# COVID-19 Impact on Quantum Industry

## Assessment and Recommendations of QED-C

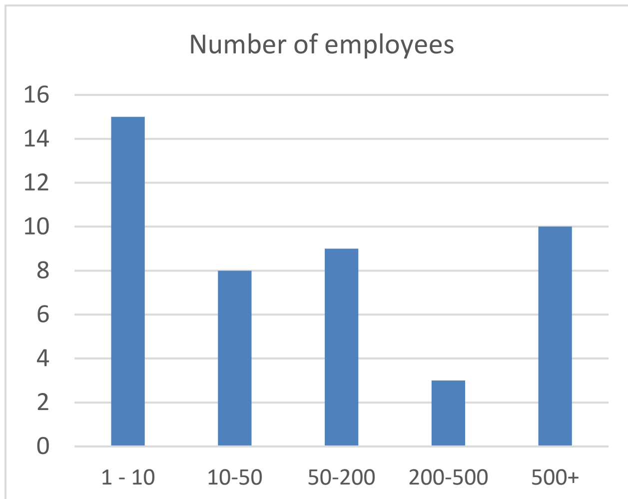
### Overview

The Quantum Economic Development Consortium (QED-C) is an industry-driven consortium managed by SRI International with the mission to enable and grow a robust U.S. quantum information science and technology (QIST) industry and supply chain. QED-C, which was established by the 2018 National Quantum Initiative Act, includes nearly 100 U.S. corporations representing the entire quantum supply chain—from component suppliers/manufacturers to software developers and end users.

During April 2-7, 2020, QED-C surveyed its corporate members about the impact COVID-19 is having on their ability to weather the crisis and what government can do to help ensure the fledgling U.S. quantum industry is able to survive and recover quickly.

### Survey Respondents

There were 46 responses; most (78%) respondents are smaller than 500 employees; a third have fewer than 10 employees.




The types of business are diverse, including component and system manufacturers, software developers, and R&D firms.

Approximately 30% of respondents will face taking drastic measures, such as laying-off workers, within 3 months if the current pandemic lockdowns persist. More than half of respondents will need to take such measures within 12 months if the situation does not improve. Many of these highly impacted companies are manufacturers that are core constituents of the quantum technology supply chain. There is no correlation between impact being felt and company size.

### Highest Concerns

Respondents highlighted concerns related to short-term and long-term viability.

1. Pre-revenue, venture capital (VC)-funded companies may not qualify for SBA Paycheck Protection Program under affiliation guidelines (see ITIF analysis)
2. Short-term Government responses could divert long-term R&D funding (e.g. NQI investments) and slow/harm industries of the future, and the QIST industry, specifically.
3. The markets for quantum technologies are still emerging and may be significantly delayed in developing, hitting startups and small businesses especially hard

### Risks

- Loss of leading-edge quantum technology capabilities and IP: Some small firms, which are a primary source of innovation that is key to national security and the DIB are facing dire financial circumstances and may take funding from investors backed by US adversaries who thereby acquire leading-edge IP, know-how and talent.
- Losing ground to competitors due to slowing of quantum science and technology (QIST) R&D progress/ momentum (see Sen. Young op-ed)

*Views expressed are the consolidated views of respondents to a survey and may not represent the views of individual QED-C member organizations.*

## Proposed Solutions

1. Strategically invest in America's industries of the future as part of our economic recovery initiative. We must include QIST-targeted investments as part of any infrastructure bill.
    - Examples include expanding a pilot testbed for characterization and testing of superconducting resonators for quantum computers, establishing a proposed National Cryogenic Quantum Technology Laboratory, and investing in the "quantum internet"
2. Provide robust post-COVID R&D funding for the QIST industry, as well as academia and national labs
    - Government can fund development of quantum enabling technology roadmaps now that will be invaluable guides for future investments
    - Incentivize private investment, including by VCs
3. Ensure support for the emerging QIST market
    - Support national-security related quantum programs, including for positioning, navigation and timing
    - Support a program that expands user access to existing quantum computing resources to (1) enhance the U.S. quantum research enterprise; (2) stimulate the fledgling U.S. quantum computing industry; and (3) accelerate advancement of quantum computing capabilities for addressing challenges facing science, technology and society, including future global pandemics.
4. Assist VC/investor-funded QIST companies that are pre-revenue
    - Take advantage of vetting and decisions by VCs and provide access to matching Government funds
5. Create a public-private partnership to support companies with investment bridge loans and to acquire IP from companies that fail and/or reinvest via an SBIC (see information about SBICs and proposal details below)

SBIC Overview

A Small Business Investment Company (SBIC) is a privately owned and managed investment fund that is licensed and regulated by the SBA. An SBIC uses its own capital plus funds borrowed with an SBA guarantee to make leveraged equity and debt investments in qualifying small businesses. There are over 300 SBA-licensed SBICs providing small businesses private capital (National Association of SBIC's). The SBICs currently operating hold a combined $6 billion in assets under management. Among the companies that began with funding from an SBIC are Apple Computer, Federal Express, Outback Steakhouse, America Online, and Intel. Since its inception in 1958, the SBIC program has provided $46 billion in long-term debt and equity growth capita to nearly 100,000 small U.S. companies.

Proposal

It is proposed that the SBA provide additional capital to existing SBICs for immediate deployment to industries of the future, and specifically to QIST companies and suppliers under already-enacted CARES guidelines. For the QIST industry, his would include manufacturers and supply-chain companies, as well companies engaged in quantum hardware and software R&D. According to JDSUPRA (Morgan Lewis), private equity/VC-owned businesses that are franchises, recipients of SBIC financial assistance, or that operate in a single location of 500 employees likely do not have to perform an affiliation analysis and are therefore more likely to be eligible to receive an assistance loan pursuant to CARES.

According to CARES guidelines, Treasury and SBA may designate "additional lenders" under this emergency loan program that "have the necessary qualifications to process, close, disburse and service loans made with the guarantee of the Administration." Lenders may approve loans with delegated SBA authority (no separate SBA approval required). SBICs and Business Development Corporations qualify as "additional lenders" under this emergency program.

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