



This Photo by Unknown author is licensed under [CC BY SA-NC](https://creativecommons.org/licenses/by-sa/4.0/)

Quantum Technology

Materials

Computing

Quantum Technology Roadmap

Updated as of 11 March 2024

OVERALL STRATEGIES

Facilities and Services

- Establishment of *Quantum Tech R&D Center*
- Establishment of *Connectivity Infrastructure* to a remote Quantum Computer
- *Establishment of a Design, Fabrication, and Characterization Facility for materials*
- Expansion of existing metrology to accommodate quantum communication and sensing

Human Resources

- Fortify Theoretical foundation in Quantum Mechanics and Quantum Technology
- Two-phase Capacity Building: (1) Core Group, (2) Local Scientists
- Implement a call for *Balik Scientists*

R&D Technologies

Quantum Communication

- Quantum memory storage device & repeater
- Quantum random number generator
- Quantum Network algorithm development
- Quantum cryptography
- Autonomous quantum key distribution system over metropolitan distances
- Satellites and high-altitude platform stations for long-distance quantum networks
- Quantum software and secure quantum web / internet / search engines development

Quantum Computation

- HPC for Quantum Circuit Simulation
- Quantum processor architectures
- Error-corrected logical qubits with fault-tolerant gates
- Local quantum computer

Quantum Materials and Simulation

- Create experimental platforms for quantum simulation
- Prototype devices simulating quantum systems
- Development of validation and verification tools for quantum simulators

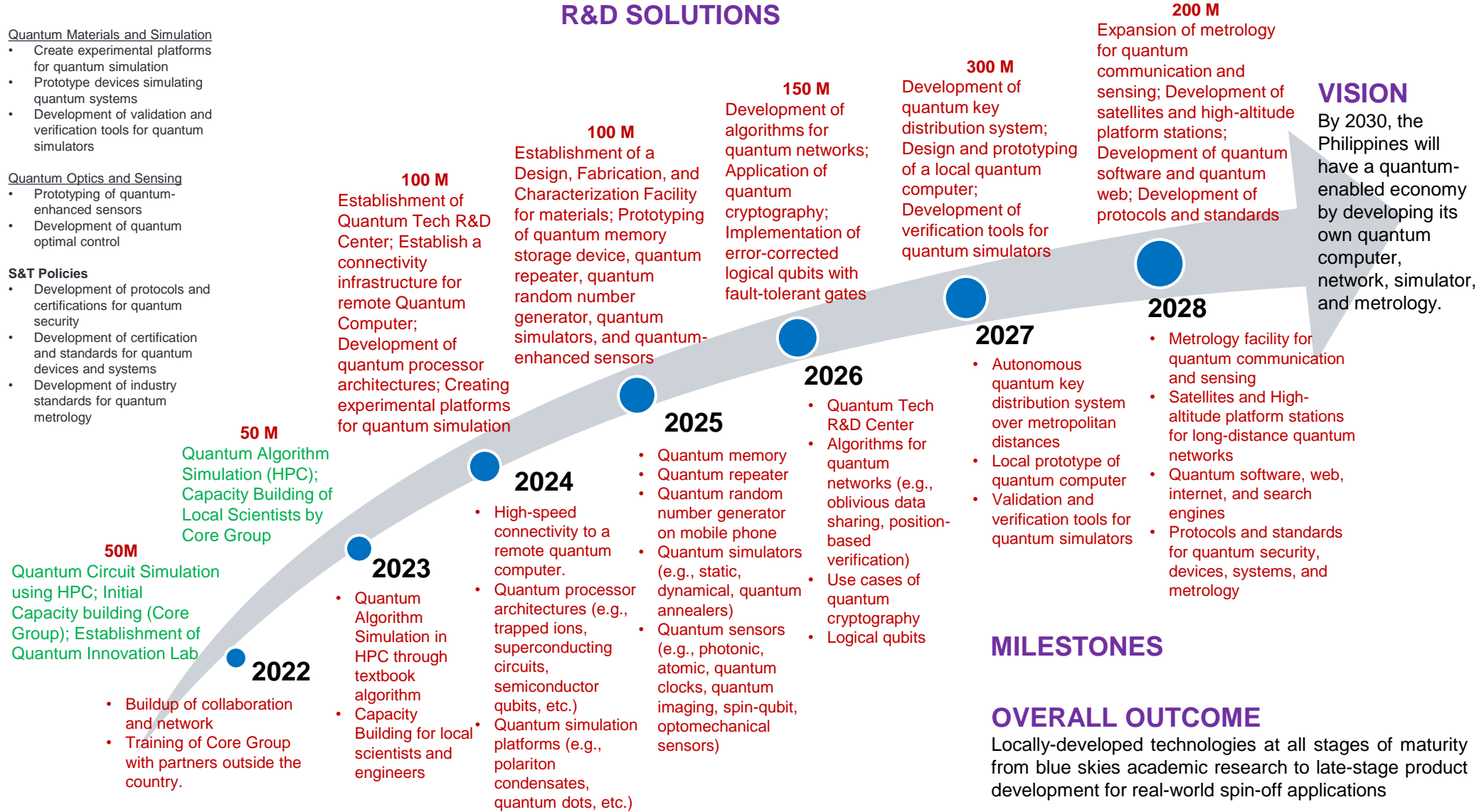
Quantum Optics and Sensing

- Prototyping of quantum-enhanced sensors
- Development of quantum optimal control

S&T Policies

- Development of protocols and certifications for quantum security
- Development of certification and standards for quantum devices and systems
- Development of industry standards for quantum metrology

R&D SOLUTIONS



VISION

By 2030, the Philippines will have a quantum-enabled economy by developing its own quantum computer, network, simulator, and metrology.

MILESTONES

OVERALL OUTCOME

Locally-developed technologies at all stages of maturity from blue skies academic research to late-stage product development for real-world spin-off applications

List of Quantum Technology Projects (for the whole duration of the roadmap)

R&D Technologies	Project Title	Budget Allocation ('000)							Status
		2022	2023	2024	2025	2026	2027	2028	
Quantum	Establishment of Quantum Innovation Laboratory: Optimizing a Decision Diagram-based Free and Open-Source Quantum Circuit Simulator for Benchmarking in an HPC Environment using Entanglement, Random Circuits, and Quantum Algorithms Benchmark Datasets	25,52,0393.60	33,640,393.60						Ongoing
	Quantum Computing-Based Forecasting and Optimization Applied to Electric Grid (MECO-TECO)								

