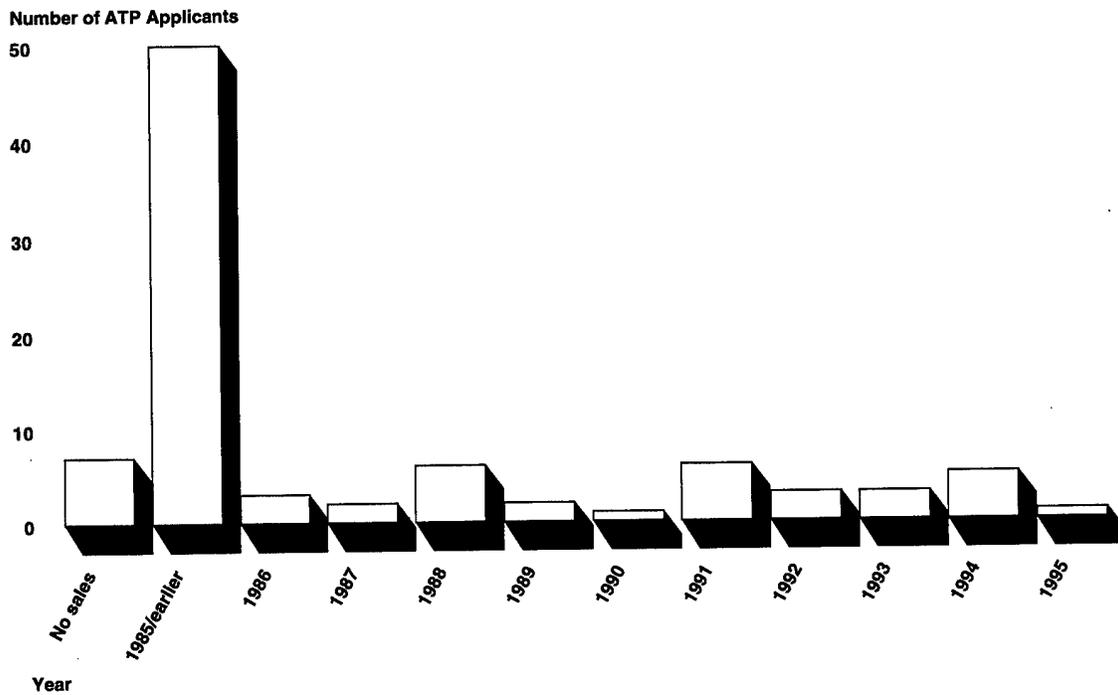
**Appendix I  
Profile Information for Single-Applicant  
Companies**

**Figure I.2: Total Value of Gross Sales  
in Fiscal Year Before Company's  
Application to ATP**



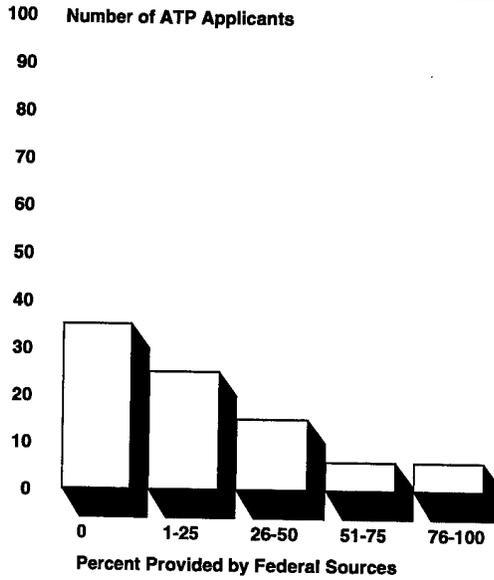
Appendix I  
Profile Information for Single-Applicant  
Companies

Figure I.3: Year of Company's First Sales

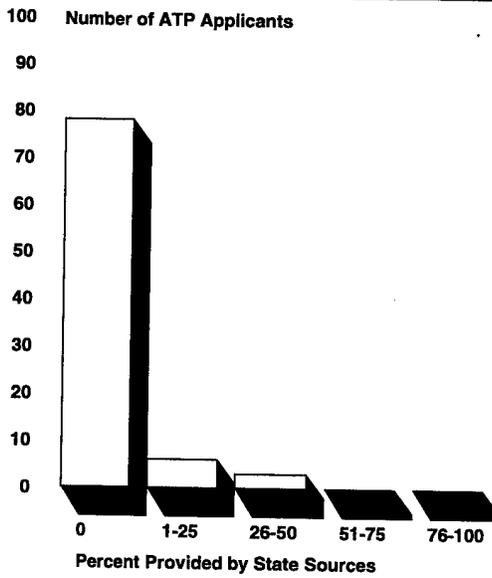


**Appendix I  
Profile Information for Single-Applicant  
Companies**

**Figure I.4: Percentage of Company's Direct Research and Development (R&D) Budget Provided by Federal Government Agencies**



**Figure I.5: Percentage of Company's Direct R&D Budget Provided by State Government Agencies**



Appendix I  
Profile Information for Single-Applicant  
Companies

Figure I.6: Percentage of Company's  
Direct R&D Budget Provided by  
Venture Capitalists

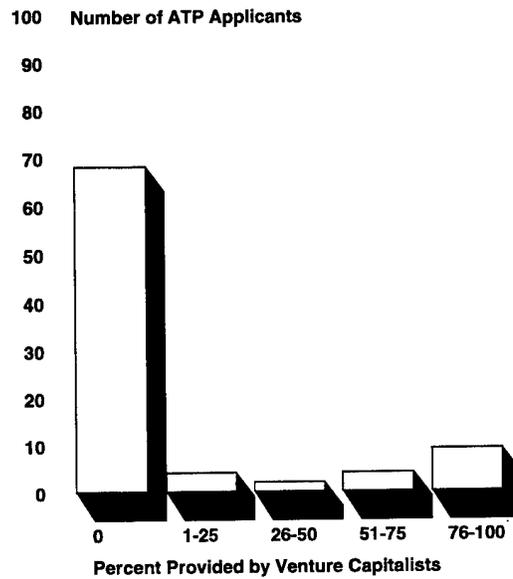
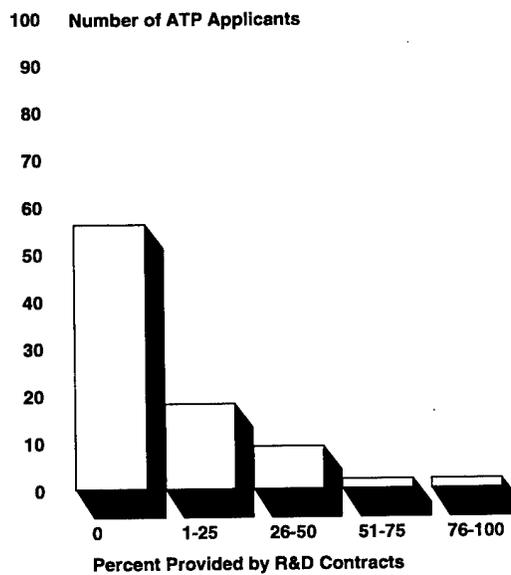
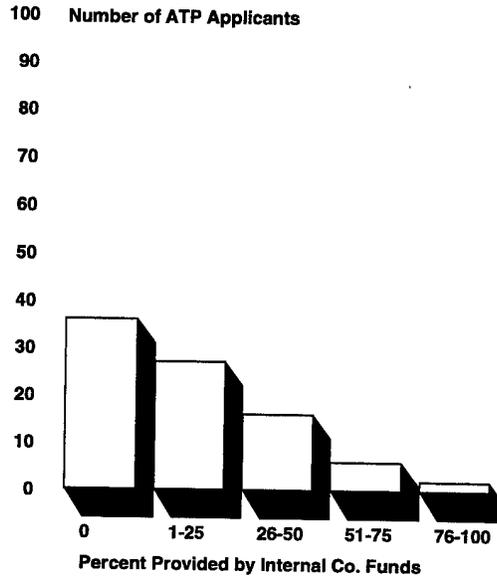


Figure I.7: Percentage of Company's  
Direct R&D Budget Provided Through  
R&D Contracts With Other Companies

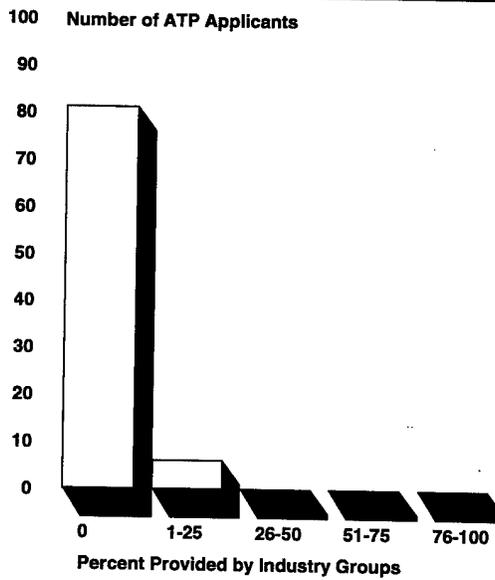


**Appendix I  
Profile Information for Single-Applicant  
Companies**

**Figure I.8: Percentage of Company's  
Direct R&D Budget Provided From  
Internal Funding**

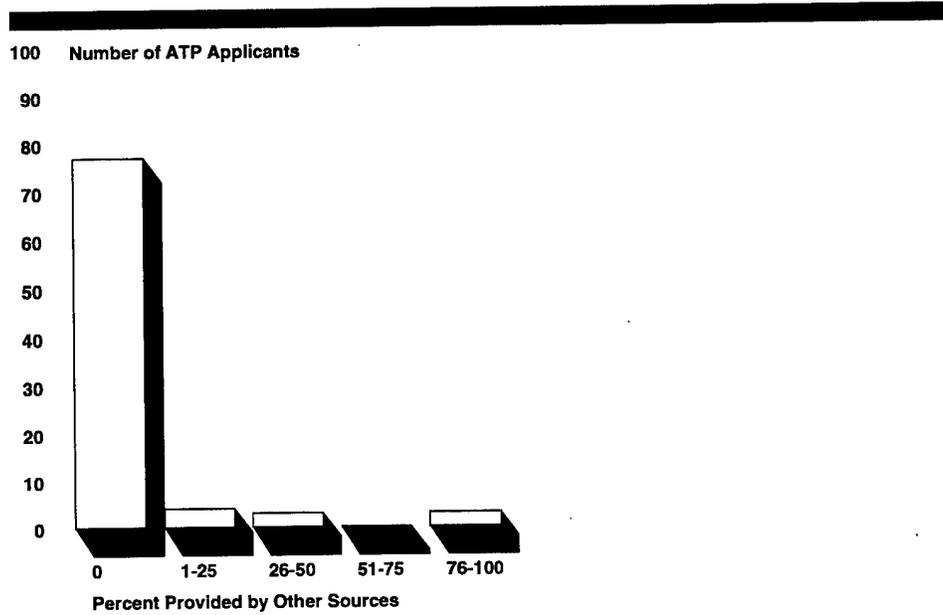


**Figure I.9: Percentage of Company's  
Direct R&D Budget Provided by  
Industry Groups or Trade Associations**



Appendix I  
Profile Information for Single-Applicant  
Companies

Figure I.10: Percentage of Company's  
Direct R&D Budget Provided by Other  
Sources



# Survey Questions and Response Frequencies for Winners and Near Winners of ATP Awards

United States General Accounting Office

**GAO**

## Survey of ATP Award Winners (Completed Questionnaire with Frequencies)

### INTRODUCTION

The U.S. General Accounting Office (GAO), an agency that examines issues and programs for Congress, is evaluating some of the impacts of the Advanced Technology Program (ATP).

If your proposal was submitted by a joint venture, answer in terms of your experience with the joint venture's *proposal*, rather than with a participating company. We recognize that joint ventures may separate various duties among participating companies, but please answer the questions as best you can.

If the proposal was submitted by a single applicant, answer in terms of your experience with the company's proposal. By the company we mean the entire company (for small businesses), or the unit or division of the company that submitted the ATP proposal (for large businesses).

**Note:** These frequencies were tabulated after excluding eleven respondents; therefore, some of these statistics may not match those in the body of the report. See appendix III for details.

### SECTION I: COMPANY BACKGROUND INFORMATION

1. How many ATP award winners?

89 Winner

2. Indicate type of application.

23 Joint venture

66 Single applicant

3. In what year did this company begin operations?

8 1803 to 1899

7 1900 to 1929

6 1930 to 1952

6 1953 to 1973

38 1974 to 1994

24 Missing

4. In what year, if any, did the company first generate sales?

35 1985 or earlier

3 1986

2 1987

5 1988

2 1989

1 1990

5 1991

1 1992

3 1993

3 1994

6 Have not had any sales

23 Missing

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

5. How many full-time equivalent employees did your company have when you applied to ATP? Include outsourced as well as permanent employees.

37 0 to 100  
4 101 to 200  
5 201 to 300  
2 301 to 400  
0 401 to 500  
16 Over 500  
25 Missing

6. In what year did the member companies of the joint venture agree to pursue the proposal described in the ATP proposal?

6 1990  
9 1991  
5 1992  
3 1993  
66 Missing

7. In what year did the joint venture actually begin working on the project?

0 1985 or earlier  
0 1986  
0 1987  
0 1988  
0 1989  
2 1990  
4 1991  
10 1992  
2 1993  
5 1994  
0 1995  
0 Not started yet  
0 Don't know  
66 Missing

8. Did the joint venture come together as a new group to pursue the project described in the ATP proposal, or was the joint venture already together working on it?

18 Joint venture came together to pursue the ATP project  
2 Joint venture was pursuing ATP project together, before ATP  
3 Joint venture was pursuing other unrelated projects together, before ATP  
66 Missing

9. What percentage of the company's DIRECT R&D budget was provided by *federal government agencies*? Base your answers on the last fiscal year completed before you applied to ATP.

26 None  
17 1 to 20%  
10 21 to 40%  
4 41 to 60%  
7 61 to 100%  
25 Missing

10. What percentage of the company's DIRECT R&D budget was provided by *state government agencies*? Base your answers on the last fiscal year completed before you applied to ATP.

57 None  
6 1 to 20%  
1 21 to 40%  
0 41 to 60%  
0 61 to 100%  
25 Missing

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

11. What percentage of the company's DIRECT R&D budget was provided by *industry groups or trade associations*? Base your answers on the last fiscal year completed before you applied to ATP.

58 None  
6 1 to 20%  
0 21 to 40%  
0 41 to 60%  
0 61 to 100%  
25 Missing

12. What percentage of the company's DIRECT R&D budget was provided by *other private companies*? Base your answers on the last fiscal year completed before you applied to ATP.

40 None  
13 1 to 20%  
6 21 to 40%  
4 41 to 60%  
1 61 to 100%  
25 Missing

13. What percentage of the company's DIRECT R&D budget was provided by *venture capitalists*? Base your answers on the last fiscal year completed before you applied to ATP.

49 None  
3 1 to 20%  
1 21 to 40%  
1 41 to 60%  
10 61 to 100%  
25 Missing

14. What percentage of the company's DIRECT R&D budget was provided by *internal funding from company income*? Base your answers on the last fiscal year completed before you applied to ATP.

20 None  
10 1 to 20%  
4 21 to 40%  
2 41 to 60%  
28 61 to 100%  
25 Missing

15. What *other funding sources* did you use? Base your answers on the last fiscal year completed before you applied to ATP.

1 Banks  
1 Corporate investors, not venture capitalists  
1 High net worth individual  
1 Internal funding from interest, dividends, gifts, etc.  
1 Licenses related to R&D contracts  
1 Owner's funds  
2 Private individuals, not venture capitalists  
1 Universities  
80 Missing

**SECTION II: ATP PROPOSAL HISTORY**

16. Did you seek funding from other sources to pursue the project described in the ATP proposal BEFORE you sought funding from ATP?

30 Yes  
58 No  
1 Don't know  
0 Missing

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

17. How long did you seek this funding?

13 0 to 12 months  
11 13 to 24 months  
4 Over 25 months  
61 Missing

18. How many full-time equivalent persons were assigned to help seek funding for the project during this period? Include outsourced as well as permanent employees.

28 0 to 5  
1 Over 5  
60 Missing

19. Where did these persons seek funding?

12 U.S. Federal government agencies other than ATP  
3 State government agencies  
10 Industry groups/trade associations  
14 R&D contracts with other private companies  
9 Venture capitalists  
9 Internal funding from company income  
2 Other  
59 Missing

20. How many attempts did you make to obtain funding from *federal government agencies*?

1 None  
5 1 to 2 attempts  
4 3 to 4 attempts  
2 Over 4 attempts  
77 Missing

21. How many attempts did you make to obtain funding from *state government agencies*?

0 None  
2 1 to 2 attempts  
0 3 to 4 attempts  
1 Over 4 attempts  
86 Missing

22. How many attempts did you make to obtain funding from *industry groups/trade associations*?

1 None  
6 1 to 2 attempts  
3 3 to 4 attempts  
0 Over 4 attempts  
79 Missing

23. How many attempts did you make to obtain funding from *other private companies*?

0 None  
4 1 to 2 attempts  
0 3 to 4 attempts  
10 Over 4 attempts  
75 Missing

24. How many attempts did you make to obtain funding from *venture capitalists*?

0 None  
2 1 to 2 attempts  
3 3 to 4 attempts  
4 Over 4 attempts  
80 Missing

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

25. How many attempts did you make to obtain funding from *internal funding from company income*?

- 0 None
- 2 1 to 2 attempts
- 3 3 to 4 attempts
- 4 Over 4 attempts
- 80 Missing

26. Were any of your attempts to obtain funding unsuccessful because you turned down funding that had terms or conditions you would not accept?

- 3 Yes
- 26 No
- 1 Don't know
- 59 Missing

27. When you submitted the ATP proposal, did you intend to pursue the project whether or not you received ATP funding?

- 27 Yes
- 9 Probably yes
- 14 Uncertain
- 17 Probably no
- 22 No

28. Did you intend to pursue the project on the same schedule as described in the ATP proposal or on a modified schedule? If modified, when would the milestones be met?

- 0 Sooner than in the ATP proposal
- 2 At the same time as in the ATP proposal
- 34 Later than in the ATP proposal
- 53 Missing

29. Was the project described in the ATP proposal underway PRIOR to submission of the proposal to ATP?

- 21 Yes
- 68 No

30. Was the funding level of the on-going project less than, about the same as, or higher than the amount requested by ATP?

- 19 Less than the ATP request
- 1 About the same as the ATP request
- 1 Higher than the ATP request
- 68 Missing

**SECTION III. PROJECT STATUS & PROJECT RESULTS**

31. What is the status of the project described in the ATP proposal?

- 55 Underway
- 28 Completed
- 3 Discontinued
- 3 Other

32. How satisfied, if at all, are you with the technical direction and progress/outcome of the project?

- 60 Very satisfied
- 24 Generally satisfied
- 0 Neither satisfied or dissatisfied
- 1 Generally dissatisfied
- 0 Very dissatisfied
- 4 Don't know

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

33. Which statement BEST describes the results you expected to have at the end of the project at the time you applied to ATP?

- 55 Project sold commercially
- 21 Process used internally
- 9 Product or process used by another firm with compensation
- 1 Product or process used by another firm without compensation
- 3 Don't know

34. When you applied to ATP, were you aware of other U.S. companies that were also conducting technical work toward objectives of the ATP proposal?

- 29 Yes
- 59 No
- 1 Don't know

35. If you have any additional comments or information you would like to provide please do so in the space below.

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***Thank you, this concludes the questionnaire!***

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

United States General Accounting Office

**GAO**

**Survey of ATP Award Near Winners  
(Completed Questionnaire with Frequencies)**

**INTRODUCTION**

The U.S. General Accounting Office (GAO), an agency that examines issues and programs for Congress, is evaluating some of the impacts of the Advanced Technology Program (ATP).

If your proposal was submitted by a joint venture, answer in terms of your experience with the joint venture's *proposal*, rather than with a participating company. We recognize that joint ventures may separate various duties among participating companies, but please answer the questions as best you can.

If the proposal was submitted by a single applicant, answer in terms of your experience with the company's proposal. By the company we mean the entire company (for small businesses), or the unit or division of the company that submitted the ATP proposal (for large businesses).

**Note:** These frequencies were tabulated after excluding eleven respondents; therefore, some of these statistics may not match those in the body of the report. See appendix III for details.

**SECTION I: COMPANY BACKGROUND INFORMATION**

1. How many ATP award near winners?

28 Near winners

2. Indicate type of application

9 Joint venture

19 Single applicant

3. In what year did this company begin operations?

2 1803 to 1899

3 1900 to 1929

1 1930 to 1952

6 1953 to 1973

7 1974 to 1994

9 Missing

4. In what year, if any, did the company first generate sales?

12 1985 or earlier

0 1986

0 1987

1 1988

0 1989

0 1990

0 1991

2 1992

0 1993

2 1994

1 1995

1 Have not had any sales

9 Missing

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

- |   |   |
|---|---|
| <p>5. How many full-time equivalent employees did your company have when you applied to ATP? Include outsourced as well as permanent employees.</p> <p style="margin-left: 20px;"> <u>8</u> 0 to 100<br/> <u>0</u> 101 to 200<br/> <u>2</u> 201 to 300<br/> <u>0</u> 301 to 400<br/> <u>2</u> 401 to 500<br/> <u>7</u> Over 500<br/> <u>9</u> Missing         </p> <p>6. In what year did the member companies of the joint venture agree to pursue the proposal described in the ATP proposal?</p> <p style="margin-left: 20px;"> <u>2</u> 1989<br/> <u>1</u> 1990<br/> <u>2</u> 1991<br/> <u>2</u> 1992<br/> <u>1</u> 1993<br/> <u>20</u> Missing         </p> <p>7. In what year did the joint venture actually begin working on the project?</p> <p style="margin-left: 20px;"> <u>1</u> 1987<br/> <u>1</u> 1990<br/> <u>1</u> 1991<br/> <u>1</u> 1992<br/> <u>4</u> Not started yet<br/> <u>1</u> Don't know<br/> <u>19</u> Missing         </p> | <p>8. Did the joint venture come together as a new group to pursue the project described in the ATP proposal, or was the joint venture already together working on it?</p> <p style="margin-left: 20px;"> <u>6</u> Joint venture came together to pursue the ATP project<br/> <u>1</u> Joint venture was pursuing ATP project together, before ATP<br/> <u>2</u> Joint venture was pursuing other unrelated projects together, before ATP<br/> <u>19</u> Missing         </p> <p>9. What percentage of the company's DIRECT R&amp;D budget was provided by <i>federal government agencies</i>? Base your answers on the last fiscal year completed before you applied to ATP.</p> <p style="margin-left: 20px;"> <u>7</u> None<br/> <u>5</u> 1 to 20%<br/> <u>2</u> 21 to 40%<br/> <u>2</u> 41 to 60%<br/> <u>3</u> 61 to 100%<br/> <u>9</u> Missing         </p> <p>10. What percentage of the company's DIRECT R&amp;D budget was provided by <i>state government agencies</i>? Base your answers on the last fiscal year completed before you applied to ATP.</p> <p style="margin-left: 20px;"> <u>17</u> None<br/> <u>0</u> 1 to 20%<br/> <u>2</u> 21 to 40%<br/> <u>0</u> 41 to 60%<br/> <u>0</u> 61 to 100%<br/> <u>9</u> Missing         </p> |
|---|---|

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

11. What percentage of the company's DIRECT R&D budget was provided by *industry groups or trade associations*? Base your answers on the last fiscal year completed before you applied to ATP.

19 None  
0 1 to 20%  
0 21 to 40%  
0 41 to 60%  
0 61 to 100%  
9 Missing

12. What percentage of the company's DIRECT R&D budget was provided by *other private companies*? Base your answers on the last fiscal year completed before you applied to ATP.

13 None  
1 1 to 20%  
3 21 to 40%  
1 41 to 60%  
1 61 to 100%  
9 Missing

13. What percentage of the company's DIRECT R&D budget was provided by *venture capitalists*? Base your answers on the last fiscal year completed before you applied to ATP.

16 None  
1 1 to 20%  
0 21 to 40%  
0 41 to 60%  
2 61 to 100%  
9 Missing

14. What percentage of the company's DIRECT R&D budget was provided by *internal funding from company*? Base your answers on the last fiscal year completed before you applied to ATP.

6 None  
4 1 to 20%  
2 21 to 40%  
1 41 to 60%  
6 61 to 100%  
9 Missing

15. What *other funding sources* did you use? Base your answers on the last fiscal year completed before you applied to ATP.

1 High net worth individual  
27 Missing

**SECTION II: ATP PROPOSAL HISTORY**

16. What reasons, if any, did ATP cite for declining your ATP award?

15 Insufficient business plan  
0 Technology not precompetitive/generic  
0 Technology posed too little risk  
5 Lack of available ATP funding  
14 Other  
0 Don't know

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

17. What were the "other" reasons cited by ATP?

- 1 ATP wants to support companies not universities in technology development proposals
- 1 Felt company did not have an adequate understanding of the chemistry of why the technology
- 1 Joint venture partners disagreed on direction of project at last minute
- 1 Lack of an adequate transfer plan
- 1 Lack of experience of team
- 1 Limited experience in commercialization
- 1 Matching funds on low side
- 1 Not a viable invention
- 1 One member of joint venture withdrew
- 1 Some minor technical issues
- 2 Technical content was incomplete
- 1 Too little company commitment for money
- 1 Uncertain about meeting proposal objectives

18. Did you seek funding from other sources to pursue the project described in the ATP proposal BEFORE you sought funding from ATP?

- 13 Yes
- 15 No

19. How long did you seek this funding?

- 6 0 to 12 months
- 4 13 to 24 months
- 2 Over 25 months
- 16 Missing

20. How many full-time equivalent persons were assigned to help seek funding for the project during this period? Include outsourced as well as permanent employees.

- 13 0 to 5
- 0 Over 5
- 15 Missing

21. Where did these persons seek funding?

- 7 U.S. Federal government agencies other than ATP
- 2 State government agencies
- 1 Industry groups/trade associations
- 8 R&D contracts with other private companies
- 5 Venture capitalists
- 5 Internal funding from company income
- 2 Other
- 15 Missing

22. How many attempts did these persons make to obtain funding from *federal government agencies*?

- 0 None
- 2 1 to 2 attempts
- 2 3 to 4 attempts
- 2 Over 4 attempts
- 22 Missing

23. How many attempts did these persons make to obtain funding from *state government agencies*?

- 0 None
- 1 1 to 2 attempts
- 0 3 to 4 attempts
- 0 Over 4 attempts
- 26 Missing

24. How many attempts did these persons make to obtain funding from *industry groups/trade associations*?

- 0 None
- 0 1 to 2 attempts
- 1 3 to 4 attempts
- 0 Over 4 attempts
- 27 Missing

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

- |   |   |
|---|---|
| <p>25. How many attempts did these persons make to obtain funding from <i>other private companies</i>?</p> <p><u>  0</u> None<br/> <u>  2</u> 1 to 2 attempts<br/> <u>  1</u> 3 to 4 attempts<br/> <u>  5</u> Over 4 attempts<br/> <u>20</u> Missing</p>              | <p>29. When you submitted the ATP proposal, did you intend to pursue the project whether or not you received ATP funding?</p> <p><u>13</u> Yes<br/> <u>  1</u> Probably yes<br/> <u>  4</u> Uncertain<br/> <u>  2</u> Probably no<br/> <u>  8</u> No</p>  |
| <p>26. How many attempts did these persons make to obtain funding from <i>venture capitalists</i>?</p> <p><u>  0</u> None<br/> <u>  1</u> 1 to 2 attempts<br/> <u>  2</u> 3 to 4 attempts<br/> <u>  1</u> Over 4 attempts<br/> <u>24</u> Missing</p>                  | <p>30. Did you intend to pursue the project on the same schedule as described in the ATP proposal or on a modified schedule? If modified, when would the milestones be met?</p> <p><u>  0</u> Sooner than in the ATP proposal<br/> <u>  0</u> At the same time as in the ATP proposal<br/> <u>13</u> Later than in the ATP proposal<br/> <u>  1</u> Don't know<br/> <u>14</u> Missing</p> |
| <p>27. How many attempts did these persons make to obtain funding from <i>internal funding from company income</i>?</p> <p><u>  0</u> None<br/> <u>  4</u> 1 to 2 attempts<br/> <u>  0</u> 3 to 4 attempts<br/> <u>  0</u> Over 4 attempts<br/> <u>24</u> Missing</p> | <p>31. Was the project described in the ATP proposal underway PRIOR to submission of the proposal to ATP?</p> <p><u>14</u> Yes<br/> <u>13</u> No<br/> <u>  1</u> Don't know</p>   |
| <p>28. Were any of your attempts to obtain funding unsuccessful because you turned down funding that had terms or conditions you would not accept?</p> <p><u>  3</u> Yes<br/> <u>10</u> No<br/> <u>15</u> Missing</p>   | <p>32. Was the funding level of the on-going project less than, about the same as, or higher than the amount requested by ATP?</p> <p><u>11</u> Less than the ATP request<br/> <u>  2</u> About the same as the ATP request<br/> <u>  1</u> Higher than the ATP request<br/> <u>14</u> Missing</p>  |

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

33. What percentage of the funding for the ongoing project was provided by *federal government agencies*?

- 9 None
- 0 1 to 20%
- 1 21 to 40%
- 1 41 to 60%
- 3 61 to 100%
- 14 Missing

34. What percentage of the funding for the ongoing project was provided by *state government agencies*?

- 10 None
- 3 1 to 20%
- 1 21 to 40%
- 0 41 to 60%
- 0 61 to 100%
- 14 Missing

35. What percentage of the funding for the ongoing project was provided by *industry groups or trade associations*?

- 14 None
- 0 1 to 20%
- 0 21 to 40%
- 0 41 to 60%
- 0 61 to 100%
- 14 Missing

36. What percentage of the funding for the ongoing project was provided by *other private companies*?

- 12 None
- 1 1 to 20%
- 0 21 to 40%
- 0 41 to 60%
- 1 61 to 100%
- 14 Missing

37. What percentage of the funding for the ongoing project was provided by *venture capitalists*?

- 12 None
- 0 1 to 20%
- 1 21 to 40%
- 0 41 to 60%
- 1 61 to 100%
- 14 Missing

38. What percentage of the funding for the ongoing project was provided by *internal funding from company income*?

- 4 None
- 2 1 to 20%
- 2 21 to 40%
- 0 41 to 60%
- 6 61 to 100%
- 14 Missing

**SECTION III. PROJECT STATUS & PROJECT RESULTS**

39. We understand that you were declined an ATP award. Since then, have you begun the project described in the ATP proposal?

- 14 Yes
- 14 No

40. Is the project's schedule the same as described in the ATP proposal, or is it modified? If modified, when would the milestones be met?

- 0 Sooner than in the ATP proposal
- 1 At the same time as in the ATP proposal
- 13 Later than in the ATP proposal
- 14 Missing

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

41. What percentage of the funding for the project described in the ATP proposal, on which you are now working is being provided by *federal government agencies*?

  9 None  
  0 1 to 20%  
  0 21 to 40%  
  1 41 to 60%  
  4 61 to 100%  
 14 Missing

44. What percentage of the funding for the project described in the ATP proposal, on which you are now working is being provided by *industry groups or trade associations*?

 11 None  
  1 1 to 20%  
  1 21 to 40%  
  0 41 to 60%  
  1 61 to 100%  
 14 Missing

42. What percentage of the funding for the project described in the ATP proposal, on which you are now working is being provided by *subsequent competition round held by ATP*?

  0 None  
  0 1 to 20%  
  0 21 to 40%  
  0 41 to 60%  
  0 61 to 100%  
 14 Missing

45. What percentage of the funding for the project described in the ATP proposal, on which you are now working is being provided by *other private companies*?

 12 None  
  1 1 to 20%  
  0 21 to 40%  
  0 41 to 60%  
  1 61 to 100%  
 14 Missing

43. What percentage of the funding for the project described in the ATP proposal, on which you are now working is being provided by *state government agencies*?

 11 None  
  3 1 to 20%  
  0 21 to 40%  
  0 41 to 60%  
  0 61 to 100%  
 14 Missing

46. What percentage of the funding for the project described in the ATP proposal, on which you are now working is being provided by *venture capitalists*?

 12 None  
  0 1 to 20%  
  1 21 to 40%  
  0 41 to 60%  
  1 61 to 100%  
 14 Missing

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

47. What percentage of the funding for the project described in the ATP proposal, on which you are now working is being provided by *internal funding from company income*?

- 6 None
- 0 1 to 20%
- 2 21 to 40%
- 2 41 to 60%
- 4 61 to 100%
- 14 Missing

48. How long did you look for funding after the ATP proposal was declined? If you looked for funding while the ATP proposal was under review, also include that time in your answer.

- 1 Did not look for funding after being declined
- 27 Missing

49. Where did you look for funding to continue or begin the project described in the proposal before you found funding?

- 7 U.S. Federal government agencies other than ATP
- 5 Subsequent competition round held by ATP
- 1 State government agencies
- 2 Industry groups/trade associations
- 4 R&D contracts with other private companies
- 4 Venture capitalists
- 1 Internal funding from company income
- 0 Other
- 14 Missing

50. How many attempts did you make to obtain funding from *federal government agencies*?

- 0 None
- 4 1 to 2 attempts
- 1 3 to 4 attempts
- 2 Over 4 attempts
- 21 Missing

51. How many attempts did you make to obtain funding from *subsequent competition round held by ATP*?

- 0 None
- 4 1 to 2 attempts
- 1 3 to 4 attempts
- 0 Over 4 attempts
- 23 Missing

52. How many attempts did you make to obtain funding from *state government agencies*?

- 0 None
- 1 1 to 2 attempts
- 0 3 to 4 attempts
- 0 Over 4 attempts
- 27 Missing

53. How many attempts did you make to obtain funding from *industry groups/trade associations*?

- 0 None
- 2 1 to 2 attempts
- 0 3 to 4 attempts
- 0 Over 4 attempts
- 26 Missing

54. How many attempts did you make to obtain funding from *other private companies*?

- 0 None
- 2 1 to 2 attempts
- 0 3 to 4 attempts
- 1 Over 4 attempts
- 25 Missing

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

55. How many attempts did you make to obtain funding from *venture capitalists*?

- 0 None
- 0 1 to 2 attempts
- 2 3 to 4 attempts
- 0 Over 4 attempts
- 25 Missing

56. How many attempts did you make to obtain funding from *internal funding from company income*?

- 0 None
- 1 1 to 2 attempts
- 0 3 to 4 attempts
- 0 Over 4 attempts
- 27 Missing

57. Were any of your attempts to obtain funding unsuccessful because you turned down funding that had terms or conditions you would not accept?

- 0 Yes
- 10 No
- 18 Missing

58. What is the status of the project described in the ATP proposal?

- 11 Underway
- 0 Completed
- 2 Discontinued
- 1 Other
- 14 Missing

59. How satisfied, if at all, are you with the technical direction and progress/outcome of the project?

- 4 Very satisfied
- 7 Generally satisfied
- 0 Neither satisfied or dissatisfied
- 3 Generally dissatisfied
- 0 Very dissatisfied
- 14 Missing

60. Which statement BEST describes the results you expected to have at the end of the project at the time you applied to ATP?

- 6 Project sold commercially
- 4 Process used internally
- 3 Product or process used by another firm with compensation
- 0 Product or process used by another firm without compensation
- 1 Don't know
- 14 Missing

61. When you applied to ATP, were you aware of other U.S. companies that were also conducting technical work toward objectives of the ATP proposal?

- 6 Yes
- 8 No
- 14 Missing

62. Have you attempted to obtain funding from sources other than ATP, or from ATP in a subsequent competition round, to CONTINUE/BEGIN the project described in the ATP proposal?

- 9 Yes
- 4 No
- 3 Don't know
- 14 Missing

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

63. Where did you look for funding to continue or begin the project described in the proposal before you found funding?

- 2 U.S. Federal government agencies other than ATP
- 8 Subsequent competition round held by ATP
- 0 State government agencies
- 0 Industry groups/trade associations
- 2 R&D contracts with other private companies
- 0 Venture capitalists
- 0 Internal funding from company income
- 0 Other
- 19 Missing

64. How many attempts did you make to obtain funding from *federal government agencies*?

- 0 None
- 1 1 to 2 attempts
- 1 3 to 4 attempts
- 0 Over 4 attempts
- 26 Missing

65. How many attempts did you make to obtain funding from *subsequent competition round held by ATP*?

- 0 None
- 8 1 to 2 attempts
- 0 3 to 4 attempts
- 0 Over 4 attempts
- 20 Missing

66. How many attempts did you make to obtain funding from *state government agencies*?

- 0 None
- 0 1 to 2 attempts
- 0 3 to 4 attempts
- 0 Over 4 attempts
- 28 Missing

67. How many attempts did you make to obtain funding from *industry groups/trade associations*?

- 0 None
- 0 1 to 2 attempts
- 0 3 to 4 attempts
- 0 Over 4 attempts
- 28 Missing

68. How many attempts did you make to obtain funding from *other private companies*?

- 0 None
- 1 1 to 2 attempts
- 0 3 to 4 attempts
- 1 Over 4 attempts
- 26 Missing

69. How many attempts did you make to obtain funding from *venture capitalists*?

- 0 None
- 0 1 to 2 attempts
- 0 3 to 4 attempts
- 0 Over 4 attempts
- 28 Missing

70. How many attempts did you make to obtain funding from *internal funding from company income*?

- 0 None
- 0 1 to 2 attempts
- 0 3 to 4 attempts
- 0 Over 4 attempts
- 28 Missing

**Appendix II  
Survey Questions and Response  
Frequencies for Winners and Near Winners  
of ATP Awards**

71. Were any of your attempts to obtain funding unsuccessful because you turned down funding that had terms or conditions you would not accept?

- 0 Yes
- 9 No
- 19 Missing

72. Are you still pursuing funding for the project?

- 3 Yes
- 6 No
- 19 Missing

73. How long have you been seeking/did you seek funding since the ATP proposal was declined?

- 4 0 to 12 months
- 3 13 to 24 months
- 2 Over 25 months
- 19 Missing

74. How many full-time equivalent persons were assigned to help seek funding during this period? Include outsourced as well as permanent employees.

- 8 0 to 5
- 1 Over 5
- 19 Missing

75. When you applied to ATP, were you aware of other U.S. companies that were also conducting technical work toward objectives of the ATP proposal?

- 7 Yes
- 6 No
- 1 Don't know
- 14 Missing

76. If you have any additional comments or information you would like to provide please do so in the space below.

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*Thank you, this concludes the questionnaire!*

# Objectives, Scope, and Methodology

The objective of this report was to examine whether funds from ATP are used to support research projects that would not have been funded by the private sector, or if it replaces private funds that would have otherwise been available. To meet this objective, we requested from ATP a rank-order listing of all the applicants that received a score from the Source Evaluation Board<sup>1</sup> for their ATP proposal during the program's first four rounds of competition (1990-93).

In the first four rounds of competition, the Source Evaluation Board gave scores only to proposals that had been determined to have "very high" scientific and technical merit and that had passed a screening stage in which it was determined that the proposals satisfied the program's requirements. The Source Evaluation Board then assigned a score to all of the proposals on the basis of a business review and all the criteria contained in Commerce's regulations. According to ATP officials, on the basis of this score, the proposals with strong technical and business merit were ranked and recorded on a list before the final oral review stage. ATP provided that list to us. Using this list, we identified those that received ATP awards as "winners" and those that did not receive ATP funding as "near winners."

In our first primary research question, we asked the near winners if they had continued their proposed projects using other funding sources after ATP declined to fund them. We developed this question to shed light on whether ATP winners (given their similarity to the near winners) would have continued their projects using other funding sources if ATP funding had not been provided. In our second primary research question, we asked the winners and near winners if they had sought funding from other sources before applying to ATP. This question provided information on whether private-sector sources had the opportunity to fund the proposed projects before the applicants sought federal funding.

Our work was structured in three phases. First, we interviewed ATP officials, winners, and near winners to increase our understanding of ATP's review process and the applicants' experiences with it. We spoke with representatives of other research and development (R&D) funding sources, such as the National Venture Capital Association. We also reviewed the

<sup>1</sup>For each competition, ATP forms a Source Evaluation Board to rank the proposals. A typical board consists of about a dozen senior-level managers from the National Institute of Standards and Technology (NIST), supplemented with additional technical consultants from NIST and other federal laboratories. The board members' backgrounds vary widely. The board may include, for example, an electrical engineer, a chemist, a biotechnologist, a materials scientist, a computer scientist, and others with business and economics expertise.

relevant economic, policy, and evaluation literature and consulted with outside experts on the overall design of our assessment.

Next, we designed a computer-aided telephone interview in which we requested several pieces of information from each applicant.<sup>2</sup> Specifically, we asked questions on (1) the applicant's general characteristics, such as the size of the company and its sources of R&D funding; (2) the history of the project put forth in the ATP proposal, such as whether the project was under way before the applicant requested funding from ATP; and (3) the project's status (for winners and near winners that continued their projects using other funding sources). We got expert review of a preliminary version of the questions from knowledgeable consultants.

To test the validity of the questions, we pretested a draft survey instrument with three ATP award winners and four near winners. We selected them using the following factors: the round of competition in which the application was submitted, geographic location, type of applicant (single company applicant or joint venture), company's size, proposal technology area, and award status (award winner or near winner). We conducted the first three pretests in person in Gaithersburg, Maryland and Somerset, New Jersey; we conducted the remaining four by telephone with winners and near winners located in Ann Arbor and Auburn Hills, Michigan, and San Jose and Menlo Park, California. On the basis of the comments and reactions from the experts' review and our pretests, we revised the telephone interview questions so that they would be uniformly interpreted and understood.

In the final phase of our work, we conducted telephone interviews with all the applicants that qualified as winners or near winners during ATP's first four rounds of competition, a total of 128 (89 winners and 39 near winners). Our survey achieved a 100-percent response rate. In our findings for both research questions, we excluded 5 near winners, reducing our total number of respondents to 123. We did this because these five near winners indicated that ATP had disqualified them late in the review process because new information indicated that their proposals did not satisfy the program's basic requirements. For example, in one instance ATP decided that the applicant would do the project without ATP funding and in another ATP decided that the project did not focus on precompetitive or generic research. In our findings for the second research question only, our total of near winners drops to 28 because 6 near winners eventually received

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<sup>2</sup>The computer was programmed to skip questions that were irrelevant to the individual respondent. For example, those involved in joint ventures were not asked for the year of their first sale. In these cases, the computer tabulated the results as a missing response. See app. II.

**Appendix III**  
**Objectives, Scope, and Methodology**

ATP funding in a subsequent round of competition, eliminating them from our consideration because we focused only on near winners that found funding from sources other than ATP.

To examine how certain characteristics affect whether the near winners continued their projects, we calculated “odds ratios.” Odds ratios measure the association between two variables. The closer the odds ratio to 1.00, the weaker the association; the further from 1.00, the stronger.<sup>3</sup> To illustrate, table III.1 reports the number of joint-venture and single-applicant near winners that did and did not continue their project after ATP declined to fund them.

**Table III.1: Number of Joint-Venture and Single-Applicant Near Winners That Continued Their Projects After ATP Declined to Fund**

	Joint ventures	Single applicants
Continued	3	11
Did not continue	6	8

The odds ratio is calculated through cross multiplication and division— $(11 \times 6)$  divided by  $(3 \times 8)$ —for a value of 2.75. Rounding to 3, we interpret this odds ratio to mean that single-applicant near winners were about three times more likely than joint-venture near winners to continue projects after ATP declined to fund them.

<sup>3</sup>For more detail on the theory underlying odds ratios and their calculation, see William Page, “Interpretation of Goodman’s Log-Linear Model Effects: An Odds Ratio Approach,” *Sociological Methods & Research*, Vol. 5, No. 4, May 1977.

# Comments From the Department of Commerce

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



**THE SECRETARY OF COMMERCE**  
Washington, D.C. 20230

Mr. Victor S. Rezendes  
Director, Energy and Science Issues  
Resources, Community, and Economic  
Development Division  
U.S. General Accounting Offices  
Washington, D.C. 20548

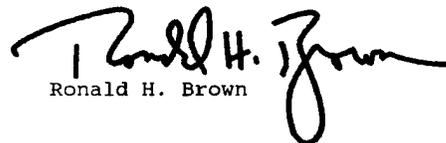
Dear Mr. Rezendes:

We appreciate the opportunity to comment on the draft report, *Performance Measurement: The Advanced Technology Program and Private Sector Funding*, (GAO/RCED-96-47, Code 307723). We note that the General Accounting Office (GAO) has not allowed us the usual 30 days to provide comments on this draft report. Our comments are enclosed.

Some of the concerns noted in the enclosure are sufficiently important that unless they are taken into account by GAO before the report is finalized, we believe the report's conclusions would be potentially misleading at best and erroneous at worst. Much of the report is well-done; and so, if our recommendations are taken into account conscientiously, this could be a valuable and generally accurate report.

If your staff requires additional information about the Department's response to your report, they may contact the Advanced Technology Program's Senior Economist, Rosalie Ruegg, at (301) 975-6135.

Sincerely,

  
Ronald H. Brown

Enclosure

**Appendix IV  
Comments From the Department of  
Commerce**

December 14, 1995

**Department of Commerce (DOC) Comments on GAO Draft Report  
*Measuring Performance: The Advanced Technology Program***

Our most important concern is that in stating the conclusion, GAO must not bury in the text of the report critical caveats that might be overlooked by the casual reader. These caveats are critically important to the conclusions that readers may draw. With these caveats, readers will correctly interpret the GAO's findings. Without them, readers will likely draw invalid conclusions.

The GAO's survey results support the conclusion that the ATP is meeting its objective of funding projects that either would not be pursued at all or projects that would have been pursued without ATP funding, but at a much slower pace.

- Of the respondents who said they intended to pursue the project whether or not they received ATP funding, nearly all indicated that without the ATP award their milestones would be met later than those set forth in the proposal.
- The remainder of those who responded (other than "uncertain) indicated that they would have been unlikely to pursue the research at all without the ATP.
- The fact that some of the near winners were able subsequently to obtain funding is perfectly consistent with ATP's decision not to fund them. If we believe that an applicant does not need ATP funds to pursue the project, we do not fund them. (One of our selection criteria is "Degree to which ATP support is necessary." )
- The fact that the scale of on-going research was expanded by the ATP award is consistent with ATP's goal.
- The fact that a higher percentage of ATP awardees indicated satisfaction with the technical direction and progress/outcome of their project than the near winners continuing may indicate that those continuing without ATP were not able to pursue the full project.
- As GAO correctly concludes, the survey results indicate that the ATP successfully fosters joint research ventures.

See comment 1.

**Appendix IV  
Comments From the Department of  
Commerce**

Because it decouples the results of two appropriately coupled questions, the GAO's first statement on pages 3 and 11 is misleading, and needs to be corrected.

- Our experience has been that if companies are asked, "Would you have pursued the project without ATP funding?" there is a very high potential for multiple interpretations of the question. At one extreme, some companies assume they are being asked whether without ATP funds they would have continued any amount of work at all in the general subject area of the proposal. Others may assume they are being asked whether the precise project would have been pursued with no changes. Still others will take an interpretation somewhere between these two extremes. For this reason, we have found that the more meaningful question to ask in this regard is,

"Without ATP cost-sharing, how would your R&D in this specific area have differed with regard to schedule, scope of project, riskiness of technical and business goals, collaborations, etc.?"

- The GAO appropriately asked a follow-on question about whether the project schedule would have been different without the ATP, but unfortunately, it failed to include the other important ways a project can be altered -- e.g., scope, scale, and riskiness of goals -- in the follow-on question. And, according to two other third-party surveys, if given the chance, the companies would also have indicated a smaller-sized effort, less ambitious research goals, and/or a less comprehensive project without the ATP award.

- More importantly, the GAO failed to report in its summary of results and conclusions, the results of the follow-on question that revealed that nearly all of those who said they planned to pursue the research without ATP, said that the research schedule would be slower without ATP. (However, the GAO did correctly report in part on the bottom of page 5 the results of the paired questions, and that information deserves to be highlighted more.)

See comment 2.

To address these concerns, we strongly urge the GAO to change the first paragraph of the executive summary section titled "Results in Brief" on page 3 and the "Conclusions" section on page 11 to read along the lines of the following. (This wording is fully consistent with the caveats noted on page 5 of the GAO report.)

ATP funds research projects that either would not have been funded at all without the ATP, or would likely have been

**Appendix IV  
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funded by others but at a slower pace and/or with less ambitious and less risky goals. Nearly all of those who said they would have pursued their project to some extent without ATP cost sharing indicated that the project schedule would have been modified without ATP cost sharing and that milestones would be met later than those set forth in the proposal to ATP. The survey questions did not ask whether, in such cases, the technical goals would also have been less ambitious and less risky without ATP cost sharing, but other surveys carried out by ATP to which we had access indicate that this also might be so in many cases.

- We also urge that the report state clearly that accelerating the pace of research is but one of the ways that the ATP funding may alter those projects that might have been pursued without ATP.

Were these recommended changes to be made, we believe the GAO survey can provide useful insight into the differences between the winners and near winners of ATP awards.

Paragraph 1 of page 1 of the report states that the ATP funding for FY95 was \$431 million. That is incorrect. Because of the \$90 million rescission, the actual funding for FY95 was \$341 million.

See comment 3.

See comment 4.

## GAO's Comments

The following are GAO's comments on the Department of Commerce's letter dated December 21, 1995.

1. While our draft Conclusions section referred to the pace of research projects, we have added a sentence to our report's Results-in-Brief on this point. In our opinion, however, Commerce's overall conclusion based on our survey results overlooks a number of significant points. First, although ATP appears to enable applicants to complete their research projects faster, companies still find it worthwhile to pursue the projects, although on a slower schedule, without ATP funds. Second, when asked, "What reasons, if any, did ATP cite for declining your ATP award?," only one applicant said that ATP had decided the project would be done without ATP funding. (Subsequently, that project did not find funding elsewhere.) Third, while our survey results do indicate that a higher percentage of ATP awardees indicated satisfaction with the technical direction and progress/outcome of their projects than the near winners, nothing in our survey supports Commerce's conclusion about what those results indicate.

2. Our draft Conclusions section referred to the pace of continued research projects, and we have added a sentence to our Results-in-Brief section on this point. While Commerce is concerned with multiple interpretations of one of our survey questions, we reduced the potential for multiple interpretations by instructing our interviewers to say specifically, "I'll be asking you several questions about the history and status of 'the project described in your ATP proposal,' which I'll sometimes refer to as 'the project.' By this we mean a project that you consider to be essentially the same as the one in the proposal." If further clarification was needed, the interviewer would add, "To be 'essentially the same project,' it should focus on the same technical work as the one in the ATP proposal."

We used this wording to allow the respondent to rely on his or her own judgment in determining if the work that had continued was still the same project—despite changes in scope, schedule, and riskiness, among other things—or if in the respondent's judgment, changes have resulted in a different project altogether. At a minimum, the project had to include the same technical work, even though, for example, some intended commercial applications of the work had changed.

3. As noted in comments 1 and 2, we feel that Commerce's conclusion overlooks a number of significant points based on our survey results.

4. We have made the suggested change.

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