

2015

Your Future in the Anthropocene

Hunter Lovins

Natural Capitalism Solutions

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NATURAL CAPITALISM SOLUTIONS



YOUR FUTURE IN THE ANTHROPOCENE

Welcome to the Anthropocene



We are the first generation to to have dominion over the earth

Campus sustainability

26 million hits on campus sustainability

739+ campuses are members of AASHE
162 Associate members



I'M LOOKING FOR HELP ON THIS, VIRTUAL TEAM...

VIRTUAL TEAM MANAGER

Function

IT'S NOT IN MY P & L.

Country

IT'S NOT IN MY OBJECTIVES.

Product Group

I'D LIKE TO HELP, BUT...

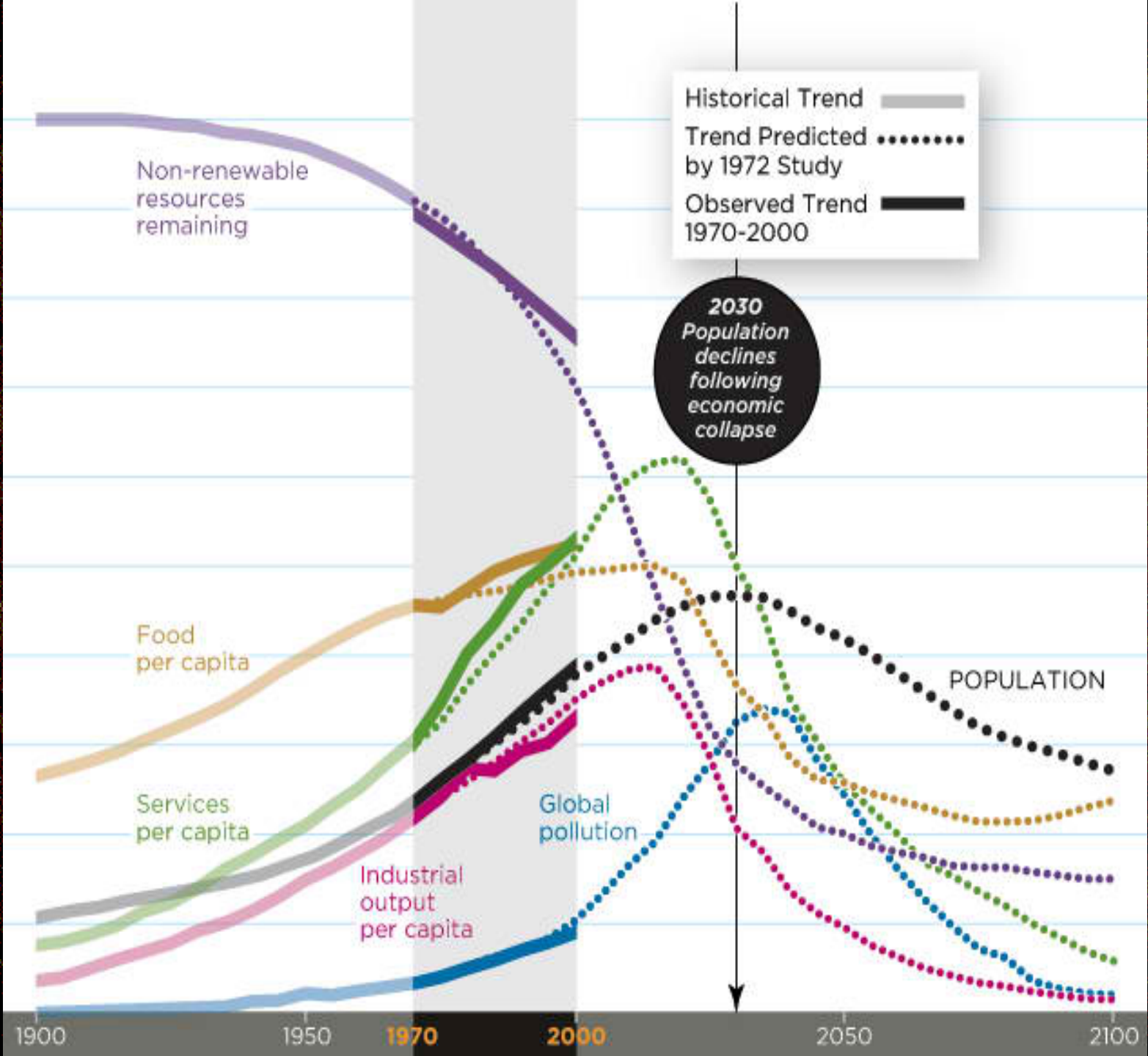
Traditional silos getting in the way?

I am a professor of a discipline
that did not exist when I went to
college





The word sustainability entered the English language the year I graduated college



Non-renewable resources remaining

Food per capita

Services per capita

Industrial output per capita

Global pollution

POPULATION

1900

1950

1970

2000

2050

2100

Research Paper Series

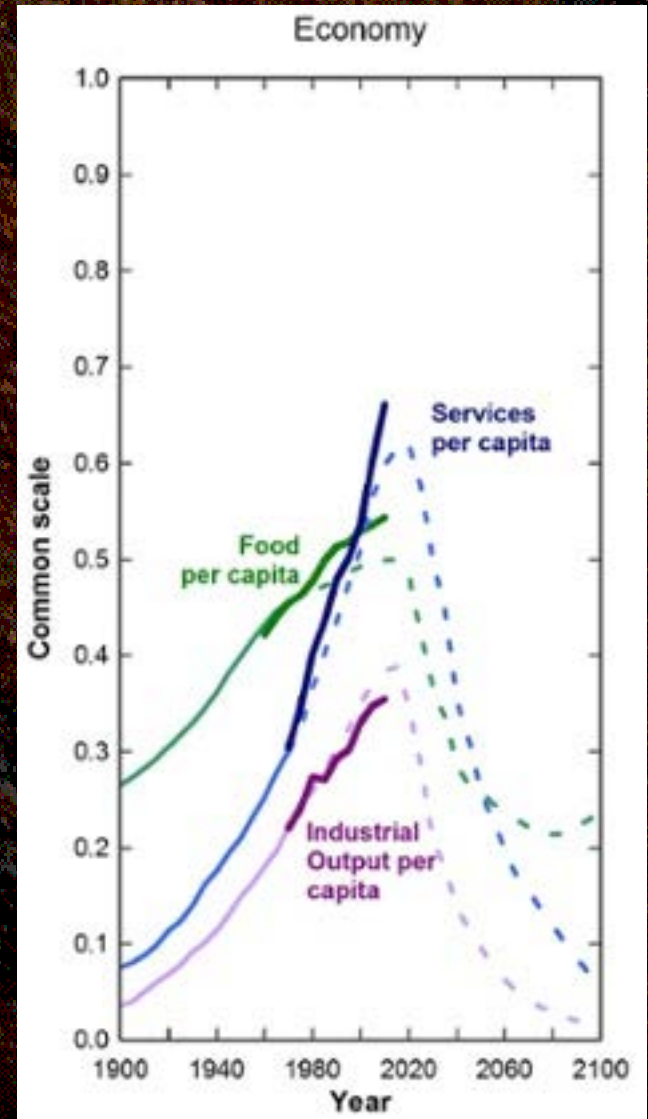
IS GLOBAL COLLAPSE IMMINENT?

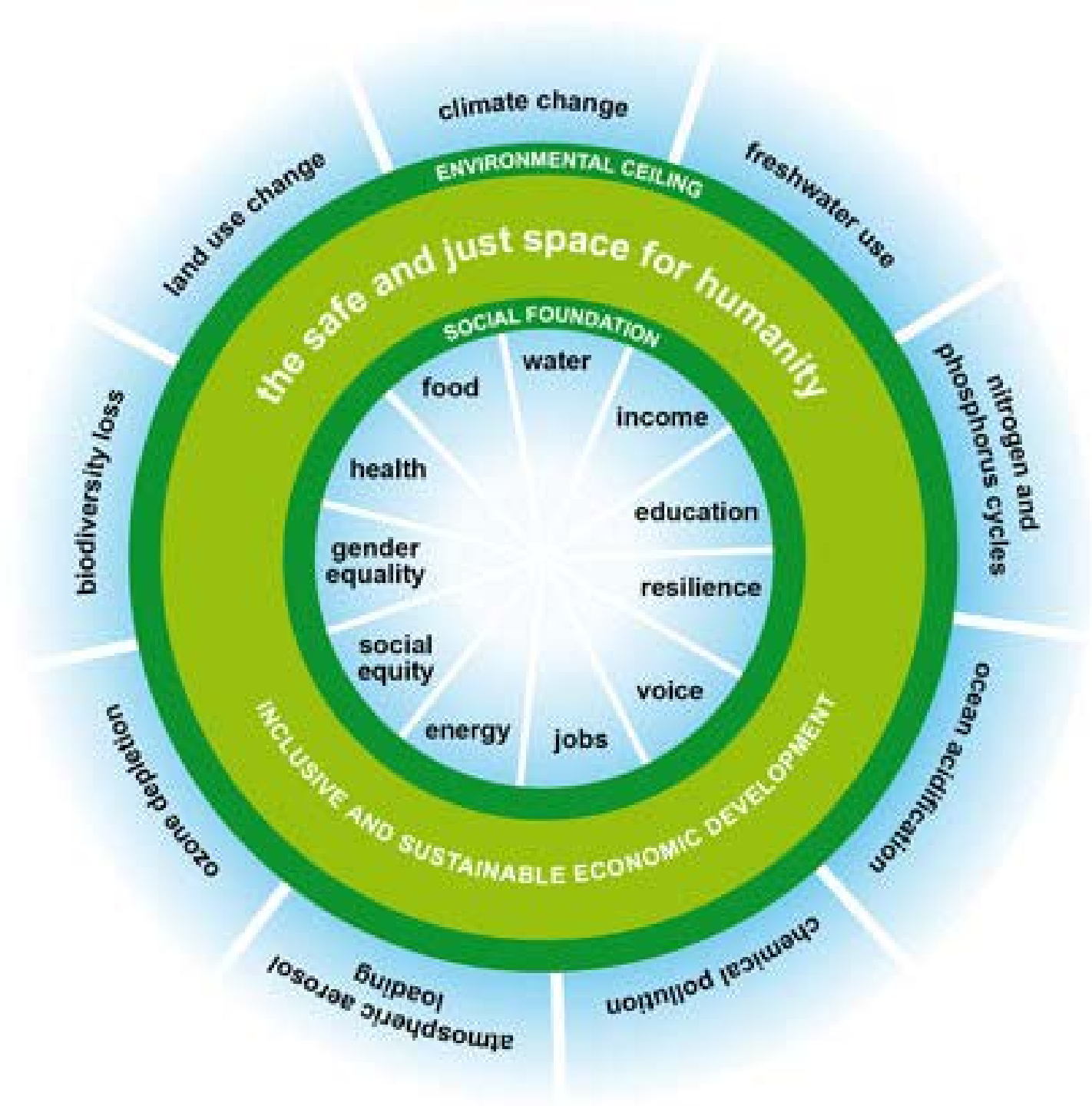
GRAHAM TURNER



MELBOURNE SUSTAINABLE
SOCIETY INSTITUTE

Replicated & verified Limits graphs

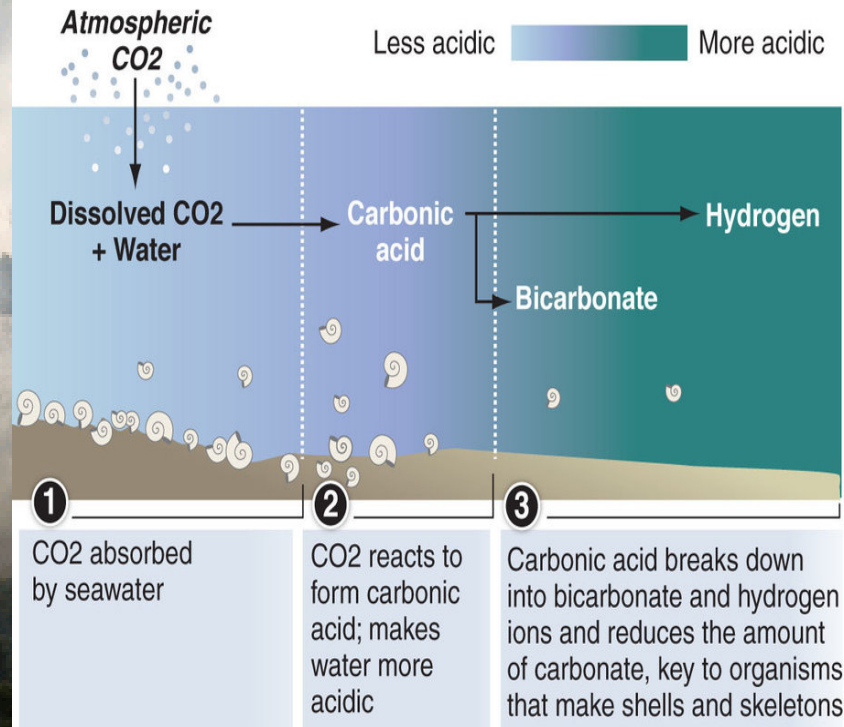




Global Biodiversity Outlook Three -

Oceans turning acidic

Higher carbon dioxide (CO₂) emissions from human activity are acidifying the oceans and could harm everything from plankton to whales.



How acidity affects marine life

- Depletes oceans of compound that clams, coral, plankton, other creatures need to build shells, skeletons
- Fish, other organisms can develop metabolic, immune, reproductive problems
- Kills off food for animals at higher end of food chain

What is campus sustainability?

campuSUSTAINABILITY
INITIATIVE

Campus
Sustainability
Day 8

October 20, 2010



Campus 
Sustainability

The
Path to a
Greener Future

It is NOT recycling

It is NOT natural gas cogeneration

It is NOT campus sustainability days

Walled off: How the Ivory Tower shuts out campus sustainability.



Justice,
Diversity
Inclusion
Transparency
Accountability
Openness

What are you invested in?

Divestment

43 SWARTHMORE STUDENTS AND ALUMNI ARE SITTING IN FOR FOSSIL FUEL DIVESTMENT.



SWARTHMORE: WHOSE SIDE ARE YOU ON?

#WHOSIDESIDE





“Climate change has become the human rights challenge of our time, responsible for many of the challenges that the impoverished face, including loss of life, lack of fresh water, the spread of disease and rising food prices.”

Climate change hurts the poorest first





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. 20 billion dollar storms

2014 only \$8 billion

Climate change in CA: \$7.4 billion lost in 2014

DROUGHT COMPARISON

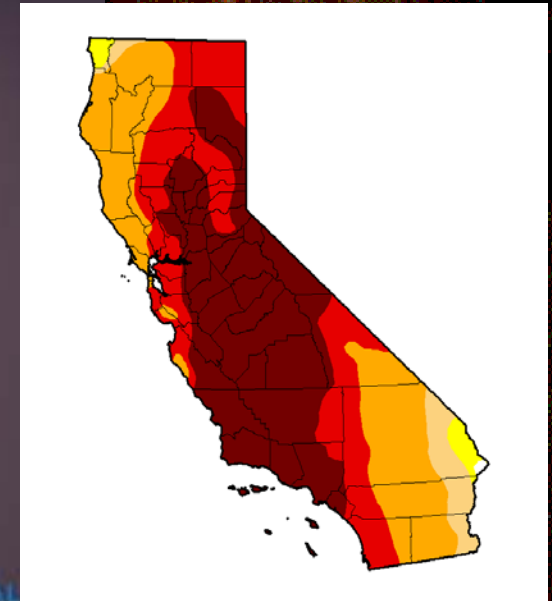
April 2, 2013

April 1, 2014



Data: NDMC, USDA, and NOAA

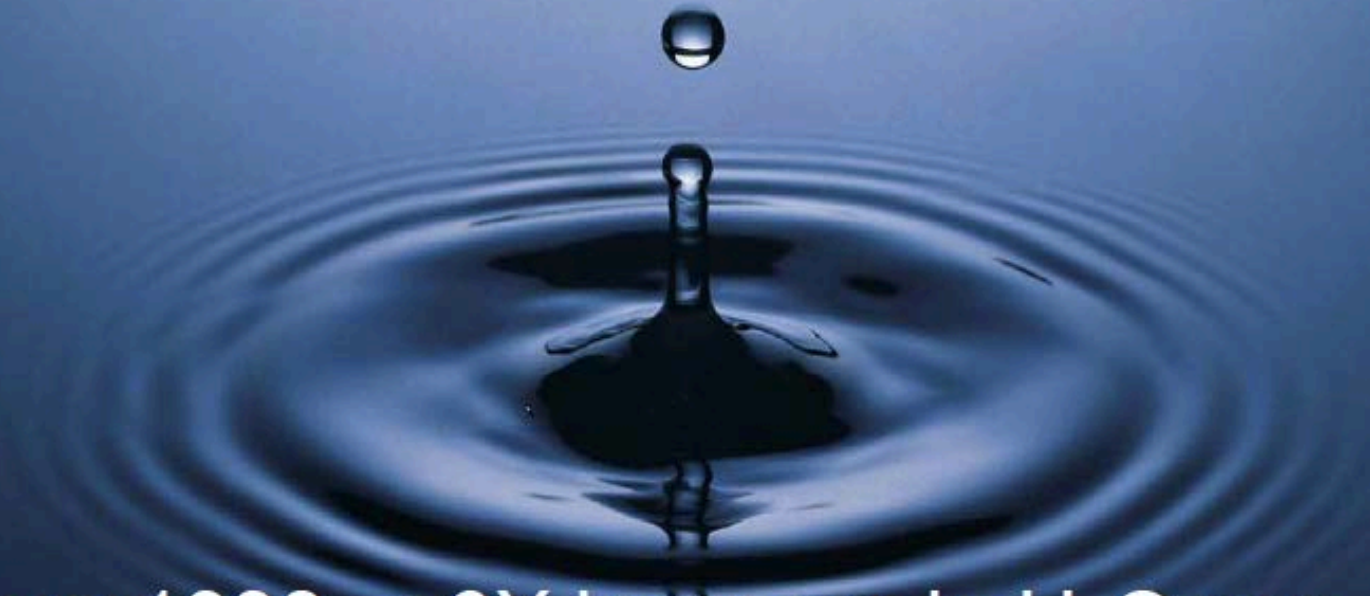
CLIMATE CENTRAL



“By the end of the century, the nation's ‘salad bowl’ could be a dust bowl. We’re looking at a scenario where there’s no more agriculture in CA. I don’t see how their cities can keep going”

WATER: THE OIL OF THE 21ST CENTURY

Worldwide H₂O usage doubling every 21 years



Since 1900, a 6X increase in H₂O use

Rising standards of living

Unsustainable levels of irrigated agriculture

Unsustainability Drove the Financial Collapse

Unsustainable business practices contributed to the economic collapse, which will not be resolvable until these more fundamental issues are addressed

“People seem blind to the fact that the causes of the economic collapse are exactly the same as those behind today's ecological crisis – and behind accelerating climate change in particular.”

- Jonathan Porritt, Forum for the Future
quoting Sir John Beddington

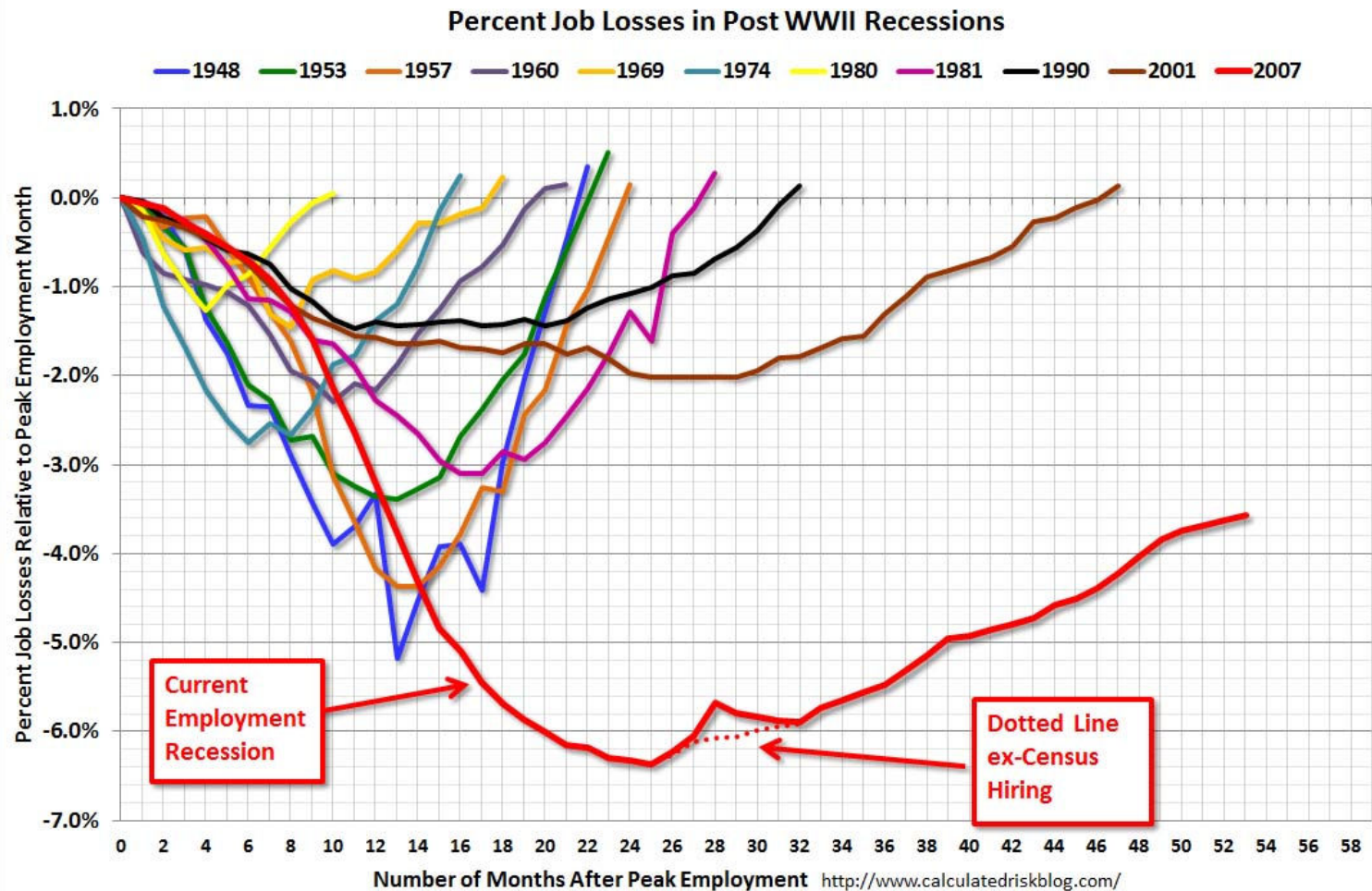


2007/ 2008 Great Recession:

\$50 trillion dollars gone

80 million jobs evaporated

WHO KILLED
BEAR STEARNS?



2014: 3.8 million long-term unemployed in US
 Real unemployment now 37.2%
 23 million on foodstamps – record number

The image features a close-up of the Goldman Sachs logo, which is rendered in a metallic, three-dimensional font. The logo is mounted on a light-colored wall. To the left of the logo, a portion of the American flag is visible, showing the stars and stripes. The background is slightly blurred, showing a tiled wall above the logo. The overall lighting is somewhat dim, with a slight glow around the logo.

Goldman

The 10 largest banks in the United States are bigger today than they were before a taxpayer bailout following the 2008 financial crisis.

“We don't fully understand what is happening to advanced economies”



WORLD NEWS

Bankers say they are flying blind

IMF mood

Experts do not fully understand what is happening in advanced economies, writes **Chris Giles**

Growing concern at the International Monetary Fund over the long-term side-effects of interest rates close to zero came as some of the leading figures in central banking conceded they were flying blind when steering their economies.

Lorenzo Bini Smaghi, the former member of the European Central Bank's executive board, captured the mood at the IMF's spring meeting, saying: "We don't fully understand what is happening in advanced economies."

In this environment of uncertainty about the way economies work and how to

Bank of England, added that "there is the risk of appearing to promise too much or allowing too much to be expected of us".

It is troubling for monetary policy experts that their crisis-fighting tools – rates stuck at zero, money printing operations to bring down longer-term interest rates and encourage private sector spending, and efforts to calm financial market fears – might have nasty side-effects.

The central bankers were clear that they had got it wrong before the crisis, allowing themselves to be lulled, by stable inflation, into thinking they had eliminated financial vulnerabilities. Speaking to the IMF's conference on rethinking global macro-economies, Janet Yellen, vice-chairman of the Federal Reserve, said: "In the years before the crisis, financial stability became a 'junior partner' in the monetary policy process, in contrast with its traditional 'lead role'." The

same mistake in their efforts to secure a recovery. Might they be storing up financial distortions which will bite in the future?

The IMF was clear in its global financial stability report that it did not want to see an end to the extraordinarily loose monetary policy being implemented across rich countries. José Viñals, its head of financial stability, said central banks' efforts were "absolutely necessary". But the fund urged countries to use the breathing space offered to repair financial systems and also to address the unintended consequences.

It cited three new risks that were all potentially associated with easy money. In the US it sees lax underwriting standards on corporate borrowing at a level normally associated with a late stage in a boom-bust credit cycle. It also

sees easy money policies spilling over to emerging economies, particularly in the form of foreign currency borrowing by emerging market corporates, leaving these companies vulnerable to foreign currency risks and emerging markets sensitive to hot money international capital flows. Third, it worries that the exit from monetary easing could lead to a spike in market interest rates that could destabilise credit markets and the US economy.

"Put simply, we are in uncharted territory," said Mr Viñals. Central bankers are divided on the relevance of such concerns. While Mr Bini Smaghi said central bankers had become cornered into ever more exotic monetary experimentation, Ms Yellen sought to reassure her audience that the Fed was getting the balance right. "I don't see pervasive evidence of rapid credit growth, a marked build-up in leverage, or significant

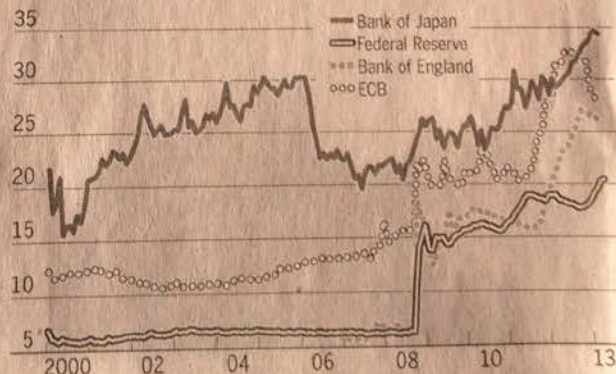
But there are signs that some parties are reaching for yield, and the Federal Reserve continues to carefully monitor this situation," she said.

The problem outlined by Sir Mervyn was that the uncertainty is so pervasive that no one can be sure that the expansionary monetary policy is appropriate in a world where nations are learning they are poorer than they expected, but are not sure by how much. How can we be sure "we really are [not] running the risk of reigniting the problems that led to the financial crisis in the first place?" Mr Bear asked the IMF panel.

His question underpinned the fear that the abilities economies have been damaged that expansionary policy is likely to go on too long as central banks and governments seek to recover lost ground. Central bankers were not worried that monetary policy already gone too far, they were nervous the

Central bank balance sheets

Assets (as a % of GDP)



Markets & Investing



**Stephen
Roach**

INSIGHT

How zombie US consumers menace the world economy

The global economy is being hobbled by a new generation of zombies, the economic walking dead. The US consumer is in the

After 9-11



The US economy is 70% dependent on consumption



Over consumption in the North

Product	Expenditure	Economic goal	Investment needed to achieve goal
Makeup	\$ 18 billion	Reproductive health care	\$ 12 billion
Pet food- EU and US	\$ 17 billion	Elimination of hunger and malnutrition	\$ 19 billion
Perfumes	\$15 b	Universal literacy	\$ 5 b
Bottled water	\$ 35 b	Clean drinking water for all	\$ 10 b
Ice cream in EU	\$ 11 b	Immunizing every child	\$ 1.3 b

- 2002 : 41 million passenger vehicles produced (5 x more than in 1950)
- Global passenger car fleet = 531 million vehicles, growing by 11 million vehicles annually



B. Smaller

"What would you suggest to fill the dark, empty spaces in my soul?"

Figure 1 Income and happiness in the USA

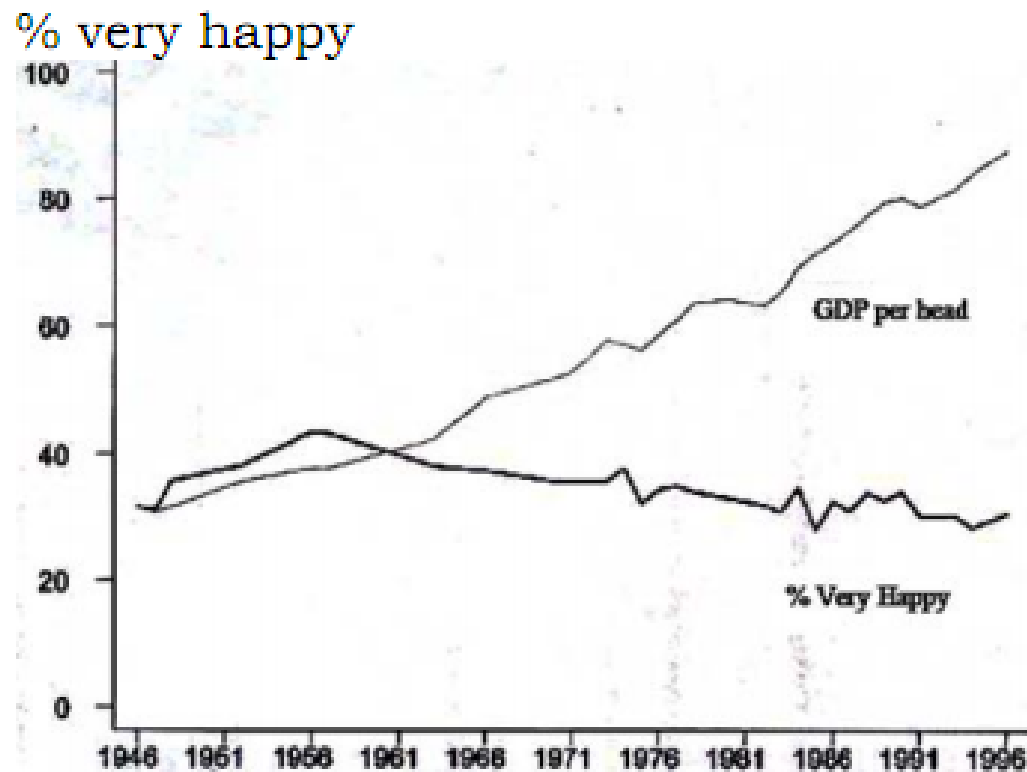


Figure taken from Layard (2005)

GDP = Gross Domestic Product, which is the total value of the annual amount of goods and services produced within a country, regardless of whether they are produced by its citizens.

Poverty is not an accident.
Like slavery and apartheid,
it is man-made and
can be removed by
the actions of
human beings.

- Nelson Mandela







**AUSTERITY
AHEAD**

Many other conventional economic ideas – as currently implemented – are also making the problems worse

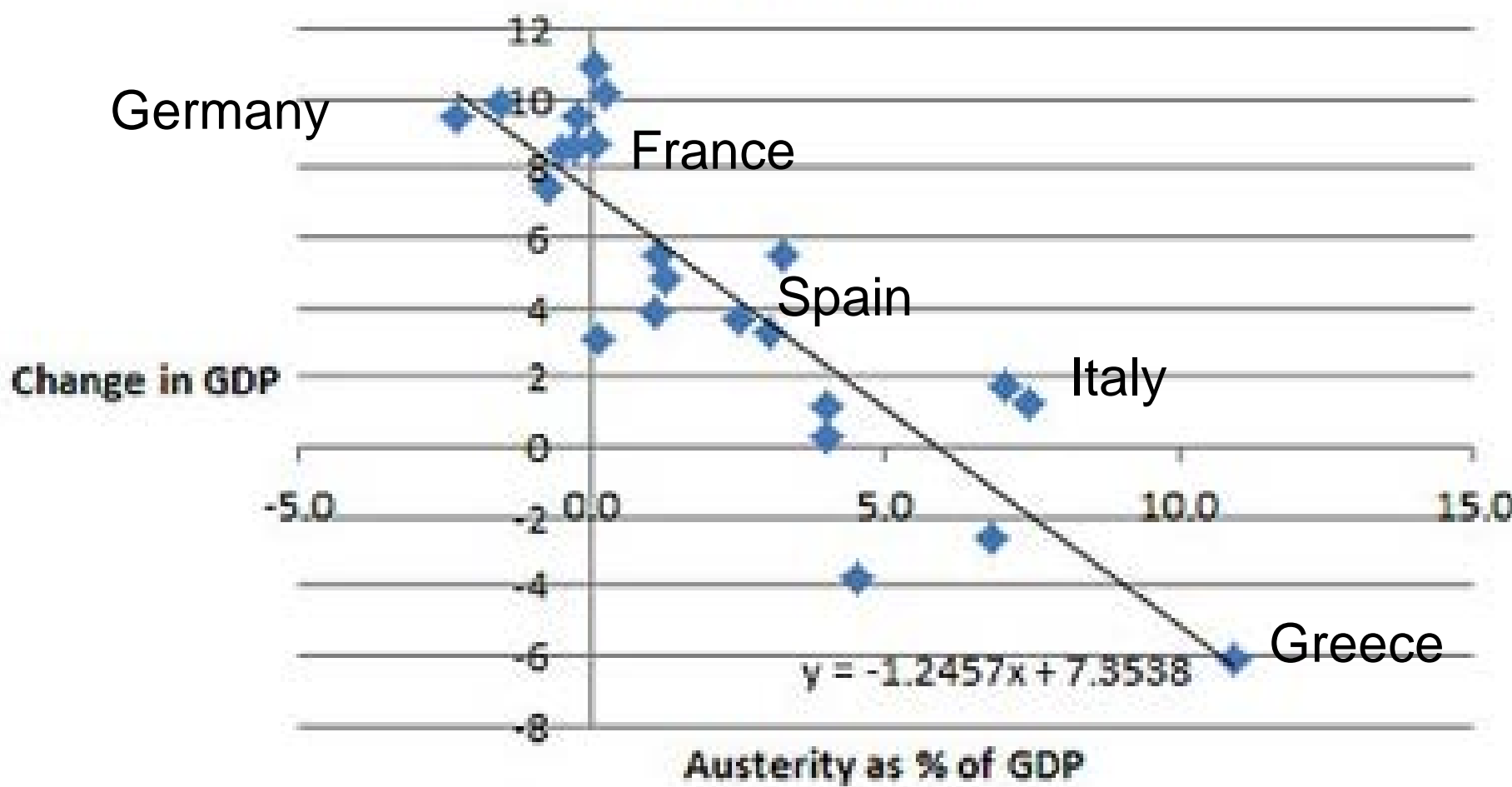
Conventional economic thinking	What happens in practice
Austerity reduces debt	Austerity increases unemployment and inequality
Low interest rates encourage people to invest in the economy	Low interest rates reduce government borrowing costs and increase bank profits
Low taxes boost growth by increasing spending and investment	Low taxes increase inequality
Markets create competition	Markets create monopolies
Small government is better	Small governments cannot solve big problems
Free trade increases average living standards for everyone	Free trade benefits the rich and makes it impossible for developing countries to compete in almost everything other than resources



Collapse of the Euro?



Austerity and growth





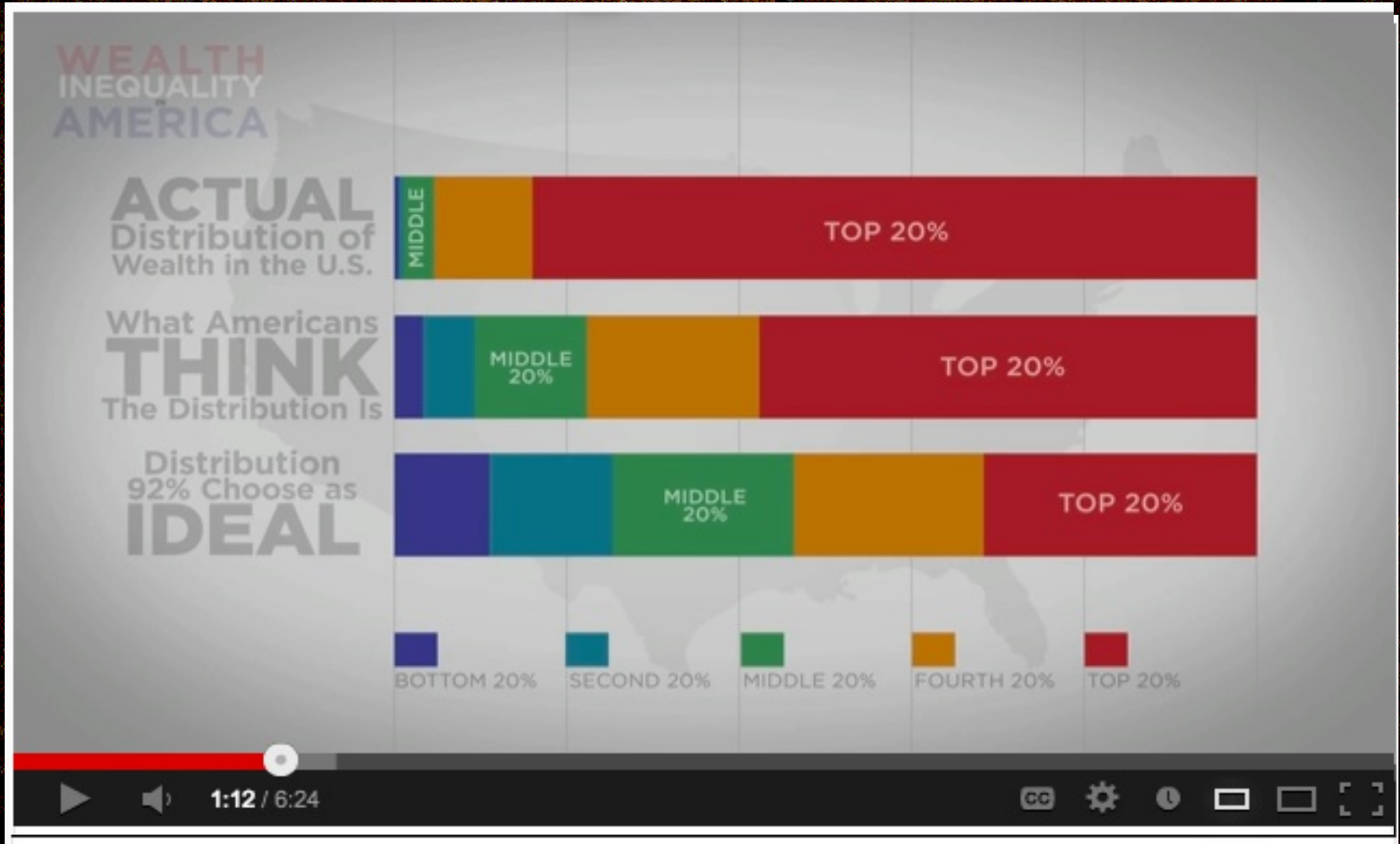
THE
85 RICHEST
PEOPLE
OWN THE SAME
WEALTH AS THE
3.5 BILLION
POOREST PEOPLE.



OXFAM

Almost half of the world's wealth
now owned by just one percent of
the population

Inequality



Growth Of Family Income

+261%



1947-1979 Source: United for a Fair Economy (www.FairEconomy.org): Based on analysis of US Census Bureau data
 1980-2007 Source: Congressional Budget Office, Average Income Pretax (www.cbo.gov): 2007 Dollars

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Health and Social Problems are Worse in More Unequal Countries

Index of:

- Life expectancy
- Math & Literacy
- Infant mortality
- Homicides
- Imprisonment
- Teenage births
- Trust
- Obesity
- Mental illness – incl. drug & alcohol addiction
- Social mobility



CEO to
worker
pay
ratios

COUNTRY	RATIO OF PAY CEO VS. AVG WORKER
JAPAN	11:1
GERMANY	12:1
FRANCE	15:1
ITALY	20:1
CANADA	20:1
SOUTH AFRICA	21:1
BRITAIN	22:1
MEXICO	47:1
VENEZUELA	50:1
UNITED STATES	475:1

The
Rising
Economic
Tide...

ENCORE
HORSEY
© 2008
DORLAND



PROFITS
ARE UP! MY
COMPENSATION
HAS DOUBLED!
LOOK AT ME!
I'M WALKING
ON WATER!



WAGES ARE FLAT...
MY BUYING POWER
IS SHRINKING...
I'M NOT EVEN
TREADING WATER!

Capital in the Twenty First Century

700 page tome for many weeks number one best seller on Amazon.com

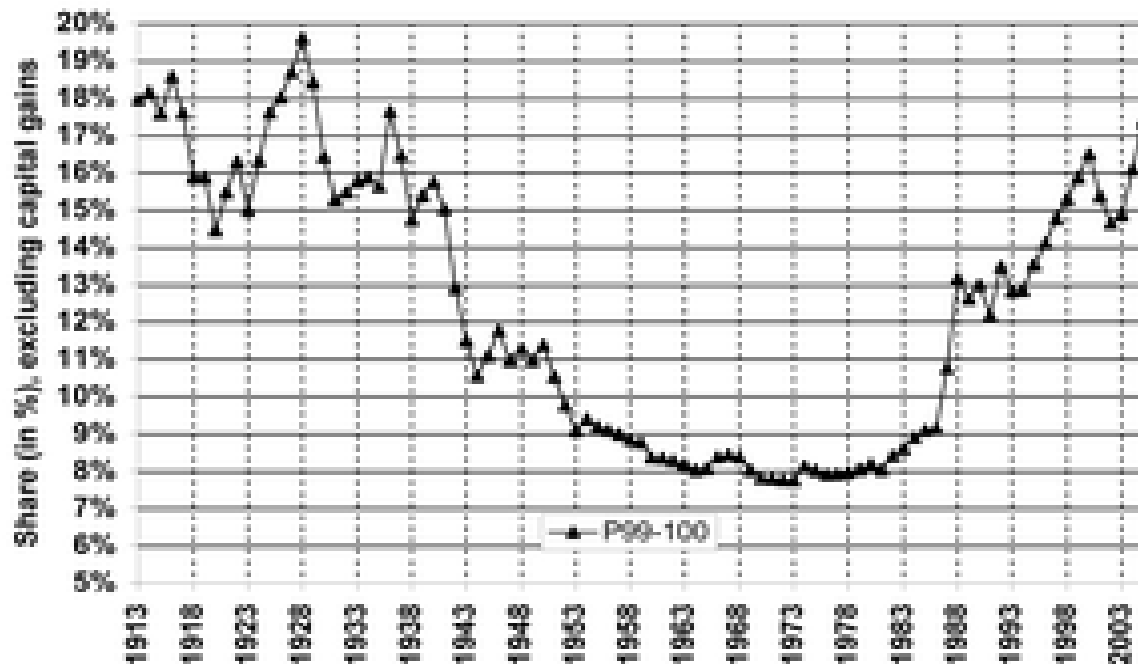


Saez and Piketty:

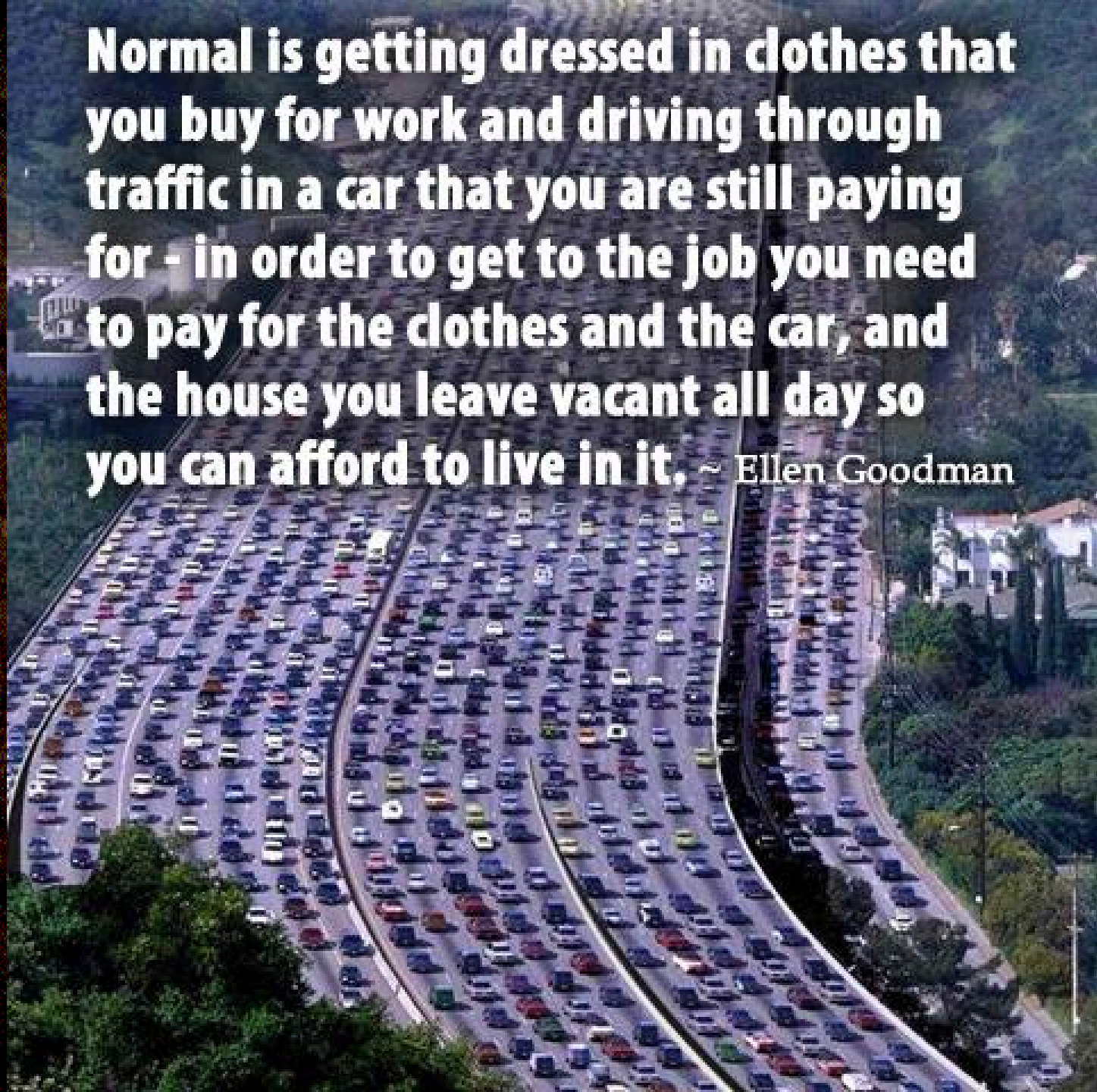
From 2000 to 2007, incomes for the bottom 90% of earners rose only about 4%, adjusted for inflation.

For the top 0.1%, incomes climbed about 94%.

Income Share of the Top 1%, Piketty-Saez IRS-Based Series



Normal is getting dressed in clothes that you buy for work and driving through traffic in a car that you are still paying for - in order to get to the job you need to pay for the clothes and the car, and the house you leave vacant all day so you can afford to live in it. ~ Ellen Goodman



....when joblessness is expected to rise thanks to new technology.....

**Probability of redundancy
within 20 years**

Insurance underwriters	99%
Insurance claims clerks	98%
Credit analysts	98%
Auditors and accountants	94%
Legal assistants	94%
Waiters and waitresses	94%
Couriers and messengers	94%
Retail assistants	92%
Taxi drivers	89%
Construction labourers	88%

- 47% of all US jobs are at risk from automation in the next 20 years
- Many of these are highly skilled
- With slower productivity growth, fewer new jobs will be created
- This will bring downward pressure on incomes
- Entrepreneurialism and innovation will help offset the effects a little
- But millions will be affected in the developing world too



500,000 miles without serious
accident

Google
plans to
have
these on
the road in
5 years



Driverless Trucks



Robot Doctors



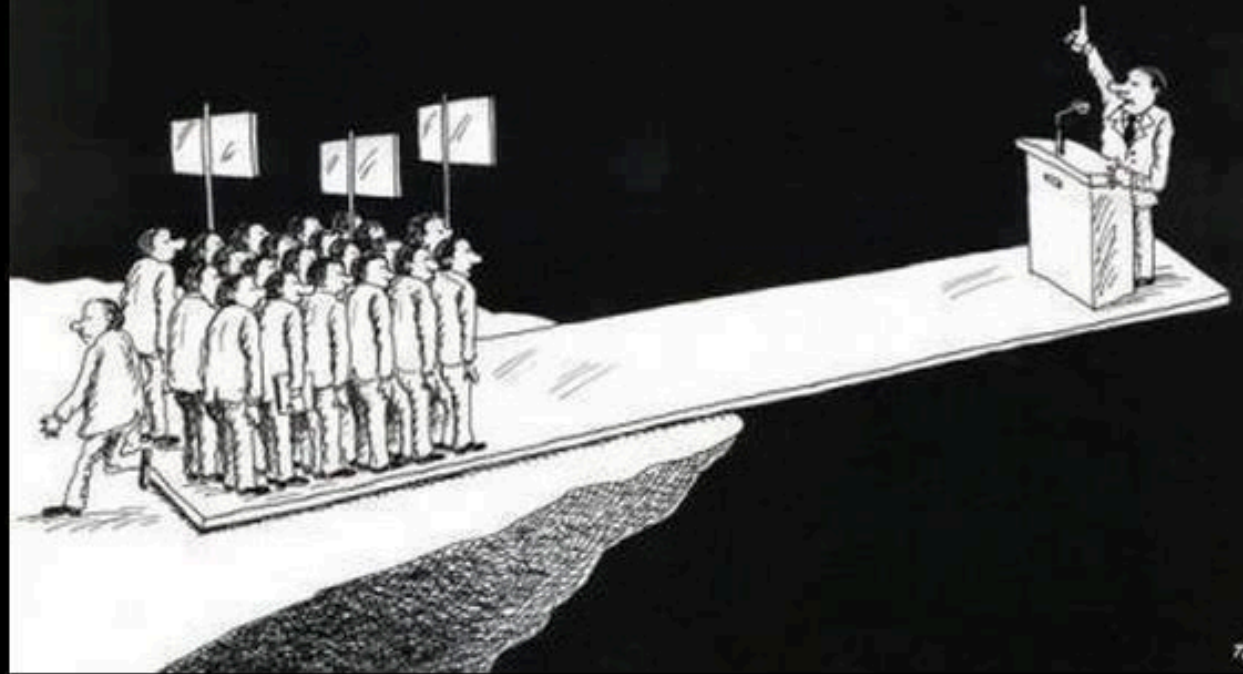
Image Courtesy of InTouch Health

Sometime this century, machines will surpass human levels of intelligence and ability. This “intelligence explosion”—will be the most important event in our history, and navigating it wisely will be the most important thing we can ever do.

Luke Muehlhauser, Executive Director of the Machine Intelligence Research Institute.

Institutions
that lose
legitimacy
collapse
very quickly

**THE PEOPLE DON'T KNOW
THEIR TRUE POWER.**





THE BANKS OWN YOU!

THE GOVERNMENT HAS A CREDIT CARD WITH NO LIMIT
AND **YOU** ARE THEIR COLLATERAL!

WE ARE THE 99%

YLONDON.ORG.UK TWITTER.COM/OCCUPYLSX

GROW THE REAL

ECONOMY

TIME

ENERGY

CARE SKILLS

EMPATHY

KNOWLEDGE

TEACHING

WISDOM

EVIDENCE

Love

SHELFNESS

LEARNING

Russell Brand vs
Jeremy Paxman

BBC Newsnight

Most watched
You Tube video
for all of 2013





Landing the plane will be a turbulent affair, a management challenge for which we are unprepared



We are lost...

Our economy has become an anti-economy, a financial system without a sound economic basis and without economic virtues.

- Wendell Berry

Desired Outcome

Finance

Economy



Humanity
is in the
muck







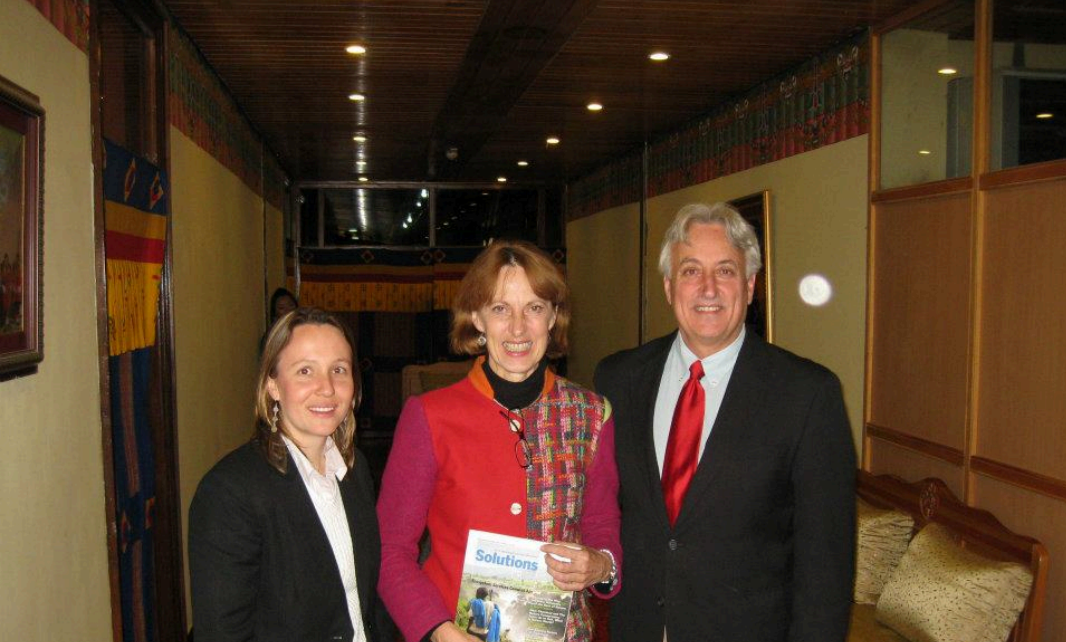
Transforming the Economy

Homo Sapiens is an interesting species.

We have incredible power to transform our environment to meet our needs, and yet we have this odd tendency to create a world, forget that we have created it, and then throw up our hands and proclaim our inability to change the system.

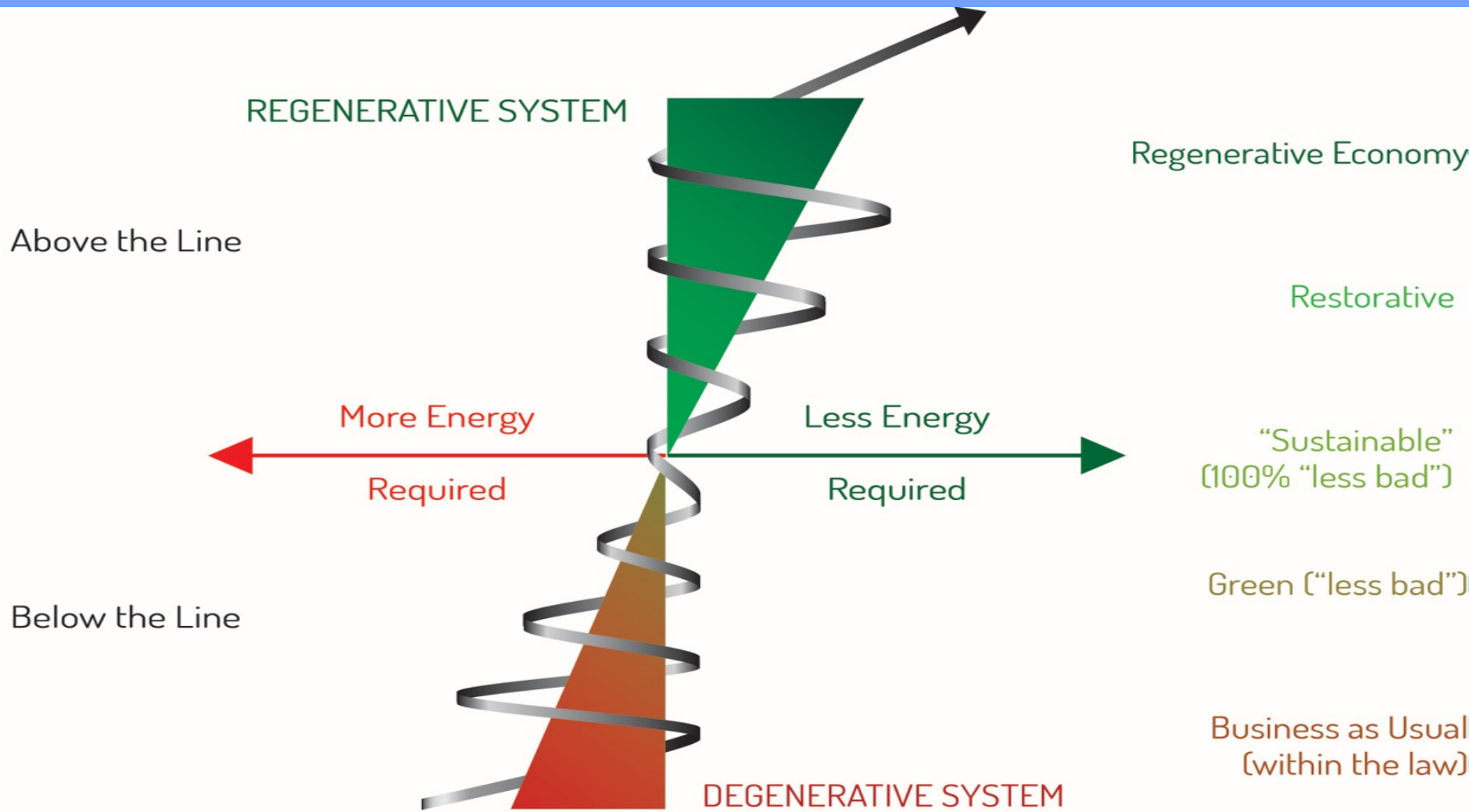
Capitalism is not a set of natural laws that Adam Smith discovered.

It is our creation, and it is constantly evolving and changing – consciously or unconsciously...



Natural systems are sustainable

because they are **Regenerative**



Derived from Bill Reed, Regenesi Group



FASTCOMPANY

CREATIVE BRAINTRUST

FASTCOMPANY

DESIGN

EXIST

CREATE

LABS



FEATURES

EMAILS

ISSUES

Creating A "Regenerative Economy" To Transform Global Finance Into A Force For Good


What if the economy protected people and the planet?

Co.EXIST

John Fullerton and Hunter Lovins

8 elements of regenerative capitalism

- in right relationship
- holistic wealth
- innovative and adaptable
- empowered participation
- edge effect abundance
- robust circulation
- seeks balance
- honors community and place

A photograph of a sunset over the ocean. The sun is a bright yellow-orange orb on the horizon, casting a shimmering path of light across the water. The sky transitions from a deep blue at the top to a warm orange near the horizon. The ocean waves are visible in the foreground, and a dark beach is at the bottom. A semi-transparent dark circle is overlaid on the left side of the image, containing white text.

**“The key to the future
of the world is finding
the optimistic stories
and letting them be
known.”**

- Pete Seeger, 1919-2014.

The environmental crisis is a crisis of education

‘The crisis we face is first and foremost one of the mind, perception, and values; hence, it is a challenge to those institutions presuming to shape minds, perceptions, and values.’



David Orr,
leading environmental educator

The top green building since 1980 – Oberlin College

PV roof produces 45 KW
grid- integrated power

Recycled materials and
FSC certified wood.

Passive solar heat/
ventilation / daylighting
geothermal HVAC

Edible landscaping



Adam Lewis Center for
Environmental Science

Whole system design is key to achieving sustainable development

“By the time the design for most human artifacts is completed but before they have actually been built, about 80-90 percent of their lifecycle economic and ecological costs have already been made inevitable. We can make no better higher-leverage investment for the future than improving the quality of *designers mindware*.’

Natural Capitalism (p 111)

Curriculum is Changing

Sustainability curriculum has increased over 900% in the last 6 years.

Over 30% of undergraduate business schools offer degrees in environmental issues.



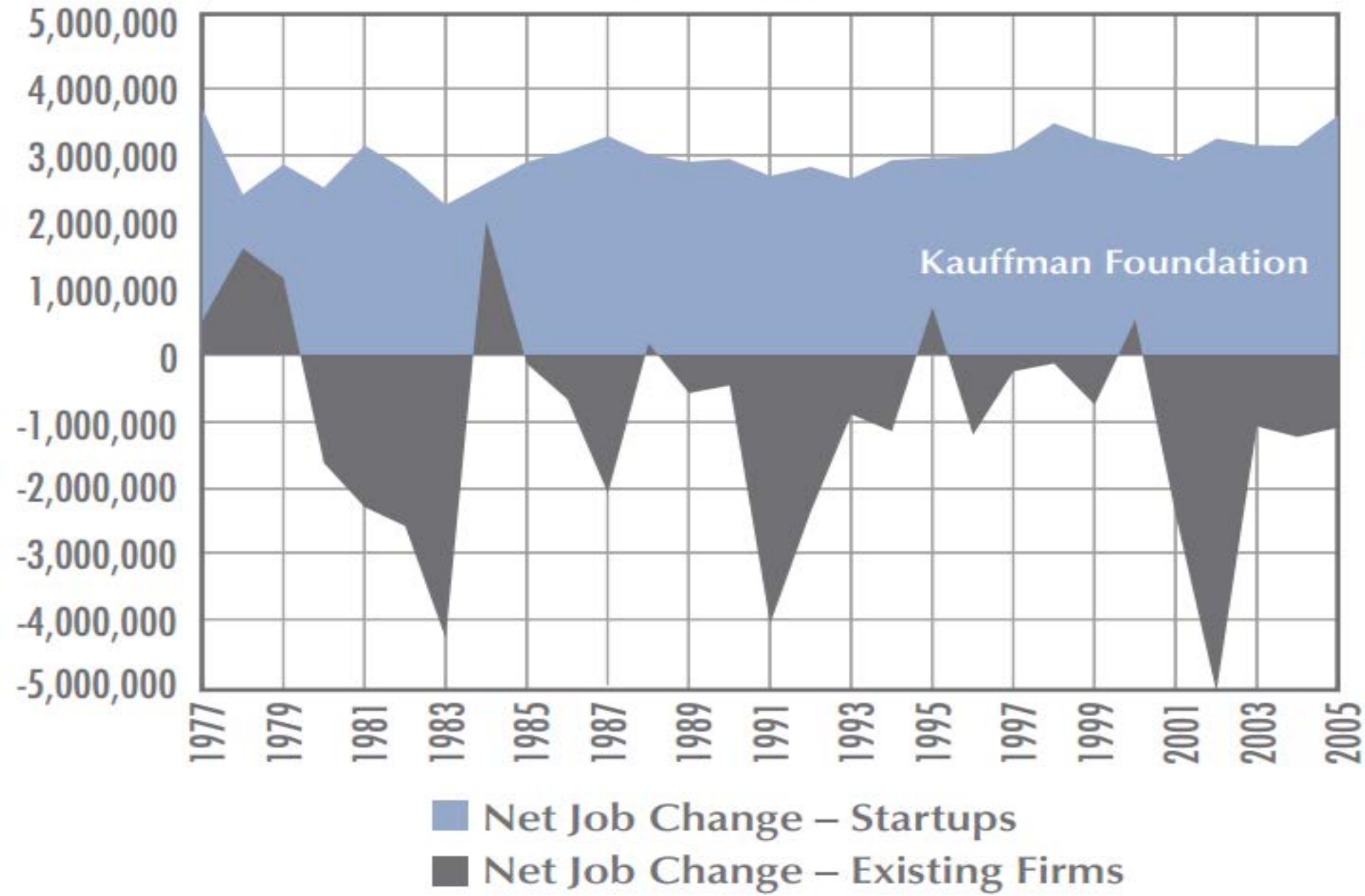
Young Professionals

96% of workers aged 18-35 want to work for a responsible and green-minded company.

-Johnson Controls Global Workplace Innovation



Startups Create Most New Net Jobs in the United States





Bard Graduate Programs in Sustainability



Bard Center for Environmental Policy

✓ MS in Environmental
Policy

✓ MS in Climate
Science and Policy

Bard MBA in
Sustainability





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)

Solve the climate crisis –

Empower entrepreneurs

Doing this creates jobs and ends poverty

Mobilize the money

Deliver full employment

All the rest will follow

We have all the technologies we need to solve **all** the challenges facing humanity

“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

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

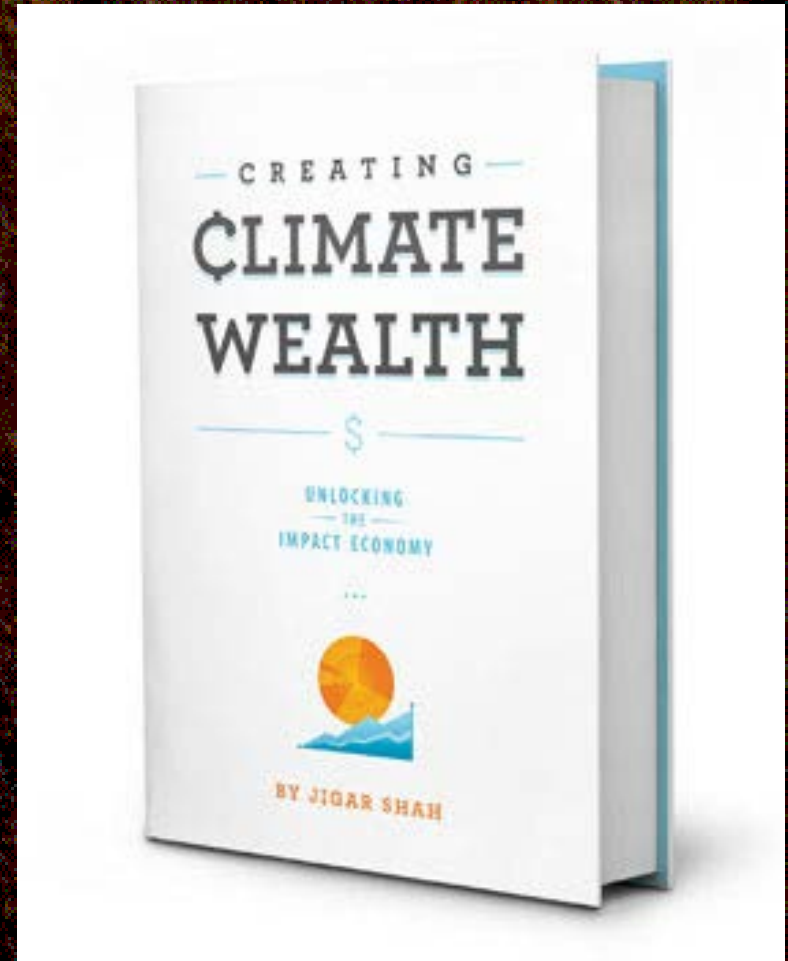


KICK-STARTING
CAPITALISM TO SAVE
OUR ECONOMIC ASS

L. HUNTER LOVINS
AND BOYD COHEN

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.





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

World now nearing 100 GW solar



Butte College – 100% renewable

First college in the U.S. to generate more electricity than it uses.

Will gain \$50-\$75 million for academic programs





ENERGY DARWINISM

The Evolution of the Energy Industry

“This is the era of renewables”

“Alarming fall in cost of solar”

10-year unsubsidized forward price of gas: 11¢/ kWh

10-year unsubsidized forward price of solar: 10¢/ kWh

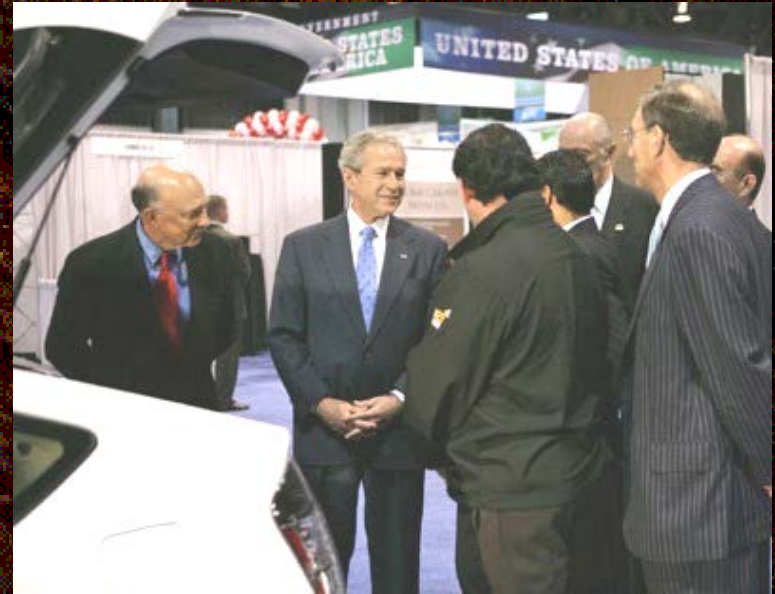
It's over: solar wins

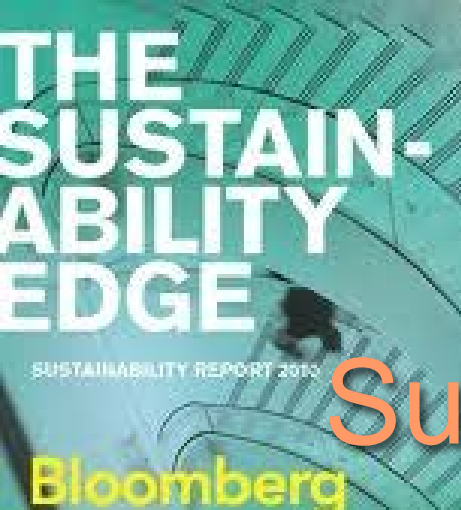


Not a left or a right
issue

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

“Osama bin Ladin hates
my car.”





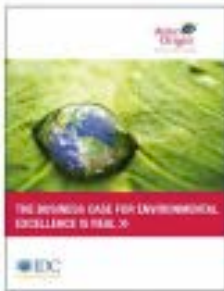
Sustainability is happening





SUSTAINABILITY PAYS

Studies That Prove the Business Case for Sustainability



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

2014 CDP report:

S&P 500 companies that build sustainability into their core strategies outperform those that fail to show leadership.

Corporations that are actively managing and planning for climate change secure an 18% higher return on investment (ROI) than companies that aren't 67% higher than companies who refuse to disclose their emissions.

Ohio State University

Turning off computers at night, saved the University over \$250,000 a year.

This money is used for academic programs across the campus



Regenerative Energy Economy in U.S.

Outperformed general economy in recession

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

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

Green economy is on track to reach \$10 trillion in investments by 2020

A greener economy already employs almost 3 million - more than fossil fuel

It could create between 15 million to 60 million jobs worldwide over the next two decades

At least half of the global workforce will be affected in some way by 2030



CORPORATION
2020

TRANSFORMING BUSINESS
FOR TOMORROW'S WORLD



PAVAN SUKHDEV

Who's
responsible?



Dr. Sylvia Earle:

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





We are called to be architects of the future, not its victims.

Buckminster Fuller



Natural Capitalism Solutions

Visit: www.natcapsolutions.org

<http://www.onetonline.org/find/green>

Database of green jobs in a wide range of sectors.

<https://netimpact.org/jobs>

Net impact is a job board for those wishing to make a positive social and environmental impacts

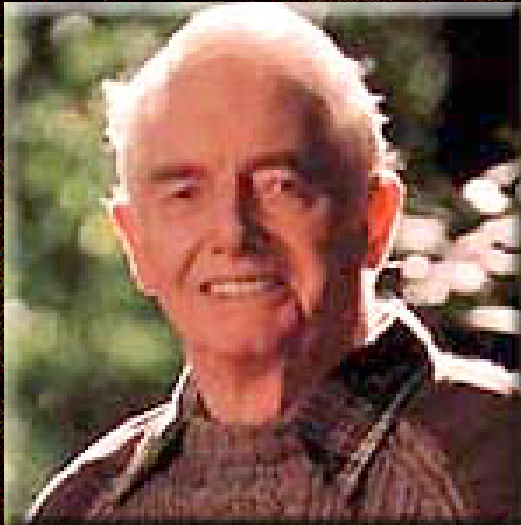
<http://www.greenjobs.net/>

A career resource for those seeking employment that is sustainable and environmentally responsible.

<http://commongoodcareers.org/>

<http://jobs.greenbiz.com/?src=promoblock/>

GreenBiz's green job searchable database



David Brower:

What do we want the earth to be like fifty years from now? Let's do a little dreaming.

Aim high! Navigators have aimed at the stars for centuries. They haven't hit one yet, but because they aimed high they found their way



unreasonable
network



PRINCIPIUM
INVEST IN PURPOSE

All in for impact

Challenge to Neo-Classical

- Fundamental change of worldview:
It's a finite planet
- Redesign world economy to preserve natural systems essential to life and balanced assets
- Shift values to material sufficiency, equitable distribution; and sustainable human well being

Herman Daly



Stop counting consumption of natural capital as income. Income = maximum amount a society can consume this year and consume the same next year.

Balance of payments accounting counts export of depleted natural capital, oil, or timber cut beyond sustainable yield, as income, put in the current account.

This is an accounting error.

Maximize the productivity of natural capital in the short run, and invest in increasing its supply in the long run.

Move away from the ideology of global economic integration by free trade, free capital mobility, and export-led growth. Seek domestic production for internal markets as the first option.

Unilever's Sustainable Living Plan:



Cut environmental impacts in half by 2020,

Source 100% of agricultural materials sustainably, and

Help more than 1 billion people improve their health and well-being.

Announced May 2014 that it would be 100% renewable by 2020

Unilever, Walmart, Apple. Google, Ikea....



Committed to be 100% renewably powered

Refusal to report quarterly

The ultimate **cost of short-termism was the financial crisis of 2008-9**. 'Too many investors have become short-term gamblers: **the more fluctuations in share price they can engineer, the better it is for them**. It is not **good for the companies or for society**, but it is influencing the way firms are being run, all the same.... To drag the world back to sanity, we need to know **why we are here**. **The answer is: for consumers, not shareholders**. If we are in synch with consumer needs and the environment in which we operate, and **take responsibility for society as well as for our employees**, then the shareholder will **also be rewarded**'



Paul Polman

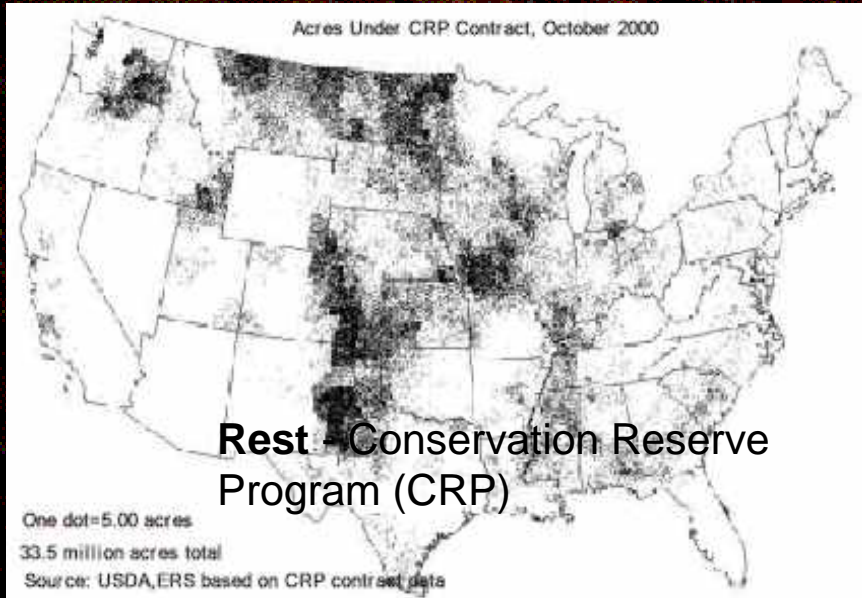
Current Practices Aren't Building Soil or Vegetation



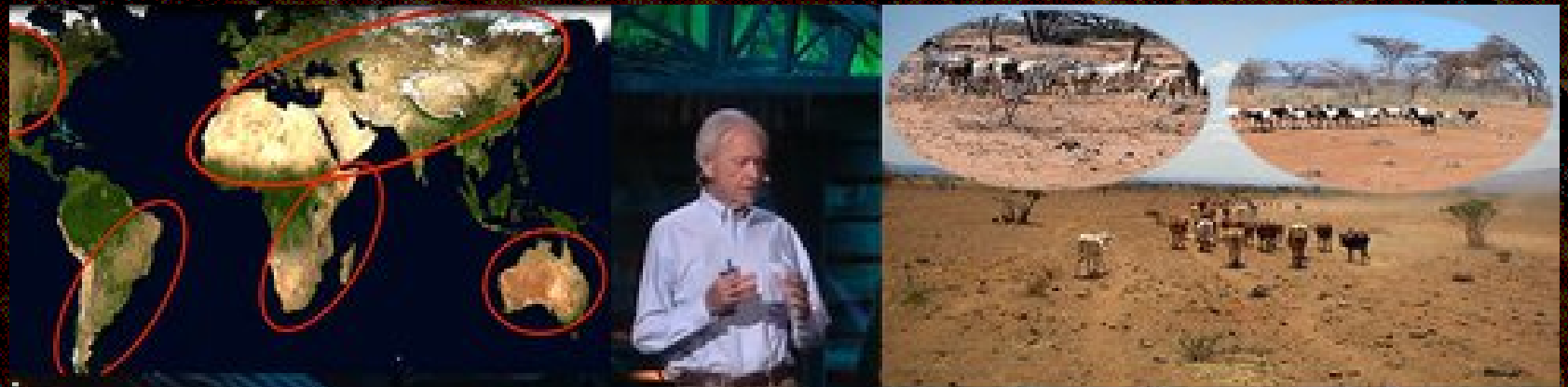
Technology – Grass seeders



Fire - Systematic Land Burning



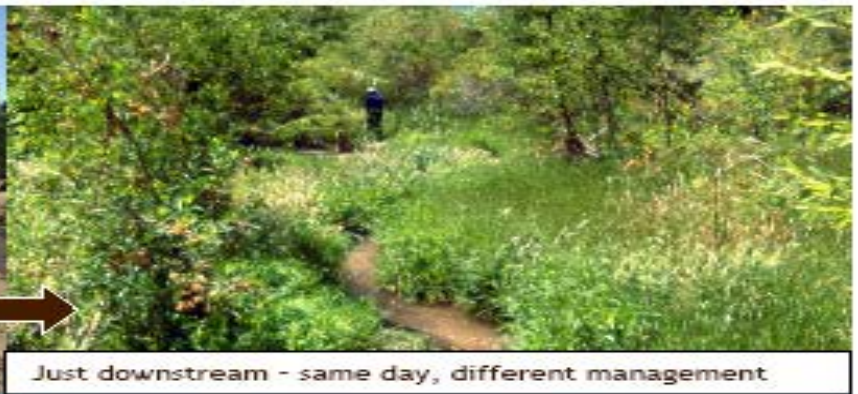
Grazing – Continuous over/under-grazing



ALLANSAVORY



Date Creek, Arizona



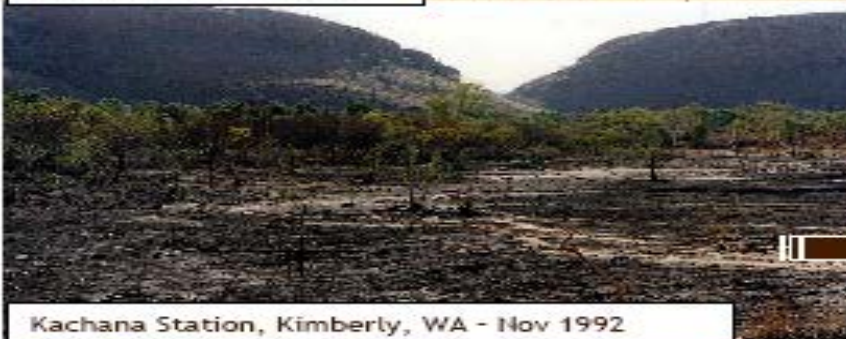
Just downstream - same day, different management



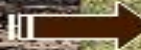
Sonoran Desert, Mexico



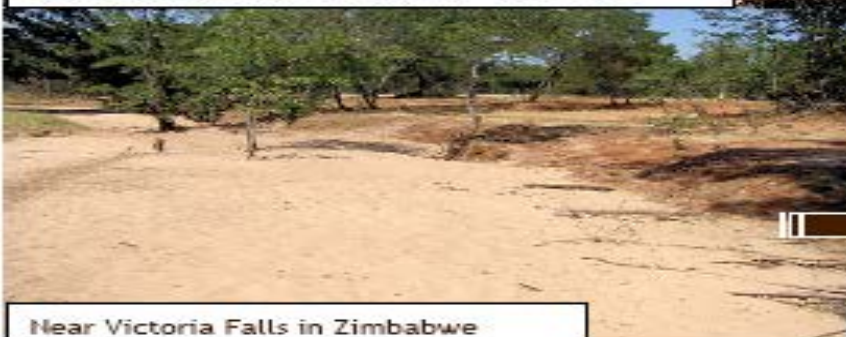
Next door - same day, different management



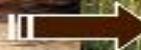
Kachana Station, Kimberly, WA - Nov 1992



Same spot, different management - Nov 1998



Near Victoria Falls in Zimbabwe



Next door - same day, different management

Wyoming – both taken same day



- Left-side upstream, managed holistically (260% inc in livestock over 10 years)
- Right-side is downstream land managed 'conventionally'

TOP STORIES IN LIFE & CULTURE 1 of 12



The Power of the Doodle: Improve Your F...



Tech Timeout for Grown-Ups



One Notch Better Than Organic?



A Platform for Moving Bodies

LIFE & STYLE

Grass-Fed Milk Is Taking Off With Health-Conscious Shoppers

At Almost \$6 a Half-Gallon at Whole Foods and Other Stores, Milk From Cows That Don't Eat Grain Is Considered Healthier Than Organic



By SARAH NASSAUER [CONNECT](#)

Updated July 29, 2014 8:58 p.m. ET

For some shoppers, organic isn't enough. They want grass-fed milk.

The pricey milk isn't only organic. It comes from cows fed mostly grass, and never corn and soy.



MASSACHUSETTS GENERAL HOSPITAL

CANCER CENTER

Everyday Amazing

Jeremy Grantham

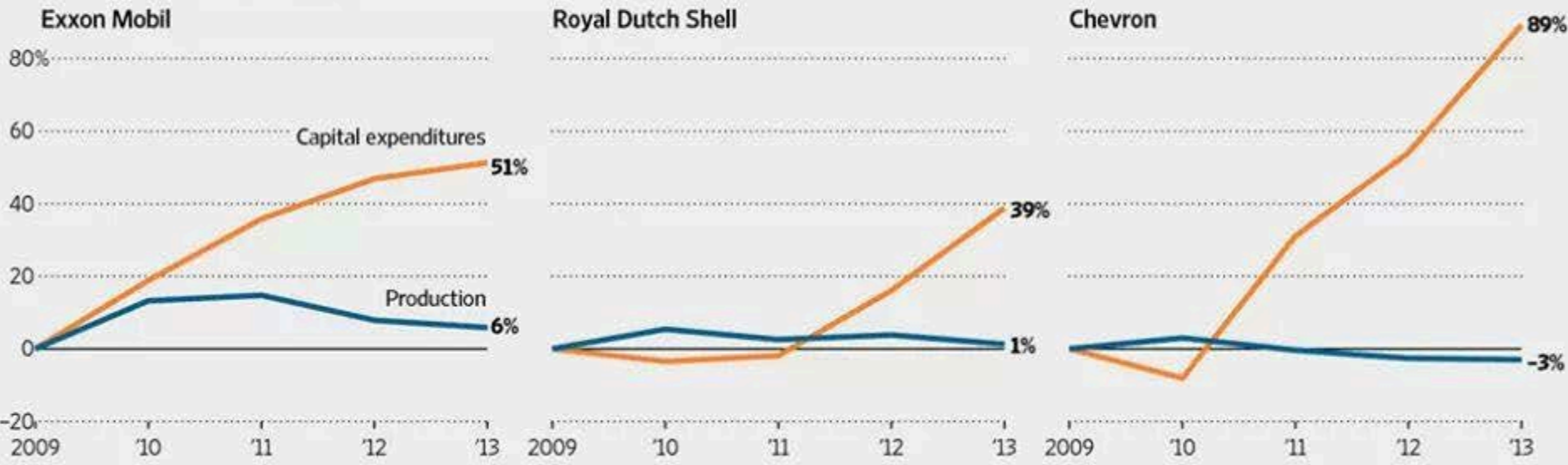


BAU assumes 3 – 8% GDP growth
it is likely to be 1% or perhaps zero

<http://www.charlierose.com/view/interview/12812>

Costly Quest

Exxon, Shell and Chevron have been spending at record levels as they seek to boost their oil and gas output. It has yet to pay off. Below, change in production and capital expenditures since 2009.



Note: Spending in 2013 reflects company estimates; for Shell it is net of asset sales; production rate in 2013 is through the first nine months. Source: the companies The Wall Street Journal

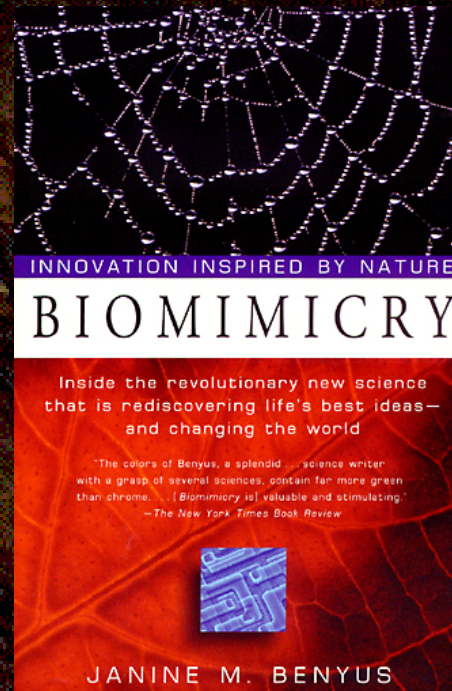
Global 1000 firms & many smaller imitators collectively hold the fate of humanity in their hands. They are trapped in the grip of short-term financial speculators and passive index investors, neither of whom are part of the, regenerative financial system we need.

Imagine big pension funds & endowments investing in and genuinely owning, with like-minded steward investors, with all associated responsibilities and benefits, 10 or 20% of real enterprises over the long run.

Financial obligations met out of enterprise cash flows, rather than “total return” of speculative portfolios of securities that are at the whim of boom -bust cycles caused by the excess of (their own) speculative capital in the system.

There's no place for self-serving interests of predatory Wall Street agents who extract endless and egregious fees through needless and non-value adding transactions: trading shares in a speculative frenzy, buying, selling, merging, leveraging, and recapitalizing companies.





How does nature do business?

Nature uses:

- Sunlight
- Low energy flows
- No persistent toxics
- Near Body manufacturing
- Ambient temperature manufacturing
- Closed loops, in which everything is recycled
 - Nature shops locally

Universities risk becoming irrelevant



Is TED

the New
Harvard?

Fast Company

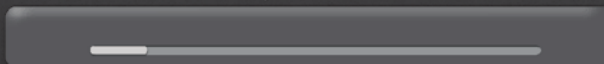


L. Hunter Lovins, Professor
Sustainability Business Management

Sustainability: The Business Case



00:38



05:41



Hunter Lovins: Pacific Gas and Electric found that if you put good daylighting in schools, you would get 20 to 26% higher test scores.

Hunter Lovins: Walmart conducted an inadvertent controlled experiment. They said "we're going to build a green building." They got halfway through it and lost interest, so they had a green half and a not-so-green half.

Hunter Lovins: Surprise! They had 40 percent higher retail sales on the green side, and all the associates wanted to work there.

Hunter Lovins: You will get 6 to 16 percent higher labor productivity in good green



Hunter Lovins: We're losing life as we know it on the planet.
Hunter Lovins: Three of the Earth's ecosystems are already tipping into collapse. Coral reefs



Slide: Global Biodiversity Outlook 3
We continue to lose biodiversity at a rate never seen in history...

00:36



Link: Scientists Adopt Tiny Island
Warming bellwether as species show decline...

00:45



In-Depth: The Other Acidification Problem
Ocean acidification and the effect on phytoplankton.

00:42



Tag: There will be no living coral reefs on Planet Earth, perhaps as early as 2050, certainly by the end...

00:45



Discussion: Unsustainable Areas in Your Organization
Begin to discuss what are the areas within your organization that are ...



02:35

A Vision of Students Today If These Walls Could Talk

<http://www.youtube.com/watch?v=dGCJ46vyR9o>

19th Century environment that still characterizes the educational establishment in which knowledge is scarce, but ordered and structured by fragmented, classified patterns subjects and schedules

Marshall McLuhan - 1967