

# Quantum Technology Roadmap

## 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

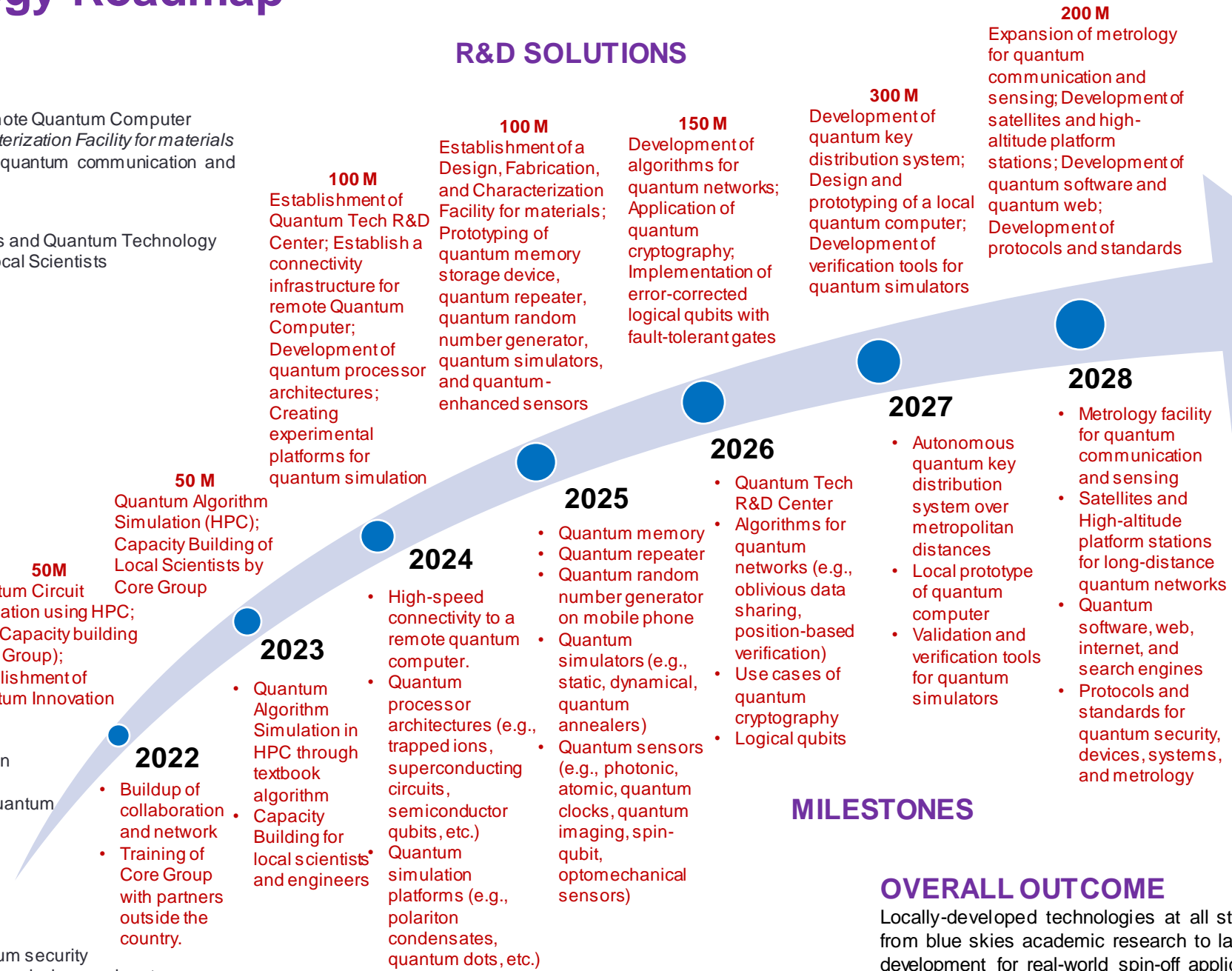
#### Quantum Optics and Sensing

- 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