

NATURAL CAPITALISM SOLUTIONS



CLIMATE CAPITALISM

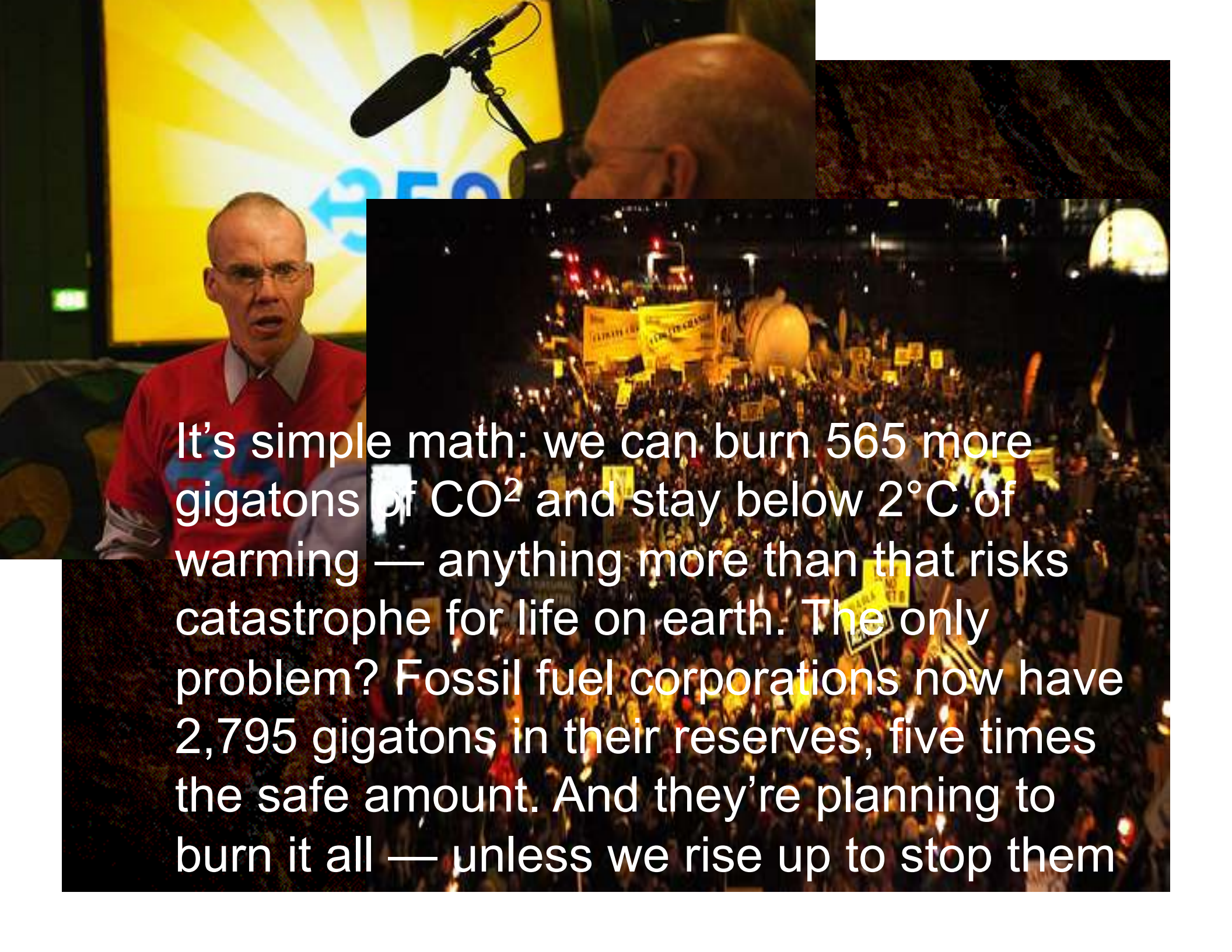
A Presentation by L. Hunter Lovins
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Dr. Sylvia Earle:

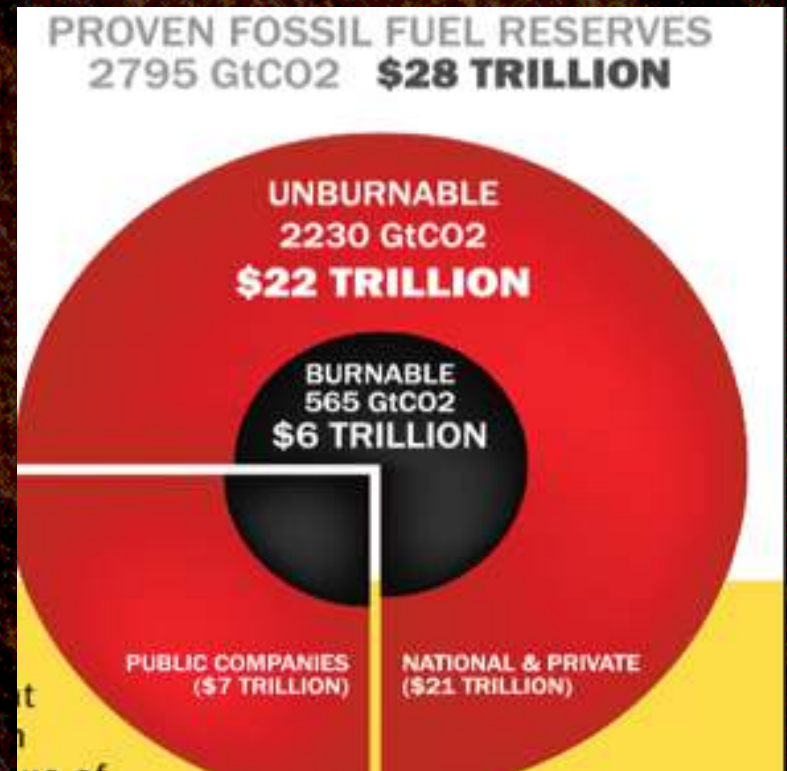
“What we do in the next ten years is more important than what humanity does in the next 10,000 years”





It's simple math: we can burn 565 more gigatons of CO₂ and stay below 2°C of warming — anything more than that risks catastrophe for life on earth. The only problem? Fossil fuel corporations now have 2,795 gigatons in their reserves, five times the safe amount. And they're planning to burn it all — unless we rise up to stop them

Carbon Bubble



“Wasted capital and stranded assets” concluded that between **60 to 80% of coal, oil & gas reserves** of publicly listed companies are “**unburnable**” to keep within the 2° C limit.

There's nothing politicians fear more
than people in the streets



400,000 people in the streets



Grandmothers, CEOs, religious leaders,
politicians, students, farmers, community
organizers, anarchists.....

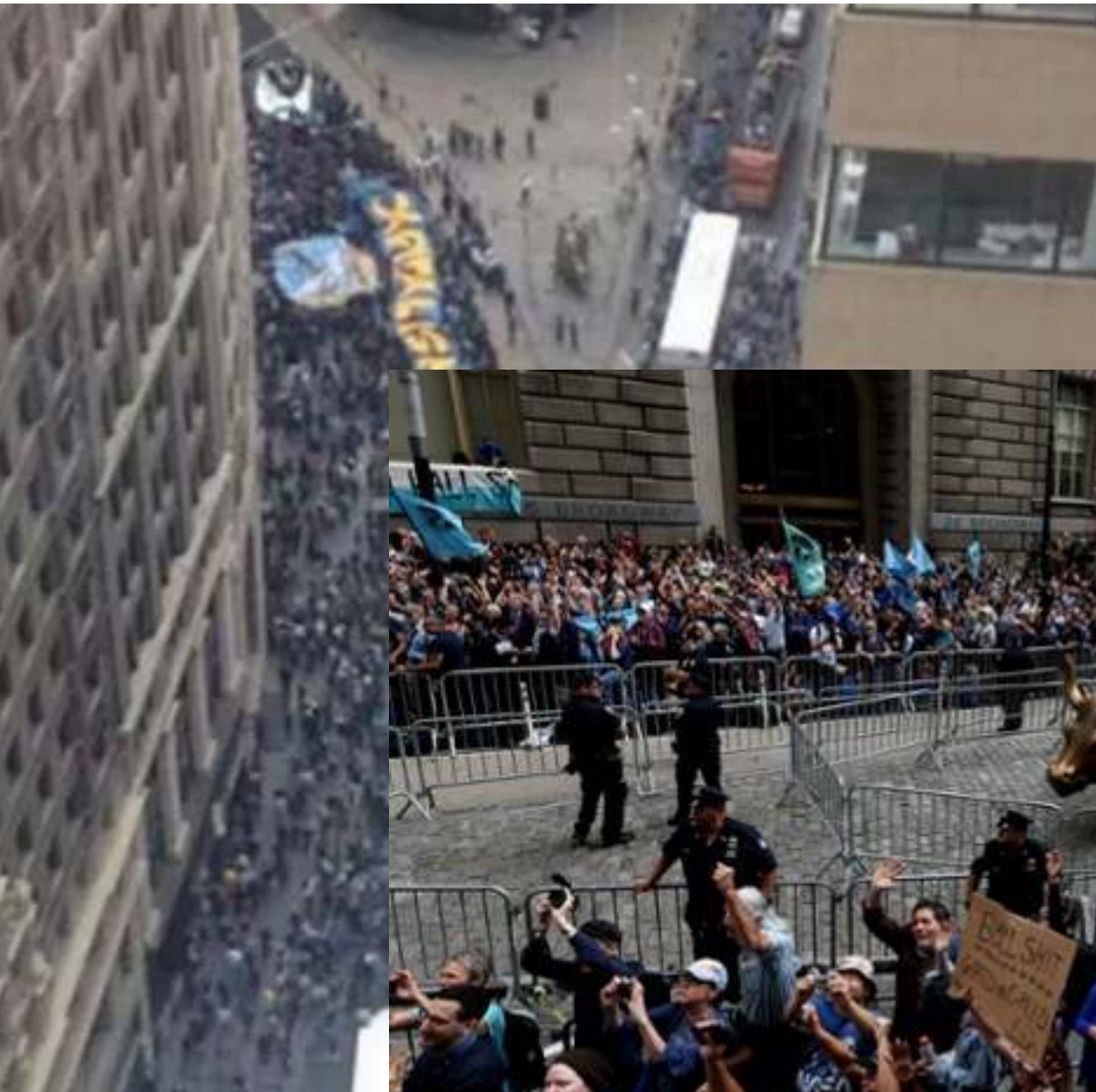


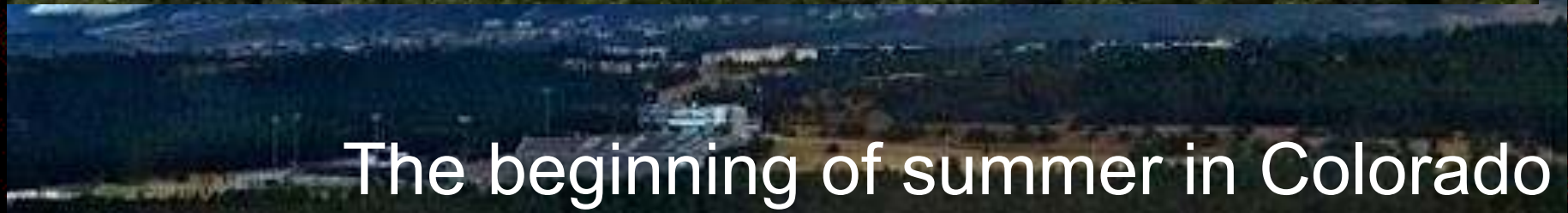
2,000 cities in 177 countries



#FloodWallStreet
Stop Capitalism!
End the climate crisis!
NYC, Sept. 22nd
FLOODWALLSTREET.NET







The beginning of summer in Colorado



The end of summer in Colorado



2011, a new record: 14 weather related disasters with damages over \$1 billion.

2013 6th year in a row with weather related damages over \$10 billion

2013 – 2014 20 billion dollar storms

The science is uncertain

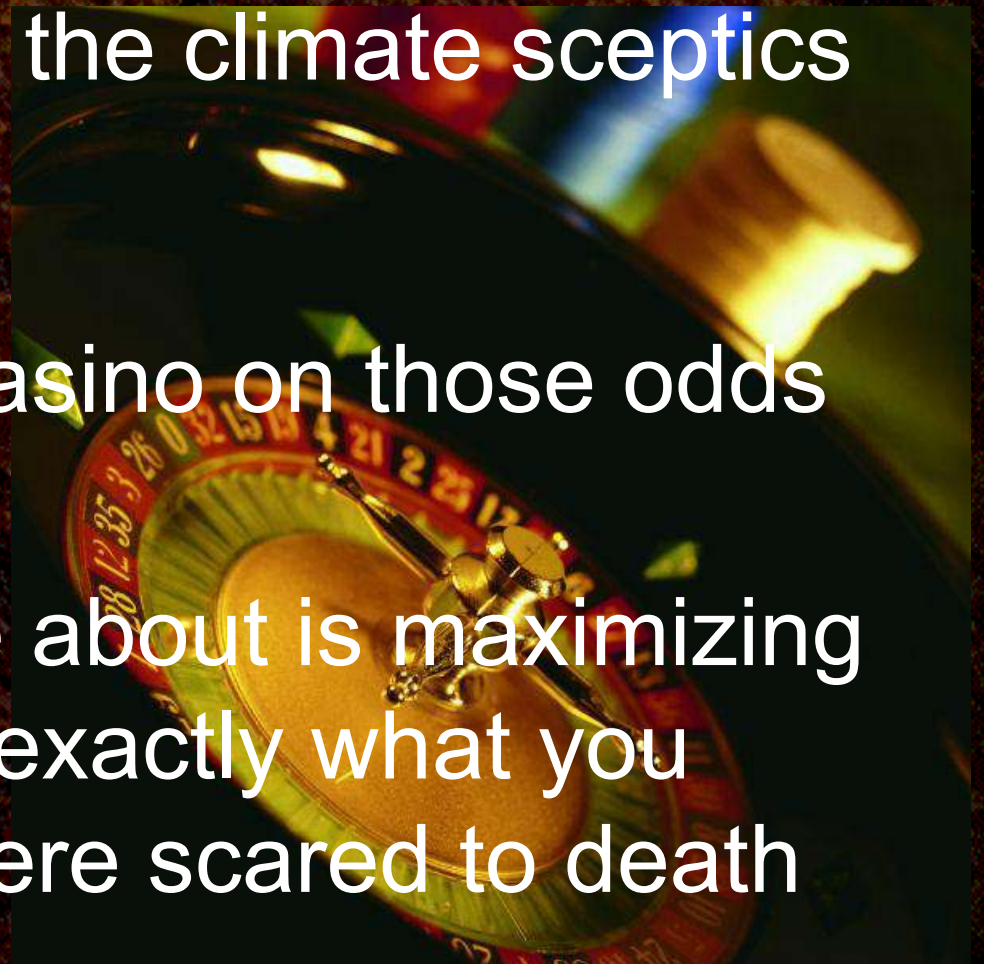


The science does not matter

Let's assume that the climate sceptics are right.

Don't go to the casino on those odds

If all that you care about is maximizing profit, you will do exactly what you would do if you were scared to death about climate



BY THE COAUTHOR OF THE BESTSELLING *NATURAL CAPITALISM*

"A must-read for entrepreneurs, industry investors, experts, and corporations."

—Jigar Shah, founder, SunEdison, and CEO, Carbon War Room

THE WAY OUT

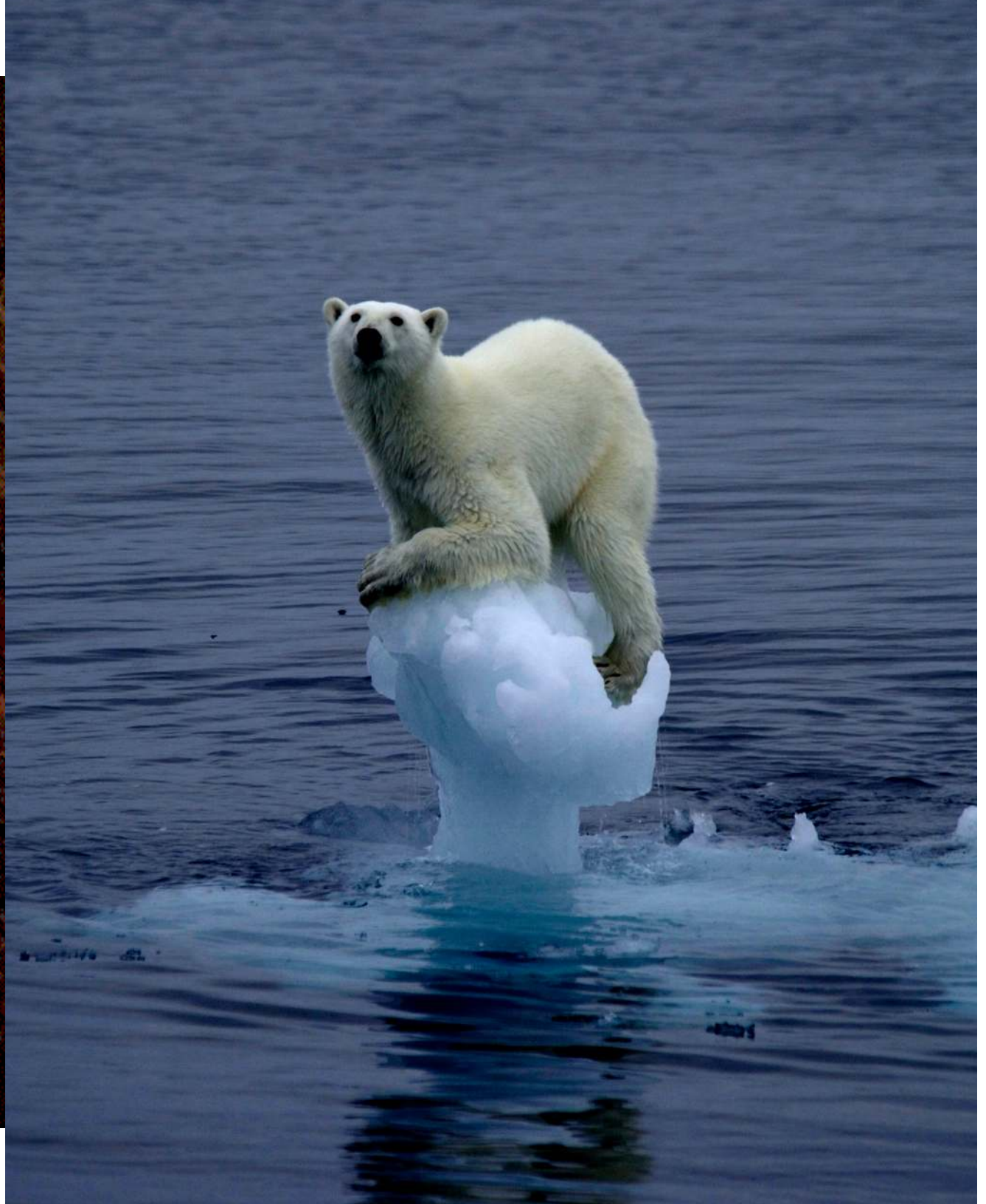
KICK-STARTING
CAPITALISM TO SAVE
OUR ECONOMIC ASS

L. HUNTER LOVINS
AND BOYD COHEN

The business case
for climate
protection

Sustainability
is not about
the plight
of these
guys . . .

It's about
business





2008 – 2012 leaders in reporting/
managing carbon emissions
information achieved 5.2% higher
return on equity, 18.1% greater
stability in cashflow generation,
and 1.6% higher growth –
twice the average total return vs
the Global 500 from 2005 - 2011

2013 CDP shows
how U.S.
businesses can
reduce emissions by
3%/ year.

Doing this will drive
savings of up to
\$190 billion per year
by 2020 and curbing
climate change.



Driving Profits Through
Carbon Reduction

6,300 computers and monitors in sleep or standby mode when not in use (24/7).

Authoritatively told five versions of "company policy" that IT updated software during off times and the machines needed to be left on.

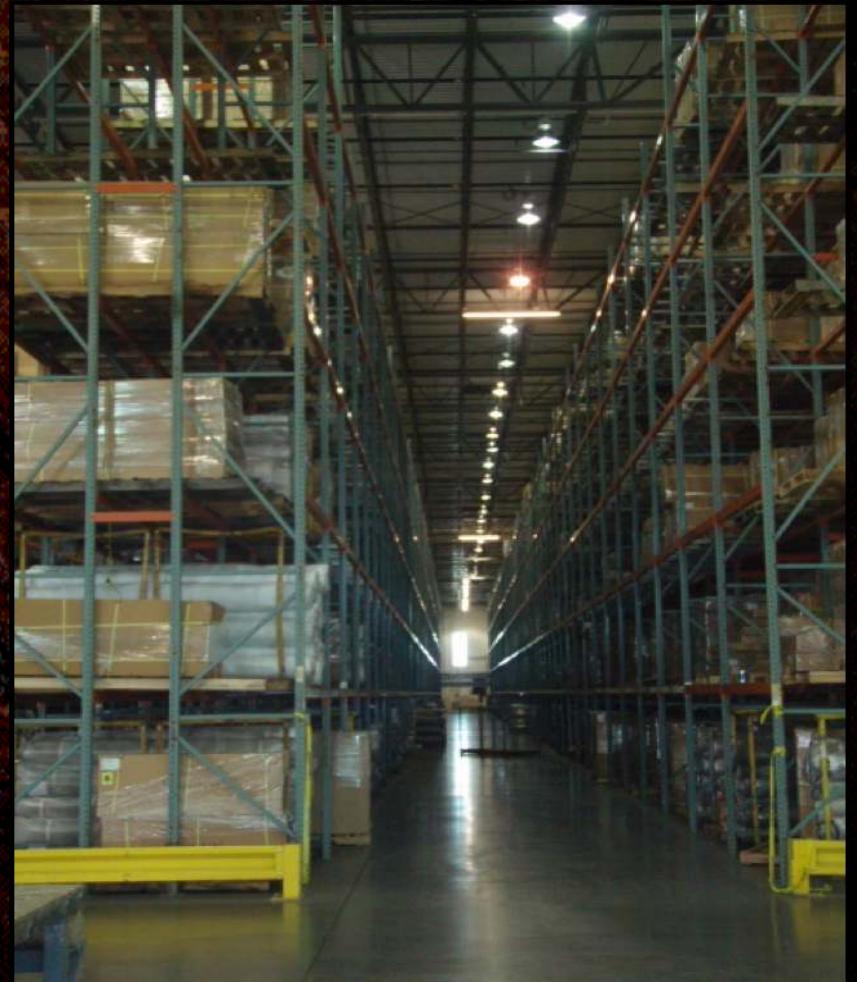
IT felt turning machines on and off reduced lifespan. Machine life was not affected by turning them off.

VERY conservative estimate of saved electricity leave machines on one evening a week for updates and turn them off at the end of the work day... \$700,000.

7M square feet DC with 500 Watt roof lights evenly spaced every 10 feet. Half the floor space was racks with boxes.

Most of this lighting was either unnecessary or redundant. Work areas had task lighting at the employee level.

Annual savings for shutting off the lights...
\$650,000.





We're at 32 GT/yr now, need to get to
14GT/yr by 2050

By 2020 we have to save 17 gigatons
of carbon annually to stay below 2
degrees C. and it would be better to
stay below 1.5 above historic levels

$$100 \times 100 = 10$$

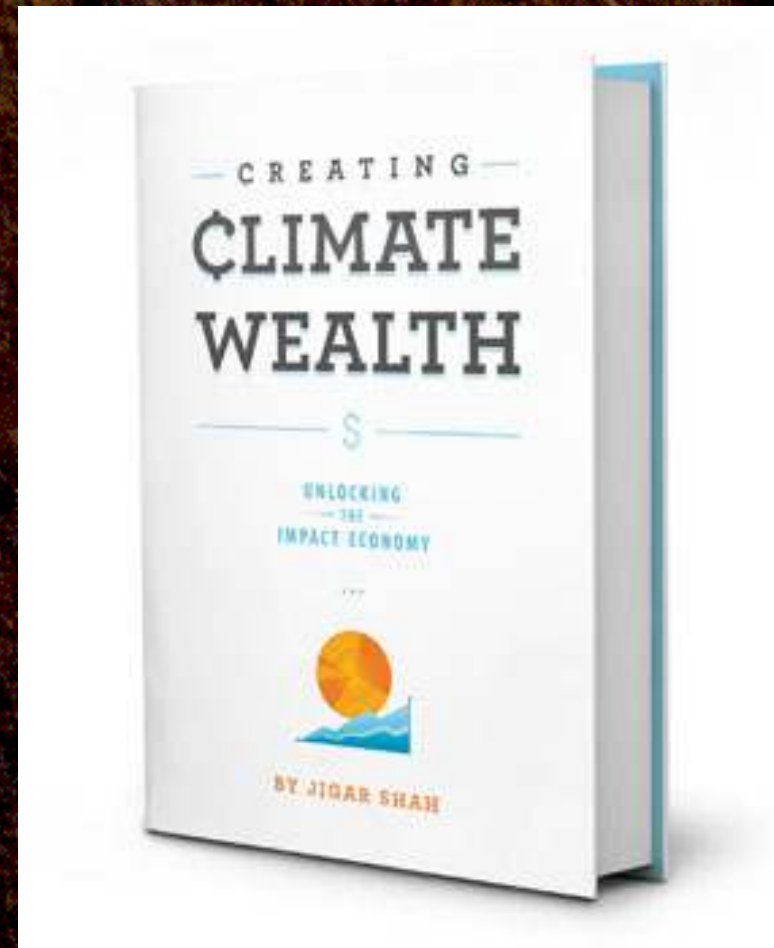
Creating Climate Wealth

Worldwide challenge to solve climate change. We need the equivalent of 100,000 companies to sell \$100 million worth of climate change solutions by 2020. Create a \$10 trillion economy.



Jigar's Climate Wealth Law

~50% of the greenhouse gas emissions will **always** be profitable to eliminate, due to continuous technology innovation – held up only by lack of effective business model and financial innovation.



First we shape the built environment, then it shapes us

Most of us spend 90% of our lives inside of buildings



70% of
electricity
consumption

30 - 60% of
green house
gas
emissions

Carbon War Room | Creating Climate Wealth



Join the Conversation



Contact Us

NEW REPORT: ENERGY EFFICIENCY: HOW TO CREATE CLIMATE WEALTH THROUGH EFFICIENT BUILDINGS

"TODAY WE ARE ON THE BRINK OF A SIGNIFICANT
ACCELERATION IN ADOPTION OF ENERGY
EFFICIENCY SOLUTIONS DUE TO MAJOR
TECHNOLOGICAL AND FINANCIAL INNOVATIONS."

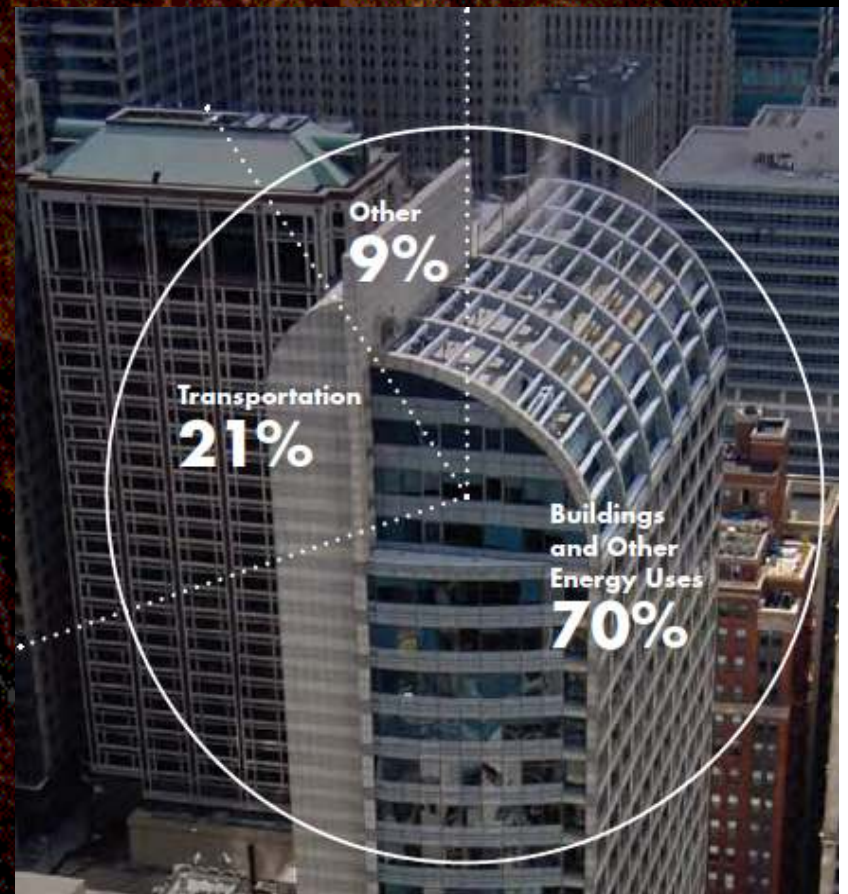
José María Figueres, President, Carbon War Room

Chicago

Goal to reduce GHG emissions to 25% below 1990 levels by 2020; 80% below 1990 levels by 2050

Buildings are the primary target, accounting for 70 percent of emissions.

Chicago is home to 300 wind and solar supply-chain companies and 18,000 related jobs, 13 wind-power corporate headquarters

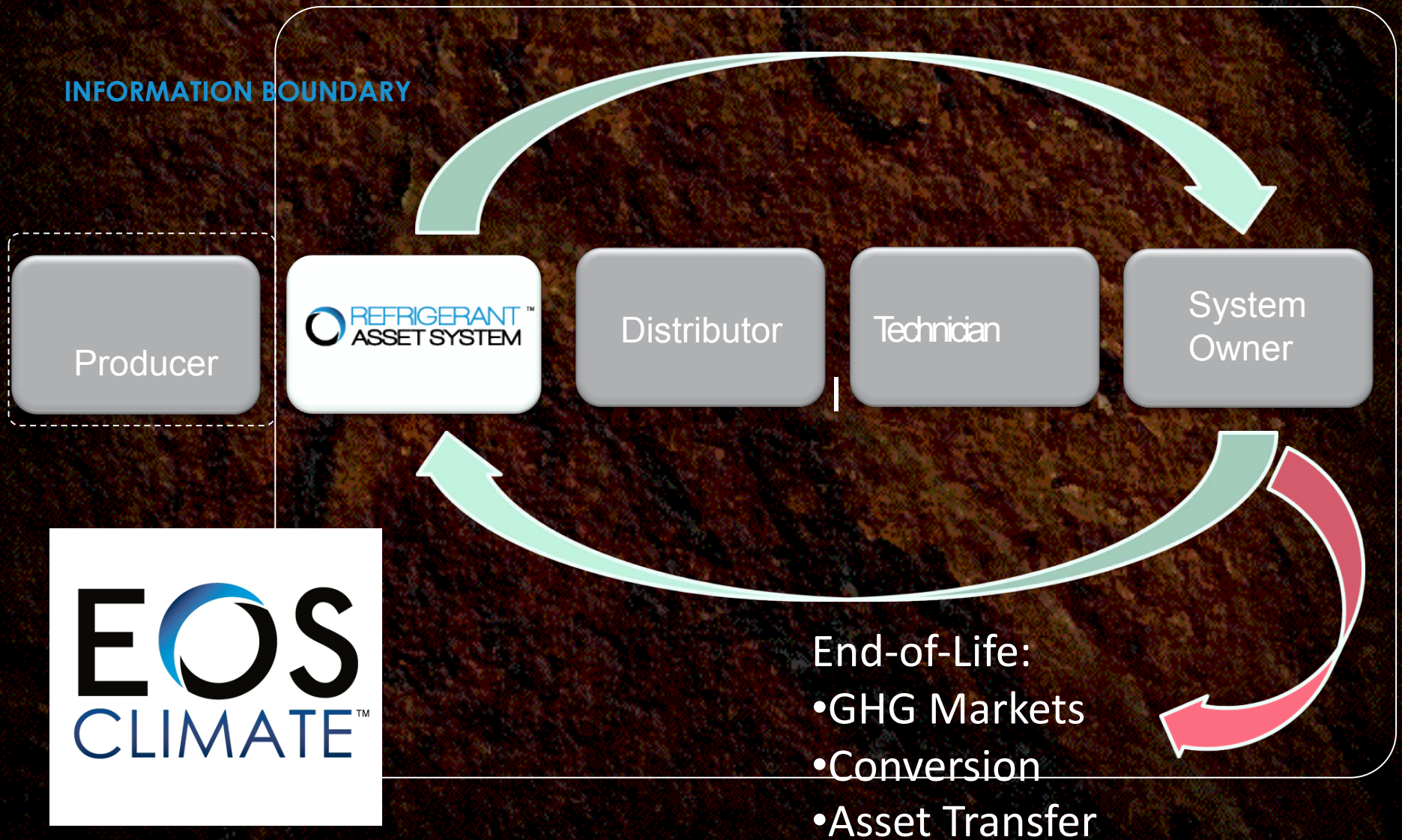


My kids



Recipients of CA's GEELA award – highest environmental award

Refrigerant Lifecycle : Closed Loop

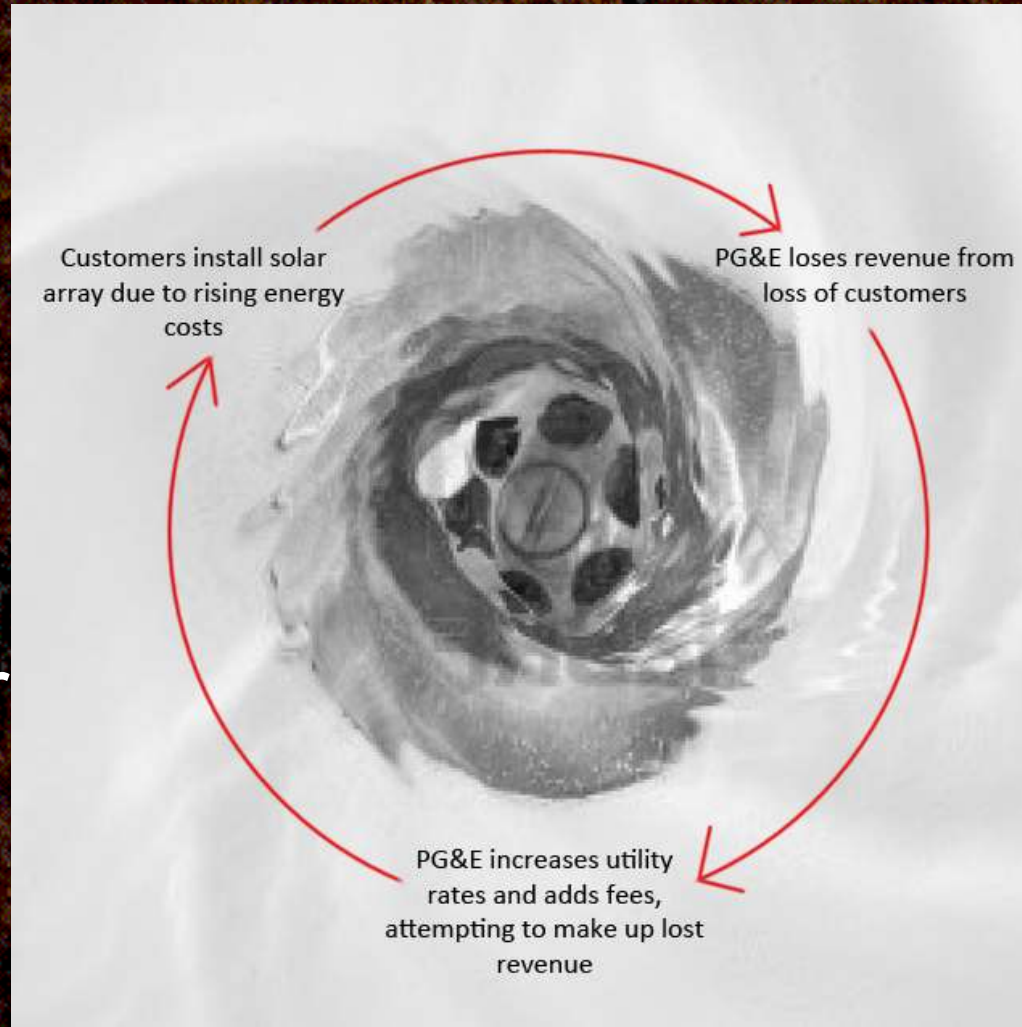


“Utilities are in danger of being FedExed, Chu said, like the Post Office got FedExed, as rooftop solar modules drop in price”



THE DEATH SPIRAL

Top 20 European utilities have lost \$600 billion in value over the past 5 years



Tesla is valued at more than half of GM – despite producing 300 times fewer cars





NY Reforming the Energy Vision

“Stresses and opportunities indicate that a **business-as-usual approach should no longer be considered the only cost-effective way** to meet our responsibility....

Demand management can be used not as a last resort but rather as a cost effective, primary tool to manage distribution system flows, shape system load, and **enable customers to choose cleaner, more resilient power options....**

Integrate energy-consuming equipment, as well as distributed generation and storage, fully into the management architecture of the electric grid....

Integrate DER as a primary means of meeting system needs.



Sustainability is happening



Harvard Business Review

“Sustainability isn't the burden on bottom lines that many executives believe it to be. It can lower your costs and increase your revenues. That's why sustainability should be a touchstone for all innovation.

In the future, only companies that make sustainability a goal will achieve competitive advantage. That means rethinking business models as well as products, technologies and processes.”

Why Sustainability is Now the Key Driver of Innovation

Sustainability pays

Companies in the Dow Jones sustainability Index outperform the general market

Goldman Sachs report July 2007: Companies that are leaders in environmental, social and governance (ESG) policies **outperform competitors in stock performance—by an average of 25%.**

72% of the companies on the DJSI outperformed industry peers



THERE IS NO
SILVER BULLET

BUT WE SURE
HAVE SILVER
BUCKSHOT



Distributed future is here



Wind is firm
power



Renewables Win

Solar added 1.7 GW in 2011, up 2x from 2010
3.3 GW in 2012 – 76% growth, prices fell 27%,
70% in last 3 years

39 GW in 2013, doubling every two years

Nuclear added 0 and coal decreased.



Japan added 9.5 GW of solar in 2013 – has a feed-in tariff

China is investing 2.4 billion in renewables, installed 14 GW solar 2013, 2014 projected

Plans to have 100 GW of wind, 21 GW of solar and 13 GW of biomass power installed by 2015

70+% of new power generation capacity added between 2012 and 2030 will be from renewable technologies.

World now nearing 100 GW solar



Wind is the 2nd fastest growing energy supply technology in the world:

37 GW in 2009, 32 GW 2010

Now 237 GW, 40 GW new 2011

Costs less than coal in good sites



Researchers at Stanford have shown that the US and indeed the world can meet its needs with 100% renewable energy.



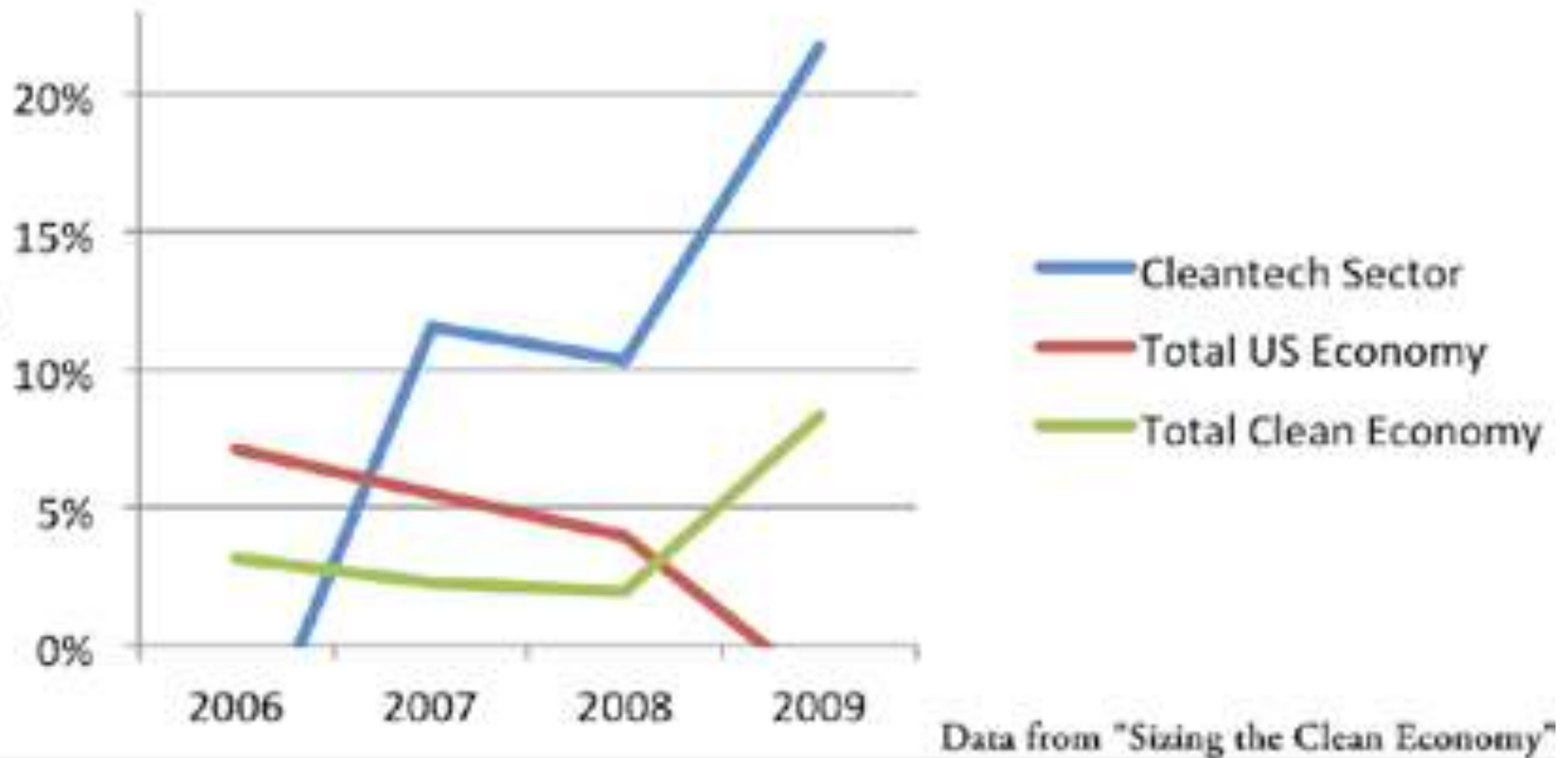
Renewables and efficiency get results quicker than through pipelines and offshore drilling.

The background of the slide is a photograph of a landscape with several white wind turbines. The turbines are situated on a dry, brownish hill. The sky is a vibrant blue with scattered white clouds. The text is overlaid on the upper half of the image.

There are no technological or economic barriers to converting the entire world to clean, renewable energy sources. It is a question of whether we have the societal and political will.

– Mark Jacobson
Director, Atmosphere/Energy Program
Stanford University

Jobs Growth Annual Rate



Regenerative Energy Economy in U.S.

Employs almost 3 million - more than fossil fuel

Outperformed general economy in recession

Offers better opportunities, higher pay for low and middle skilled workers median wages 13% higher

2012 solar jobs increased 13.2%, 17.2% in 2013

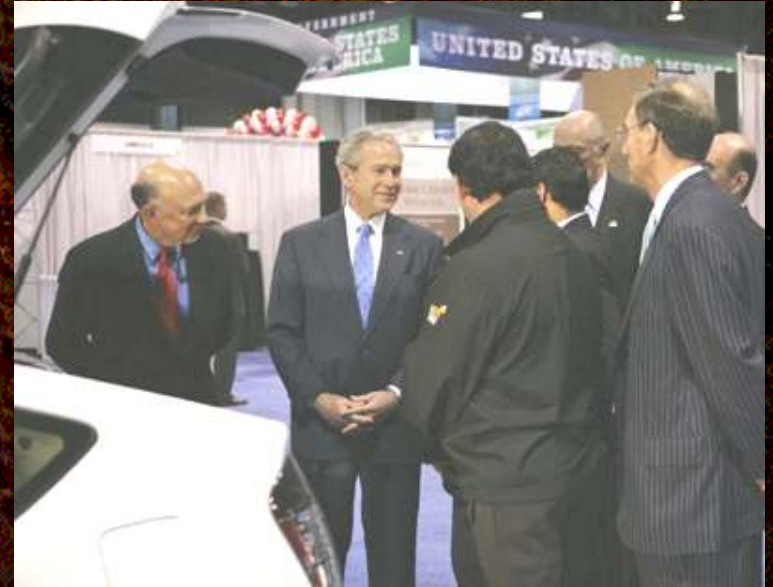
Green jobs increased five times faster than jobs in any other industry



Not a left or a right
issue

R. James Woolsey's solar
powered plug-in-hybrid
has a bumper sticker
reading:

"Osama bin Ladin hates
my car."



Great Green Fleet

Navy Secretary Ray Mabus: "We simply have to figure out a way to get American-made, home-grown fuel that is stably priced, that is competitive with oil,"



MH-60 chopper flying on 50-50 algae/ grease biofuel and petroleum fuel



Deploy a biofuel-burning carrier group by 2016 and require the Department of the Navy to get half of its energy from alternative sources by 2020.



USS Ford frigate used 25,000 gallons to sail 12,000 miles from
Everett Wash to San Diego – no difference in performance
Solyazyme and Dynamic Fuels



F-18 Green Hornet flying on Sustainable Fuels' oil seed fuel/ jet fuel mix – 60 – 75 million barrels of jet fuel/ year

The second mouse gets the cheese





Bard MBA
IN SUSTAINABILITY

- Pioneering Class enrolled fall 2012
- MBA in Sustainability in New York City
- All courses fully integrate sustainability
- NYC as living laboratory
- 2 year, hybrid program (1x month residencies and online courses)

Katie Van Sant

www.bard.edu/mba

mba@bard.edu

Invest vs divest

Investors with \$3 trillion are pressuring fossil companies to prepare for decline in demand and square their business model with carbon bubble

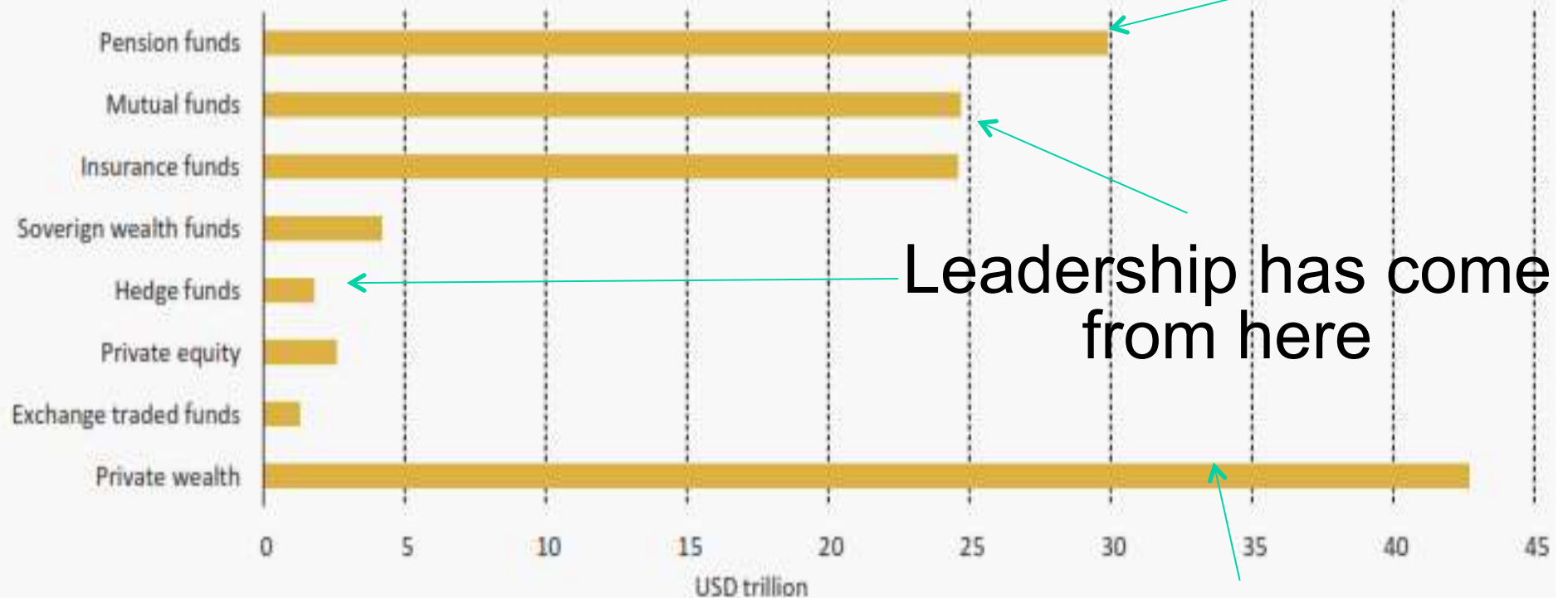
70 major investors led by CERES, Carbon Tracker ask 45 fossil firms to rethink investment in increasing supply to avoid stranded asset.

“Carry out risk assessment of the consequences of a global move to cut GHG by 80% by 2050”

HSBC: in world where GHG constrained, fossil co's lose 40 – 60% of market cap

There's plenty of money

Everyone is focused here



Leadership has come from here

Everyone should be focused here

Note: Approximately one-third of private wealth is invested in pension and mutual funds.
Source: OECD Global Pension Statistics and Institutional Investors database.



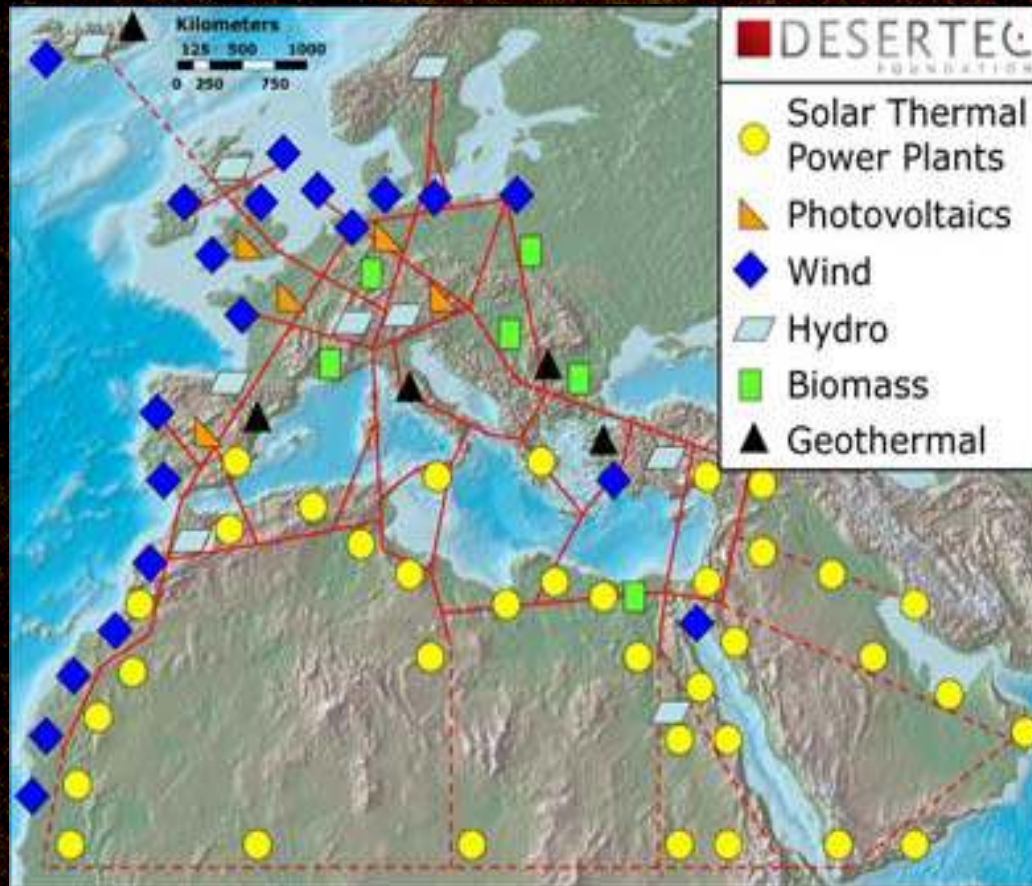
Natural Capitalism Solutions

ELDORADO SPRINGS, C O L O R A D O

FreeStockPhotos.com

www.natcapsolutions.org

European/Middle East needs



Power equal to the total present usage of the EUMENA region power could be generated covering less than 0.3% of the Sahara Desert with CSP plants. DESERTEC Foundation proposes a supergrid from Iceland to Arabian peninsula, from Baltic to west coast of Africa, in which offshore

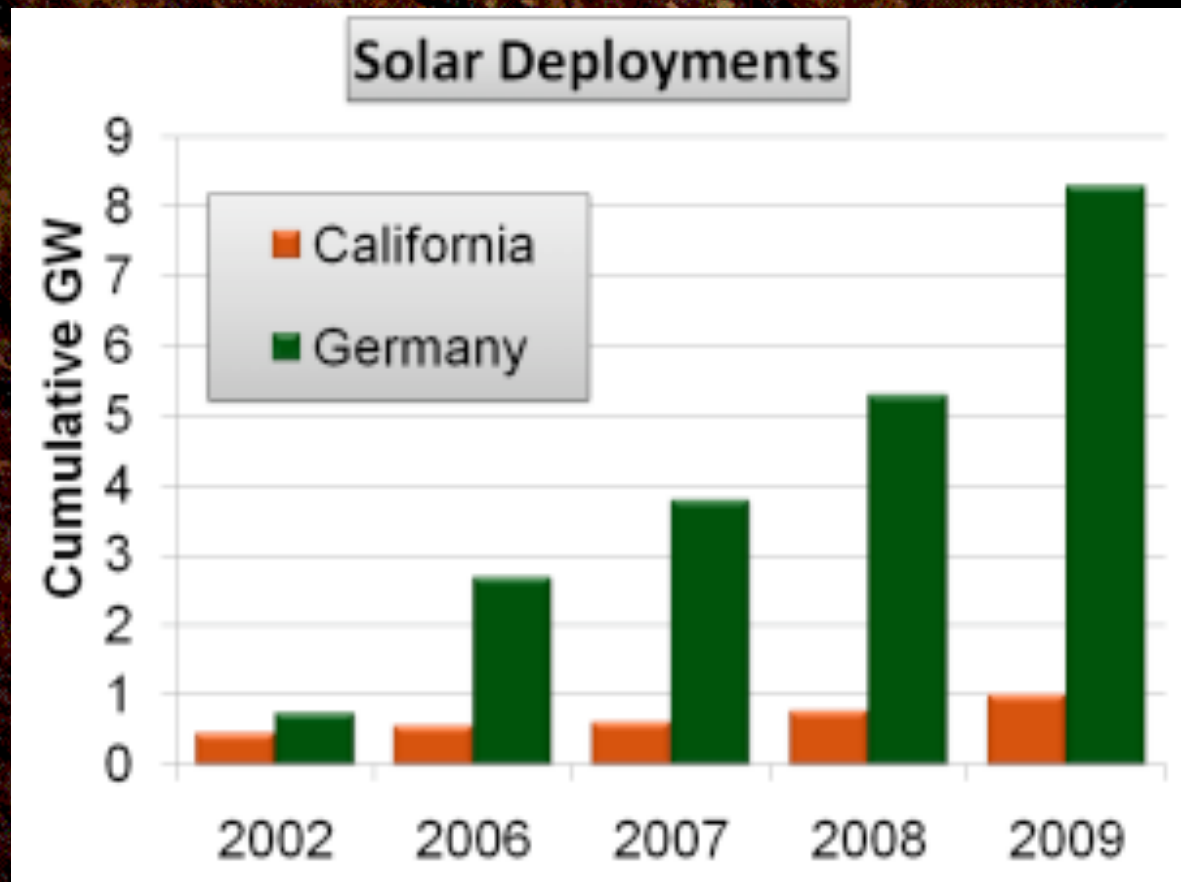
wind and wave farms, photovoltaic sites, tidal stream generators, biomass, geothermal and hydroelectric stations would unite with desert CSP arrays to meet the region's actual daily and hourly demands over an HVDC network

Solar deployment – policy matters

California receives 70% more sunlight for producing solar energy than Germany.

But 2012 Germany installs 28 times more solar electric capacity every year

Will be 100% renewable by 2050



The Economics of Feed-in Tariffs

Deutsche Bank Study: FiTs gave Germany the lead in renewable energy production.

FiTs created 500,000 new jobs

FiTs cut the unit cost of solar panels 30 percent in 2009 enough that they could pay for themselves within five to seven years, and reach grid parity (costing the same as grid electricity) by 2013.

FiTs drove German economic regeneration, enabling Germany to pay its own citizens to produce, install and maintain their own renewable energy systems, instead of buying imported fossil fuels. The program cost of €2 - 3 per month (\$50 to customers' electricity bills each year) to electricity bills in Germany (a total of €8.6 billion.)

Deutsche Bank: The savings created by FiTs exceeded total cost of payments made by households.

Had customers bought electricity from conventional generation and paid the costs of fossil fuel generation Germans would have paid over €9.4 billion.

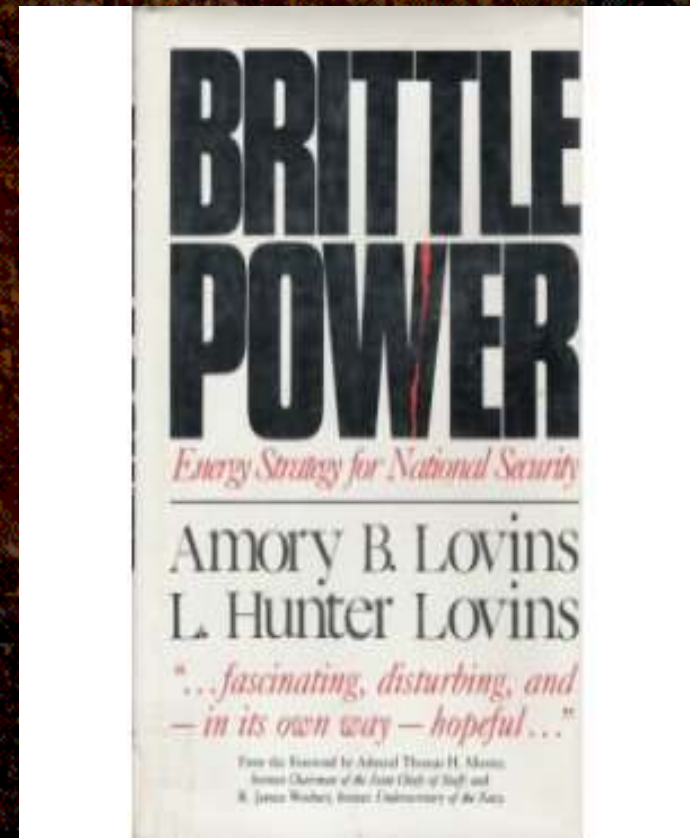
Dardesheim, Germany - 100% renewable



Wildpoldsried produces
321% more energy than it
uses; makes \$5.7 million
each year



The future may be much more brittle



17 transformers shot out in 19 minutes – dress rehearsal?



Da

Mary



Da

Mary