




# **The Power of AND: Entrepreneurs, Ecosystems and the Future of Energy AND Climate Innovation**

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CEO, Greentown Labs**


# MIT Shaped How I Think About Innovation & Impact



## Innovation Policy, Innovation Prizes and the Energy Economy

### Analyzing the role of prizes as a policy mechanism for energy innovation

Possible Investigator: Professor Peter H. Ravn, Assistant Professor of Technological Innovation & Entrepreneurship, MIT Energy Research Center, 77 Massachusetts Avenue, Cambridge, MA 02139  
 Possible Advisor: Professor Robert L. Armstrong, Assistant Professor of Technological Innovation & Entrepreneurship, MIT Energy Research Center, 77 Massachusetts Avenue, Cambridge, MA 02139  
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#### INTRODUCTION

**Research focus:** Grand Challenge Prizes as a policy tool for addressing grand social challenges in energy

**Context:** Total US R&D expenditure ~ \$280B

**Private R&D \$150B (57%)** → Internal Corporate R&D allocation (no prizes) or other internally-based advantage

**Public R&D \$130B (43%)** → Public Provision of R&D allocation (no Grand Challenge or Prizes)

However, there exists growing concern for the effectiveness of grants & procurements (e.g. limited to a selected group of larger individuals or firms) require an alternative of the best approach.

Grand Challenge Prizes could form an additional and complementary mode of inducement for innovation to public or private sector researchers. Indeed, the US government have identified prizes as a potential innovation policy tool, especially in areas such as energy, where solutions tend to have no clear technical path, require distributed expertise, can be solved using a variety of different approaches, and whose markets are subject to market failure.

**Historical Successes:**

- \$20K (~€12M today) Longitude Prize: 18<sup>th</sup> century prize to address the British Navy's problem of accurate navigation (solved by clockmaker, John Harrison)
- \$25K Orszag Prize: for the first non-stop single pilot flight between New York and Paris (solved by Charles Lindbergh in 1927)
- \$100M Ansari XPRIZE: Modern prize to promote low-cost space flight (won by Burt Rutan in 2004)
- Recent government action (to formalize the prize process)
- Sept 2009: President's Strategy for Innovation advances use of prizes
- March 2010: OMB prize guidance for government agencies
- Sept 2010: Launch of Challenge.gov (online crowdsourcing platform- 60 challenge/ 25 agencies so far)
- Dec 2010: COMPETES Reauthorization Act of 2010, providing prizes authority to all federal agencies

**"Prize competitions like these mark a dramatic departure from business as usual and - thanks to newly-enacted legislation - will soon become a standard tool in every Federal agency's toolbox"** - *USA Today*

**The Problem: Big History, Few Insights**


Despite this interest in prizes and challenges and consequent increase in descriptive cases discussing contemporary and historical prizes, there exists a serious lack of data-driven empirical analysis on prizes as a mechanism for incentivizing innovation.

**Key Research Questions:**

- Q1 To what extent does a grand challenge prize encourage diversity of approaches?
- Q2 To what extent does a grand challenge prize encourage diversity of participant/organizational forms?
- Q3 What is the nature of the motivation that the prize (competition) provides?
- Q4 What level of effort does such motivation enable?

#### RESULTS (DESCRIPTIVE STATISTICS)


**"A ten million dollar cash purse...to the teams that produce clean, production-capable vehicles that exceed 100 miles-per-gallon equivalent"**



**Striking finding is the diversity enabled by the Prize (accords with work on Incentives and approach of McKinsey but not with theoretical perspective on prizes - emphasizes efficiency)**

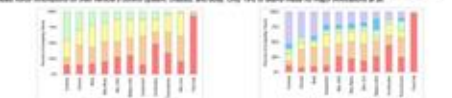
**1. Diverse participants: team members and organizational forms**

Who entered in age, education, technical experience, and competition forms far from homogeneous, administrative experience rather than direct expertise (source: prize members)



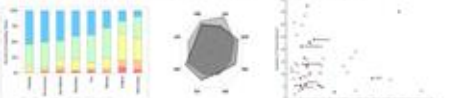
**2. Diverse technical solutions**

Over 16 teams developed non-trivial sub-technologies and made at major modifications to vehicle's chassis and body. Over 1/3 of the teams made at least three modifications to their vehicle's control systems, chassis, and body. Over 1/3 of teams made six major modifications to all



**3. Diverse Motivations**


Prizes elicited a higher motivation factor than awarding intellectual property rights from other participants (meritocracy)



#### KEY INSIGHTS/ PRELIMINARY CONCLUSIONS


**1. Prize formalized & focused the informal innovation sector**

Prize (its own team and only 20% part of formal programs, following 80% that a prize did). Prize made informal teams become more formal. Prize (from non-vehicle teams, private vehicles)



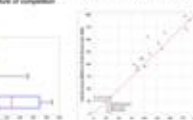
**2. Prize leveraged private dollars**

Receipts of teams still funded by US Government. Due to nonexistence (i.e. 20% of team budget came 80% a combination of success, and additional external and private resources)



**3. Prize influenced performance**

Improves MPGe scores and MPHs adjustments between rounds after risk-reduce. Potentially due to collaborative behavior and support from other teams, judging feedback, prize structure, a milestone, and competitive nature of competition



#### EXPERIMENTAL DESIGN

Analytical approach based on a survey, interviews and observation of other documentary evidence to examine the complete Prize experience. Access provided by 3-Prize foundation.

## Best poster awards



Photo: Samantha Farnell, MITe

Posing with MITe Director Ernest Moniz (left) and MITe Deputy Director Robert Armstrong (far right) are the recipients of the MITe awards for best poster (left to right): Carla Thomas, Toby Anna Klein, and Georgina Amy Campbell.

#### PRIZE OUTCOMES (PRELIMINARY)

- Q1 Enabling diversity of people, approaches and motivation
- Q2 Still determining overall productivity (in terms of \$ per and improvement)
- Q3 Success in engaging with and building a community of innovators previously disconnected from the auto sector

#### ACKNOWLEDGEMENTS

We would like to thank the MIT Energy Initiative for their research funding support, the XPRIZE Foundation for their assistance in connecting us with PMAIP teams, and the XPRIZE community (teams and organizers) for their cooperation and good spirit

# MIT recognized early that energy and climate would define this century



“This may be one of those rare moments when our society suddenly looks itself in the mirror and admits the truth: **Our comfortable lives are due in large measure to cheap and abundant fossil fuels**, yet we know that **we will pay a steep price if our utilization of those fuels does not change.**”

President Susan Hockfield, MIT Energy Forum 2006

# The real opportunity is energy AND climate

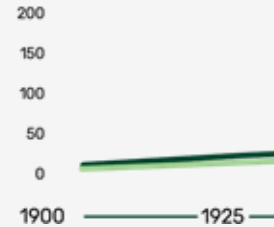
We need all forms of energy – including new energy – to meet demand and power prosperity.

There are also known risks to our health and environment **that we now know how to solve for.**

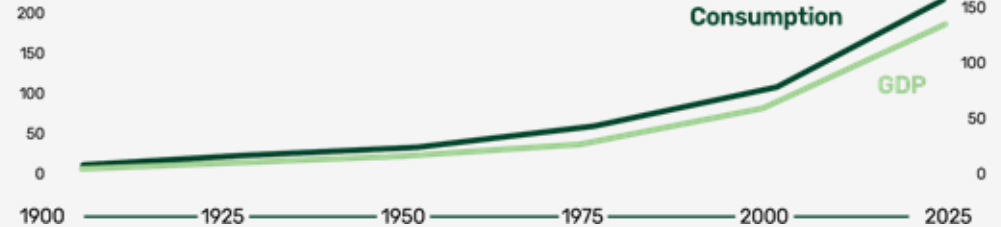
## THE OPPORTUNITY:

**We are at a critical moment – and we feel the urgency.** It's critical that we come together as an ecosystem to address this dual imperative.

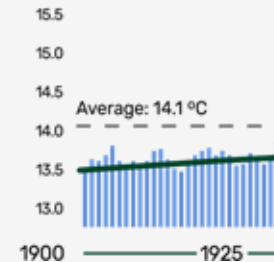
GLOBAL ENERGY CONSUMPTION  
PETA-WATT HOURS



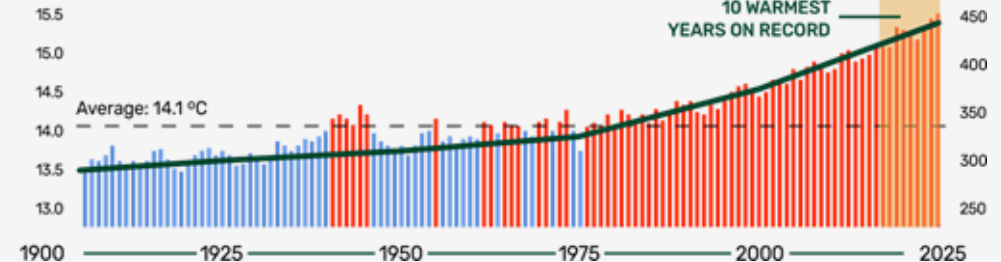
GLOBAL GDP  
TRILLIONS OF DOLLARS, PPP ADJUSTED



GLOBAL LAND & SEA AVG. TEMP, (°C)



ATMOSPHERIC CO<sub>2</sub> (ppm)



# Entrepreneurs make the AND possible – turning breakthrough science into the industries of the future

## BUSINESS INSIDER

**A startup run by a Tesla veteran and backed by Bill Gates is promising to build a long-duration battery that's 50 to 100 times cheaper than lithium-ion.**



Form Energy

Jan 24, 2023, 12:23 PM ET



**CANARY MEDIA**

Clean energy journalism for a cooler tomorrow.

**Gigantic Form Energy battery to power Google data center in Minnesota**



By Julian Spector 24 February 2023



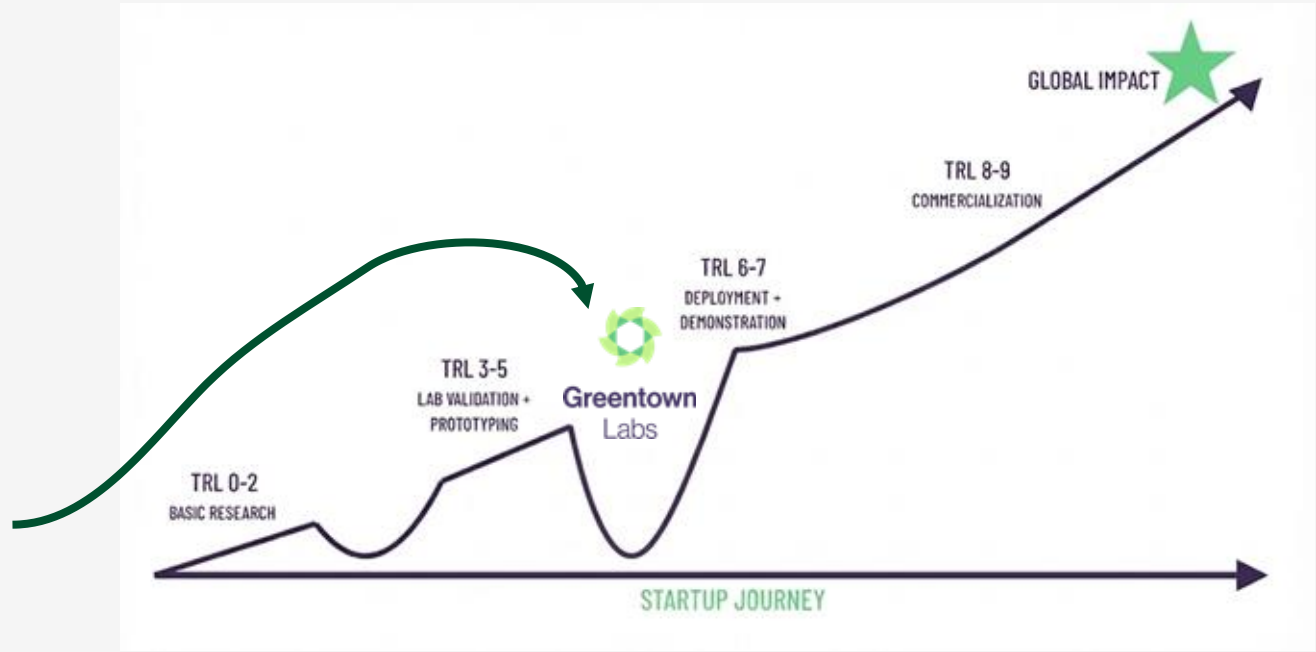
Google's data center campus in New Albany, Ohio (Google)

# Breakthroughs don't happen in isolation – Entrepreneurs only move as fast as the ecosystem around them!



# Ecosystems matter because they help entrepreneurs move faster, where exactly do they matter most?

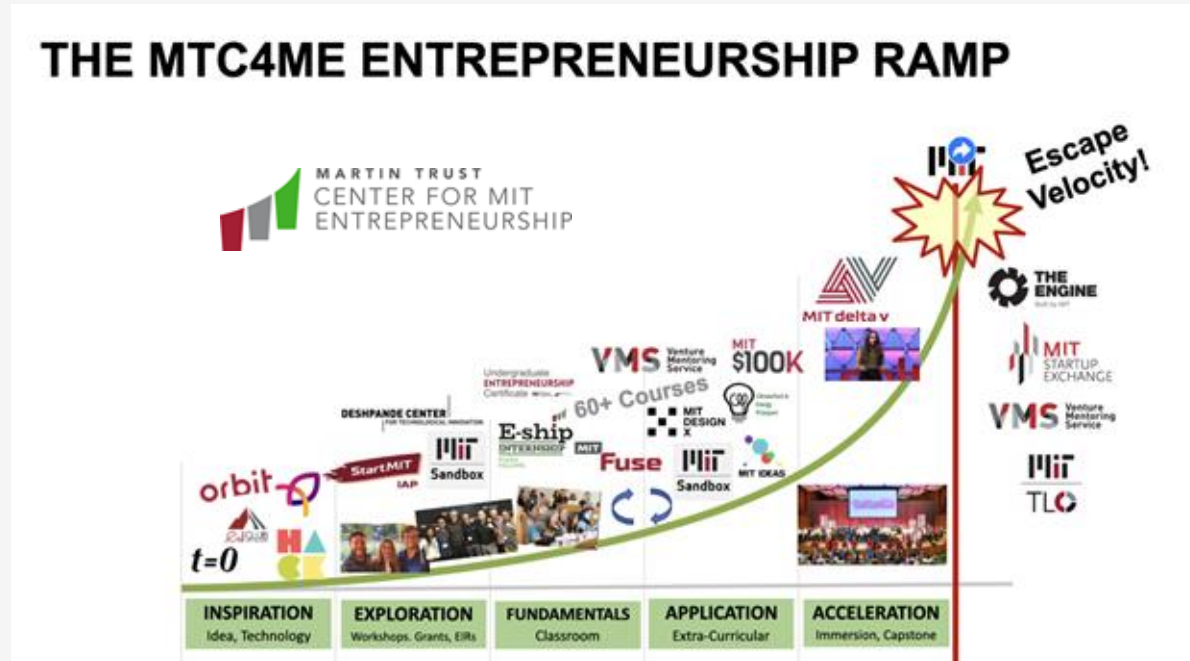
Where Climate + Energy Hardware Gets Stuck



First valley  
of death

Second valley  
of death

# MIT has built a phenomenal ecosystem to bridge the first valley









# MIT has built a phenomenal ecosystem to bridge the first valley

**HANDOUT**

## Select MIT Entrepreneurship Centers & Programs

The MIT entrepreneurship ecosystem relies on the collaborative efforts and alignment of resources across campus. The presented group of centers, programs, and offices below each uniquely serve critical needs of the MIT entrepreneurship & innovation community.

	SERVES			PROVIDES					
	STUDENTS & POST DOCS	ALUMNI	FACULTY	ENTREPRENEURSHIP COURSES	FUNDING	MENTORSHIP	PROGRAMMING / ACCELERATORS	IP SUPPORT	LEADERSHIP EDUCATION
 Teaches entrepreneurship	●	○	◐	●	◐	◐	●	◐	○
 Supports faculty innovation	◐	○	●	○	●	●	○	◐	○
 Teaches leadership	●	○	○	●	○	○	◐	○	●
 Provides student funding	●	○	○	○	●	◐	○	◐	○
 Supports IP	●	◐	●	○	○	○	○	●	○
 Mentors MIT community	●	●	●	○	○	●	◐	◐	○

○ Not a focus area    ◐ Some focus, but not primary    ● Core focus area    ● Unique value proposition

# Greentown Labs was built to solve the second valley of death

A Home for Climate and Energy Innovators, Ready to Scale



OUR FOUNDING

MOVE TO SOMERVILLE

HOUSTON OPENS

MEMBER GROWTH



# Greentown at 15

Largest and most active corporate innovation network in the world



675+  
STARTUPS  
INCUBATED

250+  
CURRENT  
MEMBERS

\$12.5B+  
RAISED BY  
STARTUPS

88%  
OF STARTUPS  
SUPPORTED STILL  
IN BUSINESS

16,600+  
JOBS  
CREATED

65+  
CORPORATE  
PARTNERS

# Greentown is built on four core principles



## PLACE

FOUNDER-FIRST  
INFRASTRUCTURE AT SCALE

- Proximity matters for speed and scale
- Purpose-built labs and incubator space remove friction for startups
- Located in world-renowned locations for innovation and energy



## PEOPLE

ECOSYSTEMS AS A FORCE  
MULTIPLIER

- Startups only move as fast as the ecosystem
- Largest network of founders, corporates, and investors in energy and climate
- Consistent proximity to drive meaningful collaboration



## PROGRAMS

DEEP FOCUS ON CLIMATE +  
ENERGY + SCALE

- Structured pathways to customers, pilots, and capital
- Programs centered on critical energy & climate verticals and 2nd valley of death
- Greentown Go programs



## PURPOSE

THE GREENTOWN WAY

- Shared mindset and purpose—grit, excellence, making the impossible possible
- High-trust founder community
- A mythology that binds us—and a blueprint that scales

# The Power of AND: MIT x Greentown Labs

From breakthrough science to companies moving the needle for energy and climate.

## MIT-Affiliated Startups at Greentown Boston



53 of 149 current startup members have significant ties to MIT\*

\*Significant affiliation = direct spinout, MIT alumni founder, or participation in delta v or MIT CEP

## Award-Winning & Program Alumni Startups



### MIT 100k Winners

Active Surfaces ('23)  
NONA Technologies ('22)  
Osmoses ('21)  
Amplified Industries ('19)  
Infinite Cooling ('18)  
Raptor Maps ('15)



### MIT Climate & Energy Prize Winners

VERNE ('21)  
AeroShield Materials ('19)  
Infinite Cooling ('17)  
Heila Technologies ('16)  
CoolChip Technologies ('11)



### delta v Participants

Carbion, EQORE, Vertical Semiconductor, MacroCycle, NeuroBionics, NONA Technologies, Thiozen, Amplified Industries, Haystack Ag, AdaViv, Biobot Analytics, Infinite Cooling, Mesodyne, Spyce, Accion Systems, Embr Labs, Grove, Loci Controls

## MIT Faculty as Greentown Startup Co-Founders



**Prof. Yet-Ming Chiang:**  
Form Energy, Sublime Systems



**Prof. Kripa Varanasi:**  
Infinite Cooling, AgZen



**Prof. Yang Shao-Horn:**  
Elementum Materials, ATOM-X



**Prof. Jeffrey Grossman:**  
Via Separations, SiTration

Many of MIT's best climate and energy innovations scale at Greentown.

# The Power of AND: MIT x Greentown Labs

## MIT continues to support companies once they arrive at Greentown

*MIT contributes significant talent to the local workforce. This helps attract startups from around the world to establish in Boston/Greentown.*



- Nearly a third (11/34) of new members to Greentown BOS in 2025 expanded to Massachusetts from other states and countries.



- Technical talent and **density**, driven by the university ecosystem and MIT, routinely cited as the top reason why

*Greentowners benefit from MIT facilities, collaborations with faculty & students*



- **MIT.nano**: Several Greentown members use the facility or participated in the start.Nano program



- As companies **transition** from academic labs to the commercial setting, many continue to work with their Professors/PI's or retain access to their MIT labs until the spinout is formally completed



- Many Greentowners source **interns** from MIT. It's common to see flocks of Sloanies following our founders around during the summer

**Greentown supports MIT and MIT-affiliated programs**

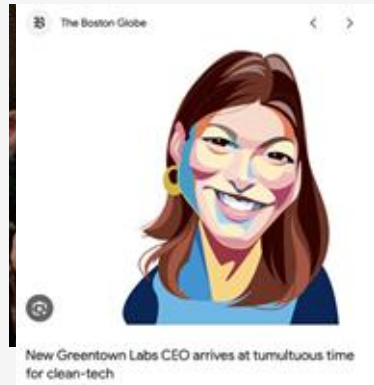


- Regular partner or in-kind sponsor of entrepreneurship programs: MIT Energy Conference, MIT CEP, Water, Food, & Agriculture Prize, etc.



- Our **staff** participate as judges, mentors, speakers, etc at courses like Climate and Energy Ventures and MIT ELab

# Power of AND: Boston works because people here lean in together



# Power of AND: The network effect



$$V \propto n^2$$



Our Summit Accomplished the Group's Goals and Built Important Collaborative Momentum

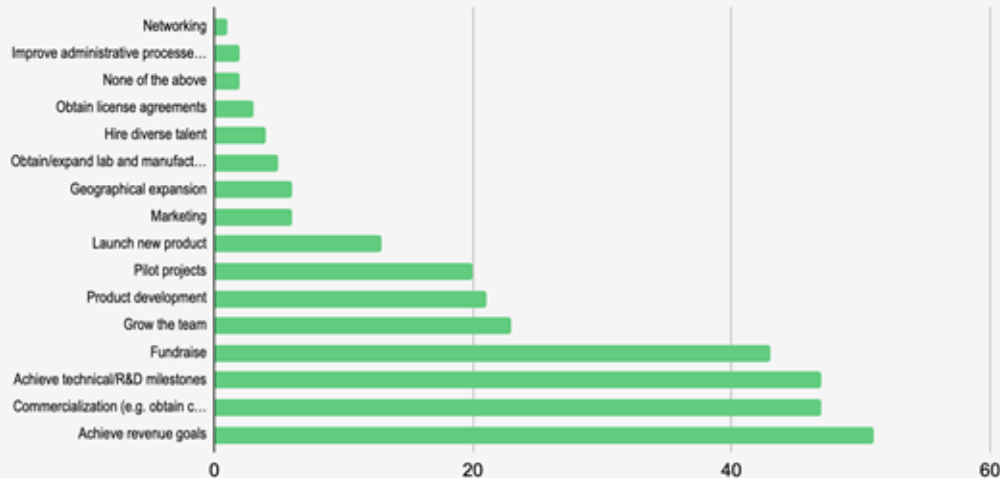
- 60+** Commitments  
(By attendees on concrete next actions)
- 100+** Opportunities  
(Additional, concrete collaborative opportunities identified)
- 6+** Hours  
(Building new and strengthening existing relationships, together)



# So what comes next?

Together we can power the future of energy and climate

What are your top three (3) goals for the upcoming year:



# 1

Build

## Infrastructure for startups scaling breakthrough technologies

- Greentown membership for MIT spinouts
- Shared lab infrastructure and scale facilities
- Helping founders cross the second valley of death

# 2

Connect

## Bring entrepreneurs into MIT's classrooms and community

- MIT CEP, Energy Conference, venture courses
- Startup founders as speakers and mentors
- Intern pipelines and student collaboration

# 3

Lead

## Thought leadership to strengthen the innovation ecosystem

- University Leadership Council
- Ecosystem convenings
- Research + policy dialogue on scaling climate tech

# Upcoming Events @ Greentown

Join us!

- **March 22– 27:** CERA WEEK, Houston
- **April 1:** Innovating with Amazon – Greentown Go Build kickoff @ Greentown
- **April 17:** MIT Climate and Energy Prize Grand Final Pitch Event @ Geentown
- **May 6:** Greentown's EnergyBar for Boston Climate week
- **June 4:** June EnergyBar @ Geentown

# CERAWeek 2026 + Greentown Labs

Mon, March 23

**10:30–11:10 AM**  
**Scaling Innovation:  
Building the Ecosystem  
for the Next Energy  
Breakthroughs**  
Innovation Agora\*  
• Georgie speaking

**5:00–7:00 PM**  
**[Activate Fellows &  
Alumni CERAWeek  
Happy Hour](#)**  
Greentown Labs  
• Networking event

Tues, March 24

**8:00 AM – 2:30 PM**  
**[Pitch Preview: Energy  
Venture Day at the Ion](#)**  
Ion Houston  
• Greentown startups

**10:30–11:00 AM**  
**Charting Careers in  
Energy: Pathways for  
the Next Generation of  
Leaders**  
Innovation Agora\*  
• Georgie speaking

**2:00 PM**  
**Microsoft Agora House  
Event**  
Innovation Agora\*  
• Greentown startups

Wed, March 25

**9:00–10:30 AM**  
**[Cup of Capital  
\(CERAWeek Edition\)](#)**  
Greentown Labs  
• Co-hosted by  
Greentown, Capital  
Factory & Mercury Fund

**1:00–4:00 PM**  
**[Energy Venture Day &  
Pitch Competition](#)**  
George R. Brown –  
McKinney Balcony  
• Greentown startups

**2:00 PM**  
**Microsoft Agora House  
Event**  
Innovation Agora\*  
• Greentown startups

Thurs, March 26

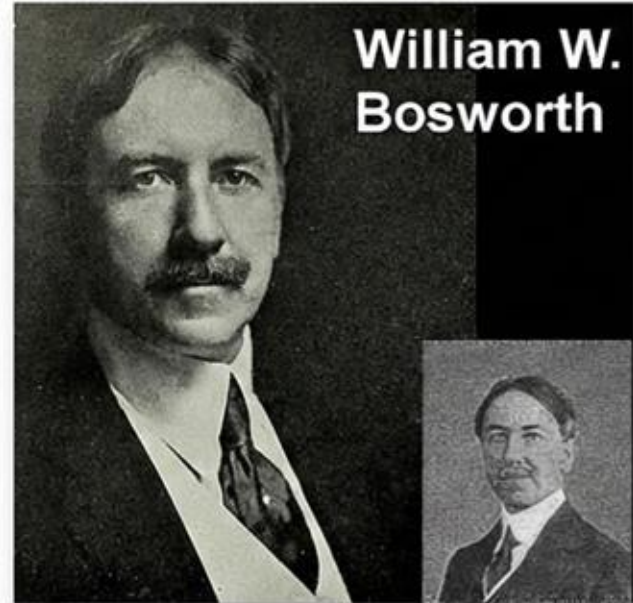
**12:30–4:00 PM**  
**[Energy Tech Market](#)**  
Downtown Houston 80 1  
Travis  
• Greentown member  
Energytech Cypher  
hosting pitches & panels

**5:30–7:30 PM**  
**[Transition on Tap  
sponsored by Fuel](#)**  
Greentown Labs  
• Networking event

# Great Ecosystems are Designed: MIT Infinite Corridor



January 2001. Photograph by Matt Yourst.  
<https://web.mit.edu/planning/www/mithenge.html>



William W. Bosworth.  
<https://art-now-and-then.blogspot.com/2017/12/william-w-bosworth.html>



Greentown Labs

# Thank You!

GEORGINA CAMPBELL FLATTER, CEO

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