

Team 7

AquaQuant



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The Problem

Freshwater scarcity

- 97% of Earth's water is salty
- With 2 billion people facing water scarcity by 2030

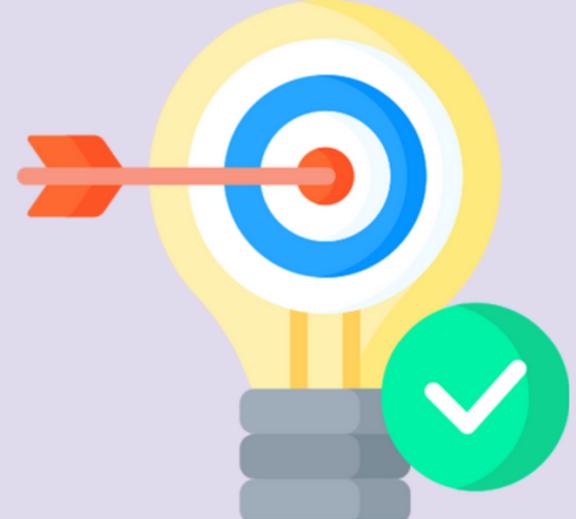
Energy and environment cost

- Consuming 300,000 barrels of oil in Saudi Arabia
- Emitting millions of CO₂

Inefficient membrane design

- Relying on costly trial-and-error
- Spending \$8 billion/year for testing thousands of material combinations





The Solution

**Quantum-
Enhanced
Molecular
Simulation**

**Breakthrough
Efficiency Gains
by getting a
stable structure**

**Replace
Guesswork with
Atomic
Precision**



SDGs



HEALTH BENEFITS

- 785 million people lack access to clean drinking water
- 3.4 million deaths annually from waterborne diseases,
- Children under 5 representing 60% of these preventable deaths



CLEAN WATER ACCESS

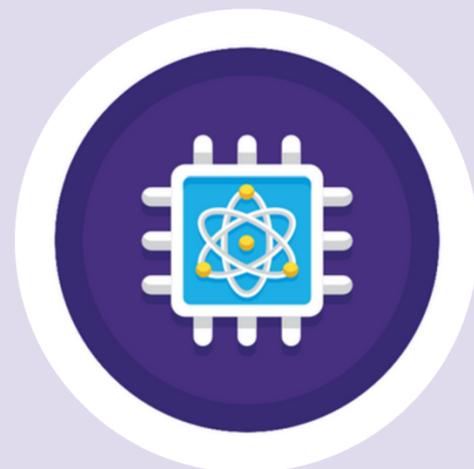
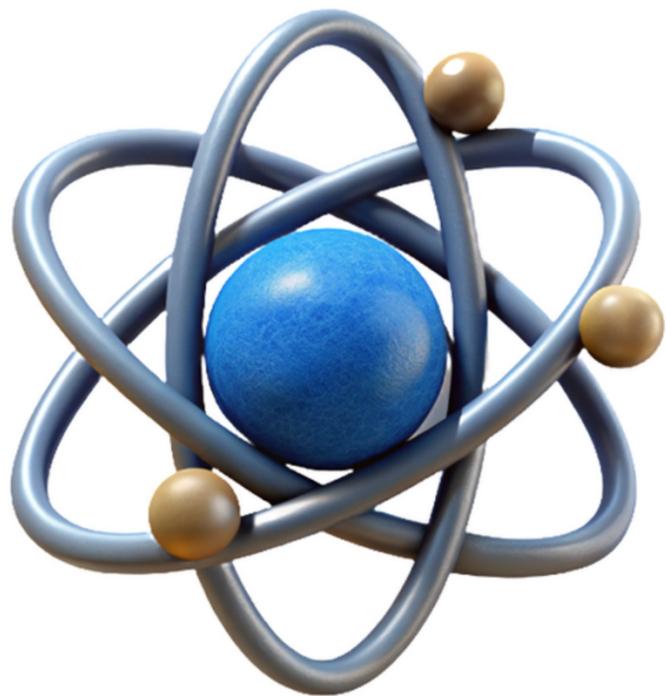
- 1% of global water supply comes from desalination
- 70% of that 1% comes from the MENA.
- 90% of Kuwait's drinking water comes from desalination



CLIMATE IMPACT

- Production of 76 million tons of CO₂ annually
- This number might triple by 2050
- Displacement of 70 million people by 2030 due to water scarcity
- Efficient desalination technology is essential to prevent this crisis





Exponential Growth

Too many **possibilities** that grow exponentially make simulations complex.



Complex Interactions

Electron interactions are **intricate** and require advanced computation for accurate simulations.

Why not classical but quantum?



Scallability

Our Solution can be applied to other molecules and even complex molecules.

Why Our Quantum Approach?

Molecular
Simulation is
Quantum
Computing's
Natural Advantage

VQE: Perfect
for Current
Quantum
Hardware

Proven Track
Record in
Chemistry



Workflow

Classical part

Geometry preparation

Quantum part :

1. Prepare Quantum Problem
2. Design Quantum Circuit (Ansatz)
3. Run VQE Optimization
4. Analyze Results



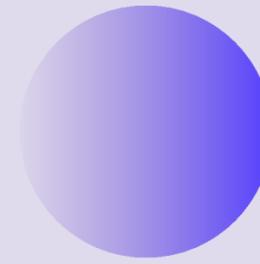
Important Remarks

- Our quantum approach does not take into account excited states
- GO membranes should NOT be used at mild temperature because it is likely to modify the structure leading to the loss of the oxygenated functional groups
- We expect to improve on that challenge in the future





Roadmap



Phase 1

Proof of concept (0-6 months)

- Secure partnerships with one or two major membrane manufacturers
- Revenue Model: \$100K–\$500K pilot contracts

Phase 2

SaaS Platform (6-18 months)

- Get other companies to subscribe to our Cloud-based quantum membrane design platform
- Revenue Model: \$10K–\$50K/month subscription per company

Phase 3

Licensing & Scale (18+ months)

- License-optimised membrane designs and implementation support
- Revenue: Royalties on membrane sales + consulting fees





Post-Hackathon

- Connect with DuPont/Toray R&D teams through accelerators/conferences
- Secure \$250K seed funding for 12-month development
- Hire quantum chemistry PhD + membrane engineer
- Build enterprise-grade platform on quantum cloud infrastructure



Thank you

