

Time to Commercialization Differs Across Technologies*

- **Timing of expected revenues vary.**
 - Across all applications, revenues are expected:
 - for 1 out of 5 applications by the end of ATP funding;
 - for 2 out of 5 applications within a year after ATP funding ends; and
 - for 4 out of 5 applications within three years after ATP funding ends.
- **Technology affects timing of revenues.**
 - Information technology (IT) applications are anticipated to earn revenues very quickly.
 - 27% by the end of ATP funding; and
 - 54% within another year.
 - Materials-chemicals, and manufacturing applications are anticipated to be the slowest to earn revenues. These applications are expected to lag IT by about a year.
 - 8% and 12%, respectively, by the end of ATP funding; and
 - 54% and 57%, respectively within two years after ATP funding.
 - Early biotechnology applications follow the “average” in the early years, but there is a noticeable second peak five or more years out.
- **Expectations about when commercialization and revenues will occur tend to mirror the expected windows of opportunity.**
 - Anticipated market windows vary by technology area in the same manner as expected revenues.

* Based on a report in progress co-authored by Jeanne Powell and Francisco Moris (former EAO staff). The report (*Different Timelines for Different Technologies*, NISTIR 6917) explores whether technology area makes any difference in the time path from research to commercialization, using ATP's database of business planning and progress reports from 519 companies involved in 299 ATP projects. These companies report that they are pursuing 1,090 applications.

- **Industry factors may help account for the differences.**
 - Biotechnologies and information technologies are “young” and often help form new industries.
 - Companies are typically young and product markets are essentially new.
 - Focus is on achieving basic functionality and performance.
 - Early opportunities for service applications (e.g., research and testing services for biotechnology and custom software development and installation for information technology) are useful for market conditioning and validation.
 - Early cash flows are earned but generally do not generate big revenues or economic impact anticipated for therapeutic markets or for broadly distributed software.
 - Biotechnologies aimed at human therapeutics often require considerable technology development beyond ATP, extensive regulatory testing and trials, and production and distribution licenses with larger companies before they can make a major impact.
 - Manufacturing and chemicals projects more typically develop new process technologies for existing classes of products in mature, commodity-oriented industries.
 - Focus is manufacturability and cost to gain advantage in “cents per pound,” high-volume markets.
 - Capital investment and validation requirements are costly and lengthy.
 - Product life cycles and market windows are longer than for IT or electronics products.
 - Technological change for commodities occurs more slowly than in high-value product areas.
 - Electronics and materials projects tend to involve a mix of “young” and “mature” industries.
 - Product applications are more common than process applications.
 - Cost and manufacturability are critical technical and business objectives.
 - Electronics product markets are extremely competitive, product life cycles are very short, and capital requirements are often steep barriers to market entry.

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