

- 1 (2) industries engaged in technology development
2 contribute greatly to economic growth, have a growth
3 rate twice the growth rate of total industrial output,
4 and make a positive contribution to an otherwise nega-
5 tive manufacturing trade balance;
- 6 (3) technological innovation is key to the efforts of
7 basic industries to improve productivity;
- 8 (4) United States technology is experiencing
9 strong competitive challenges internationally which
10 have resulted in a world-wide decline in market share
11 for high technology industries in the United States;
- 12 (5) intensive targeted research and development
13 plans of other countries are shifting technological ad-
14 vantage overseas in selected fields and may limit devel-
15 opment of valuable long-term technology markets by
16 United States industry;
- 17 (6) the development of economically strategic
18 technologies, in areas including microelectronics, mate-
19 rials development, biotechnology, robotics, manufactur-
20 ing processes, and artificial intelligence, offers great
21 potential benefits to the economy;
- 22 (7) the riskiness of long-term research and devel-
23 opment efforts and the growth of foreign research and
24 development programs require a vigorous Federal role
25 in technology development;

1 (8) assessing the adequacy of current Federal re-
2 search and development activities and spending prior-
3 ities requires—

4 (A) identification of economically strategic
5 technologies by the science and engineering com-
6 munity;

7 (B) reliable assessment of research and de-
8 velopment activity in other countries on economi-
9 cally strategic technologies;

10 (C) assessment of efforts in the United
11 States, including industrial, academic, nonprofit,
12 State, Federal, defense, and nondefense research
13 and development activity; and

14 (D) consideration of competitive strategy in
15 attaining maximum benefit from development of
16 economically strategic technologies;

17 (9) a plan for the development of economically
18 strategic technologies can best be developed by indus-
19 try, the academic community, and government, with
20 each committing appropriate resources to maximize the
21 potential for successful development; and

22 (10) the National Academy of Sciences, including
23 the Institute of Medicine, and the National Academy of
24 Engineering are representative of the science and engi-
25 neering community, including members from industry,

1 educational institutions, and government, and are well
2 suited to identify economically strategic technologies
3 and recommend technology development plans.

4 PURPOSES

5 SEC. 3. It is the purpose of this Act to—

6 (1) develop a widespread consensus within the in-
7 dustrial and academic research community as to what
8 technologies are economically strategic for develop-
9 ment;

10 (2) collect the best available data on research and
11 development efforts on economically strategic technol-
12 ogies in the United States and abroad and provide an
13 authoritative comparative analysis of the efforts;

14 (3) create a forum for the formulation of technol-
15 ogy development programs which will include industry,
16 academic, and governmental efforts and resources;

17 (4) develop technology development programs that
18 include consideration of the comparative position of the
19 United States and appropriate competitive strategy for
20 development; and

21 (5) authorize appropriations that are sufficient to
22 implement such programs.

23 DEFINITIONS

24 SEC. 4. For purposes of this Act—

1 (1) the term "Director" means the Director of the
2 Office of Science and Technology Policy;

3 (2) the term "Academies" means the National
4 Academy of Sciences (including the Institute of Medi-
5 cine and any other unit of the Academy) and the Na-
6 tional Academy of Engineering.

7 THE STUDY ON ECONOMICALLY STRATEGIC

8 TECHNOLOGIES

9 SEC. 5. Within six months after the date of enactment
10 of this Act, the Director of the Office of Science and Technol-
11 ogy Policy shall enter into an agreement with the National
12 Academy of Sciences (including the Institute of Medicine and
13 any other appropriate unit of the National Academy of Sci-
14 ences) and the National Academy of Engineering under
15 which the Academies shall make a full and complete study
16 that identifies economically strategic technologies and plans
17 for the optimal development of such technologies. The agree-
18 ment shall include provisions for the coordination of the study
19 between the Academies and a committee for making reports
20 required by section 6(c).

21 FUNCTIONS OF THE ACADEMIES IN CARRYING OUT THE
22 STUDY

23 SEC. 6. (a) In designating technologies as economically
24 strategic technologies, the Academies shall—

- 1 (1) solicit views of private industry and examine
2 evidence of current industrial initiatives;
- 3 (2) assess the economic benefit to be gained from
4 each technology including—
 - 5 (A) a description and estimate of potential
6 market;
 - 7 (B) job creation potential;
 - 8 (C) socioeconomic impact;
 - 9 (D) potential for declining product cost;
 - 10 (E) potential for followup and spinoff product
11 development;
 - 12 (F) evidence of potential widespread industri-
13 al application; and
 - 14 (G) potential for new business formation;
- 15 (3) determine the current effort for technology de-
16 velopment by Federal and State government including
17 spending levels for defense and nondefense research
18 and development, the nature of the development pro-
19 gram, and the potential for transfer of defense technol-
20 ogies to nondefense use;
- 21 (4) prepare a summary of existing and projected
22 levels of research and development activity by private
23 industry for each technology;
- 24 (5) determine current levels of research and devel-
25 opment effort by foreign nations for each technology

1 and assess the stage of development and the competi-
2 tive strategy being employed by other nations;

3 (6) consider the competitive potential of United
4 States industry for future markets, the relative benefits
5 of lead versus followup development, and competitive
6 risks involved such as the potential for development of
7 over capacity or external costs;

8 (7) assess the technological feasibility of develop-
9 ment and the risk for each technology;

10 (8) consider the necessary time for development of
11 each technology, focusing on technologies with a
12 medium-term development horizon of five to eight
13 years; and

14 (9) consider the potential economic benefit of the
15 technology and evidence that United States industry
16 will fail to realize such benefits in the absence of an
17 enhanced technology development program.

18 (b) The Academies shall develop a technology develop-
19 ment program for each technology designated as economi-
20 cally strategic. The Academies shall establish an advisory
21 committee composed of industry and academic experts to
22 make recommendations for each such program. The terms of
23 compensation for expenses or service, if any, for such mem-
24 bers shall be included in the agreement made pursuant to

1 section 5. Each technology development program shall de-
2 scribe the strategy for development and recommend—

3 (1) participants in the program and program re-
4 sponsibilities;

5 (2) levels of effort and financial commitment for
6 each participant and program totals;

7 (3) timetable of milestones and budget outlays;

8 (4) appropriate licensing and patent arrangements
9 for participants and nonparticipants, giving equal
10 weight to fair financial return to participants and rapid
11 technology transfer and diffusion;

12 (5) policy action or spending required of the Fed-
13 eral Government, including recommendations for addi-
14 tional Federal funding with an explanation of the ob-
15 stacles in finding financing from private sources and a
16 designation of appropriate Federal agencies to partici-
17 pate in the development program and to dispense Fed-
18 eral funds; and

19 (6) methods for encouraging participation by small
20 business in the technology development program.

21 (c) The committee, established in accordance with the
22 agreement made pursuant to section 5, shall submit to the
23 President and to the Committee on Commerce, Science, and
24 Transportation of the Senate and the Committee on Science
25 and Technology of the House of Representatives interim re-

1 ports of each technology development program formulated for
2 each designated economically strategic technology, an annual
3 report at the end of each calendar year summarizing the ac-
4 tivities of the Academies regarding the study, and not later
5 than three years after the date of enactment of this Act, a
6 final report of the study together with recommendations, in-
7 cluding recommendations for legislation.

8

ADMINISTRATIVE PROVISIONS

9 SEC. 7. (a) The Academies may, for the purpose of car-
10 rying out the provisions of this Act, hold such hearings and
11 consult with such representatives in the business community,
12 educational institutions, Federal, State, and local govern-
13 ments, and other organizations, associations, and individuals
14 as the President of the National Academy of Sciences or the
15 President of the National Academy of Engineering deems ad-
16 visable.

17 (b) Each department, agency, and instrumentality of the
18 executive branch of the Federal Government, including inde-
19 pendent agencies, is authorized and directed to furnish to the
20 Academies, upon request made by the President of the Na-
21 tional Academy of Sciences or the President of the National
22 Academy of Engineering any information such President
23 deems necessary to carry out the study.

1 AUTHORIZATION OF APPROPRIATIONS

2 SEC. 8. There are authorized to be appropriated such
3 sums as may be necessary to carry out the study required by
4 this Act and to implement the technology development pro-
5 grams recommended in the study.

