KEY TAKEAWAYS

1. **Quantum is as important** to the next centurt **as semiconductors** were to the last
2. **Colorado is the leader** in quantum computing, sensing, networking, and enabling hardware/infrastructure
3. Elevate Quantum has the **right consortium**, committed **resources**, leadership **team**, and **vision**
4. Elevate Quantum is building systems today to **ensure justice, equity, and diversity** in the Quantum Century

Lead Organization: Elevate Quantum, Inc. (EQ) is the non-profit entity and lead applicant.

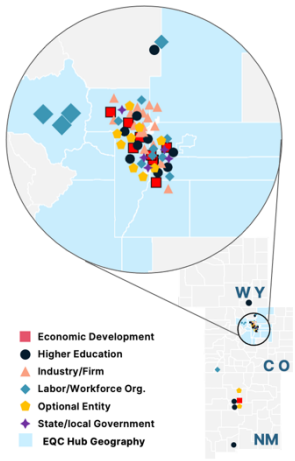
Geographic Boundaries: The Denver-Aurora, CO, Combined Statistical Area, comprising the Boulder, Denver-Aurora-Lakewood, and Greeley MSAs, and rural Grand County.

Key Technology Focus Area (KTFA): #3 Quantum information science and technology.

Core Technology Area (CTA): Quantum Information Technology (QIT) with a focus on high-TRL applications in **quantum computing, sensing, networking, and enabling hardware**. QIT leverages quantum mechanics to unlock transformative technologies. Forecasts predict quantum computing alone will unlock $3.5 trillion in value, with applications in finance, AI, and materials analysis already gaining traction.[1] Quantum sensing and networking are also rapidly developing and the quantum enabling hardware industry is already profitable and growing quickly to support research and industrialization in QIT.[2] A revolution in its own right, QIT also helps accelerate every other KTFA and is critical to US economic and strategic security.[3] Decisions made today will influence the trajectory of QIT and determine who benefits, in terms of both geopolitics and equity.

Fulfilling EDA's Geographic Constraints: Underserved rural and diverse urban communities will benefit significantly from EQC activities. Urban communities are the beating heart of the EQC; Denver's MSA includes 24 census tracts with prime-age employment gaps (PAEG) of >5% and up to 19.61%.[4] Weld County is home to 11 socio-economically distressed tracts with a max PAEG of 65.06%.[4] Other tracts in the EQC Hub, including our headquarters' tract, are considered overburdened and underserved[5] – including the nation's most polluted residential neighborhood.[6] We have also partnered with the East and West Grand County School Districts and Colorado AeroLab to provide STEM/QIT-focused programming to 1,637 students spread across >2,000mi in Grand County (Pop: <16,000)[7] – reaching underserved rural communities and expanding the QIT workforce pipeline. Additionally, EQC includes over a dozen Minority Serving Institutions across Colorado, Wyoming, and New Mexico, as well as two political subdivisions of New Mexico, an EPSCoR state.

CONSORTIUM MEMBERS MAP



A.1.b.iii Eligible Entities: The EQC includes 72 organizations: 17 industry groups/firms; 13 institutions of higher education; 17 economic development organizations; 14 labor and workforce training organizations; 4 state and local governments; and 7 other organizations including 4 federal labs. EQ's Letter of Commitment provides additional detail. Early coordination with union leaders has also identified core QIT supply chain jobs – including welding, machining, and electrical – that will strengthen Labor in the region.

A.1.b.vi Climate and environmental: QIT-enabled breakthroughs in batteries, carbon sequestration, and energy production have the potential to transform human environmental impacts and turn back the clock on climate change.[8] Moreover, while the power consumption of classical data centers has risen exponentially to meet modern computational demands, quantum computers have the demonstrated ability to consume a fraction of the energy expended by those systems.[9] Environmental justice is essential to EQC, and consortium activities will include the ongoing evaluation of potential environmental impacts and benefits.

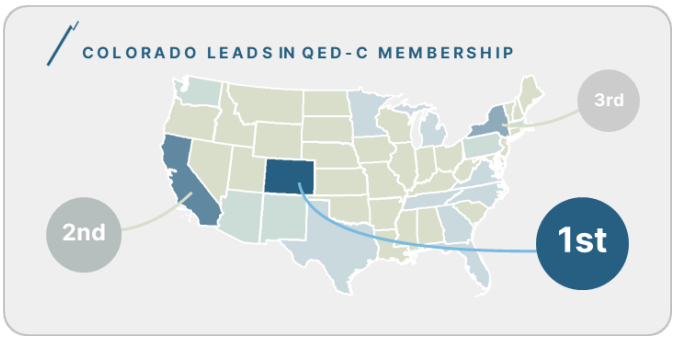
A.1.d.1: Potential of Global Competitiveness: Colorado's historic leadership in quantum, paired with the EQC's unmatched capabilities, make us a clear choice for Tech Hub designation. Our industry-led coalition

has a shared vision to: ***secure Colorado's position as the global epicenter for Quantum Information Technology development and enhance US economic and strategic security through A) accelerating lab-to-market transitions for cutting-edge quantum research, B) facilitating a vibrant startup and scale-up ecosystem, and C) building an inclusive workforce and improving quantum technology through diversity-fueled innovation.***

The EQC is committed to ambitious and measurable 10-year goals for growth and inclusivity, specifically:

1. **Startup Incubation:** Launch 50+ quantum startups, at least half from translational research.
2. **New Funding:** Draw >$2B in funding to the region for quantum startups and scaleups.
3. **Workforce Training:** Upskill >30,000 workers for QIT (see Womanium and OTE programs below).
4. **Inclusive Growth:** Promote equitable access to quantum opportunities so that 40% of newly created quantum jobs and 40% of regional quantum startup founder roles are filled by traditionally underrepresented groups (e.g., women, BIPOC, rural, and veterans) by year 10 of the Hub.

Asset Inventory: Government, private, and non-profit funding has made Colorado and the region a leader in QIT. For over 40 years, Colorado's public institutions, private enterprises, and academia have led quantum research and commercialization through global leaders such as NIST, NREL, and JILA.[10] Regional partnerships span Sandia and Los Alamos National Labs, CU Boulder, Colorado School of Mines, UWYO, and dozens of other universities. This network reflects >$9.68B in Quantum-relevant federal investment in Colorado[11] and has earned the state four Nobel Prizes for quantum science since 1997.[10] The international quantum community comes together in Colorado; the Boulder Summer School, Telluride Science and Innovation Center, and Aspen Center for Physics are global leaders in science convening. **The Quantum Economic Development Consortium (QED-C) grew out of NIST Boulder, and Colorado is home to more QED-C members than any other state.[12]** Colorado is also one of only two states with multiple major quantum processor enterprises, and more enabling hardware for quantum is built here than anywhere else in the country.[30] Additionally, **the State of Colorado intends to devote up to $193M to advancing QIT** over the next decade, **>$100m of which is already authorized**, likely the largest announced state-level commitment to QIT from any state.[32]

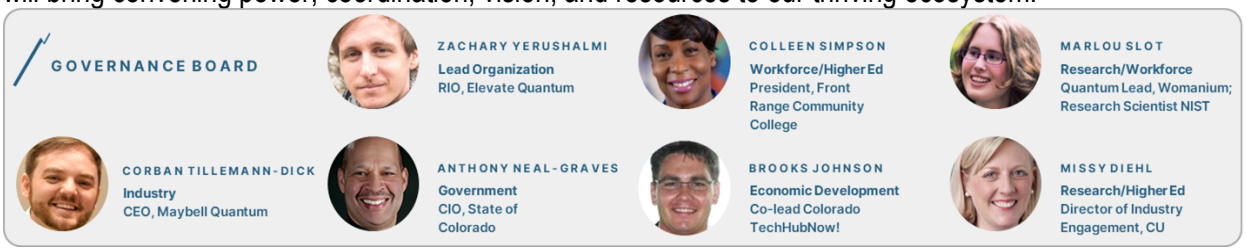


Long-term Sustainability: EQC's market-driven approach supports enduring investment, collaboration, and growth. Integral to this are five funding streams: **1)** Lab Subscriptions (see A.1.d.6), **2)** Educational Programs, **3)** Sponsorships, **4)** Research contracts, and **5)** Equity Agreements. Each stream will drive revenue, equitable access, tech transfer, and startup growth. As the Hub expands, innovation and scale will power a virtuous cycle. Modeling suggests that once stood up, these streams will cover EQ's operating budget, and McKinsey analysis suggests they will help Colorado's global QIT market share to reach 12-20% in 10 years, in line with Silicon Valley's share of the tech sector.[13]

A.1.d.2: Role of the Private Sector: Colorado is home to a thriving commercial quantum ecosystem. Players across the quantum value chain have **already committed to investing >$300M in the hub,** with >$1.3M for Phase 1, as detailed in our letters of support. Our private sector is deeply tied to our research foundation and workforce development efforts. Infleqtion, Mesa Quantum Systems, KM Labs, and Icarus Quantum all have founders who are active staff or faculty at CU/JILA/NIST.[14] Meanwhile, those and other regional companies, including Atom Computing, Maybell, Vescent, Thorlabs, and Quantinuum, have active collaborations with researchers at those institutions.[30] In 2022, for example, Maybell collaborated with CU Boulder, JILA, the School of Mines, OEDIT, Denver Economic Development and Opportunity (DEDO), Los Alamos National

Lab, Sandia National Lab, and NIST in various efforts.[30] Private-sector EQC members have attracted **hundreds of millions of dollars in investment and government contracts** to Colorado and committed similarly large sums to the region's success – Atom Computing, for example, has pledged to invest >$100M in the state after moving to Colorado because of our unmatched QIT ecosystem.[15] The Economic Development organizations in our consortium include **premier startup accelerators, asset managers, and VCs representing billions of dollars in managed assets,** investing from seed through to IPO.[30] EQC members are committed, far surpassing the 20% required match. Spurred by this joint application, we have promised a 1:1 match for future EDA investments and a 4:1 match in Phase 1.

A.1.d.3: Regional coordination & partnerships and A.1.b.iv Special considerations on how we organized the consortium: Our consortium reflects Colorado's tight-knit quantum community: 100% of consortium members have collaborated with at least one other member before, with partnerships reaching across silos and spanning decades.[30] A registered non-profit, Elevate Quantum, Inc.'s Board includes representatives from higher education, government, industry, workforce development, and economic development. It is chaired by Corban Tillemann-Dick, CEO of Maybell Quantum and a former Partner at the Boston Consulting Group. During Phase 1, this leadership team will oversee fund distribution, Phase 2 proposal development, consortium evolution, and Board and RIO changes. The EQC is more than the sum of its parts, building on decades of regional collaboration. Many consortium members are spinouts of our research institutions (e.g., Atom Computing, Infleqtion, Octave Photonics, Vescent, Mesa, LongPath, and others). Others have customer/vendor relationships (e.g., Maybell/CU, Vescent/Infleqtion, KM Labs/NIST).[30] Over many years, we have also jointly applied for grants and federal designations, both as small groups and as members of large, unified consortiums (e.g., Q-SenSE, an NSF Quantum Leap Challenge Institute at CU Boulder, which includes NIST, NREL, Los Alamos, Sandia, UNM and many others).[16] Tech Hub designation will bring convening power, coordination, vision, and resources to our thriving ecosystem.



A.1.b.v Regional Innovation Officer. EQC's Phase 1 RIO, Zach Yerushalmi, brings a wealth of experience as a deep tech entrepreneur, fiduciary, and strategic advisor. Zach was a founding member and Entrepreneur in Residence at Oxford Science Innovation, a $1B+ public-private partnership built to transform the Oxford commercial ecosystem and commercialize its research.[17] Zach fostered collaborations with governments, scientists, and NGOs and helped launch several of the UK's most successful venture-backed startups, driving billions in value. Since returning to the US, Zach has served as a strategic advisor to QIT and life science companies and to the Bill Gates-backed VC, Intellectual Ventures.

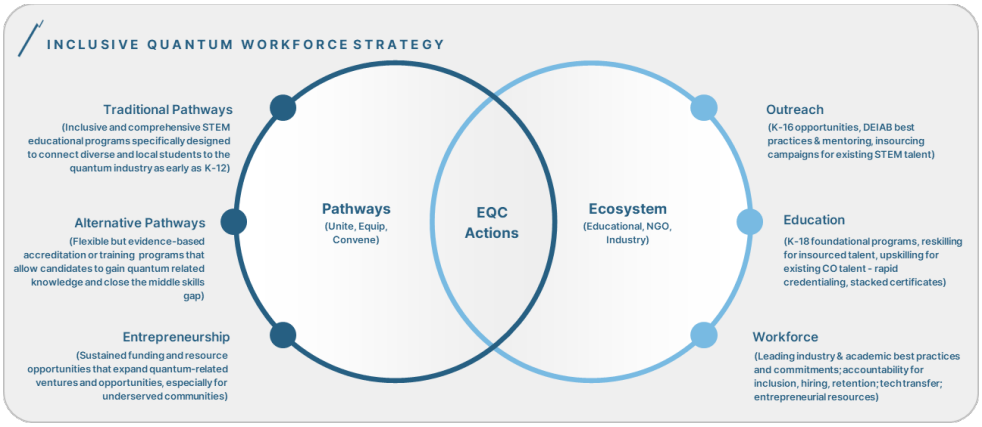
A.1.d.4: Equity & Diversity AND A.1.b.vii. Considering Equity: The EQC is dedicated to promoting Diversity, Equity, Inclusion, Accessibility, and Belonging (DEIAB) in QIT. Our partnerships with over a dozen workforce development entities will be overseen by a dedicated Quantum Workforce and Inclusion Officer. EQC has prioritized the deconstruction of barriers to STEM currently faced by members of marginalized groups such as women, people of color, veterans, and those with disabilities. QIT is a young industry with the opportunity to proactively counter the systemic bias which has defined the shape of many past revolutions, making the Quantum Century better than the Silicon Age. The EQC recognizes the value of diversity to achieve innovation and social justice.[18] Its members have been global leaders in DEIAB for decades, including Sandia National Lab's trailblazing *Plans for Progress* instituted in the 1960s[19] to NCWIT's

AiC Community, partnerships with the Latino Leadership Institute, and GeekPack's digital skills and mentorship programs empowering underrepresented groups starting careers and businesses.

EQC's DEIAB mission is backed by a commitment to accountability and transparency. Within a decade, members aim to attain **40% inclusion of traditionally marginalized groups** in quantum jobs and startup leadership roles. Partners in higher education are critical to this goal; over 60% of NMSU's student body is BIPOC,[20] the Colorado School of Mines' Society of women engineers is the largest in the country,[33] and the Colorado Community College System provides post-secondary education for >48% of Colorado's students of color.[21] EQC's collaborative approach of curriculum development, recruitment, and accountability will be overseen by a Quantum Workforce and Inclusion Officer, an EQC priority hire. Regardless of designation, EQC is hosting a state-wide convening in Fall 2023 to strategize workforce gaps and engage partner organizations and communities with an emphasis on BIPOC groups, veterans, and rural residents.

A.1.d.5: Composition and capacity of the regional workforce: Designation will help fill significant middle skills needed for quantum workers in Colorado. We have prioritized evidence-based pathways into QIT, partnering with groups like ActivateWork and Per Scholas to provide training proven to increase wages and employment over time for low-income learners, especially those from underrepresented communities. According to McKinsey, QIT has nearly three times more job openings than can be filled with current training resources.[22] Working with partners like Womanium, which has already trained >4,000 students in quantum entrepreneurship,[30] EQC is developing a kindergarten through career curriculum – with academic and industry transfer programs from High School. Colorado's model for developing high-tech industries has led it to be ranked the **#1** state for Private Aerospace Employment Concentration;[23] **#2** "State to Start a Business",[23] and "State for Technology and Science";[23] **#3** "State for Startup Early Job Creation";[23] and **#4** State for Concentration of STEM Workers.[23] With the EDA's backing, EQC can leverage this environment to bolster the quantum workforce. Moreover, today **47% of quantum jobs do not require advanced degrees**[13] and the **average wage for quantum jobs in Colorado is $124k/yr.**[13] This means that outreach, training, and reskilling can drive immediate impact. Skills-based jobs and Colorado's explosive growth will allow the Tech Hub to foster and maintain a thriving workforce.

Our *Inclusive Quantum Workforce Strategy* leverages EQC partners to accelerate the development of an inclusive, sustainable, and globally competitive ecosystem. Targeting outreach in K-12, expanding undergraduate QIT and Quantum Engineering education, and formalizing workforce pathways will accelerate economic growth while addressing regional and racial disparities. We will expand programs like FRCC's $34M+ (and rapidly growing) Optics Technology (OTE) program to train students in foundational skills for long-term quantum careers or prepare them for four-year colleges and advanced degrees.[24] Supplemented by equity training from partners such as the Colorado Inclusive Economy, these programs will expand the pipeline of quantum-ready workers and ensure diversity and equity keep pace with a rapidly expanding workforce.



A.1.d.6: Innovative "lab to market" approaches: Our Industry-led consortium has identified three core pillars to facilitate lab-to-market strategies for quantum:

1. **Elevate Quantum Labs:** Many potential quantum startups flounder because hardware procurement takes too long and costs too much. Building on Maybell Quantum Labs' thriving model, we will establish a world-leading multimodal commercial quantum lab providing world-class hardware and expertise on startup-friendly terms, enabling cutting-edge research, technological innovation, and job creation.
2. **The Quantum Leap Innovation Accelerator by Techstars:** EQC is committed to providing business management support to scientist-founded companies. Born in Boulder, the TechStars startup accelerator has blossomed into the world's premier seed capital provider;[25] their spinout, Access Mode, centers Black, Latino, Asian American, and Indigenous tech founders.[26] Fueled by EQC members' tech transfer programs, TechStars and Access Mode will run the world's premier quantum startup accelerator.
3. **The Ascend Scale-up Initiative.** Colorado quantum is poised to scale quickly in the next decade. Our ecosystem partners will facilitate scaleups by **A)** offering loan guarantees for quantum businesses and **B)** providing vital support and expertise through Endeavor Colorado. This blend of financial and experiential support will supercharge the growth trajectory of quantum businesses which are ready to scale, boosting the economy and expanding the workforce.

Partners at both the state and local government levels also will expand programs to provide non-dilutive grants, Tax Credits, no-cost consulting, and low-cost training to support these initiatives and have pledged to prioritize quantum companies in these programs, as described in their letters of commitment.

A.1.d.7: Impact on economic and national security of the United States: The strategic importance of QIT cannot be overstated. Quantum computers will revolutionize fields ranging from medicine to materials science to logistics, while quantum sensors will enhance military operations and quantum networks will ensure secure communications.[27] While America leads the race to build qubits, our quantum hardware supply chain is falling behind.[28] Most cryogenics, wiring, and control electronics are manufactured abroad[28] and for every $1 the USG invests in quantum, China invests $8.[22] We must learn from mistakes made with 5G and invest now to increase infrastructure resilience and prevent costly catch-up later. As home to many of America's most important quantum enabling hardware/infrastructure providers, including Maybell, KM Labs, Thorlabs, Vescent, and Form Factor, Colorado is America's best hope.[13] These players' participation in the country's premier open-access quantum lab through Elevate Quantum will galvanize industry growth and stability, ensuring US leadership in quantum hardware in the decades to come.

To further enhance national security around QIT, the EQC will develop and deploy best practices in research security and integrity, emphasizing openness, transparency, honesty, equity, fair competition, objectivity, and democratic values. EQC members will be trained and evaluated for research security designation, allowing them to more effectively identify QIT topics which must be developed securely vs. those conducive to an open science environment to enhance national research.

Smart investment leveraged by American innovators can win the race to define the Quantum Century. There is no more geostrategically important opportunity than 'getting quantum right.' If China surpasses America in QIT, we will suffer dire consequences.[22] A failure to lead at every layer of the QIT stack invites cybersecurity breaches from foreign-made quantum infrastructure and adversarial quantum systems. By investing in the EQC, the country can leverage the transformative potential of quantum technologies and decades of Colorado leadership, enhancing national security, protecting sensitive information, gaining a competitive advantage, and strengthening our position as the global hub for QIT innovation. The relatively modest investment that would accompany designation as a QIT Tech Hub will facilitate the equitable acceleration of the US quantum industry and prevent hundreds of billions of dollars in future spending attempting to catch-up to foreign countries.[29] Harnessing the cascading benefits of increased capital, jobs, and opportunity, the EDA and the Elevate Quantum Consortium can collaborate today to secure America's place at the forefront of the quantum future.