

# **The Intersection of Energy and Communications**

*Powered by Quantum*



# Why Should We Care?

A new decade of innovation begins in energy and broadband.



Just look out the window or out the front door.



# Fourth Industrial Revolution



1<sup>st</sup>: The Age of Mechanical Production



2<sup>nd</sup>: The Age of Science & Mass Production



3<sup>rd</sup>: The Digital Revolution



4<sup>th</sup>: The Age of Unprecedented Levels of Connectivity

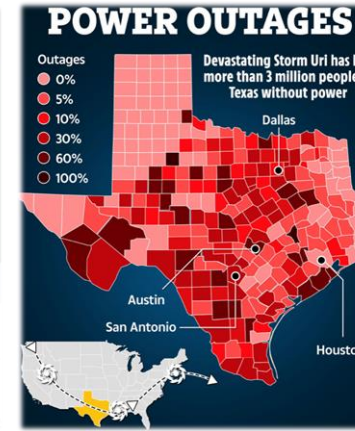
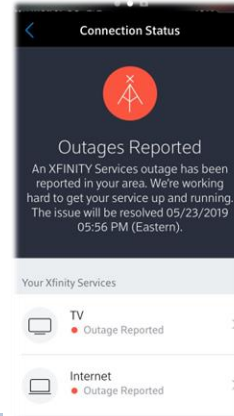




# Utility Infrastructure 2018-2022

More vital, valuable and fragile.

Work and school depended on electricity and internet service.



# **New Technological Revolution Transforms the Way We Live**

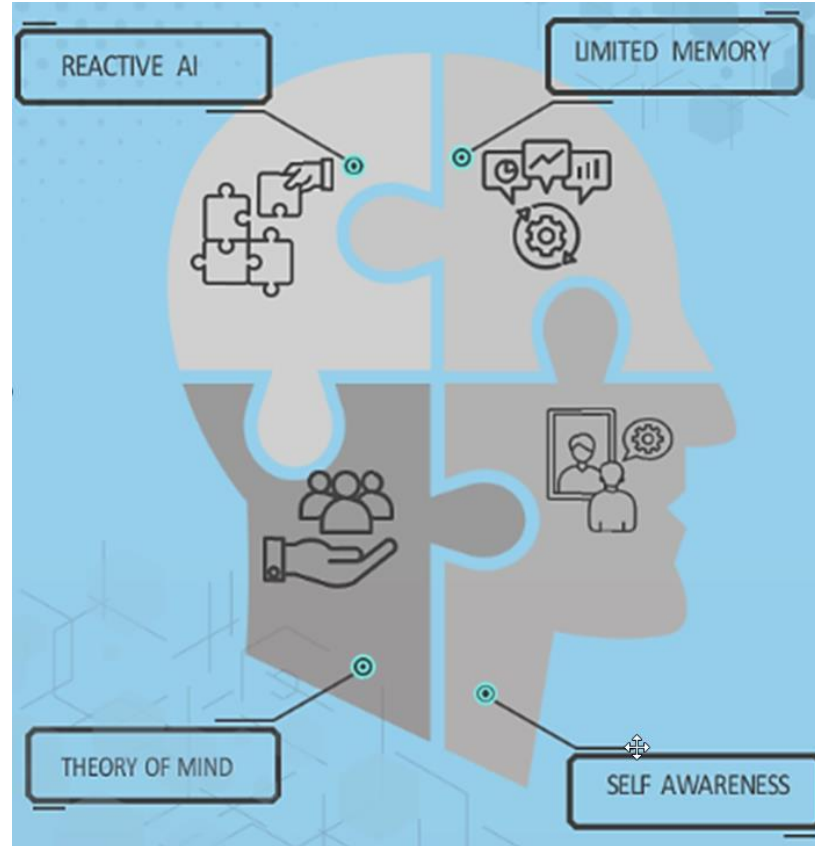
Where Are We Today? (2022-2035)



# Artificial Intelligence

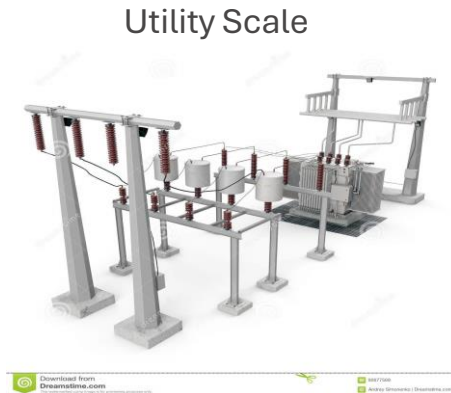
## Four Stages of AI:

1. No memory or storing ability
2. Algorithms used can mimic human brain neurons (receive new data as a training method to improve)
3. Infer & understand human mental states
4. Self-generated thoughts & feelings based off data much like humans



# Technological Revolution: Microgrids

Transforms the way we live.



Overcoming the Challenges of Net-Zero Home Design

XSCAD PRE-CONSTRUCTION 3D-BIM SOLUTIONS www.xscad.com

Customer Premise

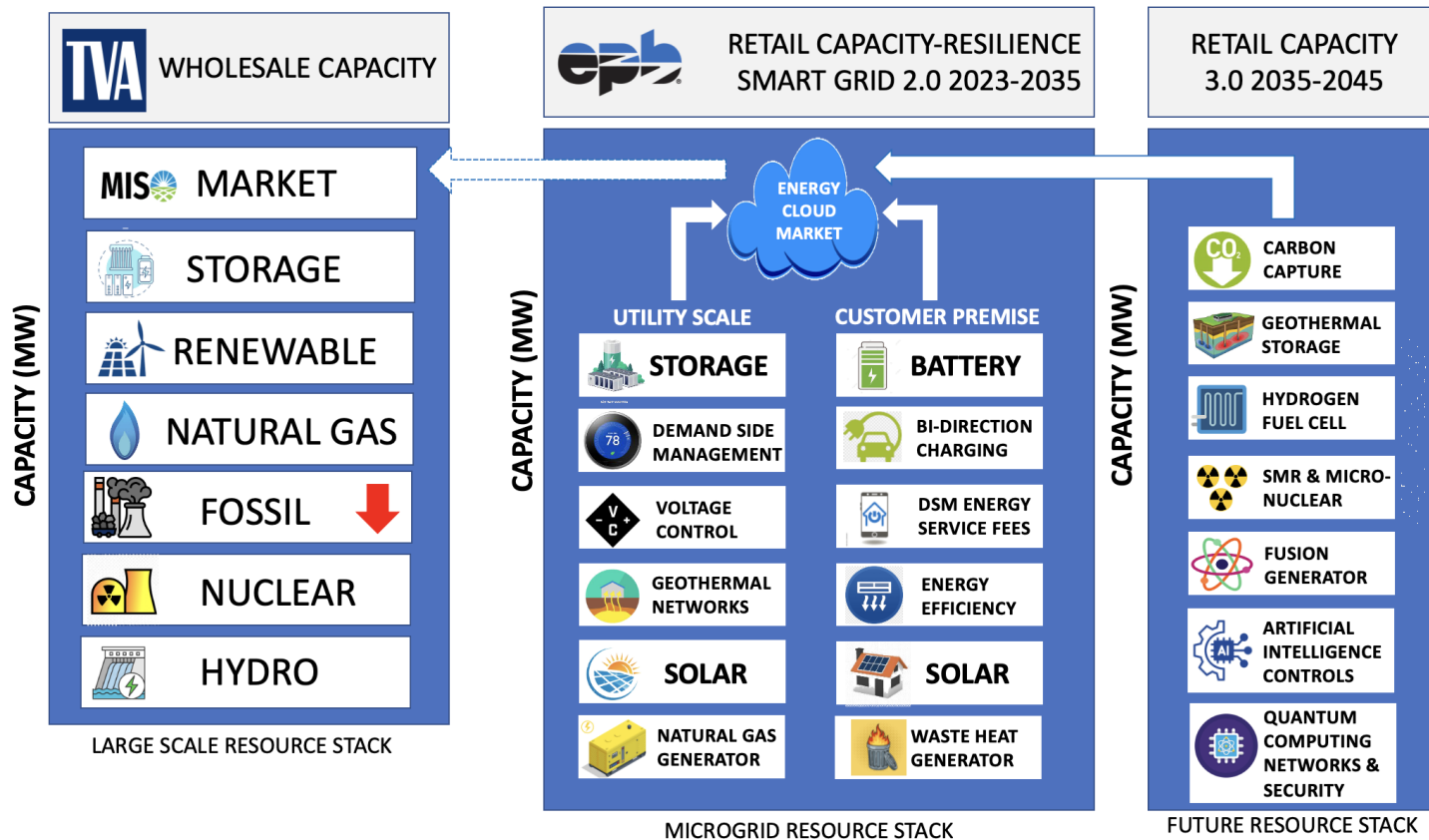
## Seven DOE Grid Modernization Goals:

Resilient — Reliable — Flexible — Affordable — Clean — Secure — Equitable





# Next Generation Electric Service Pioneer





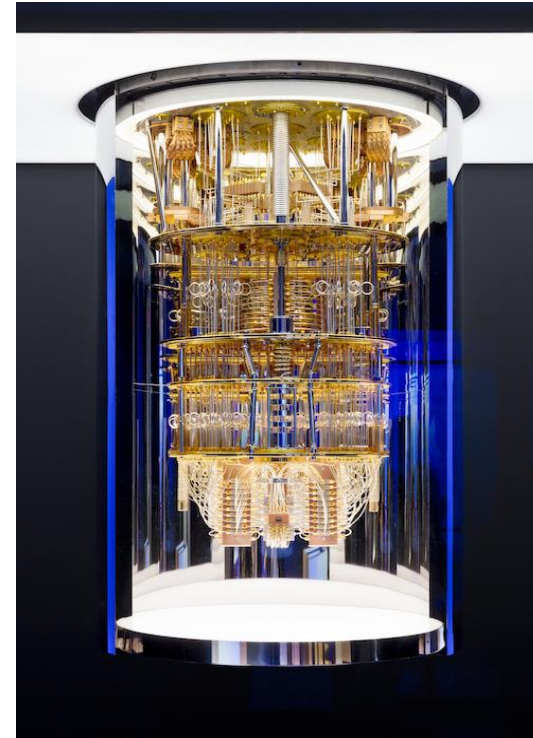
# Enter Quantum Internet

A New Age of Communications Arrives (2035-2050)



# Communications Evolve

Quantum Computing, Networks & Devices



The Quantum Internet Age Arrives 2035.



# epb Quantum Network<sup>SM</sup>

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## Introduction

- Begin deployment in January 2022
- Commercializing Quantum Technology
- Established Fiber Optic Network
- Connect business, entrepreneurs, researchers, government & universities



### MarketWatch

The next Austin? This booming city in Tennessee is about to take a leap into quantum networking.



**EPB and Oak Ridge Laboratory Aim to Use Quantum Technology to Secure the Power Grid**

**Bloomberg** Chattanooga Plants Quantum Seed to Stay on Cutting Edge





# R&D in Chattanooga!

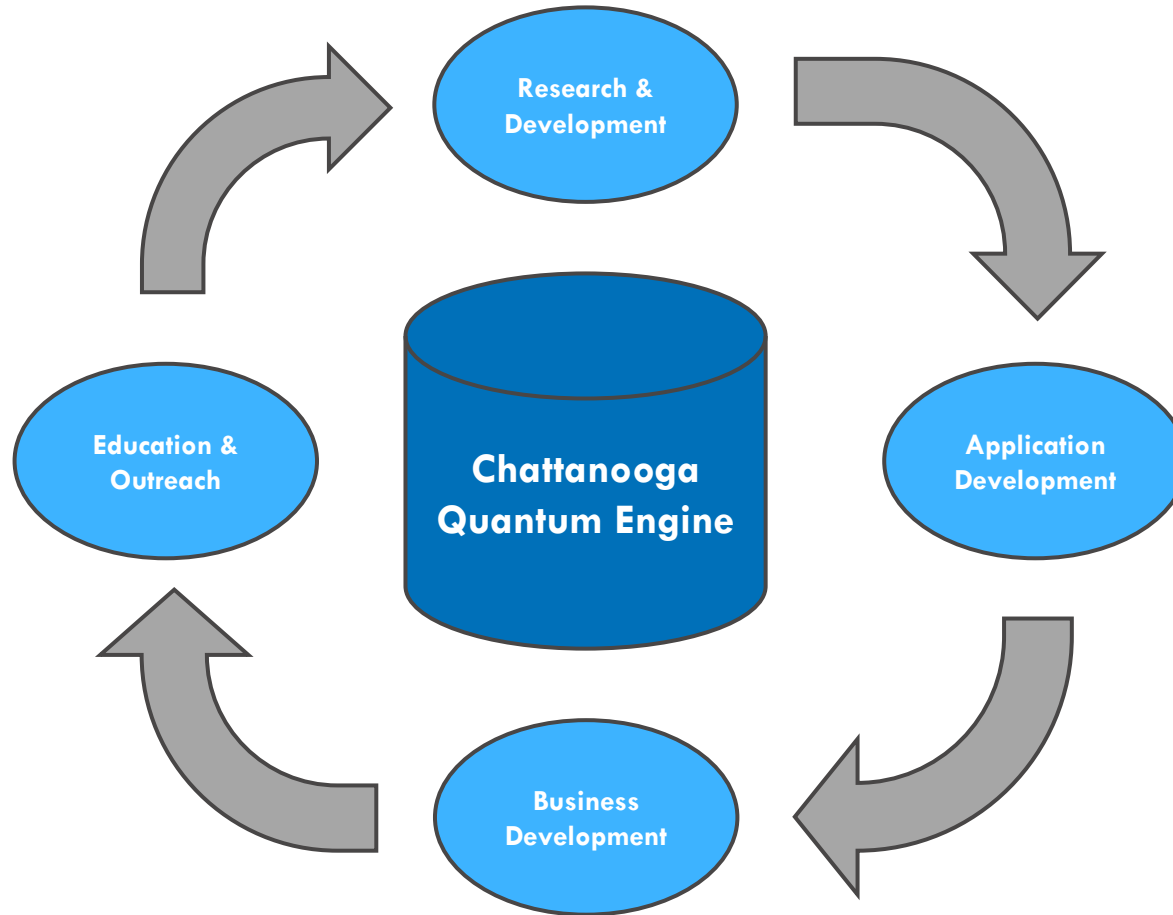


ORNL's first run on commercial quantum network





# Quantum Circular Engine Concept



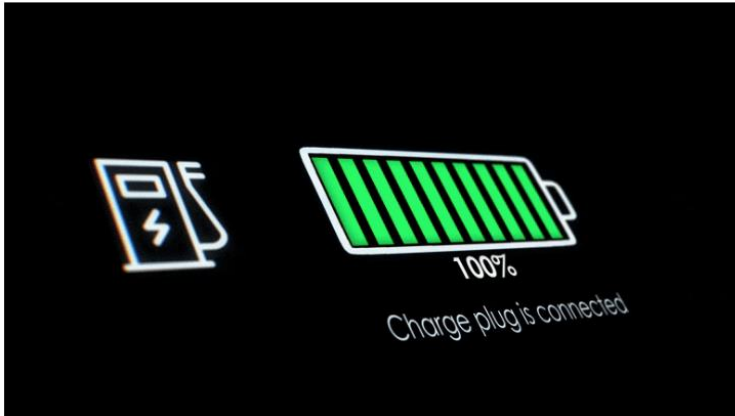
Self-sustaining business concept for Quantum in Chattanooga.



# Quantum Energy Applications

## New Quantum Technology To Make Charging Electric Cars As Fast as Pumping Gas

TOPICS: Battery Technology Energy Institute For Basic Science Popular Quantum Mechanics  
By INSTITUTE FOR BASIC SCIENCE MARCH 21, 2022



Notion Try Notion for teams Try for free

Quantum charging will cut the charging time of electric vehicles from ten hours to three minutes.



Charge Utility-Scale Batteries faster



Grid Security (QKD or PQC)

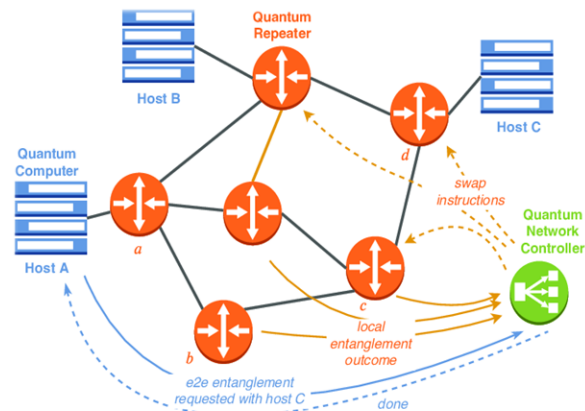
Self-sustaining business concept for Quantum in Chattanooga.



# EPB Quantum Ready Strategy



QUANTUM INTERNET



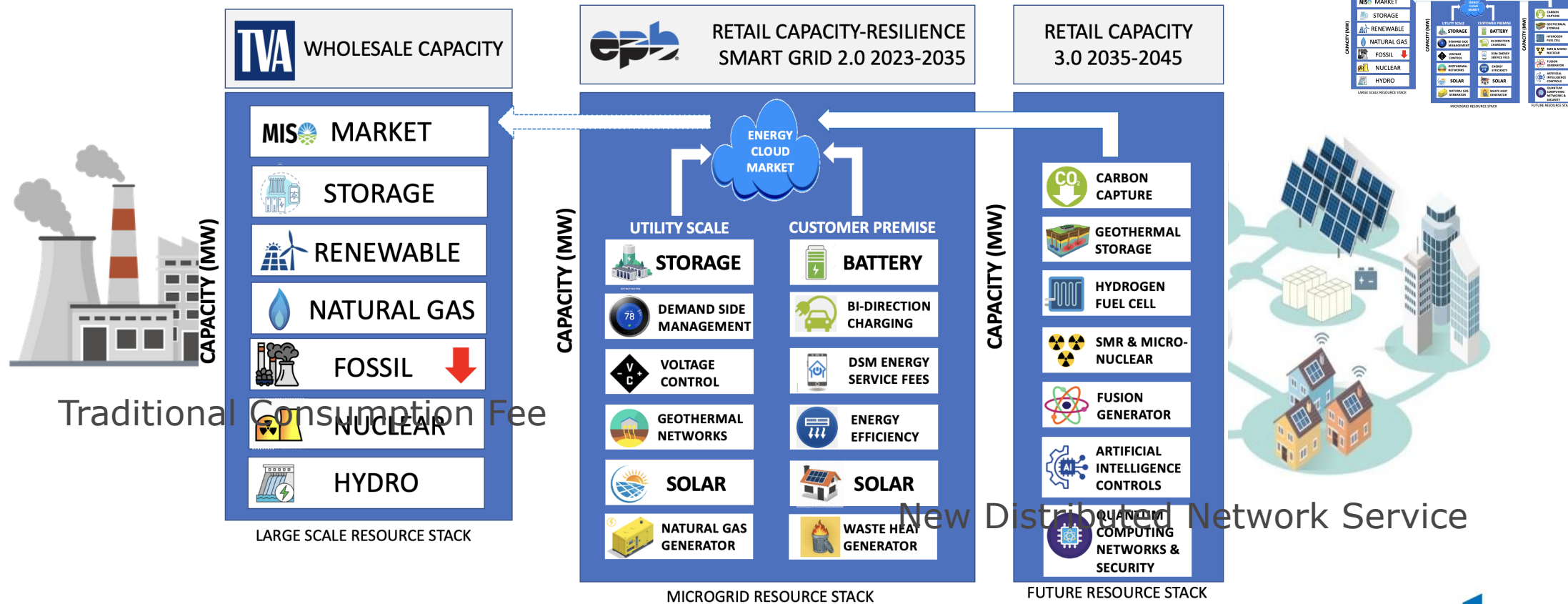
DISTRIBUTED ENERGY



Input > Transformation > Output



# Quantum Energy Holy Grail?



Commodity Electric Rates to Energy Service Pricing





# Chattanooga

Quantum will be in our DNA.

