| The New Energy Era | Better choices  
It’s working |
|-------------------|----------------|
| Massive Markets   | Electrifying everything  
The rise of clean energy  
The fall of fossil fuels |
| Communications    | Solutions vs naysayers  
Transition benefits  
Fossil reality check |
| Cultural Shift    | The tipping point |
| The Goal          | Bend the curves |
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We’ve Been Tethered to Fossil Fuels
Abundant lifestyles, at a cost

IN THE PAST

Want clean energy?
Lobby congress? Ask your utility?
Protest energy companies?
Freedom to Choose
Innovation breaks the chains

IN THE PAST

Want clean energy?
Lobby congress? Ask your utility?
Protest energy companies?

NOW

People can take direct action

We are the first generation with clean energy choices
Consumers have Better Energy Choices
The power of the market unleashed

PRODUCT INNOVATION
✓ Better performance
✓ More convenience
✓ More value

MARKET OPPORTUNITY
Over the next two decades we will invest $200 trillion rebuilding our energy economy (BNEF)
THE SAFEST CARS AVAILABLE

LOW CENTER OF GRAVITY, CRUMPLE ZONES, NO GAS ENGINE

LOWEST PROBABILITY OF INJURY

TESTED BY NHTSA
RELAX

QUIT YOUR PART-TIME JOB PUMPING GAS
DRIVE ON SUNSHINE
LOCAL ENERGY
Fast Followers
Most major brands are going electric
It’s Working
U.S. Residential Solar Capacity

Millions of homes already powered by solar

Cumulative installations, GW


Sources: Bloomberg New Energy Finance, 2022; SEIA 2023
Global Electric Vehicle Sales
Going mainstream

EV and PHEV Annual Sales, 000's

Sources: McKinsey & Company, 2017; BNEF EVO 2021; Electric Vehicle World Sales Database 2023; Counterpoint Research, March, 2023
Global Electric Vehicles
Market share

New Passenger Vehicle Sales 2022

Sources: McKinsey & Company, 2017; BNEF EVO 2021; Electric Vehicle World Sales Database 2023; Counterpoint Research, March, 2023
China

World’s Largest Market

EV sales share

- 33%
- 25%
- 20%
- 15%
- 10%
- 5%
- 0%

Sources: RMI, BNEF, BP, IEA, WEB
Breaking News!
Major milestone

WORLD’S BEST-SELLING CAR – Q1 2023

TESLA MODEL Y

Source: motor1numbers
Global Electric Scooters
Market share

New Scooter Sales 2022

39%
Combustion
Electric

Source: BNEF
Global Electric Buses
Market share

New Bus Sales 2022

Combustion
Electric

49%

Source: BNEF
Electric School Buses
Healthier, more economic, community resilience

Cumulative electric school bus commitments, U.S.

Quarterly; Q1 2014 to Q4 2022

Source: World Resources Institute; Chart: Alice Feng/Axios
<table>
<thead>
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</tr>
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Electrifying Everything
Commerce is the engine of change

IT’S SIMPLE...

Anything fossil fuels can do, electricity can do better

MORE RELIABLE - No pull cord
MORE CONVENIENT - No fuel mix
CLEANER, BETTER - No pollution
Electrifying Everything
New, better choices

MORE RELIABLE - No pull cord
MORE CONVENIENT - No fuel mix
CLEANER, BETTER - No pollution
Electrifying Everything

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Electrifying Everything
New, better choices

Children in homes with gas stoves have a 42% higher chance of developing asthma

-Science Times

Induction cooktop  Heat pump  Heat pump water heater

FULLY-ELECTRIFIED FOSSIL-FREE HOMES
This truck can power your home for up to ten days - or more with solar
More self-reliance and resiliency during power outages
Vehicle-to-home energy
The rise of clean energy

Global trends are obvious
U.S. Power Markets

Renewables have surpassed coal

U.S. SOLAR AND WIND CAPACITY
(CUMULATIVE GIGAWATTS; UTILITY SCALE)

U.S. POWER MIX
(KWH SUPPLIED BY ALL SOURCES, 2022)

Capacity source: BNEF, 2022, DOE Wind Energy Technologies Office 2022, SEIA Solar Market Insight Report 2021, FERC E1 update, March 2023 for '22 solar data (aggregate, less 6 Gw residential); Market share source: Ember Data, March 2023
Global Power Markets

Renewables are a global phenomenon

GLOBAL SOLAR AND WIND CAPACITY
(CUMULATIVE GIGAWATTS)


GLOBAL POWER MIX
(KWH SUPPLIED BY ALL SOURCES, 2021)

38% FOSSIL-FREE POWER

37% COAL

15% HYDRO

10% NUCLEAR

25% GAS

Global Progress
Embracing cheap, clean energy

Source: RMI, BNEF, BP, IEA, WEI
We Have Made Renewables the Lowest Cost Of Energy

Stunning advances...fossil fuels can’t keep up

Source: BNEF; Note: * in sample time period; Definition: the learning rate is the observed cost reduction for each doubling of deployment
Replacing Fuel with Innovation
No mining, drilling, or burning

Mine, drill, transport and burn fuels

Fuel delivered on-site for free, does not deplete
Production is modular, scalable, automated
Near-zero pollution or water use
The Stampede to Clean Energy
Investment trends are obvious

This graph shows U.S. interconnection applications for prospective new power plants. All new power plants must go through the application process.

The data shows where the industry is spending risk capital; it is a leading indicator of future capacity additions and the overall market sentiment.

Completing the process is a multi-year effort that can cost millions, so only serious projects apply. Often the study results show no grid capacity, or that connecting will be uneconomic, many drop out prior to completion.

Source: Berkeley Lab review of interconnection queues
Massive Investments Ahead, for Decades

Commerce is the engine of change

$194 trillion
invested 2022-2050

- Electric vehicles: 47%
- Low-carbon power: 18%
- Grids: 11%
- Carbon capture: 6%
- Sustainable materials: 5%
- Heat pumps: 4%
- Hydrogen: 1%
- Fossil fuel: 8%
The fall of fossil fuels

Negative trends abound
Demand for Coal
Sharp declines

OECD
-35%
United States
-60%
UK
-87%

Source: IEA WEB
Investments Stagnating
Risk adjusted returns increasingly unattractive

ICE sales (m)

Coal and gas power capex ($B)

Oil and gas upstream capex ($B)

ICE sales are down by 20% since 2017.

Fossil fuel power station capex is down 26% since 2015.

Oil and gas upstream capex is down 41% since 2015.

Source: BNEF, IEA WEI
Cost of Capital
Pricing expected risks and returns

Source: RMI; Goldman Sachs, Bloomberg
Meaningful Policy Shifts

U.S. momentum is building with passage of recent IRA and Infrastructure bills

In 2022, over 90% of the world by GDP had set net-zero targets, up from 6% in 2017.

Fifty countries and regions are planning to ban ICE cars.

The share of emissions covered by tax has increased fourfold in a decade to nearly a quarter.

Source: RMI; IEA, BNEF, World Bank
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We Have Everything We Need to Transition To Clean Energy
Even “difficult” sectors have well-funded solutions scaling up

<table>
<thead>
<tr>
<th>Electricity and Thermal Storage</th>
<th>Decarbonizing Steel and Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="https://example.com/form-energy" alt="Form Energy" /></td>
<td><img src="https://example.com/electra" alt="Electra" /></td>
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<td><img src="https://example.com/brimstone-energy" alt="Brimstone Energy" /></td>
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</table>
The Energy Transition Will Require Less Minerals and Mining
Fossil fuels extract far more materials than clean energy

15B tons of hydrocarbons are extracted a year
Extraction of energy transition metals is (and will be) minuscule compared to coal, oil, and gas

Tonnes of annual production, 2019

Coal: 7.6 billion
Oil: 4.3 billion
Gas: 3 billion

Lithium + cobalt + nickel + silicon + silver + rare earths + copper + aluminum + steel
Transition Benefits
So much upside

We’ll Save Water
Almost 50% of our water is drawn by thermal energy generation

United States Water Withdrawals
- 33% Agriculture
- 47% Power Plants
- 9% Other
- 11% Public

We’ll Breathe Easier
Over 70% of air pollutants come from the power and transportation sectors

Sources of Primary Pollutants
- 12% Other
- 15% Public
- 27% Power Plants
- 46% Transportation

Transition Benefits

EVs don’t use biofuels

36% Biofuel (ethanol)

Food

Much of the U.S. corn crop is used as biofuel

Biofuels consume vast amounts of land, fertilizer and energy

Source: BNEF
Transition Benefits

Fossil Fuels comprise 40% of Global Shipping
Solar panels are a miracle
They turn sunlight into cold beer
<table>
<thead>
<tr>
<th>Moral License Revoked</th>
<th>Political Latitude Curtained</th>
<th>Legal Scrutiny</th>
<th>Constrained Financial Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religious leaders calling for transition away from fossil fuels.</td>
<td>Keystone XL pipeline was an unprecedented denial of a major fossil project based on its carbon footprint.</td>
<td>ExxonMobil investigation taking shape of tobacco industry path.</td>
<td>G20 joins multilateral banks in ending support for new coal-fired power plants.</td>
</tr>
</tbody>
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<tr>
<th>Social Stigma</th>
<th>Escalating Regulations</th>
<th>Investment Risks</th>
<th>Global Agreement to Reduce Emissions</th>
</tr>
</thead>
<tbody>
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<td>Divestment movement gaining traction.</td>
<td>EPA and other state and local initiatives trending toward clean energy future.</td>
<td>Notion of stranded assets and the “carbon bubble” reaching the financial community.</td>
<td>Plan to move from fossil fuels to clean energy adopted worldwide</td>
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Reality check
Calling the game

Society is moving past fossil fuels
You are losing market share
Stop fighting progress
Do the right thing
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The Daily Question
Climate is an escalating global risk
**Systems Thinking**
A paradigm shift is the best leverage point to change a system
Predatory Delay
Active measures to forestall decline

CLIMATE
- Physics of CO₂
- Overload
- Warming
- Storms
- Drought

ACTION FORCING IMPACTS
- Floods
- Heatwaves
- Power
- Outages
- Damage
  - Risk of Systemic Tipping Points

NOISE
- Incumbents Resisting Change
- Divisive Politics
- Denial
- Misinformation
- Chaotic uncertainty
- Discord and Strife

Decisions Stalled

PARADIGM SHIFT
Discouraging Phrases, Repeated Often
A diet of bread and water

The Old Script

- We are dependent
- Problem is too big
- Future is grim
- Clean Energy myths
- Climate denial
- Climate doom and gloom
The New Reality
Momentum is contagious

The Old Script

WE ARE DEPENDENT
PROBLEM IS TOO BIG
FUTURE IS GRIM
CLEAN ENERGY MYTHS
CLIMATE DENIAL
CLIMATE DOOM AND GLOOM

The New Energy Reality

WE’RE MAKING PROGRESS
THERE ARE SOLUTIONS
BROAD PUBLIC SUPPORT
TRENDS ARE FAVORABLE
THE ENERGY TRANSITION IS HAPPENING

MY CHOICES MATTER
I can be part of the solution
Better, more affordable
Sign me up

I’M A BELIEVER
Hopeful
More confident future
Let’s all do our part
The Tipping Point
Change happens slowly... then all at once

CLIMATE IMPACTS

IT'S TIME TO ACT

PARADIGM SHIFT

NEW
Goals
Priorities
Rules

Politics
Economics
Laws

RAPID SYSTEM CHANGE

UNIFIED

NEW ENERGY ERA
We have better choices
It’s working

MASSIVE MARKETS
Electrifying everything
The rise of clean energy
The fall of fossil fuels

COMMUNICATIONS
Challenges
Benefits
The Growth Path Forward
What does a cultural shift look like?

- **LINEAR**
  - NEW TOOTHBRUSH

- **EXPONENTIAL**
  - CELL PHONES

- **VIRAL**
  - DIGITAL VIDEOS
An Idea Whose Time Has Come
Ideas can crystallize across society and result in durable change

“You can resist an invading army, but you cannot resist an idea whose time has come.”

-Victor Hugo
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| Cultural Shift     | The tipping point                                                         |
| The Goal           | Bend the curves                                                            |
The Mission
100% clean energy

100% CLEAN ENERGY

50 YEARS?
The Goal
Get there sooner

REDUCE ENERGY DEMAND
ACCELERATE CLEAN ENERGY
BEND BOTH CURVES

100% CLEAN ENERGY

25 YEARS? 50 YEARS?
Resources

Read

- **Drawdown**: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming by Paul Hawken
  - Foreword by Bill Gates
  - Reviewed by over 100 international experts

- **Speed & Scale**: A Global Action Plan for Solving Our Climate Crisis Now by Michael Shellenberger & TomDispatch.com

- **Electrify**: An Optimist’s Playbook for Our Clean Energy Future by Saul Griffith

Listen

- **My Climate Journey**: The Energy Transition Show by Chris Nelder

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