

List of Critical and Emerging Technologies

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Lead country and technology monopoly risk

Technology	Lead country	Technology monopoly risk
Advanced information and communication technologies		
1. Advanced radiofrequency communications (incl. 5G and 6G)	China	high
2. Advanced undersea wireless communication	China	high
3. Advanced optical communications	China	medium
4. Distributed ledgers	China	medium
5. Mesh networks/infrastructure independent communication technologies	China	medium
6. High performance computing	USA	low
7. Protective cybersecurity technologies	China	low
Advanced materials and manufacturing		
8. Coatings	China	high
9. Nanoscale materials and manufacturing	China	high
10. Advanced composite materials	China	medium
11. Advanced explosives and energetic materials	China	medium
12. High-specification machining processes	China	medium
13. Novel metamaterials	China	medium
14. Smart materials	China	medium
15. Wide bandgap and ultrawide bandgap semiconductor technologies	China	medium
16. Additive manufacturing (incl. 3D printing)	China	low
17. Advanced magnets and superconductors	China	low
18. Advanced protection	China	low
19. Continuous flow chemical synthesis	China	low
20. Critical minerals extraction and processing	China	low
Artificial Intelligence technologies		
21. Advanced data analytics	China	medium
22. Artificial intelligence algorithms and hardware accelerators	China	medium
23. Advanced integrated circuit design and fabrication	USA	low
24. Adversarial AI	China	low
25. Machine learning (incl. neural networks and deep learning)	China	low
26. Natural language processing	USA	low
Biotechnology, gene technology and vaccines		
27. Synthetic biology	China	high
28. Biological manufacturing	China	medium
29. Vaccines and medical countermeasures	USA	medium
30. Genetic engineering	USA	low

31. Genome and genetic sequencing and analysis	China	low
32. Novel antibiotics and antivirals	China	low
33. Nuclear medicine and radiotherapy	USA	low
Defence, space, robotics, and transportation		
34. Hypersonic detection, tracking, and characterisation	China	high
35. Advanced aircraft engines (incl. hyper-sonics)	China	medium
36. Drones, swarming and collaborative robots	China	medium
37. Advanced robotics	China	low
38. Autonomous systems operation technology	China	low
39. Small satellites	USA	low
40. Space launch systems	USA	low
Energy and environment		
41. Electric batteries	China	high
42. Hydrogen and ammonia for power	China	high
43. Supercapacitors	China	high
44. Directed energy technologies	China	medium
45. Nuclear waste management and recycling	China	medium
46. Photovoltaics	China	medium
47. Biofuels	China	low
48. Nuclear energy	China	low
Quantum		
49. Quantum Computing	USA	medium
50. Post-quantum cryptography	China	low
51. Quantum communications (incl. quantum key distribution)	China	low
52. Quantum sensors	China	low
Sensing, Timing and Navigation		
53. Inertial navigation systems	China	high
54. Multispectral and hyperspectral imaging sensors	China	high
55. Photonic sensors	China	high
56. Sonar and acoustic sensors	China	high
57. Atomic clocks	USA	medium
58. Radar	China	medium
59. Satellite positioning and navigation	China	medium
60. Gravitational-force sensors	USA	low
61. Magnetic field sensors	China	low
Unique AUKUS Technologies		
62. Autonomous underwater vehicles	China	high
63. Electronic warfare	China	high
64. Air-independent compact energy generation	China	medium