

The Great Simplification Movie Transcript

Part 1:

The world to come will be different from our expectations.

The arc of human history informs the trajectory of our future.

We need to know who we are and how we got here: The ecology, biology, and physics to know which paths remain open to us -and which lead to dead-ends.

4.5 billion years ago, stardust coalesced to form a planet. A billion years later, simple life emerged. By 500 million years ago, a profusion of LIFE had exploded on our blue green planet. Fast forward to 66 million years ago and dinosaurs were taken out by our planet's most recent mass extinction and small shrew-like survivors continued an evolutionary line that would eventually become.... Us.

Of all our hominid ancestors, one species would ultimately remain. Homo sapiens a creature variously curious, creative, kind, cruel, cooperative, competitive, combative, and clever.

When Earth's climate warmed and stabilized around 10,000 years ago, Homo sapiens tribes who pivoted en masse to agriculture and pastoralism out-reproduced their hunter gatherer cousins. Unbeknownst to them, (and to most of us) this was a planet changing event.

Sustained by new agricultural surplus, these early humans slowly spread out around the globe expanding trade and technology. For thousands of years, the average annual growth in the size of the human economy would be unnoticeable from one generation to the next.

By the 16th century however, more complex social organization and advanced navigational technology kickstarted a unique period in human history. Yet even with these advances, Human cultures remained powered by biomass and the muscles of humans and our draft animals, limiting growth. Until in the early 19th century, 10,000 years after the agricultural revolution, humans discovered how to extract fossil energy and materials from under Earth's surface to boost their economies

This new discovery of geologically 'stored sunlight' in the form of coal oil and gas changed everything. For the first time, human and animal labor played second fiddle to the power of these new energy sources. When combined with a machine, a gallon of gasoline could output the same work in a few minutes as a person laboring for an entire month.

The Great Simplification Movie Transcript

We increasingly replaced manual human tasks with machines, at a tiny fraction of the cost. The result: higher profits, higher wages and cheaper goods. Sudden access to this bank account of stored carbon energy turbocharged our populations, access to goods, services, and technology and quadrupled our economic growth rate.

Yet Humanity's great acceleration was still ahead. In the latter half of the 20th century, with this new power source, and an upgrade from coal to higher quality liquid oil, the human economy's average growth rate doubled yet again, to now over 30x what it had averaged-during the last few thousand years.

Compared to a global labor force of around 5 billion real humans, the machines and work powered by access to buried carbon energy added the equivalent power of 500 billion human workers. Access to these fossil energies and materials brought billions more humans into existence and brought billions more out of poverty. And led to the creation of new myths, institutions, and expectations.

Our ancestors' lives were tightly linked to the natural flows of the Earth - the sun, the rain, and the soil. But during this moonshot of growth and consumption, our fundamental tether to nature was first neglected and then forgotten. The main inputs to our economies were now mostly free – we merely had to pay for the cost of their extraction, not the cost of their creation, their true worth, nor their pollution.

To our ancestors, the benefits from carbon energy would have appeared indistinguishable from magic. And, instead of appreciating this giant one time windfall, we developed stories that our newfound wealth and progress had emerged purely from human ingenuity.

...We had become Energy Blind...

Part 2:

Energy is and always will be the currency of life. Animals were the first investors. Obtaining a larger energy surplus gives an animal a competitive advantage for survival and reproduction.

This role of surplus energy is a core driver of the natural world and dictates what can and can't happen.

The Great Simplification Movie Transcript

We rarely think about it or talk about it, but we are all alive during the carbon pulse - the few hundred years where humans are drawing down Earth's energy battery millions of times faster than it was trickle charged by daily photosynthesis. Fossil hydrocarbons - at a vast scale - have enormously increased the surplus energy available to human economies.

Pulses - by definition - don't last forever. High quality ores and energy deposits are now mostly things of the past. Plenty remains, but it's of lower quality, and both more costly and ecologically destructive to extract.

In nature, there are countless examples where energy exists, but the effort to obtain it is so large that the meal is effectively off the menu. In our lifetimes, society will have to redirect increasing amounts of our energy surplus towards obtaining the surplus itself, leaving less affordable energy to support many of our current economic activities. One day - the energy it will cost to extract energy will be so large it won't make sense to do so even though resources remain. Energy depletion will act as a growing tax on human societies.

In this unprecedented era of large surplus, we have excelled at combining energy and materials into technology and inventions that improve the human experience. New technology can allow us to use resources more efficiently, or it can transform natural flows into energy, but mostly technology just creates new ways for humans to consume— and builds higher future requirements for energy and materials.

Things that are more complex require more energy. When we add nodes to a supply chain, each connection requires energy to maintain. The complexity of our globally interconnected system currently requires the equivalent of 170 billion light bulbs constantly turned on, burning brightly, powered by the carbon pulse.

Even rebuildable technology that harnesses the sun and the wind grows our total consumption and has not yet reduced the use of carbon energy globally.

Most people believe that money is real wealth. Yet, everything we spend money on requires energy to mine, create, deliver, run, maintain, and dispose of. In this way, money is ultimately a direct claim on energy and resources.

Our economic stories assert that with more money we can create more of anything. The truth is we cannot create energy. We both extract and burn it faster by using technology and printing money.

The Great Simplification Movie Transcript

Natural capital - particularly energy - is the true foundation of our monetary systems. As we create more money we don't create more resources, we merely access them faster.

The highest sustained growth rate of human economies ever before and likely ever again peaked 50 years ago when oil production growth was at its highest. But rather than living within our means, we found creative ways to extend growth for a while longer.

We created complex supply chains - outsourcing the heavy lifting to countries with cheaper labor.

We turned to debt in a large way to maintain high levels of consumption - a behavior that accelerated in 2008 and has gone into overdrive since 2020. Debt allows us to spend resources from the future and call it economic growth. This phenomenon has become so pervasive in the last 50 years that we think it's normal to consume today and pay tomorrow.

The developed world is now using debt to enable the extraction of things we couldn't otherwise afford to extract to produce things we otherwise couldn't afford to consume. This strategy has an expiration date - because all this new money will one day be spent on real things requiring energy.

Enabled by an extraordinary but temporary energy surplus, the human economy is now over 1000x bigger than it was just five centuries ago. Most of the benefits of this one time geological surplus now flow to a fraction of people, not to the rest of living humans, nor future generations.

As we extract minerals and burn fossil carbon to support modern living standards, their waste streams are in turn diminishing the life support systems of other species and future beings. The impact of our global energy metabolism on nature has been tragic, and is now accelerating - resulting in among other things - animal, bird and fish populations dropping by 50% since the 1970s, plastic now weighing more than all animals on land and in the sea, and a child born today - being expected to outlive Earth's coral reefs.

As a culture, we have recently but almost entirely financialized the human experience. Not only have we parsed the rich fabric of human life into a single monetary marker, but in doing so we've used the wrong prices.

The price of money is wrong because we grow it with a keystroke with no tether to finite natural capital.

The Great Simplification Movie Transcript

The price of energy is wrong - because we don't treat it as the extraordinary irreplaceable resource it is - non-renewable on any human time scale. And in setting prices on everything, we've lost sight of the large costs their use has on Earth's ecosystems.

This biophysical story is all connected in an emergent -and unexpected way. As the carbon pulse boosted our economies - our institutions and governments self-organized around expectations of growth.

Now, ~8 billion members of a social species collectively seek 'profits', which are linked to energy, which is linked to fossil hydrocarbons and minerals. Growth-as measured by increases in GDP, is now required for stability. We have arrived at a place where we as a culture have outsourced our decisions and planning to the financial system. The market's compulsion to grow now outcompetes any alternative paths of wisdom or constraint.

The system is no longer in anyone's control. The human species - at least to this point - has become a mindless, insatiable, energy hungry superorganism.

Part 3:

The superorganism is an emergent phenomenon of the animals that comprise it. Us.

Human beings are related to ALL other creatures on Earth. We are the product of an unbroken chain connecting to the first life, which means that hidden beneath our stated motivations of what we do every day in industrial society, we are driven to pursue the same neurochemical brain rewards our ancestors pursued. This has huge implications for our behaviors, our economies and our futures.

Reaching for our phone to see if someone liked our Facebook post or to see if Bitcoin is up or down aren't really our goals. We are in reality just seeking the same brain rewards that led to success for our hunter-gatherer ancestors.

Dopamine is a molecule that in animals - and humans - leads to motivation and action.

In a materially rich modern world, the habituation to the action of "consumption" leads to the WANTING of things - culture wide - being stronger than the reward we get from HAVING them. This is a fundamental problem for an economic system that's turning billions of barrels of oil into microliters of dopamine.

The Great Simplification Movie Transcript

As a carryover from ancestral tribal life, we are highly tuned to social signals, comparing ourselves to others, seeking approval, acceptance and jockeying for status. With material - and now digital - wealth as today's primary status signal, consumerism is now largely based on having as much - or more - than those around us, rather than focusing on what we may actually need.

Modern humans are still tribal beings. We staunchly support those in our ingroups and easily ostracize outgroups -from trivial divisions like sports teams, to political affiliation, race or nationality. Our evolution has primed us to blame other humans for situations we don't like or understand.

We have rich, creative and colorful imaginations that reside in the virtual worlds of our minds. The human brain can imagine – and verbalize – limitless combinations of physical impossibilities - sustainable outposts on Mars, self-perpetuating energy machines, and an economy based on physical consumption growing continually for centuries.

In ancestral times these virtual worlds overlapped with the physical world we inhabited, making us more content and effective as a tribal unit.

But in a culture of vast material wealth, information overload and social media, it's increasingly difficult for us to separate fantasy from reality.

When these individual virtual worlds connect with the virtual worlds of others, the result is widespread shared beliefs - that money is real, that our current wealth is due mostly to our cleverness, and that technology will lead to limitless growth.

When we look to others to try and understand our complex modern world, as social beings 'who said it' becomes more important than logic or the quality of the evidence. Celebrity and group affiliation now matter more than truth.

Our stone age brains are no match for the social media algorithms that now constantly hijack our attention. Modern media outlets prey on our evolutionary inclinations for novelty and in-group defense via capturing our attention and turning clicks and shares into consumption:

Computer algorithms - optimized for profit - are splintering our society by reducing attention spans, accelerating addiction, polarization, apathy, and mistrust in science. A metaphorical technology 'worm' driven by exponentially improving artificial intelligence is silently-eating our minds.

Humans are creatures with finite lifespans. The future isn't a priority to us emotionally - instead we're focused on the very short term: this weekend's plans, this quarter's earnings, this term's election, the next set of compelling images we're urged to scroll to.

The Great Simplification Movie Transcript

We often promise to make big 'changes' starting tomorrow, until tomorrow becomes today, and the cycle repeats, delaying any actual change.

Like other biological organisms, humans seek gains and are averse to losses. We look for undervalued stocks to invest in, sales on new shoes, or 2 for 1 cocktails at happy hour. Unlike squirrels or cheetahs, we are an extremely social species. We coordinate as families, small businesses, corporations and nation states to maximize our virtual surplus - dollars - which we then spend on real things.

Our core economic and environmental challenges stem from a mismatch of hunter gatherer minds inhabiting a competitive consumer growth culture. Together, these human universals have led to incentives and behaviors which have created a metabolic superorganism, whose objective is disconnected from the well-being of its parts (us).

It is tempting to look at how we live today and conclude that this is how humans are. But modern society is only a single brief example out of thousands of successful arrangements in human history. Humans alive today don't "choose" to be hierarchical or greedy - many of our choices are constrained by the economic system we were born into.

Our current high consumption, high inequality, high technological distractions and low levels of daily human connection are a direct product of the carbon pulse.

Though human brains don't change quickly, under the right circumstances, our behaviors and cultural norms can move at lightning speed. Our species is incredibly adaptive when we're challenged.

The way we've been living is an anomaly. But we take it for granted, because as individuals it's all we've ever known.

Going forward, a lifestyle adapted to lower energy use will reconnect our virtual and physical worlds. By necessity our lives will become less global, more interpersonally engaged, and more tethered to natural flows.

As a species, a global superorganism is not our destiny. Who we are has brought us to this precipice. Who we are capable of becoming, as individuals and as a society, will be the question of our time.

Part 4:

We are alive at a time of wonder, peril and possibility.

The Great Simplification Movie Transcript

Ahead are a million unknown destinations, some dark and foreboding, and some welcoming and beautiful.

Many of us sense that something is different, something is coming. But we lack a shared understanding of the path that brought us here and of the terrain ahead.

Which future we expect depends upon which lens we use to see the road.

Modern society is polarized, stressed, and overwhelmed with information, good and bad. As a result, common points of view - our lenses - focus on the road just in front of us. For the view to the future, we defer to culturally accepted guides, who are confident they know the way forward.

Through the lens of an economist, for example, we see a glorious road leading to growth that never stops. Any scarcity of energy or material inputs will be solved by price signals, creating incentives which increase our productivity and growth. The economic lens shows us that human ingenuity and the market – will solve everything.

A financial lens translates stock markets at all time highs as a sign of society's health, portending a rich and virtuous future. With enough financial capital we'll be able to build roads to anywhere.

A technology lens promises a shiny road of comfort, novelty and prosperity enabled by future inventions. Innovation, artificial intelligence, and a vibrant metaverse will sidestep any energy or resource constraints. We envision future humans breaking free from the confines of Earth and enjoying high-tech lifestyles where the biggest problem is runaway robots.

These lenses are all optimistic, but misguided. All these lenses are energy blind.

The real paths ahead can only be seen by integrating energy awareness with biology, sociology, physics, and everything science has discovered. We need a “systems” lens to read the map.

A systems lens reveals the holistic story that explains humanity's path. In pursuit of the same emotional experiences of our ancient ancestors, we transform materials and energy into technologies that make our lives more comfortable and fun. We keep score of our progress using money, which has become a psychological stand-in for all the things our ancestors valued. The massive scale of humanity's consumption is evidenced by the excess CO₂ being absorbed by Earth's oceans and atmosphere.

The emergent result is a metabolic superorganism - with oil as its hemoglobin, transporting goods through the arteries and veins of the global supply network.

The Great Simplification Movie Transcript

Like a shark needing to swim to get oxygen flowing through its gills, our current economic system has an imperative to grow in order to satisfy prior financial commitments. We can't stop nor can we slow down or the system will crash.

A systems lens reveals that the road ahead is closed to our current cultural expectations - yet we continue to bear down on the accelerator.

Wearing systems lenses removes the blindspots created by any single issue lens.

Global economic growth will never meaningfully decouple from energy consumption. It cannot - because the world's GDP, by definition, has always been a proxy for how much energy we burn. If we were to grow the global economy at 3% a year as most governments and institutions expect, we would use as much energy and materials in the next 30 years as we have in the past 10,000.

Stock markets are poor guideposts for prosperity when inflated by government and central bank support. All the cash, stocks, bonds, and pension funds in the world will need energy and materials to be cashed out and turned into real wealth.

Creativity and innovation will be central to human futures, but modern technology requires huge amounts of energy to build and operate. As long as GDP is our goal, efficiency gains from new technology will serve the superorganism. Transitioning from fossil hydrocarbon to rebuildable energy won't change this dynamic. Ultimately, in addition to using different energy, we'll need to use energy differently.

Seeing our future through a systems lens - changes everything. We have spent the last century harnessing enormous amounts of fossil energy to build a world of complexity like nothing seen before.

In the coming century, humanity will experience A Great Simplification.

There will always be energy on Earth as long as the Sun burns, but the amount of surplus energy available to human societies will soon be diminishing: As the extraction of geologically stored energy becomes more difficult, everything we're used to in society will become more costly or less available. We are not planning for this because it's never happened before.

The onset of the Great Simplification will be financial and economic turbulence, followed by contraction. When we can no longer grow fast enough to maintain all the increased financial claims, economies will recede to a scale that can again be supported by physical flows without credit. Complex global supply chains, the related high consumption lifestyles and many of the conveniences and freedoms we take for granted in this era of abundant energy surplus will diminish.

The Great Simplification Movie Transcript

The ensuing simplification will be among the most significant events ever experienced by our species. Those who look through a systems lens can serve as early visionaries of a simpler life with new ways of relating to technology, to consumption, to each other and to Earth's ecosystems.

There are many pathways wending through a Great Simplification. Some are wise, humane, and even preferable to what we have now. Some are so dark as to be nearly unthinkable. Yet, it is precisely "thinking about" these pathways, and actively choosing among them, which offers the only realistic hope for a long and meaningful human future.

Nature has gifted us with a productive and beautiful home, the ability to understand how we got here, and the creativity to imagine which paths are possible. The future need not be dystopian, but cleverness alone will no longer suffice for the next leg of our journey. We will need imagination, foresight, empathy and above all wisdom to navigate the path to the future that is arriving - The Great Simplification.