## CalPERS Board of Administration Offsite

July 2024



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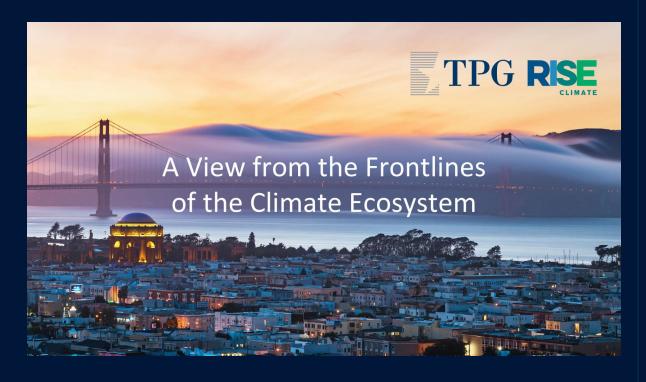
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#### **Forward-Looking Statements**

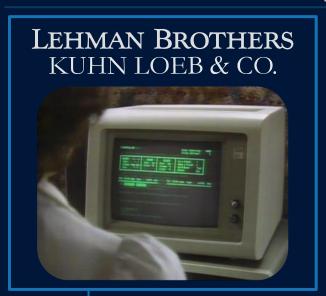
All statements in this Presentation (and oral statements made regarding the subjects of this Presentation) other than historical facts are forward-looking statements, which rely on a number of estimates, projections and assumptions concerning future events. Such statements are also subject to a number of uncertainties and factors outside TPG's control. Such factors include, but are not limited to, uncertainty regarding and changes in global economic or market conditions, including those affecting the industries discussed herein, and changes in US or foreign government policies, laws, regulations and practices. The market analysis, estimates and similar information, including all statements of opinion and/or belief, contained herein are subject to inherent uncertainties and qualifications and are based on a number of assumptions. Opinions expressed are current opinions as of the date of this presentation. Should TPG's estimates, projections and assumptions or these other uncertainties and factors materialize in ways that TPG did not expect, actual results could differ materially from the forward-looking statements in this presentation, including the possibility that investors may lose all or a material portion of the amounts invested. While TPG believes the assumptions underlying these forward-looking statements are reasonable under current circumstances, investors should bear in mind that such assumptions are inherently uncertain and subjective and that past or projected performance is not necessarily indicative of future results. Investors are cautioned not to place undue reliance on such forward-looking statements and should rely on their own assessment of an investment.

### Topics for Today's Presentation





### A Practitioner's Viewpoint



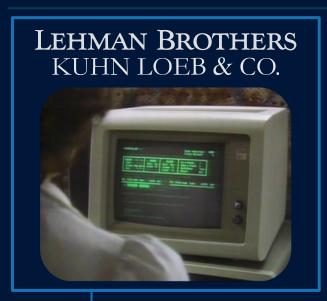
1982

1984



Note: Statements herein reflect the subjective views of TPG and cannot be independently verified. Actual results may vary.

#### A Practitioner's Viewpoint





1982

1984

1986

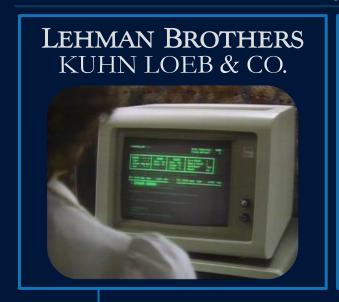
1992



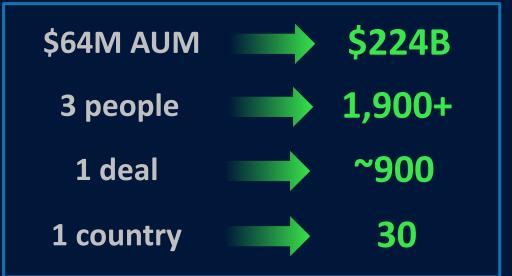
Robert M. Bass Group

Note: Statements herein reflect the subjective views of TPG and cannot be independently verified. Actual results may vary. Companies are for illustrative purposes only and do not represent TPG portfolio companies

#### A Practitioner's Viewpoint

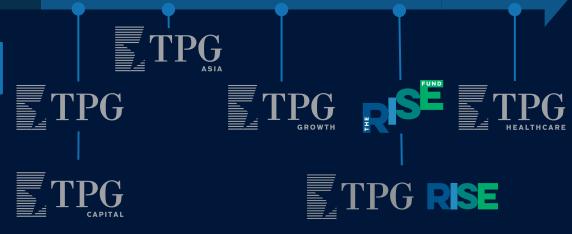








Robert M. Bass Group



Note: Statements herein reflect the subjective views of TPG and cannot be independently verified. Actual results may vary. Companies are for illustrative purposes only and do not represent TPG portfolio companies. As of June 30, 2023

#### Climate: A Cutting-Edge Investment Theme

#### **Artificial Intelligence**



### **Bloomberg**

"Global **Investment in AI** is Forecasted to Approach **\$200 Billion** by 2025"

#### **Decarbonization**



McKinsey & Company

"Climate Investing Is Well Positioned to Continue Its Growth Trajectory in this Turbulent Environment"

#### **Deglobalization**



## **/XIOS**

"The Future of the World Economy is Deglobalization"

### TPG Rise Climate's Origin Story: Full Returns, Full Impact

## 2016-2017 Launched The Rise Funds

## 2020-2021 Launched TPG Rise Climate

## 2024 TPG Rise Climate Portfolio





**80+** 

60+

Companies<sup>1</sup>

Countries<sup>1</sup>

\$8.8B

AUM<sup>2</sup>



Fortune
"Change the
World" List
2022, 2023



\$7.3B

**Fund Size** 



Hank Paulson



Jim Coulter





**23** 

Companies<sup>1</sup>

50+

Countries of Operations<sup>1</sup>

\$8.6B

2024E Portfolio Revenue<sup>2</sup>

765M+

Estimated mt CO<sub>2</sub>e emissions averted<sup>3</sup>

1. As of June 2024. | 2. Collective Portfolio Revenues reflect latest estimates for TPG Rise Climate portfolio companies for May 2024. | 3. Estimated at the portfolio companies for TRC ownership stake; over the TRC hold period, inclusive of terminal value and lifetime impact attribution for investments enabling physical infrastructure and durable products. | 4. Presented to the TPG Rise Platform. No cash compensation was provided directly or indirectly in connection with obtaining or using these ratings. | Note: Includes climate investments from Rise I-III and TPG Rise Climate. Above based on TPG's subjective views and is subject to change. There can be no assurance that any trends described continue. Rise Climate Coalition logos include all relevant logos for which there is approval to represent logo. Does not reflect all Rise Climate Coalition members.

#### **Portfolio**

\$7.3B

Of committed capital

1,400+

Deals evaluated, resulting in...

\$8.6B

2024E combined portfolio revenue<sup>1</sup>

**23** 

Portfolio companies with...

2

IPOs to date (Nextracker and Tata Technologies)

#### **Impact**

#### 765 million

Estimated mt CO2e emissions<sup>2</sup>

Equivalent to<sup>3</sup>:



180M gas powered cars off the road for one year



12.6B trees grown for 10 years

### 25 people

on Y Analytics team dedicated to assessing and measuring Impact

<sup>1.</sup> Includes revenue positive TPG Rise Climate portfolio companies as of May 2024 (Form Energy, Gridserve, Nextracker, Anew, Matrix Renewables, Monarch Bioenergy, Tata Motors EV, Beta Technologies, Intersect Power, Rubicon Carbon, Monolith Materials, Enpal, Palmetto, UBQ Materials, Ohmium, Twelve, Tata 2. Estimated at the portfolio company level and not adjusted for TRC ownership stake; over the TRC hold period, inclusive of terminal value and lifetime impact attribution for investments enabling physical infrastructure and durable products

<sup>3.</sup> EPA Greenhouse Gas Equivalencies Calculator | Global Carbon Atlas





24K solar systems and batteries installed in Germany





18.5M tons of CO2 sequestration capacity per year





Largest EV manufacturer in India





Production capacity for 300 aircraft when facility ramps





Signed offtake agreements with Alaska Airlines and Microsoft





1M+ deliveries in Africa globally





Generates ~30% of voluntary carbon credits in North America





100-hour duration grid-scale batteries at <1/10th the cost of lithium-ion





6 operating electrolysers across 3 continents





14 miles of owned and operated pipeline





375 biofuel testing, inspection, and certification locations spread across 61 countries





6M acres of forest held in conservation efforts





200+ customers developing utility-scale solar projects





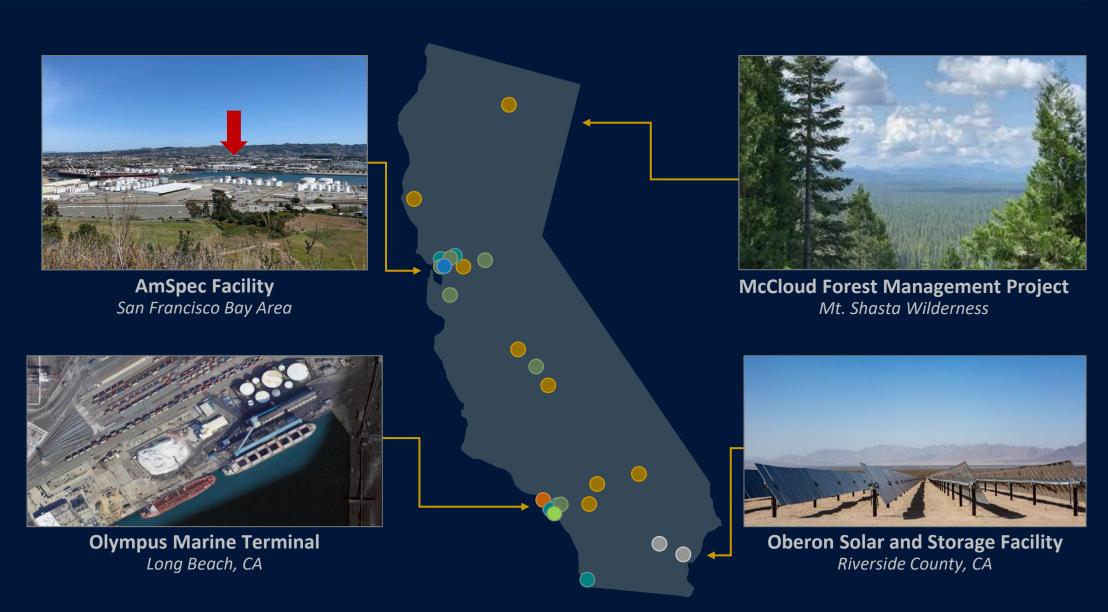
2.2 GW of solar PV across California and Texas

#### Rise Climate's California Presence

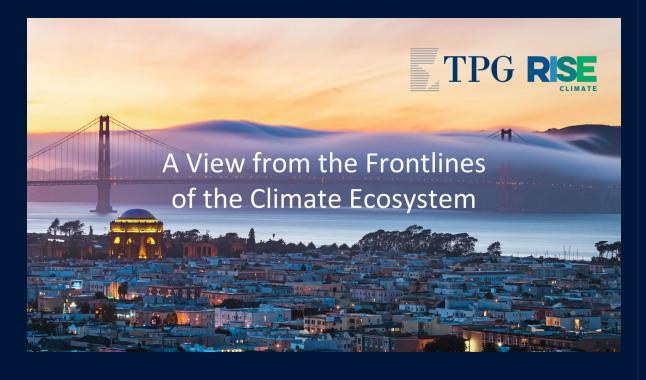


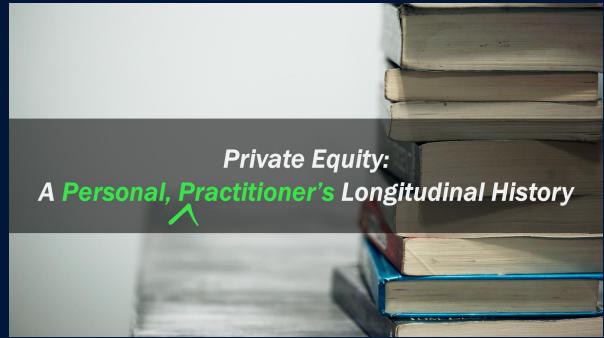






### Topics for Today's Presentation





### Topics for Today's Presentation

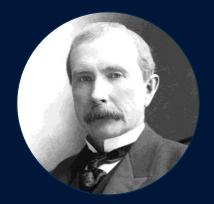
A View from the Frontlines of the Climate Ecosystem The Missing The Lithium Middle Green Valley Shoots What-The aboutisms Passing the Policy Box Baton

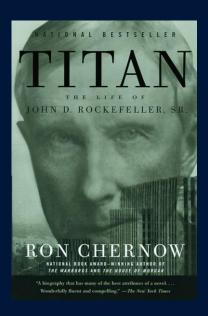
#### Privat Equity: A Personal, Practitioner's History



# The Power of Prehistory

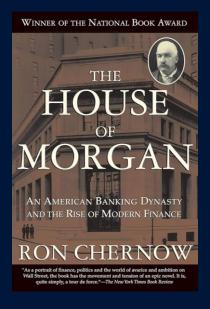
John D. Rockefeller



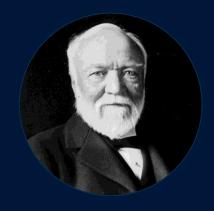


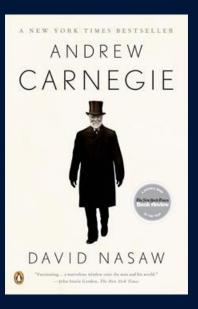
J.P. Morgan





#### **Andrew Carnegie**





### Wave 1: Lewis & Clark(s)

## Warburg Pincus



Eric Warburg



Lionel Pincus





Theodore Forstmann



Brian Little

#### KKR 1976



George Roberts



Henry Kravis

## Wesray Capital Corporation 1981



William Simon



Raymond Chambers

#### Wave 2: 1980s Firms







\$327M





Mitt Romney

\$37M





Peter Brooke

\$225M

Blackstone 1985





Pete Peterson

Steve Schwarzman

\$859M

## CARLYLE





William Conway

\$100M

HICKS MUSE





John Muse

\$250M

## LGP



Leonard I. Green

\$216M

#### APOLLO 1990







Marc Rowan

Leon Black

Josh Harris

\$400M

# Drexel Burnham Lambert Incorporated





~\$1.2T





APOLLO

26NORTH\*





STONE POINT CAPITAL







#### LEHMAN BROTHERS



~\$1.4T



#### Robert M. Bass Group





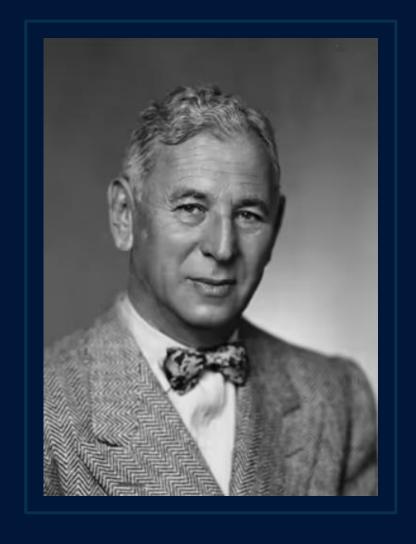
~\$750B

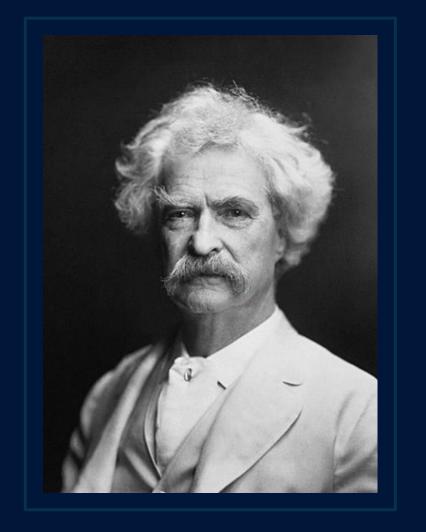


Note: For Lehman Brothers, Blackrock and Neuberger Berman represent close-end funds closed in the last 10 years – for Blackrock (\$67B out of ~\$8.6T total AUM) and for Neuberger Berman (\$31B out of ~\$440B total AUM). Logos for illustrative purposes only. Source: Pregin (Accessed October 2023), Websites and Press Releases for Each Firm (Accessed October 2023)

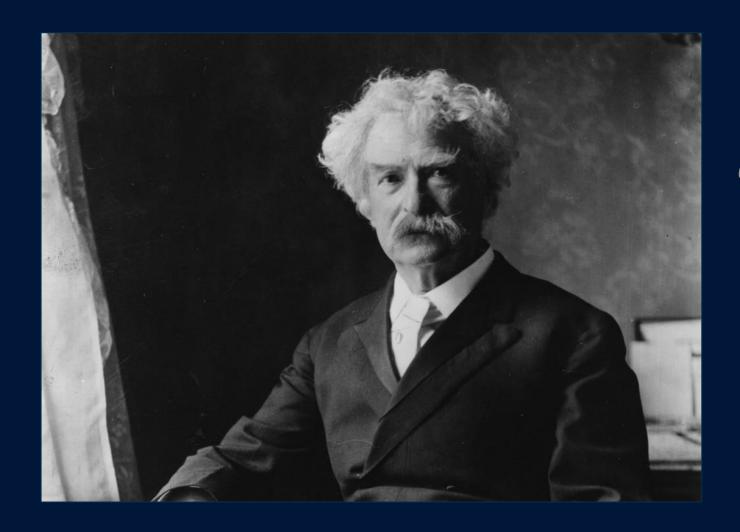
# Mark Twain & Rube Goldberg

### Connecting Mark Twain with Rube Goldberg





#### Mark Twain Resilience



The report of my death has been grossly exaggerated

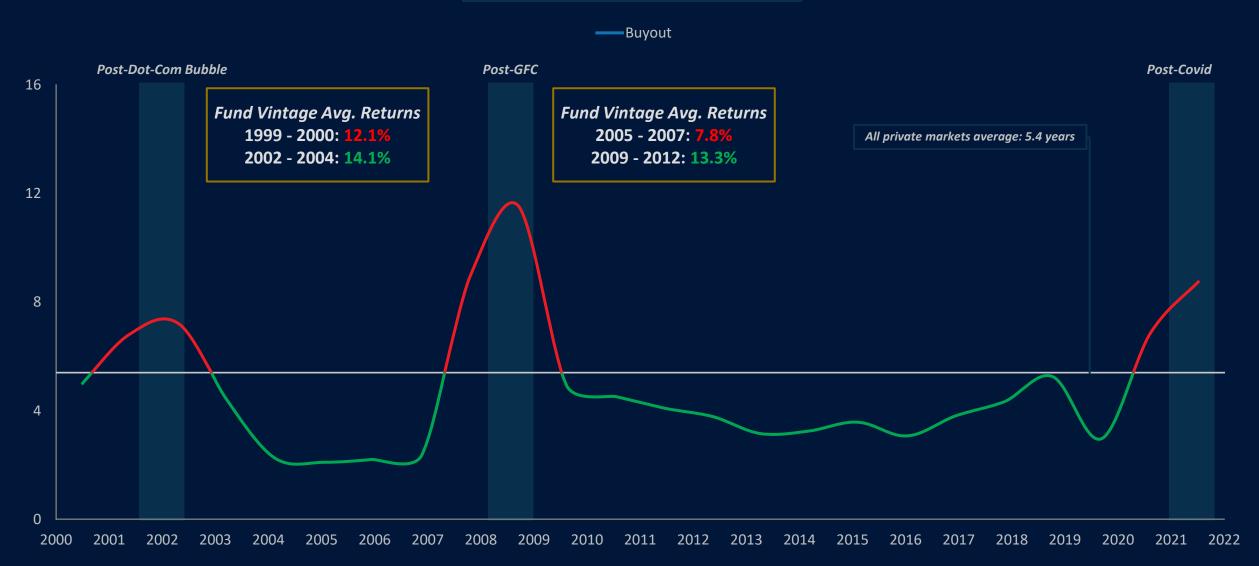
- Mark Twain, 1897

#### We're In a Logjam Moment



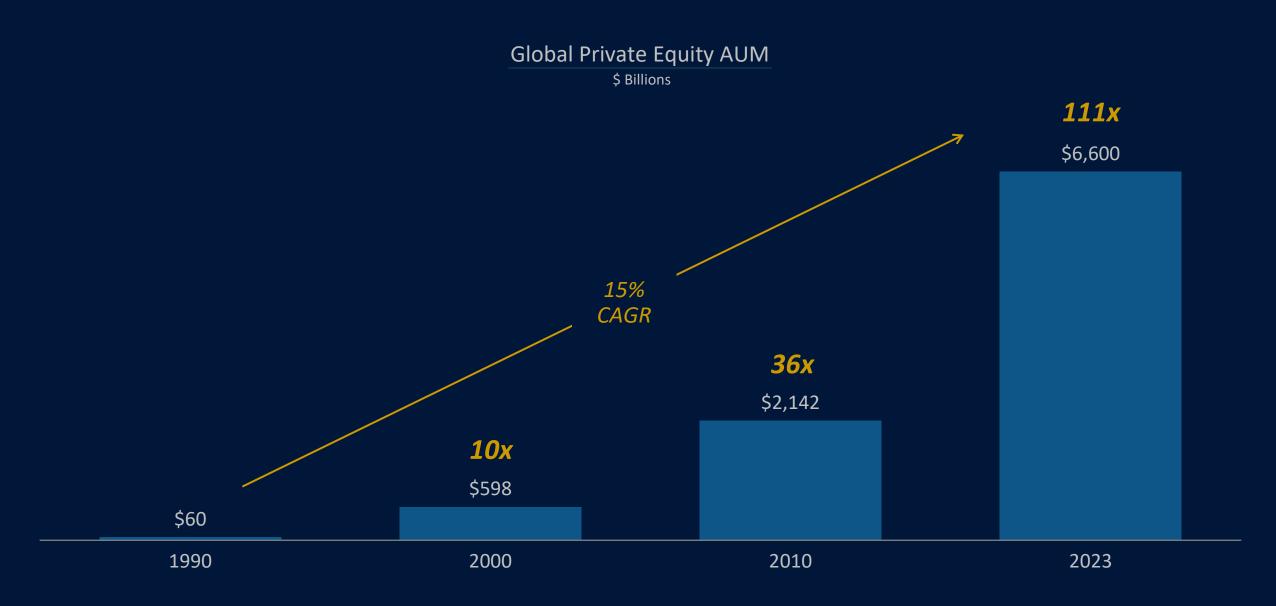
#### The Current Moment: Post-Covid





# The Surprise of Size

### **Unexpected Growth**



Note: includes buyout, distressed PE, growth, and venture funds, \$ based on fund final size and inclusion by year based on fund close date.

Source: Preqin (Accessed as of October 2023) for 2000 onward and proxy (last 10 years of funds raised) estimate for 1990; 2023 actuals as of October 2023

### Private Equity: Today

#### **Private Equity Firms**

#### Private Equity Firms + Portfolio Organizations



























**4,500+**US Private Equity Firms

16,000 - 32,000

US Private Equity-Backed Companies Since 2017



**12** 

Million Employees

of US Workforce



34M

Retirees Dependent on Private Equity

11%

of Public Pension Portfolios



\$880B

Earned Wages

\$23B

√||| **1.5**T

GDP Contribution

6% of US GDP

**Annual Advisory Fees Paid** 

Note: GDP contribution calculated across PE firms and portfolio companies in the US. US PE revenue represents advisory services generated through deal transaction services and value creation advisory.

Source: SEC.gov (May 2021); AIC website (October 2023); Economic Contribution of the US Private Equity Sector by American Investment Council (AIC) and EY (2020), Preqin Private Capital Compensation Report (2023); Bureau of Labor Statistics (~161M workforce as of 2023); Public Pension study report by AIC (July 2022)

#### **Deal Size**



Note: Includes add-ons and only deals with associated deal value; deal sizes are in nominal USD. Source: Dealogic (Accessed in September 2023)

#### **Industry Aperture**

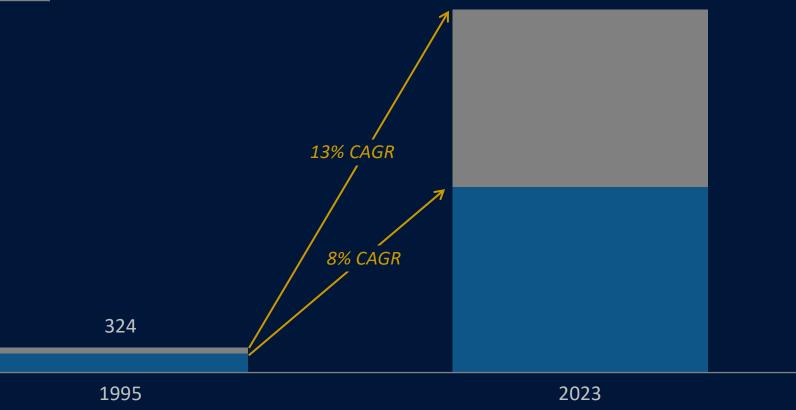


#### US Buyout Deals by Industry Sector

By Deal Count

- Traditional Sectors (Industrials / Retail / Financials / Energy)
- Tablet Sectors (Technology / Healthcare)

4,695



Source: Bain & Company Analysis (October 2023); 2023 actuals as of October 2023

### Building the Toolbox

#### **GP Toolbox**















### **LP Toolbox**













# Timelapse Volatility

# Day to Day



June



July

#### Top 40 NA Firms



Note: Includes capital raised over past 10 years (from 1984-1993 based on Vintage) by global fund managers based in North America for buyout, growth, venture, distressed PE, and other funds excluding Softbank's vision fund; includes publicly disclosed funds only. May not represent all relevant investment managers. Source: Preqin (October 2023)

#### Top 40 NA Firms



Note: Includes capital raised over past 10 years (from 1984-1993 based on Vintage) by global fund managers based in North America for buyout, growth, venture, distressed PE, and other funds excluding Softbank's vision fund; includes publicly disclosed funds only. May not represent all relevant investment managers. Source: Preqin (October 2023)

#### Top 40 NA Firms



Note: Classification of firms as generalists reflect the subjective views and opinions of TPG and its personnel. There can be no assurance others would have classified these firms similarly. Includes capital raised over past 10 years (from 2004-2023 based on Vintage) by global fund managers based in North America for buyout, growth, venture, distressed PE, and other funds excluding Softbank's vision fund; includes publicly disclosed funds only.

Source: Preqin (October 2023)



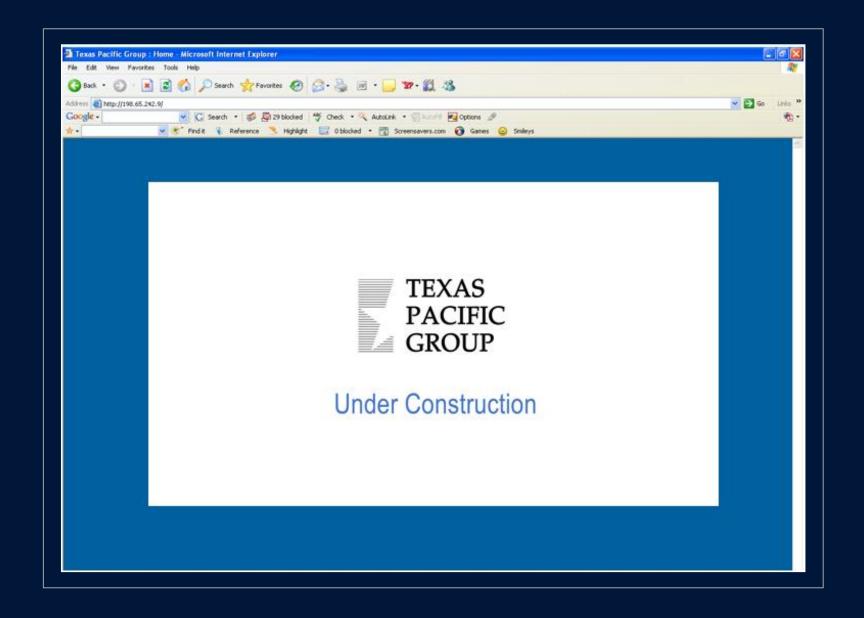




Building

**Executing** 

# Responsible Private Equity



#### LPs Leading the Way

Implementation of Labor Principles

Agenda Item 5e, Attachment 1, page 10 of 11

#### CalPERS Labor Principles

Freedom of association and the effective recognition of the right to collective bargaining

Seek to support and improve the well-being of employees as part of human capital management strategy and in compliance with applicable laws.

The elimination of all forms of forced or compulsory labor

Respect the human rights of those affected by their investment activities and seek to confirm that their investments do not flow to companies that utilize forced labor.

The effective abolition of child labor

Respect the human rights of those affected by their investment activities and seek to confirm that their investments do not flow to companies that utilize child labor.

The elimination of discrimination in respect of employment and occupation

Respect the human rights of those affected by their investment activities and seek to conform that their investments do not flow to companies that maintain discriminatory policies. Seek to improve diversity, equity, and inclusion in portfolio investments to address recruitment, retention, and compensation.

A safe and healthy working environment

Seek to support and improve the well-being of employees as part of human capital management strategy that includes providing a safe and healthy workplace.



# 250+ ESG DDQs annually





#### Shared Initiatives



ESG Data
Convergence
Initiative

#### **Private Equity Contributing**



### GUIDELINES FOR RESPONSIBLE INVESTING

#### US Life Sciences PE Deal Activity



Note: ESG-dedicated and ESG-inclusive due diligence questionnaires received by TPG and TPG Angelo Gordon in 2023. Source: American Investment Council, Pitchbook (as of December 31, 2021)

Who Is in the Room: The "Dinner Party Model"





**Kathy Phillips** 

Columbia Business School Reuben Mark Professor of Organizational Character Director of Sanford C. Bernstein & Co. Center for Leadership and Ethics

"Diverse groups... guessed correctly with far greater frequency, [but] reported much lower confidence in their decisions."





# **Green Shoots**

#### The Pessimism Paradox

**Consumer adoption** 

Public policy gaps

**Geopolitical risks** 

Lack of offtake certainty

**Access to critical minerals** 

Long time horizons

**Affordability** 

**High interest rates** 

Supply chain resilience

Lack of skilled workforce

Challenges deploying capital at scale

High cost of capital

**NIMBY** 

**Green premium** 

Lack of bankable projects **Uncertainty of returns** 

Unproven technology

**Barriers** to scale

**Consumer hesitancy** 

**Complex rules and policies** 

**Regulatory uncertainty** 

**Permitting Delays** 

**Limited storage capacities** 

**Inflation** 

Aging grid infrastructure

**Supply/demand imbalances** 

Supply chain inflation

#### The Pessimism Paradox

Unpro In teles, Dellitty 1000

#### The Power of Cost Curves in Climate



Note: All historical figures adjusted for inflation Source: BloombergNEF, New Energy Outlook (2022)

### Sun Machines: "Solar Is Going to Be Huge"



Now that **solar energy** is a significant part of the world's entire energy portfolio, the world is going to see the energy used in many applications **get cheaper and cheaper**.

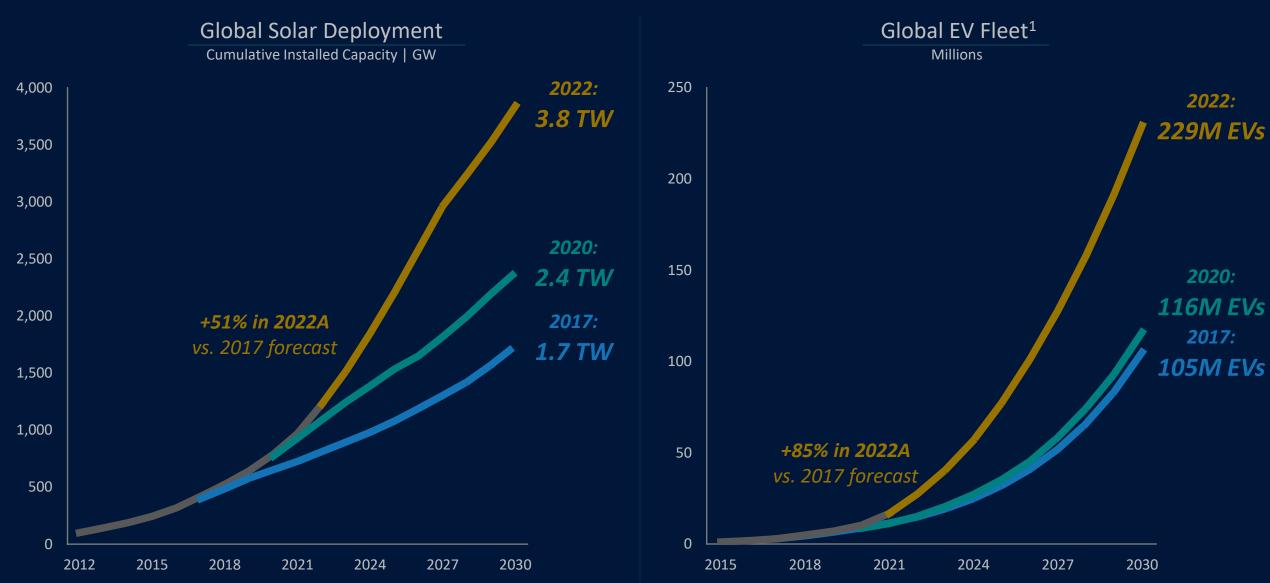
It will be the **steepest drop in the price** of one of the basic factors of production that **the world economy has ever seen**.

[...]

In 2015, [the] levelized cost of electricity (LCOE) for solar, on a global basis, was \$122 per MWh, almost half as high as onshore wind, then \$83. The LCOE for [at the time,] coal was \$50-\$75.

**Today** both **solar** and onshore wind are **in the low \$40s**, while **coal remains at \$50-\$75**, pretty much where it was.

#### EVs and Solar Second Derivative Change



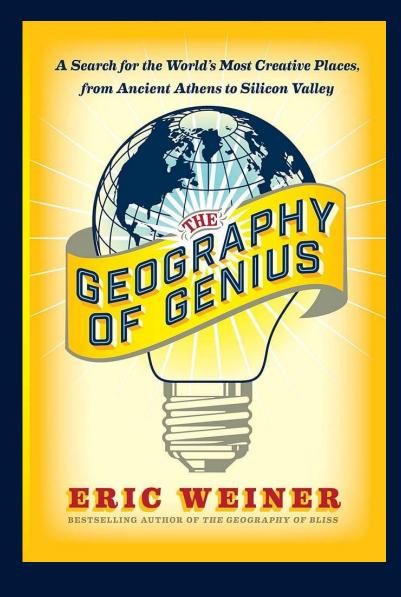
<sup>1.</sup> Includes battery and plug-in hybrid electric vehicles

Note: Dotted lines in charts represent forecasts, which are inherently uncertain and subject to change (or were so at the time of publishing)

Source: BloombergNEF, New Energy Outlook (2017, 2020); BloombergNEF, Solar Data Tool (2022 ETS); BloombergNEF, Long-Term Electric Vehicle Outlook (2017, 2020, 2022)

# Lithium Valley

#### Genius Usually Has a Geography





merchant class, and the classical

heritage of Greece and Rome.

#### Detroit: The 1920s

#### 200+ Auto Manufacturers

Company; Century

Electric Car Company

Abbott Motor Car Company **Aerocar Company** Aland Motor Car Company American Cyclecar Company American Voiturette Company Anderson Electric Car Company **Anhut Motor Car** Company **Autoparts** Manufacturing Company Benham Manufacturing Company Blomstrom (C.H.) Motor Company Blomstrom Manufacturing Company **Bour-Davis Company Briggs-Detroiter Motor** Car Company **Brush Motor Car** Company **Buick Motor Company** Buick Auto-Vim and **Power Company** Cadillac Automobile Company Carhartt Automobile Company Cartercar Company

**Century Motor** 

**Chalmers Motor Car** Company; Chalmers-Detroit Chevrolet Motor Car Company **Chrysler Corporation** Columbia Motors Cricket Cyclecar Company **Davis Cyclecar Company** Day Automobile Company De Luxe Motor Car Company **Demot Car Company** Detroit Air-Cooled Car Company Detroit Auto Vehicle Company **Detroit Automobile** Company, Henry Ford Company **Detroit Automobile** Manufacturing Company **Detroit Cyclecar** Company **Detroit Steam Motors** Corporation **Detroit-Dearborn Motor** Car Company Dingfelder Motor Company Dodge (A.M.) Company **Dodge Brothers** 

Company **Dodgeson Motors** DODO **Downing Motor** Company **Dragon Automobile** Company E-M-F Company **Essex Motor Company Excel Distributing** Company Faulkner-Blanchard **Motor Car Company** Fischer (G.J.) Company Ford Motor Company General Engineering Company **General Motors** Corporation **Gray Motor Corporation** Grinnell Electric Car Company Griswold Motor Car Company Hackett Motor Car Company **Hammer Motor** Company Hammer-Sommer Auto Carriage Company Hawk Cyclecar Company Herreshoff Motor Company **Hudson Motor Car** Company

**Hupp Motor Company** 

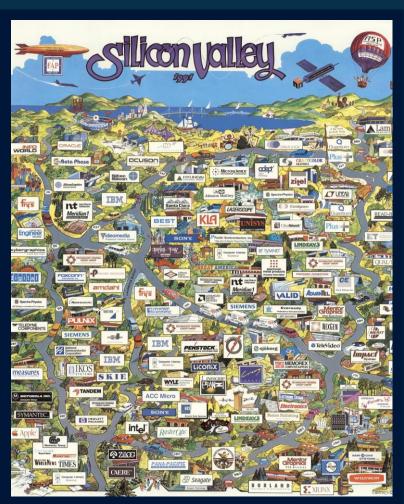
Adams Randall

#### The Silicon Valley Miracle: 1991 to 2025

#### **Informed Investor Base**



#### Silicon Valley: 1991



#### **Human Capital Factory**





**69** Nobel Prizes

#### **Entrepreneurial Pipeline**

















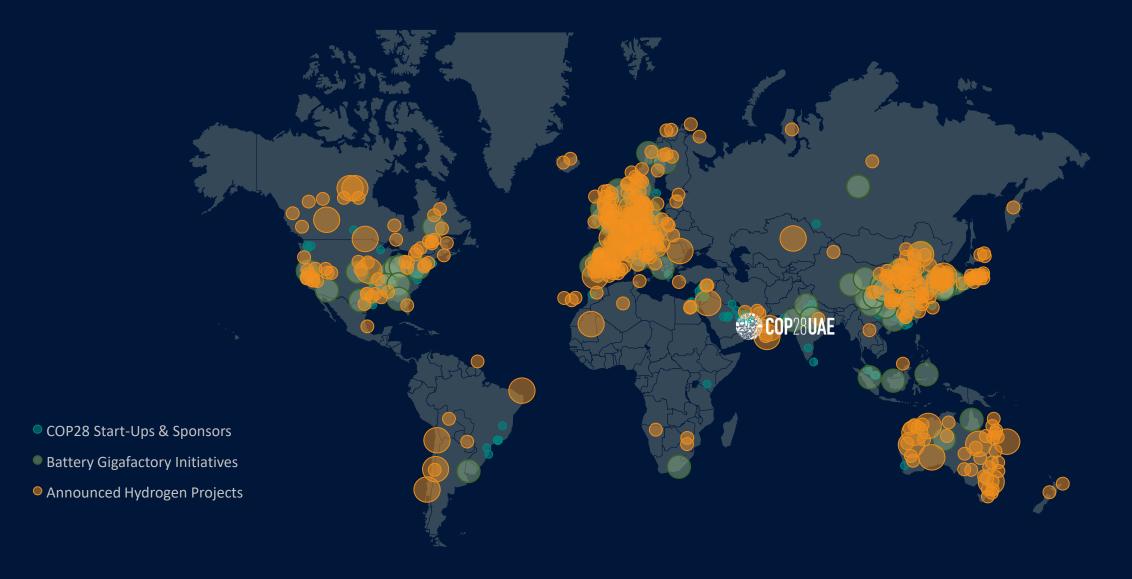






Source: Rao, A., A History of Silicon Valley (2013; retrieved April 2024); David Rumsey Map Collection: Cartography Associates, Early Mapping of Silicon Valley and the Web (March 2019); Pressman, M., Elon Musk, Disruptive Tech, and the 'PayPal Mafia' (October 2020); Silicon Valley Map, Interactive Silicon Valley Map (Retrieved April 2024)

### The Geography of Climate



#### The California Model







– CalPERS November 2023

### **Climate Opportunity Set**

**Public Markets** 

**Private Equity** 

**Real Assets** 

Infrastructure

**Debt Markets** 

## The California Model







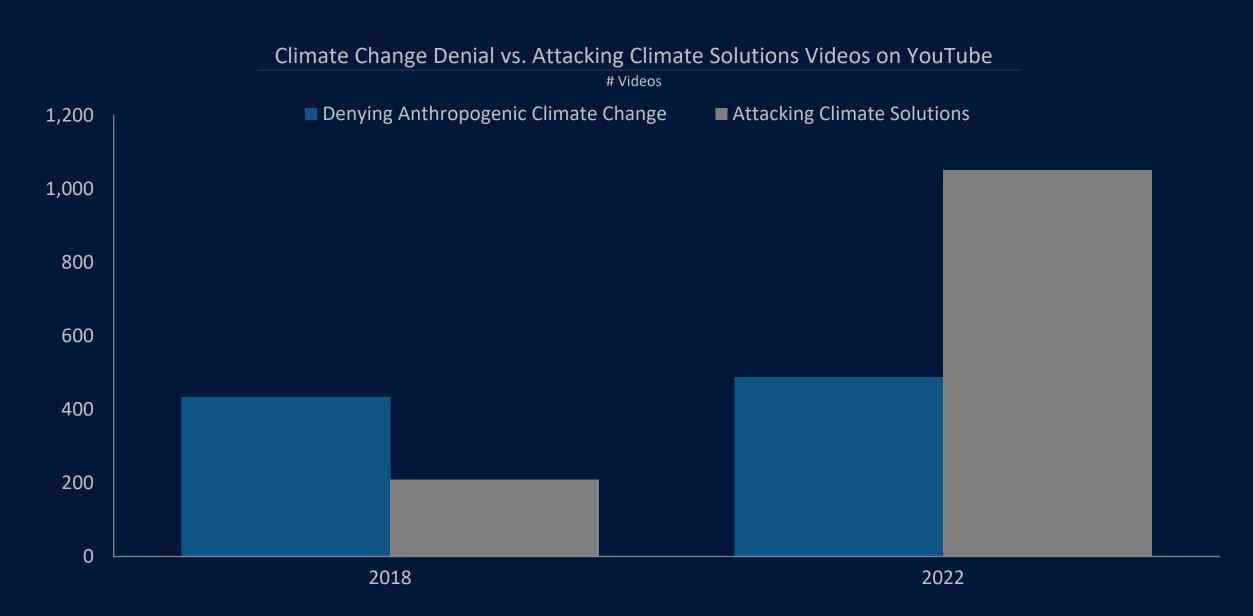






# Whataboutisms

### Climate Change Critics Now Attacking Solutions



Note: 96 YouTube channels in study, as of January 2024 Source: Center for Countering Digital Hate – "The New Climate Denial" (January 2024)

#### Whatabout: The Greenness of EVs

# The Washington Post

"The Underbelly of Electric Cars"



"Study Casts Doubt On Electric Vehicles' Climate, Cost Benefits"



Just bought an EV but now I'm told they are bad for the environment?





r/AskEngineers • 7 mo. ago





r/RandomThoughts • 6 mo. ago

What's the point of electric cars if we don't even have enough green electricity to power everyone's homes? Surely the electricity farmed for those cars are made with planet killing process' anyway?

Are electric cars better for the environment if the power comes from coal and the grid is not efficient?





**r/askscience •** 6 yr. ago

Can someone explain the environmental impact of electric car batteries?

#### Whatabout: Critical Minerals Panic



"A Worldwide Lithium Shortage Could Come as Soon as 2025"

# Bloomberg

"China's Grip on Critical Minerals **Draws Warnings at IEA Gatherings**"





r/sustainability • 5 mo. ago

Are we going to run out of lithium?





r/NoStupidQuestions • 1 yr. ago



r/collapse • 1 yr. ago

Mining the raw materials needed for the "green transition" could take centuries





r/electricvehicles • 8 mo. ago

Is there enough Lithium to make enough batteries for all the cars in the world to be electric?

What happens when we run out of oil and lithium?

#### **Exploration and Innovation**







# The Atlantic

"America Just Hit the Lithium Jackpot"

# S&P Global

"Direct Lithium Extraction
Players To Draw Wave Of
M&A From Battery Supply
Chain"



"India Finds Lithium Deposits
For First Time in Country"



Whatabout... solving the problem?

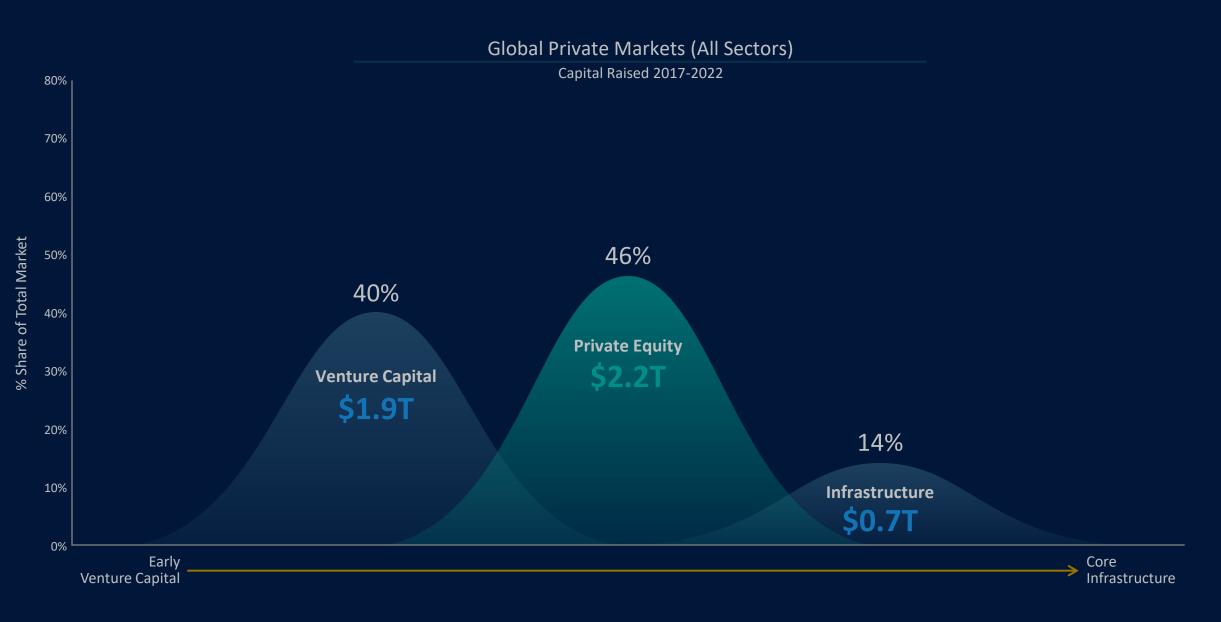
# The Missing Middle

#### Market Map of Private Climate Investors

#### Climate Investors



### The Missing Middle in Climate



## The Missing Middle in Climate



# The Policy Box

#### We Subsidize Important Industries



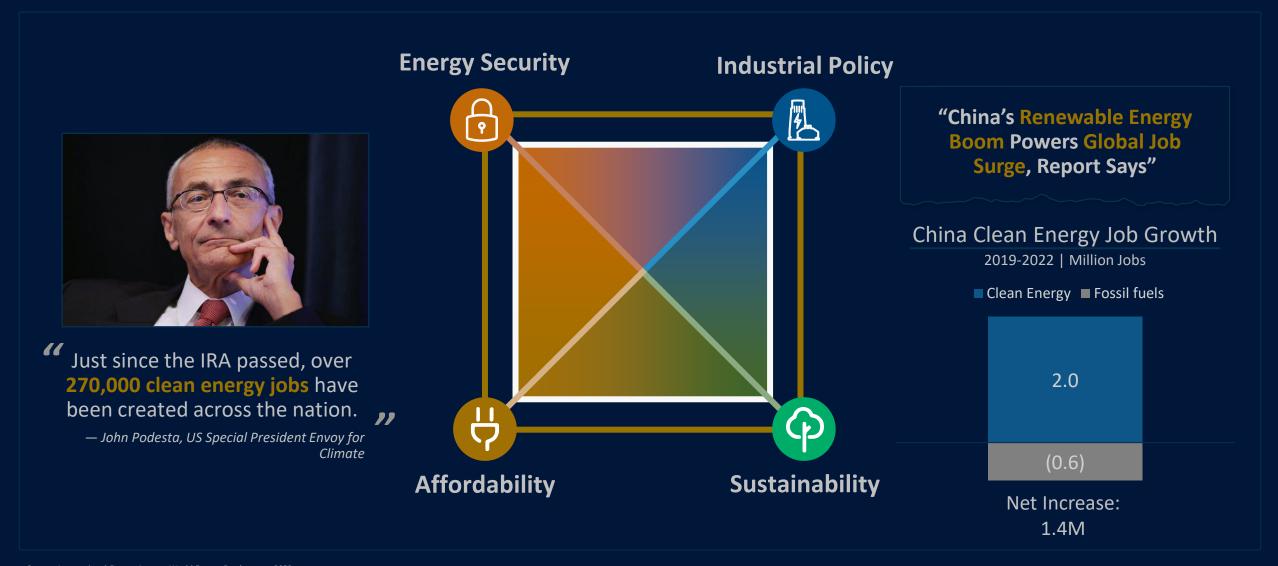
<sup>1.</sup> Totals for EU based on total funding for EU Agricultural Fund for Rural Development and EU Agricultural Guarantee Fund for 2021-2027. Totals for US based on total funding in the US Farm Bill allocated for fiscal years 2019-2028. EU value based on average EUR/USD exchange rate in 2023

<sup>2.</sup> Based on 2023 funding for Fannie Mae and Freddie Mac, Low Income Housing Tax Credits, and mortgage interest rate reduction

<sup>3.</sup> Based on 2023 levels for coal, oil, and natural gas

Source: European Commission. "Common agricultural policy funds"; Congressional Research Service. (February 2024). Farm Bill?; International Energy Agency. "Fossil Fuel Consumption Subsidies 2022"; Carey, Lachlan, and Jun Ukita Shepard. (August 2022). "Congress's Climate Triple Whammy'

# The Policy Box



### Jobs Winning Over IRA Critics

#### **IRA VOTE**

















Marjorie Taylor-Greene (R-GA)

Andy Biggs (R-AZ)

Buddy Carter (R-GA)

Carol Miller (R-WV)

"The expansion of Q Cells will add more jobs to Dalton thanks to our good county and state people that worked together"

"Queen Creek is set to become the new home for a high-tech battery manufacturing facility. [...it will] employ thousands of people and will help unleash American energy" "With this investment, Georgia will be a leader in the electric vehicle industry"

"Hardworking businesses like GreenPower Motor are [...bringing] much needed investment to West Virginia"

# Passing the Baton

## Evolution of The Relay Race



**Ancient Greece** 



**Modern Olympic Ceremony** 



**Marquee Olympic Event** 

# The Relay Race of Revolutions

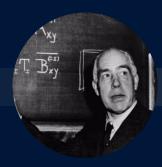
The Scientists

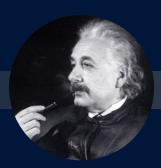


The Policy Makers

The Builders / Scalers

Atomic Revolution









Internet Revolution









COVID Therapy Revolution









#### The Climate Revolution









## The Last Leg is the Fastest

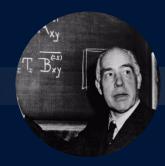
The Scientists

The Prophets

The Policy Makers

The Builders / Scalers

Atomic Revolution



26 Years



3 Years



3 Years



Internet Revolution



10 Years



19 Years



9 Years



COVID Therapy Revolution



9 Years



6 Years



9 Months

