

# Session 4: Real estate: The great US renovation?

2023 Frontier Advisors Annual Conference

## Chair:



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Principal Consultant, Frontier Advisors



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Partner, Fifth Wall

# **Back to basics**

# Real estate is responsible for 40% of global carbon emissions





# The heat is on

# Comply or be fined

- Corporate pledges to meet their Paris Agreement and other social obligations.
- Regulator scrutiny: e.g. Local Law 97 in New York, Existing Buildings Energy Ordinance in San Francisco, Building Energy Reporting & Disclosure Ordinance in Boston, CREEM.
- Capital providers:
  - Demanding change. Fifth Wall investors across the globe are running pilot programs across portfolios.

# What does this mean for investors?

NOI capex required (circa US\$8.0 trillion) to retrofit real estate = circa 3% per annum of NOI to meet net zero targets by 2050. Mature cities are currently provisioning only 1%.

Retrofitting existing buildings versus demolition and new builds.

Cost of operational carbon is real (cost per day per mtCo<sub>2</sub>e varies from US\$100 to US\$234).



# **Drilling deeper**

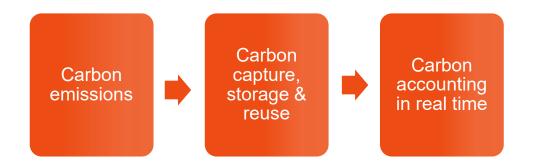
# Every facet, every sinew of an existing building requires upgrading or replacement

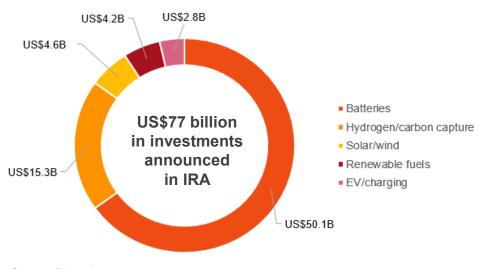
LEDs, solar panels, waste management are not enough.

Have you heard of:

- Brimstone Oakland, CA
- Ecoworks
- Juno
- Loop
- nZero
- Turntide Technologies
- Veev

The US Climate Bill is already making an impact.









# Retrofitting versus new constructions (US)



MetLife Building, New York



**Rockefeller Centre, New York** 



1 Vanderbilt, New York



Already non-compliant with NY LL97 – burns natural gas



# Student housing – CSULB – Gensler designed

# Producing more energy than it consumes





# Conclusion

# Passive, yester-year strategies will not help transition to net zero by 2050

- Legislation is being enacted at a greater pace
  - Carbon pricing penalties will impact real estate values.
- Active, differentiated strategies will become the norm
  - Investment in new ideas and new technologies can create measurable impact
- Manager selection is critical
  - How does a manager think about de-carbonisation and implement?



# What should clients do?

# Assess your portfolio's susceptibility to under-achieving net zero carbon objectives

- Assess your exposures today, fund by fund, asset by asset to understand your starting point and your investment managers' objectives.
- Measure and map your portfolio by sector, geography and revenue for weak points (potentially stranded assets) and premature obsolescence.
- Observe and learn from your peers' approach to achieving carbon neutrality or net zero carbon.
- Prioritise new property investments. Tap into meaningful strategies, partnerships and technology.





# REAL ESTATE'S CLIMATE RECKONING





This company meets the highest standards of social and environmental impact

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# Fifth Wall is the largest and most active venture investor in Real Estate technology, or "Proptech"<sup>1</sup>

FIFTH WALL AT A GLANCE

# \$3B+ Assets Under Management 5X LARGER THAN THE NEXT LARGEST PROPTECH FIRM2 MORE STRATEGIC INVESTORS THAN ANY OTHER VC FIRM





OUR STRATEGIC LPs COVER EVERY SQUARE FOOT OF THE REAL ESTATE INDUSTRY...

# **EXAMPLES INCLUDE:**

Multifamily



Retail

**ACADIA** 

nuveen

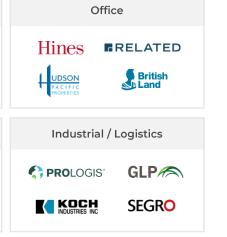
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MACERICH

≥ KIMCO"







# ...AND OUR INSTITUTIONAL LPS SPAN A DIVERSE RANGE OF INVESTOR TYPES THAT CAN SCALE WITH US EXAMPLES INCLUDE: INSTITUTIONAL LP BREAKDOWN: NEW ZEALAND INSURANCE, 5% FOFS, 2% Energy Corporate, 2%



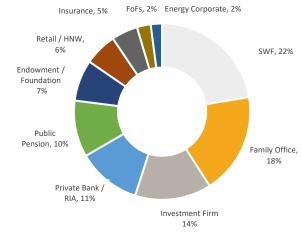














# Fifth Wall was purpose-built to create structural advantages in our investment process

# OUR CORPORATE PARTNERS CAN GENERATE ALPHA AT EVERY STEP OF THE INVESTMENT PROCESS

# PRE-INVESTMENT (DEVELOP THESES)

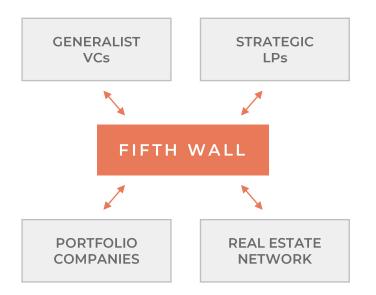
Our LP Coverage team works with our real estate partners to figure out what they want from tech. Which means that we know what to look for.





# DUE DILIGENCE (ASYMMETRIC INFO)

Our LPs are amongst our portcos' largest potential customers – **their feedback is crucial to our investment process** (and we selectively share it with other VCs).



# POST-INVESTMENT (DISTRIBUTION)

After we make an investment, we leverage our LPs as a direct distribution network. They help our portfolio companies scale faster.







# A Venture Capital investor across Enterprise, Industrial, and Climate Technologies

# **EXPERIENCE**













# **INVESTMENTS**





























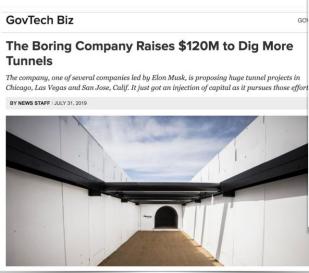


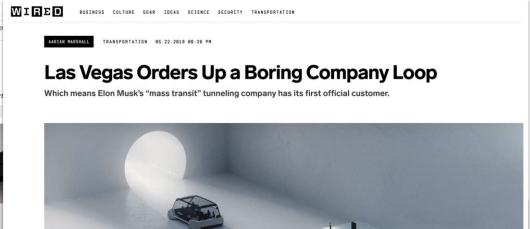


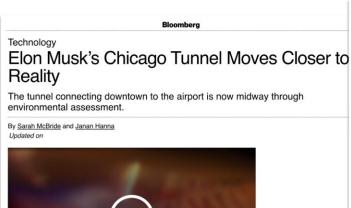
additional details.

# Spent years pushing the boundaries of Construction and Science













Boring Company unveils Hyperloop

route for L.A.'s Dodger Stadium

By ANTONIO PACHECO • August 17, 2018

**BORING PLANS** 



# Dedicated Climate investment team with expertise across the climate ecosystem



# **GREG SMITHIES PARTNER**



# PETER GAJDOS **PARTNER**



# **ALOK SINDHER**

WORK















FOCUS AREA(S)

 Led sustainability investing at **BMW iVentures** 

> Led finance & operations at The Boring Company and Neuralink

 Started investment career at **Battery Ventures** 

Industrial Tech, Manufacturing, Automotive









**EDUCATION** 

**Wharton** 

FOCUS AREA(S)





 Head of Venture Capital at IPM Group

 Managing Director and Portfolio Manager at Presidio Partners

 Started investment career at Sir Richard Branson's Virgin Green Fund

Renewable Energy, Battery Storage, Energy Transition



# **PARTNER**

WORK





J.P.Morgan

**EDUCATION** 



**Wharton** 

FOCUS AREA(S)

Infrastructure, Capital Markets, **Energy Transition** 

Partner in D.E. Shaw's renewable

energy and infrastructure group

 Advisor to the Department of Defense and Stanford School of



# JENNIFER PLACE **PRINCIPAL**









Food & Ag, Consumer, Circular Economy



# ANASTASIA ISTRATOVA PRINCIPAL





standard

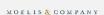
## FOCUS AREA(S)

Renewable Energy, Industrial Technology, Infrastructure



# PRINCIPAL

WORK





FOCUS AREA(S)

**CLAY MACFARLANE** 

Sustainability

Construction Tech, Building Materials, **Energy Storage, Transportation** 



# FRANCESCA WHITEHEAD **VICE PRESIDENT**









FOCUS AREA(S)

Circular Economy, Food & Ag, Industrial Tech



WORK



**CEDRIC CHAR VICE PRESIDENT** 

> FOCUS AREA(S) Industrial Tech



# CHRISTIAN THATCHER VICE PRESIDENT

WORK



**BARCLAYS** 

FOCUS AREA(S) Deep Tech



# **NOAH SUMAIT ASSOCIATE**



**ALEC MORGAN ASSOCIATE** 



# **DYLAN SMALL ASSOCIATE**



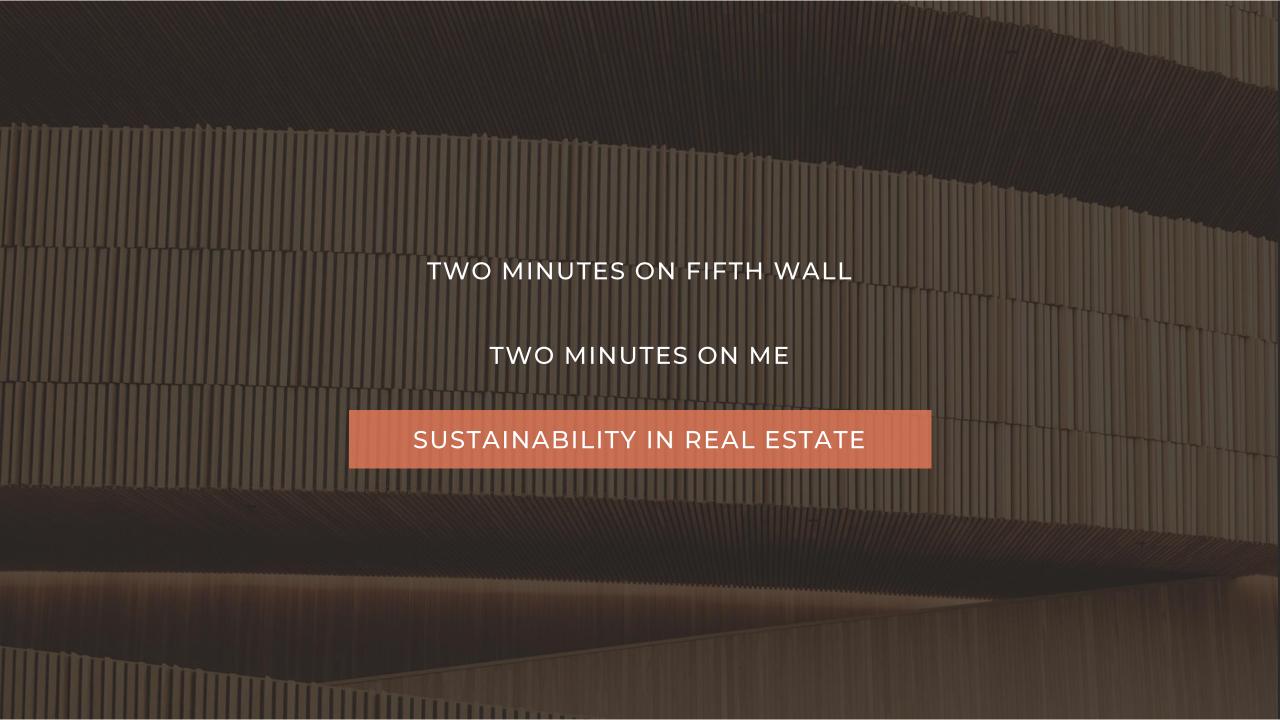
# We built a platform with the goal of being the go-to investor for climate tech for the Built Environment

#### WE HAVE SCALED OUR CLIMATE PLATFORM OVER THE PAST TWO YEARS \$760M+ 12 INVESTED CAPITAL PORTFOLIO COMPANIES INVESTMENT TEAM MODULAR HOME **3D PRINTING HOME** SMART ELECTRICAL **BUILDING ENERGY** WASTE **SMART** EFFICIENT HVAC CONSTRUCTION CONSTRUCTION **PANELS MANAGEMENT MOTORS** MANAGEMENT TRASH CANS mill ROADRÛNNER Veev **TURNTIDE** KON **SPAN** runwise CARBON OFFSET MODULAR HIGH-RISE CARBON-NEGATIVE **ELECTRIC HOME** LONG DURATION **MULTI-TENANT EV** HIGH-THROUGHPUT **APPPLIANCES** CONSTRUCTION CEMENT **ENERGY STORAGE** CHARGING TRADING PLATFORM **BATTERY R&D** OC \*\*\* Flowcarbon\*\* **ASSEMBLY OSM □ BRIMSTONE** ıиpulse lcop Discovery echnológies. PREMIER SEED STAGE ATMOSPHERIC WATER HOME RETROFIT GREEN HYDROGEN COMMERCIAL FLEET **RESIDENTIAL SOLAR** LITHIUM-ION CLIMATE INVESTOR BATTERY RECYCLING **GENERATION PLATFORM ELECTROLYZERS** EV CHARGING FINANCING **ASCEND**FLEMENTS SOURCE 4 ELECTRIC HYDROGEN selfácil **evrealty** POWERHOUSE Sealed **REAL-TIME CARBON** SOLAR PANEL AI-POWERED ESG **EMISSIONS REDUCTION HYDROELECTRIC** E-COMMERCE CARBON SOLAR DEVELOPMENT ACCOUNTING PLATFORM RECYCLING RATINGS SOFTWARE **POWER** OFFSET PLATFORM AUTOMATION nZero\* **▼ EcoCart** C CLARITY AI SOLARCYCLE



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# The real estate industry is the single-largest emitter of CO2, but for some reason we're the only climate fund of scale that's focused on it

IT IS OUR CONTENTION THAT DECARBONIZATING THE REAL ESTATE INDUSTRY PRESENTS A GENERATIONAL ECONOMIC AND ENVIRONMENTAL OPPORTUNITY TO INVEST BEHIND

# THE BUILT ENVIRONMENT IS RESPONSIBLE FOR...

# **37%** of CO2 EMISSIONS

That's more than any other industry – including transportation

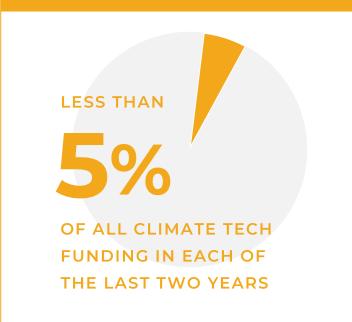
# **34%** of ENERGY DEMAND

That's also more than any other industry

**50%** of RAW MATERIALS USE

You guessed it - more than any other industry

# **BUT ONLY RECEIVED...**



Estimated investment required to decarbonize the entire real estate industry:

\$18T



# We believe those who invest in climate tech now will reap the rewards of the world's inevitable transition to a zero-carbon economy

# WE NEED TO STOP FIXATING ON THE FINISH LINE AND START RUNNING THE RACE

**IT'S 2023 AND** IN ONLY SEVEN YEARS AT CURRENT EMISSION LEVELS IF WE DON'T ACT NOW **WE ARE BEHIND MOST NET-ZERO WE ARE ON BY 2050 IT WILL** THE CURVE PLEDGES KICK-IN<sup>2</sup> TRACK TO BLOW BE TOO LATE<sup>4</sup> Above Pre-Industrial Levels<sup>2</sup> so we need to start and in order to meet to scale the climate tech PAST 1.5°C investing now because those pledges the tech we need to solve this way before the Paris the climate tech we need we're investing in now problem and life as we Agreement deadline, to decarbonize the planet needs to work, at scale, in know it will never recover which will unleash requires both time and 2030 irreversible consequences capital<sup>1</sup> for people, wildlife, and ecosystems<sup>3</sup> 2030 2050 2040



the end of this presentation for additional details.

Climate change has created both attractive opportunities and existential risks for real estate owners...

# **RISKS**

# **OPPORTUNITIES**



Physical damage and operational disruptions from severe weather events, which also lead to higher insurance rates



Local energy generation and storage through solar arrays and batteries on-site



In New York City alone, Local Law 97 will require **50,000** building retrofits at cost of **\$24.3** billion through **2030** 



Marquee corporate tenants increasingly demand greener buildings, which can command **2.5-5% higher base rents** 



Higher cost of capital as investors and lenders price in climate and transition risk



Ancillary revenue through on-site EV charging

17%

Reduction in projected RE portfolio value when factoring physical climate risk and transition risks

10-21%

Higher asset values for green buildings

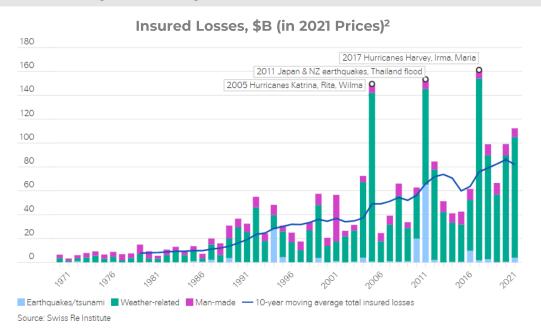


# ...and the market is still learning how to price these risks

The US property insurance market is large and wellestablished

US P&C Insurance Market Exceeded \$840Bn in 2022<sup>1</sup>

Increasing frequency and severity of extreme weather events is causing escalating losses...



...and causing insurers to either drastically increase pricing or pull out of high-risk markets entirely...

The New Hork Times

Wildfires Hasten Another Climate Crisis: Homeowners Who Can't Get Insurance



Changing weather could put insurance firms out of business

- ...demonstrating that incumbent insurers are poorly equipped to deal with these issues
- Traditional carriers and reinsurers are centuries-old institutions, whose primary role is to mitigate risk, not develop new technologies
- Underwriting and actuarial modeling uses historical actuals, which are fundamentally inaccurate to model risk of loss in the face of changing weather patterns due to climate change<sup>3</sup>
- Meanwhile, new technologies enable improved climate modeling, underwriting, and policy coverage
- Advanced modeling techniques and increased computing power enable more precise understanding of risk
- Satellite images and analysis provide a better data source for underwriting and claims



# We look at climate tech through the lens of the lifecycle of a building – because we already know where building emissions come from

# REAL ESTATE IS RESPONSIBLE FOR 37% OF GLOBAL CARBON EMISSIONS - THESE FALL INTO TWO BROAD BUCKETS:

**EMBODIED** CARBON

Emitted **before** / after a building's operating life

**OPERATIONAL** CARBON

Emitted **during** a building's operating life

# MATERIALS STAGE

Raw Materials, Manufacturing, Industrials, Supply Chain

E.g. novel materials, chemicals, process optimization

**EMBODIED CARBON** 

# **CONSTRUCTION STAGE**

Construction, Installation, Automation

E.g. prefab/modular/3D printing construction

**EMBODIED CARBON** 



Building Energy Efficiency, Grid Decarbonization, Water, Waste

E.g., heating/cooling, electrification, EV charging, long duration batteries, water generation, building management systems, insulation

**OPERATIONAL CARBON** 

# **END OF LIFE STAGE**

Deconstruction, Demolition, Waste Processing, Recycling / Upcycling

E.g., recyclable materials; 2nd-life upcycling processes

**EMBODIED CARBON** 

**OPERATIONAL CARBON** 

# CLIMATE RESILIENCY

#### WILDFIRE MITIGATION

E.g. early detection systems, fire suppressant delivery systems

#### CLIMATE INSURTECH

E.g. catastrophe risk modeling, paramedic insurance

#### CLIMATE RISK FORECASTING

E.g. risk modeling and measurement tools

#### GRID RESILIENCE

E.g. infrastructure operations monitoring, battery storage



# These opportunities fall into three distinct buckets:

# DEFENSIVE

Make your buildings cleaner and greener



Capture financial upside in the energy transition



Drive outsized returns by underwriting long-term theses around climate change risk

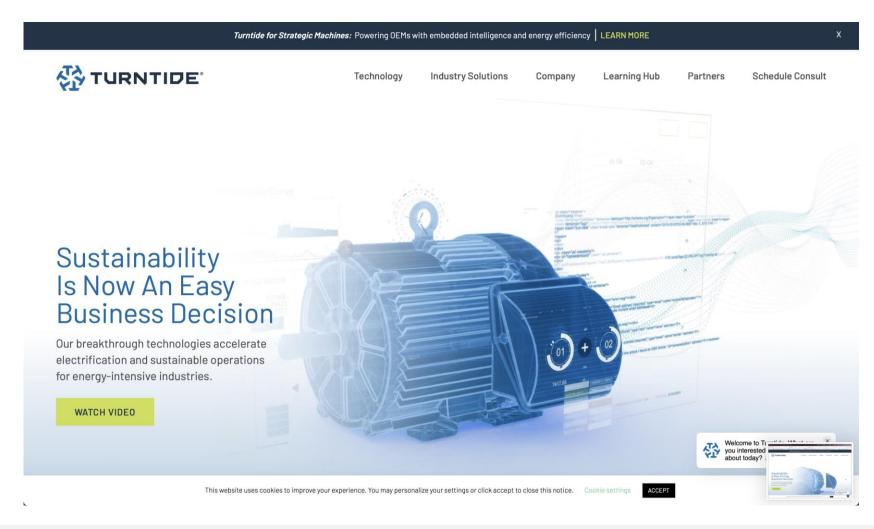


# Defensive case study: Turntide electric motors significantly reduce buildings HVAC energy consumption and associated operating emissions

#### **COMPANY DESCRIPTION**

 Turntide produces the world's most reliable, efficient, and intelligent switched reluctance electric motor system, which decreases energy consumption and generates ongoing cost savings

- Increased efforts by federal/local governments and corporations to promote energy-efficient buildings, with several large cities establishing new zoning requirements to mandate net-zero emissions
- Demand for HVAC units is growing across sectors and geographies due to rising disposable incomes around the world as well as increasing global temperature
- Increased interest in new HVAC technology has also been catalyzed by COVID raising awareness for the health hazards of impure air





# Defensive case study: Veev streamlines the construction process to eliminate material and labor waste from new builds

#### **COMPANY DESCRIPTION**

 Veev is an innovative modular builder providing "design, fabrication, and build" services for low-rise single and multifamily homes and accessory dwelling units across California and Texas

## **MACRO TRENDS & TAILWINDS**

- Modular construction can close the gap in the US housing shortage (~5M homes), enable more efficient use of materials and labor in the construction process, and improve the overall quality of homes
- Veev's addressable market is substantial -\$600B for SFH and MFH alone – and can accommodate multiple entrants across categories
- As homebuilders continue to face supply chain disruptions and labor shortages, technology can help provide a solution to logistical issues



Veev System

# To reimagine the home, we reinvented the wall.

Engineered for strength, embedded with technology, panelized for efficiency, the Veev system delivers higher quality – faster, for less than anything else in the market.

Examine Our Approach →



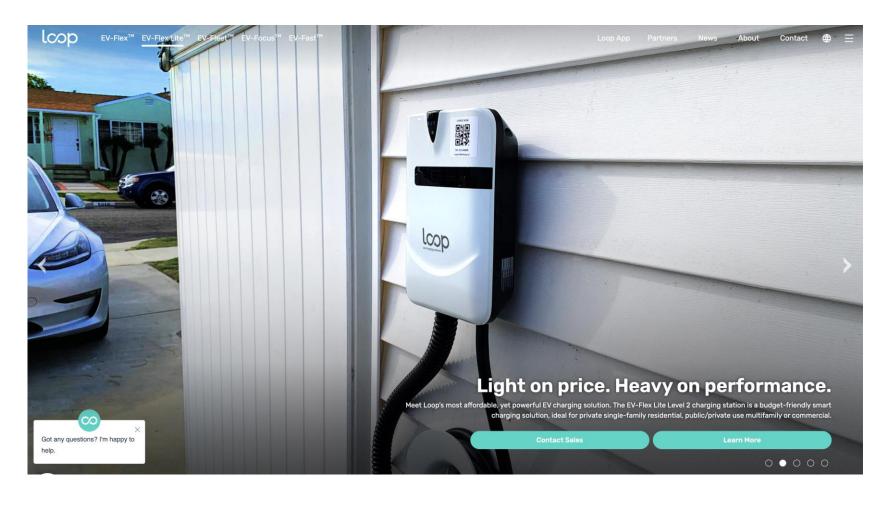


# Offensive case study: Loop enables building owners to create a new revenue stream and capture value from the transition to EVs

#### **COMPANY DESCRIPTION**

 Loop provides a full end-to-end EV charging solution for multi-tenant and commercial real estate customers with a reliable low-cost product and a unique asset-light distributor/contractor partnership model

- EVs are becoming increasingly cost competitive against ICE vehicles – expecting to pass upfront price parity on an unsubsidized basis through the coming decade – beyond ongoing cost advantages on "refueling" and maintenance
- Significant EV charging infrastructure deployment is required to support EV adoption, necessitating the mass deployment of EV charging across buildings
- Multi-tenant electric vehicle charging is a large and under addressed market, with 40% of Americans living in multi-family residences and ~66% of new home construction attribute to multi-family residences



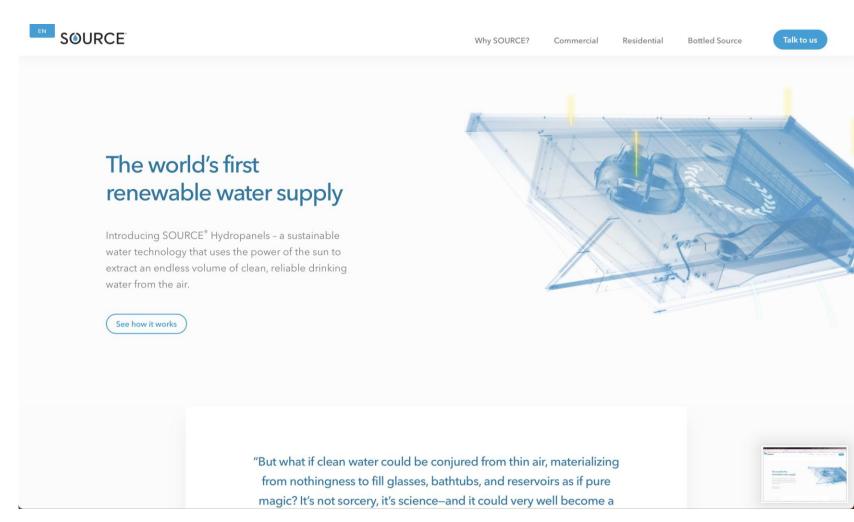


# Offensive case study: Source provides water resiliency to building owners in an increasingly water scarce world

#### **COMPANY DESCRIPTION**

 Source has developed atmospheric water generation panels which enable distributed generation of potable water out of air costs competitive with bottled water

- The global bottled water market was \$280B in 2021, growing at a projected CAGR of 11% over the next decade
- The premium bottled water market exceeds \$10B and is composed primarily of mineral water shipped over long distances and priced at a premium
- Water scarcity is becoming an increasing climate issue around the world, requiring novel and scalable solutions



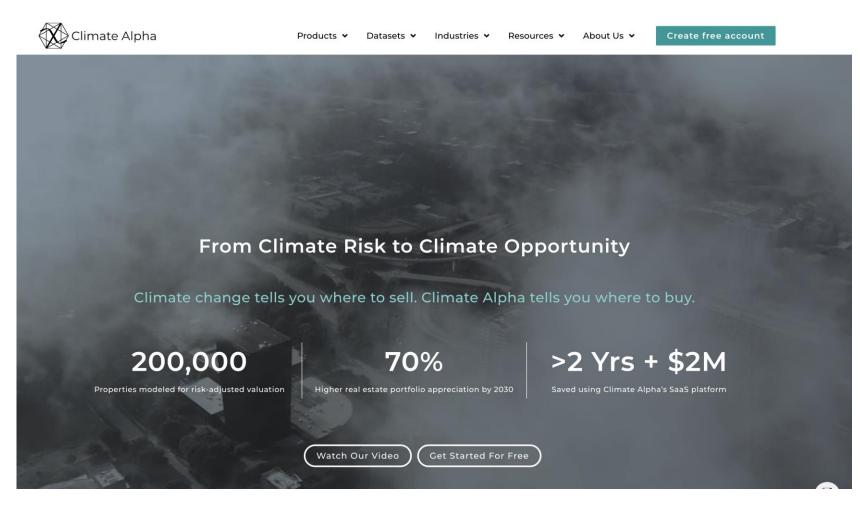


# Financial arbitrage case study: Climate Alpha knows how to price in climate risk today to identify arbitrage opportunities in property values

#### **COMPANY DESCRIPTION**

 Climate Alpha is an Al-powered analytics platform that drives future-proof real estate strategies. It employs machine-learning techniques to combine hundreds of socioeconomic, demographic and market indicators with multiple climate scenarios to generate land and property value forecasts for every year through 2040

- Climate-related impacts are causing a shift in property value, with high-risk areas becoming less attractive and experiencing price drops. Taking proactive measures to go green and construct energy-efficient buildings can mitigate these risks and make properties more appealing to tenants.
- The frequency and intensity of weather events such as hurricanes and wildfires are rising, resulting in a higher risk of property damage.
   Repair bills, insurance premiums, and real estate prices are increasing in affected areas





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