A FINER FUTURE IS POSSIBLE

How humanity can avoid system collapse and craft a better economic system

June 2016: A report by Hunter Lovins, Anders Wijkman, John Fullerton, Stewart Wallis, Graeme Maxton

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“WE ARE CALLED TO BE ARCHITECTS OF THE FUTURE, NOT ITS VICTIMS.”

– Buckminster Fuller
Is it possible to stop climate change and the rapid rate of environmental destruction, while reducing inequality, in a world so dependent on continuous economic growth?

Not without radical change. A successful transition requires a new cultural story, one where humanity lives in harmony with nature, and today's social tensions are greatly reduced.

But this will take many years because a number of barriers need to be overcome. Given the seriousness of the social and environmental problems, it would take too long to avoid collapse.
So society needs to buy time. It can do this by moving towards a circular economy and by transforming the economic system gradually, by restructuring finance and business, shifting to renewable energy, reforming food production and redefining the nature of work, to generate jobs and guarantee livelihoods.

The technology and understanding to make these changes already exists. It is a question of social and political will.
Climate change, rising inequality and environmental impact show how urgently we need a more sustainable model of social and economic development. But is it actually possible to change the economic system without collapse?

To answer this question, the Club of Rome commissioned an interdisciplinary and international group of experts to develop a comprehensive framework for change.

The underlying assumption is that the dominant global economic system, focused on continuous economic growth, unlimited levels of consumption, and minimal regulation needs to change. But change is hard.
INTRODUCTION (CONT.)

Humanity is on an economic treadmill, which requires ever-rising throughput of resources, and which is creating environmental destruction while also widening social divisions. In short, the current economic system is moving human society towards an eventual collapse.

This project has been established to see if there is a better way forward, to shift our economic world onto a better - though not necessarily ideal – long term foundation.
This report was developed in three stages. In the first stage, a group of more than 20 internationally renowned experts on climate change, economics, the media, finance, population, environment degradation, project planning and other relevant areas were invited to Sweden for three days in May 2015 to develop the methodology to be used for this project, define the key issues for analysis and a working hypothesis, identify data gaps, define the workplan and draft the report outline. A steering committee was appointed.

During the second stage, the committee commissioned a number of international experts to provide insight into issues such as an energy transition, reforming the finance sector and sustainable agriculture, where additional insight was needed. The results of this work were then built into the report.
Once a draft report was completed, it was peer-reviewed by a wide range of experts, mostly within the Club of Rome. The entire report is now being converted into a book for publication in 2017.
CONCLUSIONS

1. The human world faces civilizational collapse with widespread environmental and social consequences, many already obvious.

2. The conditions for this were created by human activity and can be undone by human actions.

3. To avoid collapse, we need to embrace a new cultural story, one where humanity lives in harmony with nature and where social tensions are drastically reduced.

4. As this new story will take several years to implement we need a strategy to survive in the short-term and buy time.
5. Buying time will work only if it is accompanied by reforms in the sectors of finance and business, agriculture, energy and the nature of work.

6. We will also need to overcome a number of significant hurdles that hinder change, some of which are political.

7. A finer future is possible. We already have the understanding and the technologies to make a successful transformation. It is a question of political and societal will, as well as time.
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In 1972, the Club of Rome rose to prominence with the publication of *The limits to growth*. Based on work done at MIT the book presented 12 scenarios for the future, and found that in every case but one (the sustainability scenario) humanity faced collapse.

This modeling was brought up to date in Graham Turner’s report, “Is Collapse Imminent?” and verified that humanity has continued on the Business As Usual (BAU) trend line, warning that, “the BAU scenario results in collapse of the global economy and environment (where standards of living fall at rates faster than they have historically risen due to disruption of normal economic functions), subsequently forcing population down.”
In 1972 the Limits to Growth also warned of collapse (cont.)

The dotted lines in the graph show the “business as usual” scenario we have actually experienced. Use of resources grows, population rises, availability of non-renewable resources begins to fall until, at some point, around the mid-2030s, there is collapse. The solid lines on the graph are the actual data from the time The limits to growth was published until 2000.
According to the Global Footprint Network, humanity currently live as if it had 1.5 planets and concludes that this can only continue for a short time before the system forces a return to equilibrium.

Rockström et al has identified nine "planetary life support systems" or boundaries (see picture) essential for human survival. They found that we have already crossed four of these: climate change, biosphere integrity, land-system change, and biogeochemical cycles (phosphorus and nitrogen cycle).

A number of the Earth’s ecosystems are approaching "tipping points" where their ecosystem services will be disrupted. Three are at particular risk: coral reefs, the Amazon and the oceans.

• Climate change is expected to kill the world's coral reefs progressively and perhaps as early as 2030.

• The Amazon is drying and facing decay, with the release of large quantities of greenhouse gases.

• The oceans are acidifying, risking species loss on a large scale.

The Convention on Global Biodiversity warns: "We continue to lose biodiversity at a rate never before seen in history—extinction rates may be up to 1,000 times higher than the historical background rate."
THE IMPACT OF CLIMATE CHANGE IS ALREADY CLEAR

“Climate change is no longer some far-off problem. It is happening now…disrupting our agriculture and ecosystems, our water and food supplies, our energy, our infrastructure, human health, human safety…few things will disrupt our lives as profoundly.” President Obama

… AND THE SITUATION WILL WORSEN FOR MANY DECADES, NO MATTER WHAT WE NOW DO

Early aggressive climate action (left) minimizes future warming. Continued inaction (right) results in catastrophic levels of warming, 6°C over much of the world. All we can do is limit the pace of change.
SOCIALLY THERE ARE BIG PROBLEMS TOO: THERE IS EXTREME AND WIDENING INCOME INEQUALITY

Just the wealth of 62 people is equal to the wealth of the poorest 3.5 billion. The richest 1% have more wealth than the other 99%.

This brings a growing risk of social unrest. The pursuit of economic growth, which many think is the way to narrow this gap, and also to reduce global poverty is incompatible with staying within planetary boundaries. It would increase resource use and energy demands even more.
HOW DID WE GET HERE?
COLLAPSE WILL BE DIFFICULT TO AVOID

In 2010, NASA funded the Human And Nature DYnamical Study (HANDY) Study: “Is Industrial Civilization Headed for Irreversible Collapse?”

The study found that two features have played a central role in the process of all cases of civilization collapse over the last five thousand years:

1. “...the stretching of resources due to the strain placed on the ecological carrying capacity; and

2. ...the economic stratification of society into Elites [rich] and Masses (or "Commoners) [poor]."

The study concluded that “under conditions closely reflecting the reality of the world today... we find that collapse is difficult to avoid.”

HUMANITY CREATED THE ECONOMIC SYSTEM THAT BROUGHT US HERE

The dominant economic system is built on the notion of growth in GDP, which, as presently organised, requires an ever-higher throughput of energy and materials. This dynamic lies at the root of our social and environmental problems. GDP is a quantitative indicator and says nothing about the qualitative dimensions of growth.

In the last 50 years, the rise in the human population and a more extreme version of the free-market economic thinking, has made the situation worse. In 1947 Ludwig von Mises, Fredrick Hayek, Milton Friedman and 33 other prominent economists formed the Mont Pelerin Society which established the intellectual foundation of today’s extreme sort of neo-liberalism, the ideology that underpins most national economic policies, even those nominally labeled otherwise.
Neo-liberalism holds that government interference is undesirable, that markets should be minimally regulated and that individual freedom is paramount. Proponents believe that strong property rights, little government interference and free trade are the best institutional means through which liberty and freedom can be achieved.

These ideas have led to a widespread conviction that the only legitimate goal of business is to maximize shareholder value in the short term. Any other action by a company is seen as philanthropy, which comes at the expense of corporate owners.

To maintain economic growth, and so output, modern society seeks to meet non-material needs with material goods, celebrating consumerism. Conversely, if humanity stops consuming, the economy falls into a recession, with rising unemployment and even wider inequality.
So wealth and success are measured in dollars and Simon Kuznet’s gross domestic product (GDP) is viewed as the hallmark of national achievement.

Neo-liberals believe that maximizing individual utility (in this case through material wealth) ensures the maximization of total social utility. Proponents of this worldview see inequality as both acceptable and inevitable.
With the election in the US of Ronald Reagan, and of Margaret Thatcher in the UK, the ideology of neo-liberalism came to domination.

Members of the Mont Pelerin Society have advised many heads of state and their influence remains strong.

Their thinking still dominates teaching in universities and many leading advisory groups and think-tanks.

Picture: Friedrich Hayek from the Mont Pelerin society meets with US President Ronald Reagan

SINCE 1980 NEO-LIBERALISM HAS BEEN THE DOMINANT ECONOMIC IDEOLOGY
Neo-liberalism has only dominated global economic thinking for 35 years. So we know it is possible to change the dominant economic philosophy.

Advanced western economies have actually experienced two major economic transformations in the last 100 years.

• From the 1930s to the late 1970s Keynesianism, with its emphasis on the management of markets and the provision of social safety nets and social security, dominated.

• Since the late 1970s neo-liberalism, with its focus on individualism and free-markets, has dominated.
Shifts in economic thinking during the 20th century occurred because advocates of the new system discredited the old system or story. They created a new story, weakened existing power bases and constructed new power bases.

The neo-liberals created and disseminated a message that rested on four principles: small government, free markets, freedom of the individual and strong defence. These have been continually repeated and become embedded in global thinking.

The task facing humanity now is to create a compelling new story and a powerful movement for a new economic system based on different values, such as strengthening human dignity, promoting the common good and good stewardship of nature.
For there to be a change to a better system, social and political leaders throughout would need to demand change.

To do this they need to understand that change is both possible and desirable, that it would lead to a better outcome. They need to see a better way forward.

New power bases and political movements operating at all levels of society, would also be needed – local, national, regional and, eventually, global.

These would consist of collaborating networks from civil society, from research and policy communities, from business, from faith groups, from cultural groups, and from new economics practitioners. Such groups are needed to fuel and sustain change.
TELLING A BETTER STORY
William Allen, former Chancellor of the Delaware Court of Chancellery, noted: “One of the marks of a truly dominant intellectual paradigm is the difficulty people have in even imagining an alternative view.”

Neo-liberalism is not a set of natural laws. Neo-liberalism is our creation, and it is constantly evolving and changing – consciously or subconsciously.

What is needed is an alternative view, one that is sustainable and desirable to the democratic majority, and to those they elect.
THIS SHOULD SEEK TO MAXIMISE HUMAN WELL-BEING WITHIN PLANETARY BOUNDARIES

A better story needs to explain how a new economic system would:

• Redistribute income and wealth more fairly
• Meet basic needs of all people on earth
• Allow natural systems to recover and prosper
• Promote long-term thinking and investment
• Maintain a strong economy
• Ensure democratic economic governance and diverse and equitable access to resources.
A SUSTAINABLE AND FAIR ECONOMIC SYSTEM, IN OTHER WORDS

Humanity must operate within planetary boundaries and also ensure human well-being and dignity. We need a “safe and just operating space for humanity.”

A rising population - in combination with wasteful lifestyles among the rich - will make it increasingly difficult to respect the planetary boundaries. Affluent lifestyles must be curbed and efforts made to limit the growth of population.
IT IS ALSO POSSIBLE TO IMPROVE HUMAN WELL-BEING AND REDUCE THE ECOLOGICAL FOOTPRINT

Just under two on the horizontal axis represents one planet living. If we are all to live within planetary boundaries, countries need to move to the top left through decoupling. Currently, many countries are doing the opposite - increasing their footprint and reducing average wellbeing.

WE NEED TO STOP BOOSTING GDP FOR ITS OWN SAKE

Maximizing well-being (feeling well on long-term basis) is key to freeing humankind from the current consumption-based treadmill which is so destructive to the planet.

Secure employment and the economic stability matter more to people’s wellbeing than rate of economic growth in any case.

It is still possible to have economic growth however, as this is a measure of value. But humanity should not seek economic growth for its own sake.

Society should focus on reducing the ecological footprint until it is in balance with nature, and sustainable.
In the current economic system, planetary resources are used to develop economic wealth. This then flows largely to the rich and the finance sector. Investment and rewards have a short term focus.

A sustainable system turns this around. The finance sector supports the economy which is run sustainably for the benefit of the majority, operates for the long term and exists in balance with the planet.
HUMANITY NEEDS BETTER ECONOMIC PRINCIPLES…

<table>
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<th>Current economic system</th>
<th>Better economic system</th>
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<td>GDP growth: more economic activity the aim</td>
<td>‘Beyond GDP’: prosperity the aim</td>
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<td>Short-termism</td>
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<td>Efficiency measured in monetary terms (CBA)</td>
<td>Multidimensional efficiency (e.g. multi-criterion analysis, MCA)</td>
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Nature does not set out to be sustainable but achieves it because it is regenerative. If the economic system is to prosper long term, it must operate like nature; regeneratively.

BUYING TIME TO MAKE THE SHIFT
Given the seriousness of the environmental and social problems, it would take too long to gain widespread acceptance of a better story and implement a better economic system. We would not avoid collapse. So humanity needs to buy time during the transition.
In a circular economy, products are designed for ease of recycling, reuse, disassembly and remanufacturing. It replaces the traditional, linear ‘take, make & dispose’ model that has dominated the economy so far, and promotes efficient energy and resource use.

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1. Hunting and fishing
2. Can take both postharvest and postconsumer waste as an input
A CIRCULAR ECONOMY CAN REDUCE EMISSIONS, CREATE JOBS AND IMPROVE THE TRADE BALANCE

Every effort must be made to reduce the pressure on the natural resource base. By doing so we can avoid looming resource constraints, limit ecosystem decline and reduce carbon emissions.

A recent study by the Club of Rome analyzed the impact of a circular economy on carbon emissions, job opportunities and the trade balance in five European countries.

It assumed 1) increasing the renewable portion in the energy mix by cutting fossil fuel use by 50%; 2) enhancing energy efficiency by 25%, and 3) enhancing material efficiency by 25% by replacing 50% of virgin materials with secondary materials and doubling the life-time of long-lived consumer products.

The results showed that a circular economy would lead to a reduction in carbon emissions by roughly 2/3, a significant increase in the numbers of jobs, and reduced trade imbalances. It makes sense within the existing economic system, in other words, and so would aid a transition.

The following policies are needed to move towards a circular economy:

• Targets for material as well as energy efficiency
• Mandatory targets for use of secondary materials
• Design requirements for products
• Tax on waste incineration
• Tax shift: lower taxes on labor, higher taxes on resources
• No VAT on recycled materials
• Material efficiency as a key priority in climate change mitigation and adaptation strategies
THE KEY ELEMENTS OF A BETTER ECONOMIC SYSTEM
DURING THE TRANSITION TO A BETTER SYSTEM. SOCIETY WILL NEED TO REFORM KEY SECTORS

Buying time only makes sense if it is accompanied by fundamental reforms of many economic sectors but primarily:

• Finance and business
• Agriculture
• Energy
• The nature of work
FINANCE AND BUSINESS
IN FINANCE, THE EXPECTATIONS OF CAPITAL MARKETS AND INVESTORS NEED TO BE MODIFIED

According to the Global Commission on the Economy and Climate, the global economy requires around $90 trillion for infrastructure investment in cities, energy, and land-use systems over the next 15 years as well as investment in the transition to a low carbon economy, if we are to stay within the limit of a 2°C global warming.

The scale of this investment and the urgency of transition argue for quick and radical financial sector reform.

In many countries banks are overly focused on investing in non-productive and speculative assets. Both structural and incentive changes (how banks are rewarded) can stop this. Quantitative easing, by printing money and using it for green energy development, for example, would be a powerful way to build a zero carbon economy.
A REFORMED BUSINESS SECTOR REQUIRES RELATIVELY FEW CHANGES

‘Quarterly Capitalism’ drives continuous growth and ecological overshoot. It contributed to the financial crisis too, as banks took on too much debt to boost returns. Relatively simple remedies include:

• Differential voting rights for shares held for different periods

• Taxation of short term returns

• Shift from a shareholder to a stakeholder economy (one that includes employees, society and the environment, for example)

• Reform of the private limited company to make it more accountable

• Business charter renewal is based on environmental performance

• Putting major environmental liabilities on company balance sheets.

• New investment methods (rather than just debt and equity) and the ending of tax exemptions for debt.
If the business and finance sector put less store on continuously rising quarterly earnings, resources are taxed rather than labor and the environment is properly valued, business and investment priorities will change.

Changes in investment priorities will help slow the pace of climate change. Christiana Figueres from UNFCCC noted "Where capital goes over the next 15 years is going to decide whether we’re actually able to address climate change and what kind of a century we are going to have."

This is made easier in some cases because many sectors are competitively concentrated. Nearly two-thirds of carbon dioxide & methane emissions can be attributed to just 90 companies, for example.
The world’s cultivated soils have lost between 50 and 70 percent of their original carbon stock. This serious degradation not only makes it difficult for soils to carry out their many functions (like filtering and storing fresh water and crop nutrients), it means that what was once soil carbon has been oxidized upon exposure to air and is now $\text{CO}_2$.

The existing approach is not working in other ways: Modern industrial agriculture has not ended hunger.

The current system is increasingly vulnerable to climate change too.
WE NEED TO SHIFT FROM INDUSTRIAL AGRICULTURE TO HOLISTIC LAND MANAGEMENT

Both developing and developed countries need a major shift in agricultural development: from a "green revolution" to a "truly ecological intensification" approach. This implies a rapid and significant shift from conventional, monoculture-based and high external-input-dependent industrial production towards sustainable, regenerative production systems that would improve the productivity of small-scale farmers.

We need to see a move from a linear to a holistic approach in agricultural management, which recognizes that a farmer is not only a producer of agricultural goods, but also a manager of an agro-ecological system that provides quite a number of public goods and services (e.g. water, soil, landscape, energy, biodiversity, and recreation).
Holistic land management rehabilitates habitats by reducing overgrazing and erosion and enhancing natural processes, such as nutrient and water cycling. As a result, land productivity increases, generating higher cattle production rates of up to 50 percent, while sequestering tons of carbon.
ENERGY
“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
RENEWABLES ARE ALREADY REPLACING CONVENTIONAL ENERGY IN MANY PLACES

Renewable power is expanding fast; it now represents more than 45% of overall supply additions. In contrast, the share of nuclear in the global energy mix is stable while the share of coal has decreased. According to the International Energy Agency, by 2040, renewable power will reach a share of 50% in the European Union, around 30% in China and Japan, and above 25% in the United States and India. By contrast, coal will account for less than 15% of electricity supply outside Asia.

Photo credit: Activ Solar, 2012
Solar energy is expected to achieve grid parity in 80% of global markets by 2017.
Meeting the IPCC’s conditions for there to be a 66% chance to stay below a 2 °C rise in average global temperatures (Representative Concentration Pathways (RCP) 2.6 on the graph) is possible if society:

• Is fossil free by 2100
• There are negative emissions during the last 40 years of the century
• We develop the technology to capture this carbon in sufficient quantities
AND THE STEPS ARE CLEAR

Energy efficiency: In the transport, buildings and industry sectors energy demand needs to be reduced by 25% more than the IPCC baseline by 2050. This will require regulation, innovation and improved planning.

Energy transition: Low carbon energy needs to rise from around 15% in 2010 to roughly 60% by 2050 and then close to 90% by the end of the century.

Increased electrification: Society needs to quit virtually all forms of fossil fuel use by electrifying everything that can be (cars, heating, cooling, industry) and powering these sectors with low carbon electricity (renewables, nuclear, biomass . . ).
THE NATURE OF WORK
WE NEED TO TACKLE THE HURDLE OF JOB CREATION

Even though many new jobs will be created in a circular economy, lowering resource throughput will have negative implications for many traditional business sectors and for lifting people from poverty. Millions of jobs will be lost.

Two other trends will make employment more difficult worldwide: a rising population and technological change, i.e. robotization.

To smooth the transition, society needs to provide meaningful purpose and sufficient incomes for people, especially those made unemployed through efficiency gains and to absorb a working population rising by 40 million a year.

A 2013 Delphi survey of some 300 global experts carried out by the Millennium Project found that without changes in socio-political-economic systems, unemployment is thought of as an increasing trend.

Nearly half of the workforce will be affected by automation in some way by 2030.

“Productivity” is seen as “labour productivity” rather than “resource productivity”. In much of the service sector, in areas such as care, culture and crafts, aiming to maximise labour productivity like this makes no sense. Society's economic focus needs to switch from maximizing labor productivity to maximizing resource productivity.

Work needs to be redefined to provide those who are home carers to participate in the economy; compulsory pension ages need to be scrapped; and the state needs to provide a basic income for all those who need it (sick, elderly and unemployed) in the rich world. The poor world needs to be provided with incomes & jobs too.

 Particularly in richer countries, working time will also need to be reduced to allow more people to work in paid employment. Work needs to shared more equitably, in other words, so that society can make the transition.
WHAT IS STOPPING US MAKING THE CHANGE?
The steps required to shift humanity onto a sustainable path are known. The necessary technology is also available.

Making the transition requires many governments to act in a way that we have not often seen before, and to cooperate more.

Such a change is not unprecedented: The Marshall Plan for the reconstruction of Europe after World War II required change on a similar scale. Without actual collapse, however, we acknowledge that such foresight and focus on the global common good appears very unlikely. For politicians to act will require concerted pressure by a sizeable vanguard of informed citizens, combined with a compelling new story about how we can all live better lives that don’t cost the earth. This is hard to see, but not impossible.
**THERE ARE A NUMBER OF BARRIERS THAT WILL NEED TO BE OVERCOME**

**Political**: Most parties are stuck in an outdated conventional growth logic, and financially dependent on big business and maintaining the status quo. Governments, on their own, are unlikely to decide on making the bold steps necessary.

**Vested interests**: Those who would lose out are often the wealthiest and more powerful citizens – the 1%

**Short-termism and natural inertia**: Humanity is short-termist and fears change, especially when the alternative is uncertain.

**Timing**: Change has to be introduced when there is an appetite for it, and this is hard to anticipate.
To overcome these hurdles will require concerted pressure from a sizeable vanguard of informed citizens, as well as a series of policy initiatives that can gradually shift the economic system in a better direction and that, importantly, appeal to the short term mindset of the majority of voters.
A FINER FUTURE IS POSSIBLE
WE ARE IN OVERSHOOT AND NEED TO BRING THE ECOLOGICAL FOOTPRINT BACK INTO BALANCE

Trend

Planet's initial carrying capacity

Planet's current carrying capacity

Sustainable path

Limits to Growth

Club of Rome, 2016
The human world is in a dangerous place, in ecological overshoot and with unsustainable levels of inequality. The situation is still deteriorating currently, and heading towards collapse.

Humanity's situation is the result of human decisions which led to the development of our current economic system.

Logically then, different human decisions can change the current system and avoid collapse.

This is hard, because it requires a new story, a different worldview, and a number of policy decisions which will be difficult to implement.
We first need to craft a new cultural story, one where humanity lives in harmony with nature and where social tensions are drastically reduced.

This will take time to implement and so we need to buy time

• through implementing the circular economy
• by progressively reforming key economic sectors (finance and business, agriculture, energy and the nature of work)
• by introducing policies that appeal to the short-term interests of the democratic majority

Creating the political and social desire for change is key.

A Finer Future IS Possible
“CAN THE WORLD ACTUALLY EASE DOWN BELOW THE LIMITS AND AVOID COLLAPSE? IS THERE TIME? IS THERE ENOUGH MONEY, TECHNOLOGY, FREEDOM, VISION, COMMUNITY, RESPONSIBILITY, FORESIGHT, DISCIPLINE, AND LOVE ON A GLOBAL SCALE?”

- Donella Meadows in the Limits to Growth
REFERENCES


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