

APPENDIX TABLE 3A-3. Evaluative metrics of projects focused on situational awareness as well as any technology-specific projects that addressed the innovation ecosystem. Direction of arrow corresponds to strategic planning vs. impact-assessing metrics: left-facing arrows indicate historical assessment metrics, right-facing arrows indicate future strategic planning metrics. Numbers in the arrows correspond to the note numbers below.

National objective	Science and technology (S&T) ecosystem			
Project topic area	Inputs		Outputs	
	Research funding	Research labor force	Scientific discovery	Technology commercialization
Situational awareness	1	2 3	4	5
AI		6	7	
Semiconductors				8
Biopharmaceuticals				9
Energy and critical materials	10			11

- 1 Compared national research funding sources and international scientific funding streams
- 2 Inventoried science and engineering labor capitalization rate and identity characteristics
- 3 Scaled research productivity penalty incurred by scientists who pivot between topic areas
- 4 Analyzed national-level research productivity and disciplinary clustering in both established and emerging fields
- 5 Identified “on the shelf” research with high commercialization potential and characterized barriers and frictions in the technology transfer process
- 6 Measured level of AI-related skill development in the education of scientific disciplines
- 7 Quantitative assessment of potential applicability of AI to a variety of scientific fields
- 8 Identified technical bottlenecks of advanced (“beyond-CMOS”) semiconductor technologies, estimated the cost to commercialize these technologies, and characterized the facilities used in published research on these designs
- 9 Assessed public perception of emerging biopharmaceutical and advanced manufacturing technologies, access and quality of generic drugs, and the mismatch between public and expert perceptions
- 10 Identified that additional supply of lithium domestically or in locations with lower risk of trade restrictions and increased use of cobalt-free batteries (such as lithium-iron-phosphate) will mitigate current supply chain vulnerabilities and their negative impacts and that increases in lithium supply and cobalt-free batteries could be accelerated through investments in innovations in novel lithium processing and cobalt-free battery chemistries
- 11 Identified that additional supply of lithium domestically or in locations with lower risk of trade restrictions and increased use of cobalt-free batteries (such as lithium-iron-phosphate) will mitigate current supply chain vulnerabilities and their negative impacts and that advancing the commercialization and adoption of existing cobalt-free battery technologies would help address these issues