



SCENARIOS WORKSHOP: SCENARIO SYNOPSES



This workshop uses hypothetical scenario narratives to help participants explore ways in which the operating environment for critical infrastructure owners and operators may evolve over the next 15–20 years, and how this evolution may affect the security and resilience of critical infrastructure systems. The workshop’s three scenarios center on plausible future changes pertaining to the following topics: (1) brain-computer interfaces (BCIs); (2) quantum technologies; and (3) synthetic biology. Each workshop scenario is briefly described below

SCENARIO #1: TECHNOLOGY DOLDRUMS

Private sector exuberance in developing the next transformative technology ends in disappointment as three key areas of U.S. investment in the 2020s—BCIs, quantum technologies, and synthetic biology—fail to live up to their anticipated promise. Meanwhile, events transpire—such as a problematic migration to post-quantum cryptographic algorithms and complaints about BCI attention-monitoring devices in the workplace—that stymie the adoption and maturation of these technologies. After early commercial hype, U.S. companies struggle to emerge from a period of disillusionment, exemplified by the quantum winter of the early 2030s.

SCENARIO #2: NEW GOLDEN AGE OF TECHNOLOGY

Greatly invigorated government interest in and coordination of scientific investment leads to major growth in three key areas, with benefits largely going to the public sector and critical infrastructures. First, advances in BCIs lead to increases in safety, security, medical treatments, and entertainment. As adoption increases, efforts to increase the privacy of neurodata and BCI cybersecurity yield multiple benefits. Second, investment in synthetic biology leads to applications for bioremediation, carbon sequestration, biological monitoring, and a robust domestic biomanufacturing capability. Third, delayed realization of a quantum computer that can crack public key encryption allows additional time for critical infrastructure stakeholders to successfully transition to post-quantum cryptographic algorithms. The United States also achieves first-mover advantages in quantum applications, including quantum sensing and quantum simulations.

SCENARIO #3: RUNNING FREE

In the years following the COVID-19 pandemic, the United States experienced a period of austerity in government spending as the public sector worked to recuperate from the massive financial costs incurred. Government entities focused on economic recovery and were reluctant to enact any regulations that could hinder economic development, especially from new and emerging technologies. The private sector did not share the same funding limitations. By 2035, technological advances—driven primarily by private investments—are achieved in several fields, including synthetic biology, BCIs, and quantum computing. These advances benefit Americans in many ways. However, the benefits are primarily reaped by those with economic means, furthering the socioeconomic divide in the United States.

For more details, please contact SecureTomorrowSeries@cisa.dhs.gov.