Quantum Computing Market in 2026: Trends, Opportunities, and Challenges

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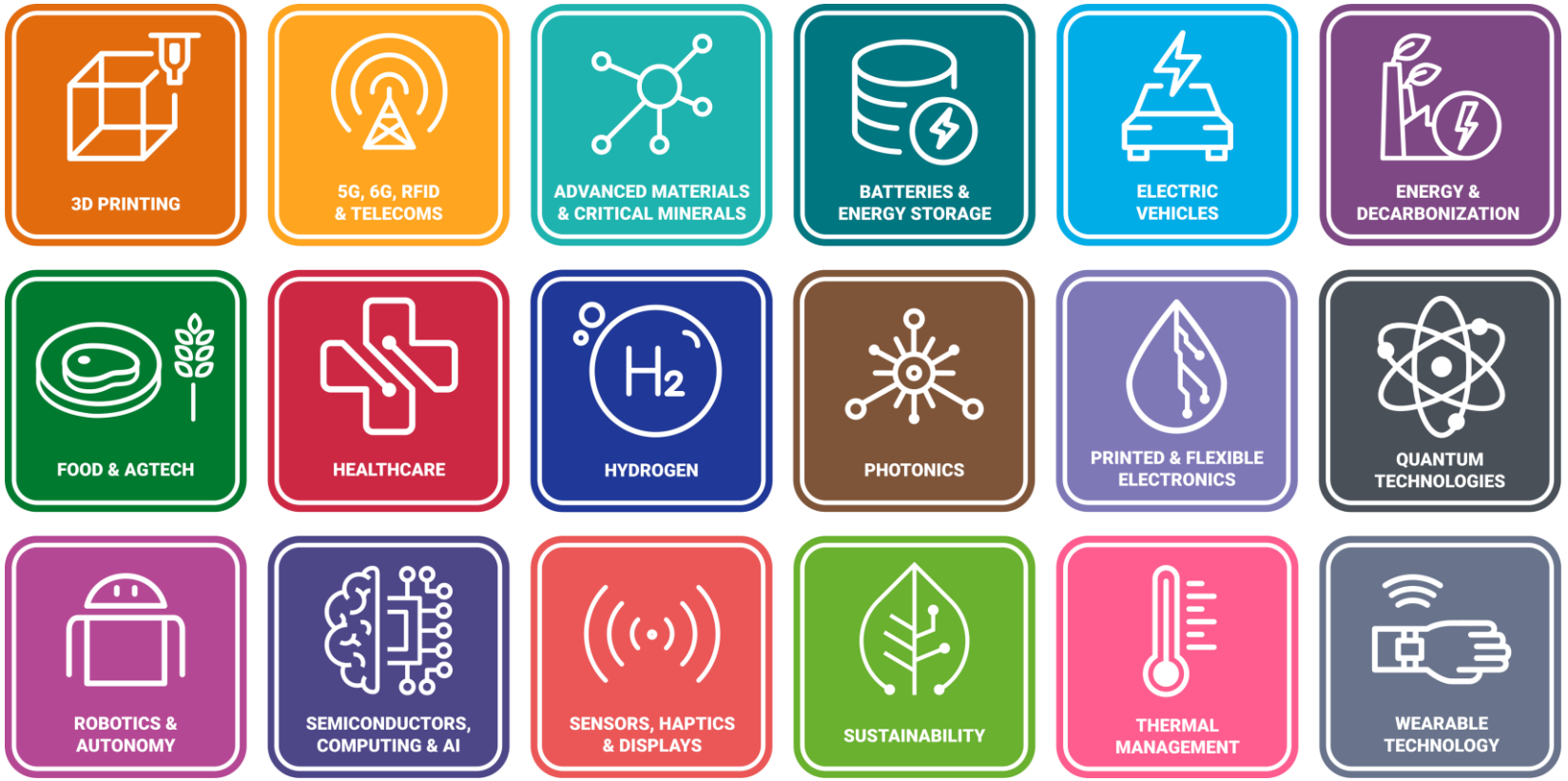
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San Jose, California

Who are IDTechEx?

IDTechEx

Since 1999 IDTechEx has provided independent market research, consultancy and subscriptions on emerging technology to clients in over 80 countries.

- Technology assessment
- Technology scouting
- Company profiling
- Market sizing
- Market forecasts
- Strategic advice

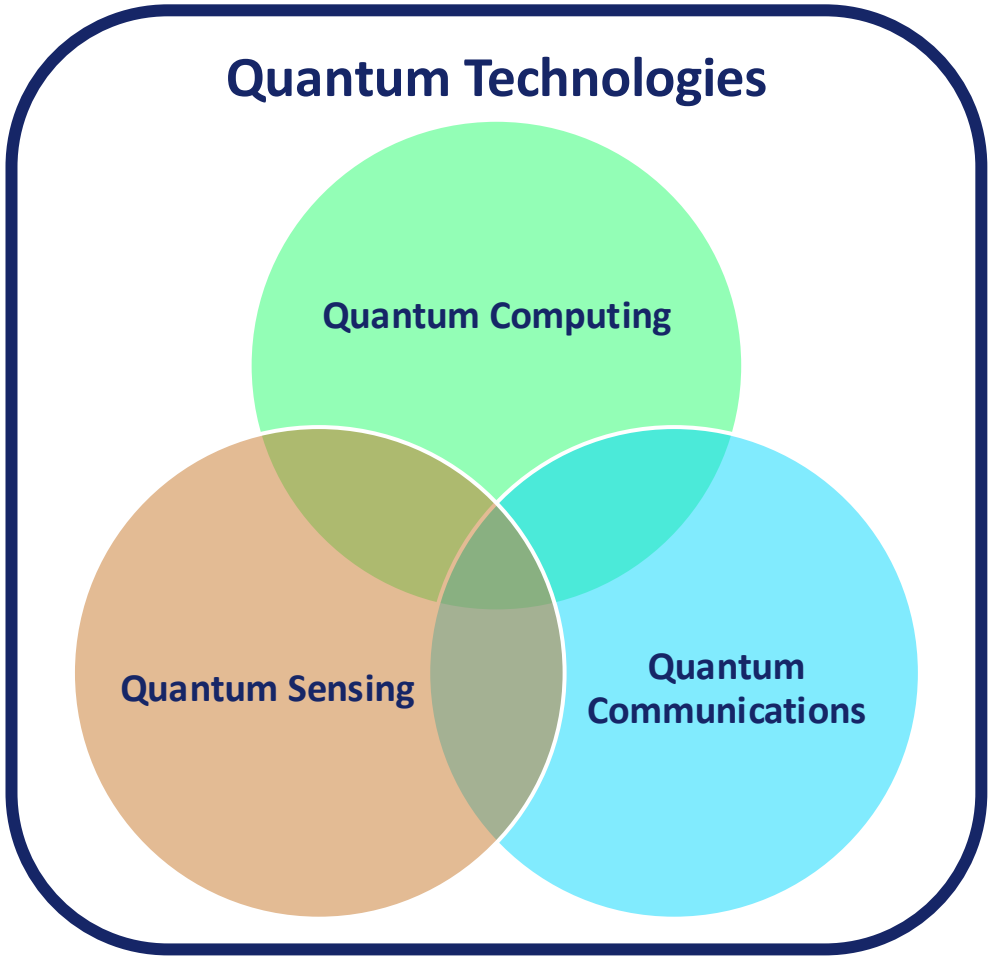


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Scaling Innovation for the AI Era.

Overview of the Quantum Technology Market

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The quantum technology market can be segmented into:

1. **Quantum computing**
2. Quantum communications
3. Quantum sensing

Today's presentation will focus on:

1. **The Quantum Computing Market Landscape**
   - Technology approaches (qubit modalities)
   - Key trends for 2026
2. **Opportunities & Challenges for QC Data Centers**
3. **Market Outlook for Quantum Computing**

Different Approaches to Building a Commercial Quantum Computer

Commercialized approaches to building a universal quantum computer:

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+ many more…

Different Approaches to Building a Commercial Quantum Computer

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Commercialized approaches to building a universal quantum computer:

Superconducting

IBM, rigetti, Google Quantum AI, IQM

Trapped Ion

IONQ, QUANTINUUM

Neutral Atom

Infleqtion, PASQAL, QuEra Computing Inc., atom computing

Photonic

PsiQuantum, XANADU, ORCA Computing, QUANDELA

+ many more…

Alternative approaches to quantum computing:

IDTechEx Research

Silicon Spin

intel, quobly, QUANTUM MOTION

Superior scalability on a single chip?

Diamond Defect

QUANTUM BRILLIANCE, XEED

Reduced infrastructure?

Topological

Microsoft

Others/Hybrids

C12, Photonic

Annealing/Analog

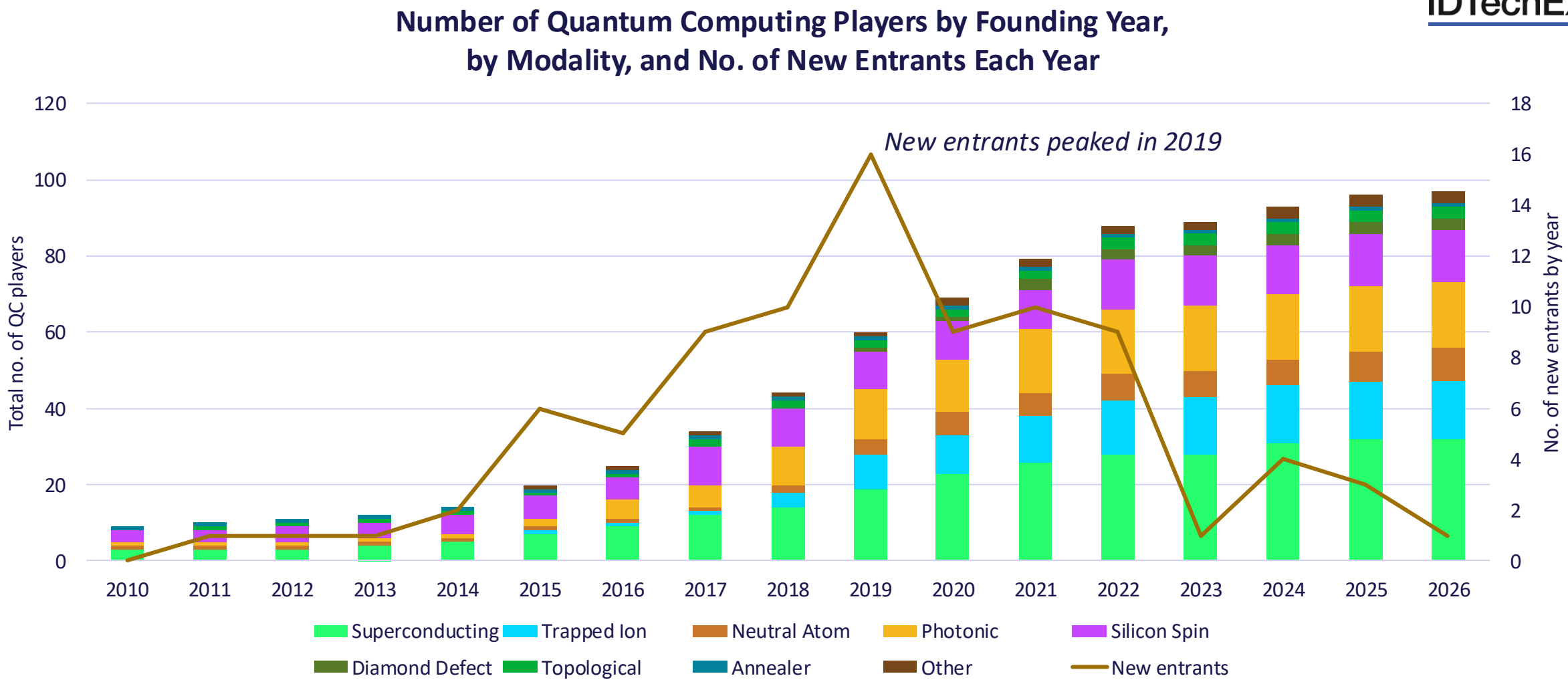
D-Wave The Quantum Computing Company™, NEC, QCi Innovative Quantum Solutions Company

Closer to advantage?

Note: non-exhaustive lists of players

No. of New Quantum Computing Players has Saturated Since 2019

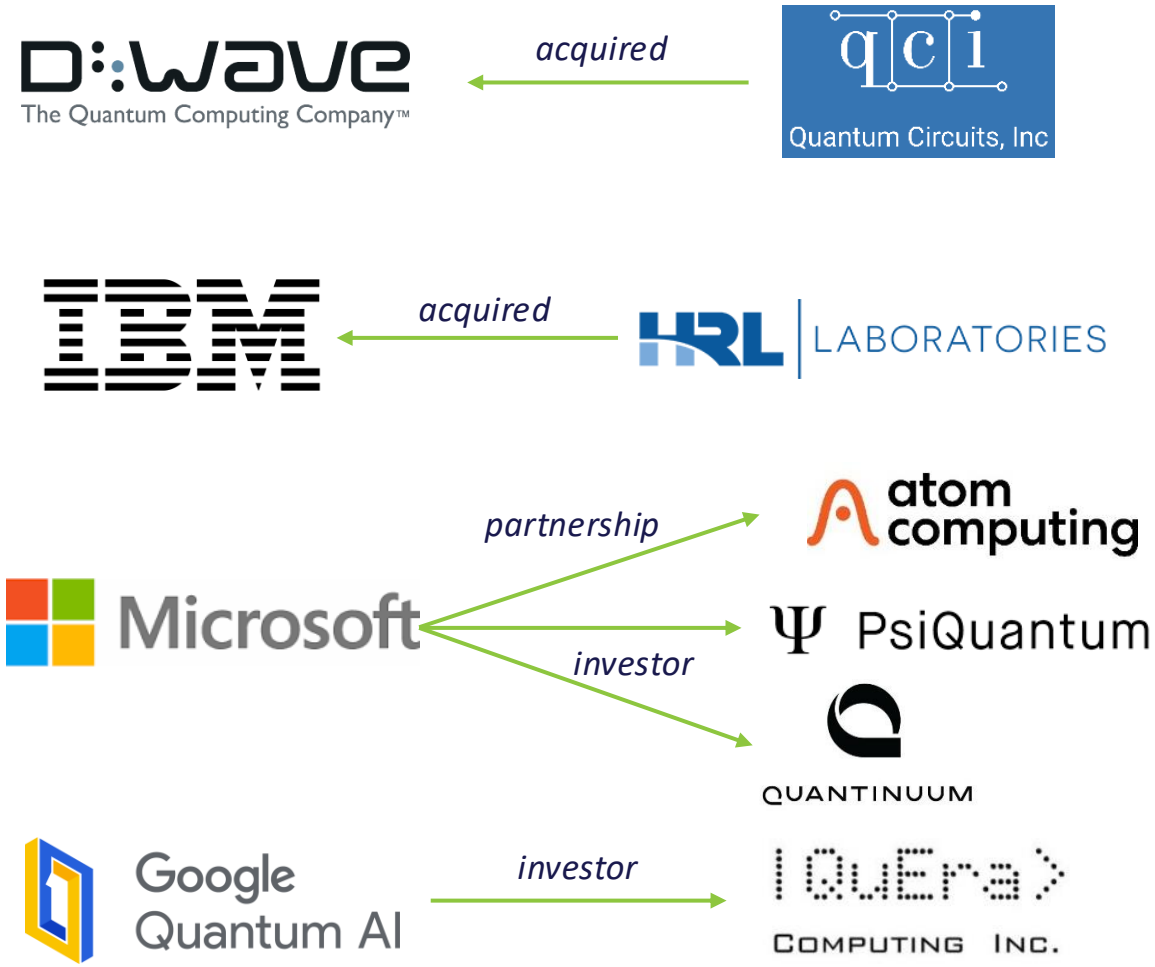
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Spreading Bets Over Multiple Approaches?

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- **D-Wave acquires Quantum Circuits Inc** – the leader in quantum annealers acquiring a (universal gate-based) superconducting qubit startup.
- **IBM acquires HRL Laboratories** – the superconducting qubit giant acquiring a leading research laboratory in the development of silicon-spin qubits.
- Microsoft and Google have been long-term backers/partners of quantum computing startups developing qubit modalities different to their own in-house projects



2026: the Year Quantum Goes Public

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QC Startup	Qubit Modality	Ticker	IPO Date
Quantum Computing Inc	Photonic	QUBT	2021
IonQ	Trapped Ion	IONQ	2021
Rigetti	Superconducting	RGTI	2022
D-Wave	Annealing	QBTS	2022

**This list contains only "pure-play" companies with a primary focus on developing quantum computing hardware.*

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Infleqtion	Neutral Atom	INFQ	February 2026
Xanadu	Photonic	XNDU	March 2026
IQM	Superconducting	IQMX	July 2026
Quantinuum	Trapped Ion	QNT	June 2026
Pasqal	Neutral Atom	PSQL	August 2026
SeeQC	Superconducting	SEQC	2026 (planned)

Number of public pure-play* QC companies more than doubled by the end of 2026

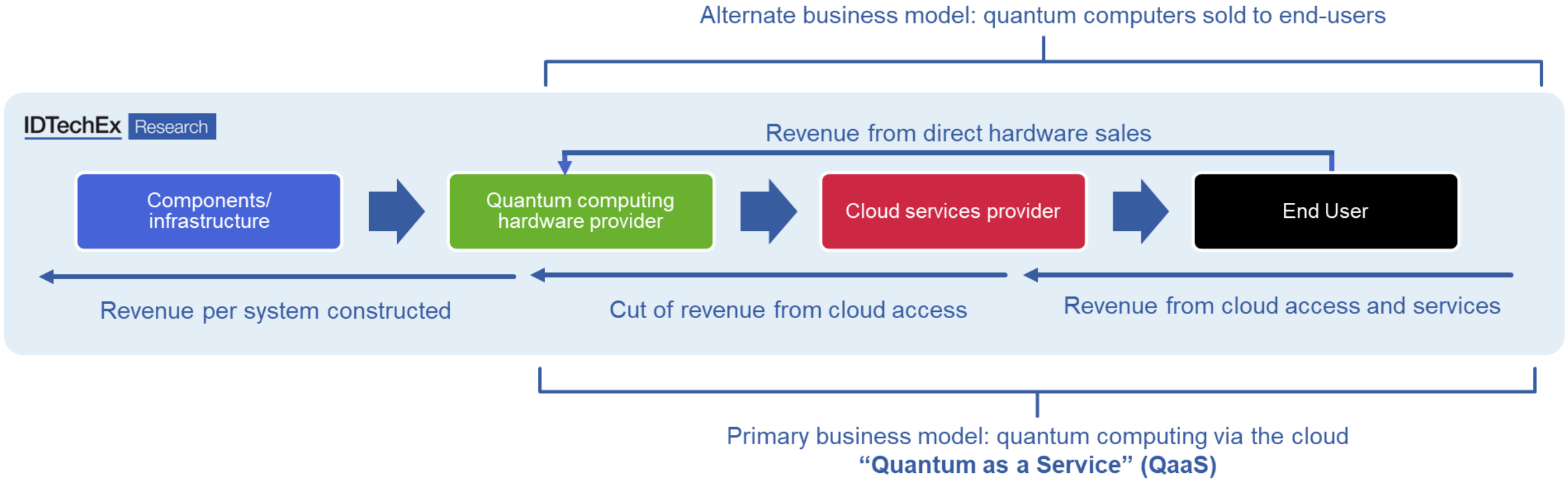
+ Origin Quantum, Qboson, Ciqtek and TuringQ registering to IPO on Shanghai's STAR market in last 12 months

➢ Multiple different vendors for 4 universal quantum computing modalities + quantum annealers

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Opportunities & Challenges for Quantum Computing Data Centers

The Opportunity: Growing the number of quantum computers accessible via the cloud through “Quantum as a Service”



Opportunities & Challenges for Quantum Computing Data Centers

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The Challenge: New infrastructure demands and sensitive equipment

Requirement	Cooling	Noise	Communication	Power

Opportunities & Challenges for Quantum Computing Data Centers

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The Challenge: New infrastructure demands and sensitive equipment

Requirement	Cooling	Noise	Communication	Power
Problem	Use of liquid cryogens for mK temperatures is expensive and new	High sensitivity to, RF, microwave and magnetic fields	Communication with classical systems is essential	Disruption can decohere qubits or damage equipment
Solutions	Closed/dry cryostats, self-calibrating systems, room temp qubits?	Multiple levels of shielding around a quantum computer – typically copper boxes	Analogue to digital converters, server racks built-in to the quantum computer enclosure	Consistent, low-noise power supply with backup systems

Opportunities & Challenges for Quantum Computing Data Centers

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Pain Points

- Complex, unfamiliar
- Large footprint
- Expensive
- Limited supply chain

Our Quantum Computing Hardware Forecast Methodology

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Core assumption: QC TAM will grow with capability

↓

Forecasting TAM over time

↓

Match to known deployments today

↓

Convert TAM to install base of systems

↓

Annual unit sales & revenue

Our Quantum Computing Hardware Forecast Methodology

IDTechEx

Capability & Commercial Value

QCRL	Paradigm	Product	Approx. logical/physical qubit no.
1	NISQ	Education-only tool.	0 logical, <10 physical
2		Early Use-case development tool.	0 logical, 10s physical
3		Advanced use-case development tool. ***State-of-the-art today***	1-10 logical, 100s-1000s physical
4	FTQC	Computer for application-specific commercial deployment.	100s logical, 1000s-10,000s physical
5		Computer for versatile deployment but at a premium.	100s-1000s logical
6		Affordable for cloud access where there is a clear business case.	1000s logical
7	FTQC+ (long-term future)	Quantum computing hardware affordable for cloud platforms or on-premises.	Thousands-millions of logical qubits depending on use case and application requirements
8		Quantum computing hardware in high-end consumer PCs.	
9		Quantum computing hardware in high-end consumer phones.	
10		Quantum computing hardware is utilized in most computers.	

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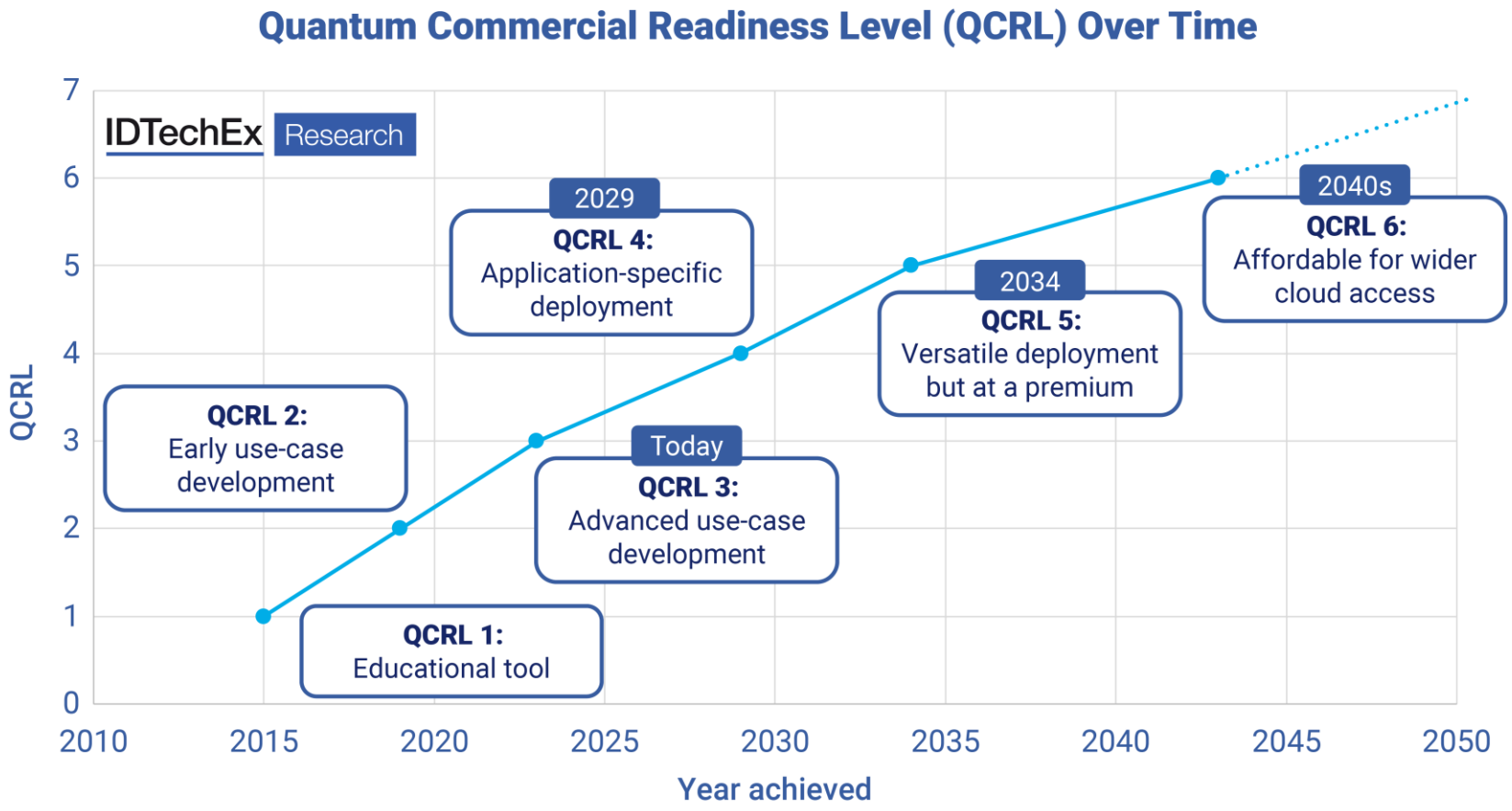
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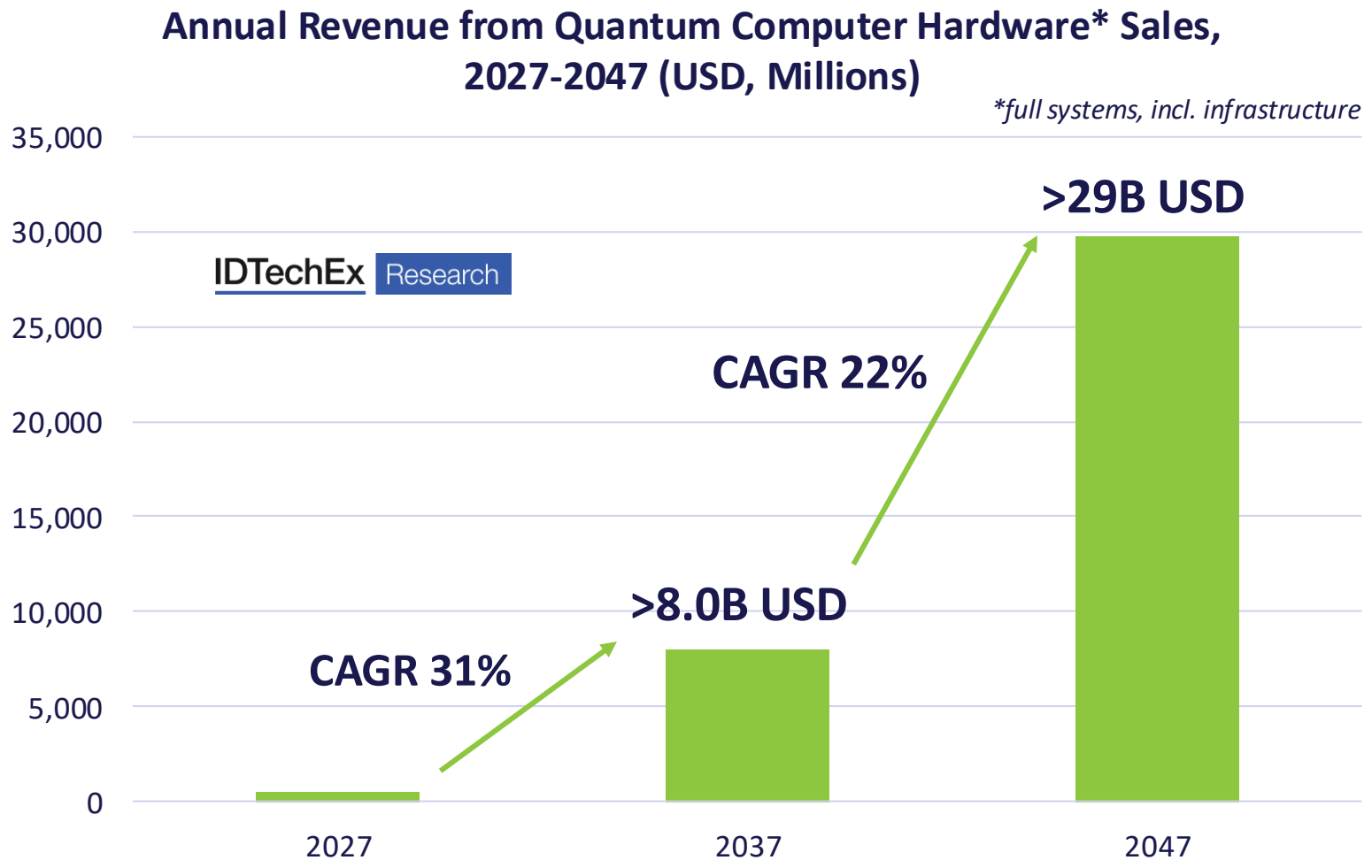
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Enabling Industries & End-User Industries

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- Vital for ecosystem building & highlights geographical strengths

Enabling industries

- Semiconductors
- Photonics
- Nanomaterials
- Electronics
- Thermal management

End user industries

- Chemical
- Automotive
- Aerospace
- Healthcare & Pharma
- Finance

How do we get different sectors
to align on quantum?

Key Takeaways for the Quantum Computing Market in 2026

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Competition Between Different Qubit Modalities

- A range of different hardware approaches, “qubit modalities”, are surprisingly close in technical progress.
- The number of new entrants has mostly saturated, but several startups are going/have gone public this year.
- Some major players are diversifying across multiple approaches.



Quantum Computing Market 2026-2046: Technology, Trends, Players, Forecasts

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Quantum Computers in Data Centers

- The primary business model for quantum computers is through centralized cloud access – quantum-enabled data centers grow this model.
- New infrastructure demand is a challenge for quantum computing deployment.



NEW 2027-2047 version coming very soon

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Market Outlook for Quantum Computing

- Success of quantum computing requires cooperation with enabling industries (infrastructure, supply chain), and end-user industries.
- Based on the addressable markets, a multi-billion industry in the 2030s and multi-10 billion industry by the 2040s is possible.



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