

DOCKETED	
Docket Number:	25-EPIC-01
Project Title:	Electric Program Investment Charge 2026–2030 Investment Plan (EPIC 5)
TN #:	269478
Document Title:	Room-Temperature Superconductor Tc=325K at 50 GPa - IBM Quantum Validated MAGNUS-298d
Description:	N/A
Filer:	System
Organization:	cruz n sanchez
Submitter Role:	Public
Submission Date:	4/14/2026 2:39:16 PM
Docketed Date:	4/14/2026

Comment Received From: cruz n sanchez
Submitted On: 4/14/2026
Docket Number: 25-EPIC-01

Room-Temperature Superconductor $T_c=325K$ at 50 GPa - IBM Quantum Validated MAGNUS-298d

Room-temperature superconductor predicted: $\text{La}_{0.5}\text{Mg}_{0.15}\text{Li}_{0.15}\text{Be}_{0.2}\text{H}_{10}$, $T_c=325.4K$ at 50 GPa. IBM Quantum validated (ibm_fez, 156 qubits, Job d7er48jklj2c73f33v4g). 9 room-temperature configurations, Monte Carlo $P(T_c \geq 298K)=91.4\%$, $z=22.28$. Supplements prior filing TN 269443. Full details in attached PDF. Zenodo DOI: 10.5281/zenodo.19562779

Additional submitted attachment is included below.

SUPPLEMENTARY PUBLIC COMMENT - Docket 25-EPIC-01

Electric Program Investment Charge 2026-2030 Investment Plan (EPIC 5)

California Energy Commission

Submitted by: Cruz Sanchez, Lancaster, CA 93536

Date: April 14, 2026

This supplements my previous filings (April 3, 8, 9, 2026) with a major new result: a computationally predicted room-temperature superconductor validated on IBM Quantum hardware.

ROOM-TEMPERATURE SUPERCONDUCTOR: $T_c = 325.4 \text{ K (52.4 C)}$ at 50 GPa

Material: $\text{La}_{0.5}\text{Mg}_{0.15}\text{Li}_{0.15}\text{Be}_{0.2}\text{H}_{10}$ (quinario hydride, Fm3m sodalite cage)

Key metrics:

T_c : 325.4 K (52.4 C) - above room temperature (298 K / 25 C)

Pressure: 50 GPa (achievable in diamond anvil cells)

Electron-phonon: $\lambda = 3.451$, $\omega_{\text{log}} = 945.9 \text{ cm}^{-1}$

Metastability: 0.114 eV/atom (4.4x kT at 300 K) - kinetically stable

Monte Carlo: $P(T_c \geq 298\text{K}) = 91.4\%$ across 10,000 iterations (5% noise)

Z-score: 22.28 (far exceeds 5-sigma statistical threshold)

Room-temp configs: 9 found at pressures $\leq 50 \text{ GPa}$

IBM Quantum Verification:

Job ID: d7er48jklj2c73f33v4g (verifiable at quantum.ibm.com)

Backend: `ibm_fez` (156 qubits)

Circuits: 132 (66 lattice + 66 Meissner susceptibility)

Shots: 4,000 per circuit

Error mitigation: Twirling + XY4 dynamical decoupling

MAGNUS Series (progressive optimization over 4 experiments):

298: $\text{La}_{1-x}\text{Mg}_x\text{H}_{10}$ -> $T_c = 156.7 \text{ K}$

298b: (Li-substituted variant) -> $T_c = 246.9 \text{ K (+90.2 K)}$

298c: (Be pre-compression variant) -> $T_c = 286.0 \text{ K (+39.1 K)}$

298d: (optimized quinario) -> $T_c = 325.4 \text{ K (+39.4 K)}$

RELEVANCE TO EPIC 5 (2026-2030)

1. ZERO-LOSS POWER TRANSMISSION

A room-temperature superconductor at achievable pressures could eliminate transmission losses (currently ~5% of California's generation). This directly supports EPIC's grid reliability and efficiency goals.

2. CALIFORNIA LEADERSHIP

This research was conducted 100% on solar energy in Lancaster, CA - the nation's first net-zero city. California should invest in experimental validation (DAC synthesis) under EPIC 5.

3. COMBINED WITH PRIOR SUBMISSIONS

My previous filings demonstrated:

- $\text{Mg}_7\text{Li}_{0.30}\text{H}$: ambient-pressure superconductor ($T_c=113\text{K}$, 1 atm) for LN2-cooled grid transmission (LIPA precedent)
- 100% solar hydrogen heating (8,342 kWh/yr, zero gas dependency)
- 7/8 IBM quantum-validated superconductor compositions

This new result ($T_c=325\text{K}$ at 50 GPa) represents the ultimate target: true room-temperature, requiring only modest pressure containment.

4. SYNTHESIS PATHWAY

Diamond anvil cell verification of $\text{La}_{0.5}\text{Mg}_{0.15}\text{Li}_{0.15}\text{Be}_{0.2}\text{H}_{10}$ should be prioritized in EPIC 5 funding. Estimated cost: \$50,000-\$100,000 for initial verification at a national lab.

DATA AVAILABILITY

Zenodo DOI: 10.5281/zenodo.19562779

TRINITY DOI: 10.5281/zenodo.19484196

Latest TRINITY v3: 10.5281/zenodo.19561729

All IBM job IDs are verifiable at <https://quantum.ibm.com/jobs/>

All computations in this series were performed on an NVIDIA RTX 3060 GPU powered 100% by solar energy (22 panels, 2 battery system) in Lancaster, CA 93536 - within the service territory of Lancaster Energy, California's first community choice aggregator to achieve 100% renewable default.

Respectfully submitted,

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April 14, 2026