

# WHY WE ARE AT THE START OF A THIRD INDUSTRIAL REVOLUTION

An Occasional Essay from:

Michael McAllum,

Futures Architect.

[michael.mcallum@globalforesight.net](mailto:michael.mcallum@globalforesight.net)



In 2007 the European Union Parliament endorsed the idea of the five pillars of the Third Industrial Revolution as the basis for the future design of Europe. This was reaffirmed again in 2012. More recently, in an explicit initiative of the current Chinese President Xi Jinping, some US\$18 billion is to be invested in Third Industrial Revolution projects. Elsewhere cities and regions (Rome, San Antonio, Monaco, Utrecht) are developing master plans to transform themselves into viable 21st century regions. Notwithstanding this global interest, many have never heard of this revolution and its ideas are at the margins of conversation and policy.

***“The Third Industrial Revolution will be the last of the great industrial revolutions and (it) will lay the foundation infrastructure for an emerging Collaborative Age.***

***Its completion will signal the end of a two hundred year saga characterized by industrious thinking, entrepreneurial markets and mass labour workforces.”***

***Jeremy Rifkin***

The purpose of this brief essay is to explain the logic of the Third Industrial Revolution and what it might mean. It argues that significant energy and communication technology change is upon us and that transformation, in the next decade, under almost any conditions, will be both dramatic and rapid. Think ‘cars’ in an age of stables and blacksmiths and you get the point. It suggests that the transformation is necessary because so many of the ideas that have underpinned our current views are at their limits, as are the resources that we have used, almost without thinking. As the old normal of the mechanistic industrial world seizes up and is replaced with a ‘new normal,’ significant investment opportunities are emerging for those that understand the necessary changes that must be made. This essay will also contend that the failure to rapidly transition will consign the laggards of the world to a future of unsustainably high costs, decaying fabric, inappropriate regulation and standards and profound dislocation, unless some kind of environmental collapse overwhelms us all first.

### **A short history of revolution.**

The premise that underpins the concept of Industrial Revolution, or for that matter the Agricultural Revolution that preceded it, is that when there is a radical shift in energy and communication technologies, acting in concert, there is a fundamental reframing of every aspect of a society or societies. This makes this type of revolution different from revolutionary events such as the French or Russian revolutions although there are instances when the two do interact.

About 200 years ago, most cities and some societies were dramatically transformed by what has come to be known as the First Industrial Revolution. Great factory based cities sprang up and the infrastructures of the Steam Age reshaped our landscapes. Even more importantly, the widespread

availability of cheap printed newspapers, magazines and books kickstarted the democratisation of literacy and education. It provided for some the opportunity of childhood before a life of work. This Steam Age had two other important features. Firstly, it provided a mechanism for those that owned machines and resources to accumulate capital and thus the idea of capitalism as we now know it became a key feature of many societies. Secondly, it allowed access to resources in ways that were hitherto impossible. It established the illusion that humans as species had escaped from nature's constraints. The benefits from access to many more resources we called 'growth' and the escape we called 'progress.'

	Agricultural Revolution	1 <sup>st</sup> Industrial Revolution	2 <sup>nd</sup> Industrial Revolution	3 <sup>rd</sup> Industrial Revolution
<b>Time</b>	5000BC-C18 <sup>th</sup> C	19 <sup>th</sup> C.	20 <sup>th</sup> C.	21 <sup>st</sup> C.
<b>Energy Construct</b>	Horse power & Water	Steam	Oil & Electricity	Renewable
<b>Communications technology</b>	Writing	Cheap printing (Convergence of linotype and press)	Telephony & Media	Digital Networking
<b>Form of social organisation and settlement</b>	City States Hydraulic Civilisation	Factory based cities	Suburban conurbation	Interconnected 'village' ecologies

Just over 100 years ago a second revolution occurred. Quantum leaps in energy efficiency emerged with the introduction of cheap oil and electricity. This allowed the development of a new prosperity and the emergence of the suburban world as we know it today. We called this process, this desire to always improve, where the average person can be king or queen of his or her own castle, consumption.

This shift was greatly aided by telephony and from mid century by television and early digital. As with the Steam Age almost all the things we saw as being important were shaped by this revolution. The pace of transformation (1912 to 1922) was also startling as the historic records and modern fiction like "Fall of Giants" testify. Monarchs fell, nation states became the norm and class was replaced by displays of wealth together with a requisite 15 minutes of fame.

Now according to transformational theorists, like Jeremy Rifkin, a Third Industrial Revolution is underway. As with the other industrial revolutions, paradigm shifts in energy and communications will change how and where we live, the nature of economy and our institutional framework. By design it must enable some 9 billion people to live well (materially, socially and philosophically) within the constraints of the planet. This revolution has been described as a shift from a competitive mechanistic world to distributed and collaborative age. It represents a fundamental reframing of our entire social and economic fabric. This revolution is not some kind of future fantasy. The key platforms for an energy, communications and economic revolution are already here.

***“A brilliant new economic paradigm to guide the human journey in the 21st. century”***

***Gianni Alemanno,  
Mayor of Rome.***

In places like Spain, California and Germany a rapid transition is already underway. Increasingly expensive oil and fossil fuel electricity is now giving way to a wide variety of competitive renewable energies. Ideally these are, or will, be generated close to the source of consumption. In just a few decades almost every building will become its own power plant, trading seamlessly with its neighbours. If this sounds too far fetched, remember so did wiring every home and factory 100 years ago. As a consequence the critical utilities we all depend upon; standalone water, electricity, fuel etc will collapse into integrated utilities with micro grids and intergrids. This new utility model has been recently dubbed the Internet of Things. This Internet of Things will connect everything; “people machines, natural resources, logistics, consumption flows, recycling and the like, into multiple nodes in real time.” As this new Internet of Things takes shape the age of the combustion engine will be parked on the sidelines.

According to the International Telecommunications Union, some time in 2014 the number of mobile phone subscriptions on the planet will exceed the total population of the planet (7 billion). This ability to communicate from almost anywhere at any time, even among the poorest peoples is changing the dynamics of every society. Increasingly the powerful are losing control of their ability to be the ‘source of information’ and to benefit from knowledge as power. Instead those who know how to network, share and collaborate are creating new enterprises and social entities that, through the way they are designed, use far fewer resources to deliver value than contemporary hierarchical models. So powerful are these dynamics that the US transnational GE estimates that every organisation will need to fundamentally reinvent its business model by 2020.

It is important to understand that Industrial Revolutions are not just about technology. In a world freed from “the constraints of location” they will cause a fundamental rethinking of how we organise, create spaces and think about time. Suburbs and vertical communities (what we now call skyscrapers) will redefine themselves as interconnected village ecologies. Small modular units including 3D printing manufacturers will outperform those that rely on economies of scale. Capital accumulation will become increasingly difficult as the size of transaction costs, for those that supply services and those that demand them, become very very small. Crowd sourcing opinions and design will become the norm and crowd funding will compete with conventional investment. Many will look to take advantage of education on demand rather than ‘education by timetable.’ Most other 20th. century institutions will need to make similar adjustments. Finally it is unlikely that this revolution will take more than another decade or so.

## **Stepping back from the cliff.**

Unlike earlier revolutions, we have other reasons to consider making this transformation sooner rather than later. One of the by-products of our resource driven progress has been to fundamentally alter many of the planetary conditions that make the Earth conducive to human habitation. Much of our wild foods and biodiversity has disappeared. At a global level, usable fresh water stocks are dwindling and topsoil fertility is eroding. Oceans are acidifying and Arctic summer sea ice will, in all likelihood, be a thing of the past. Many of our urban environments produce excess wastes that are now hard to dispose of. Some have such toxic air that day to day living is a health hazard. Most concerning of all, as the science from all the world's great scientific academies suggest is that a future (circa 2060) of more than 4 degrees global warming is more likely than not. The World Bank has described this as “so dramatically different from today’s world that it is hard to describe accurately.” As each of these environmental tensions begins to effect the others, our children and grandchildren are unlikely to think about us kindly if we simply keep on with business as usual.

The ‘canary in the coming disaster mine’ is our food system. As Paul Ehrlich in a recent Royal Society address points out, “no civilization (and ours is now global) can avoid collapse if it fails to feed its population.” Such a scenario is possible, not as some distant possibility, but potentially in the next few decades. Significant challenge will come, for some, from a combination of soil and water shortages. For others it will arise through the unsustainability of a technology-dependent (oil) production and distribution systems. The good news is that all the technologies and case studies to overcome this disjunction are known and can be easily implemented. However significant rethinking is required. Protection of the most fertile production areas is vital. Turning this into reality will require a major repositioning of how our cities are ‘developed.’ It is concerning that none of our large cities have coherent periurban strategies that protect these vital spaces and that those who advocate such thinking are seemingly marginalised. A second important consideration for our crowded cities is a new green revolution. This will require designs and plans for a future where some of the food that urbanites require is grown in or on (rooftop gardens) the cities themselves.

The sheer scale and speed of what is coming towards us seems almost overwhelming. It is of course understandable that some, in order to stay sane, will simply deny everything. But history shows us that those who have the humility and courage to reinvent themselves will be those who lead us into this new age.

## Rethinking Identity

**Steam Age:**  
*I think  
therefore I am.*

**Oil Age:**  
*I participate  
therefore I am.*

**Collaborative Age:**  
*I am connected,  
therefore I exist.*

Our sense of identity, be that for an individual or a community, is constructed from multiple interactions over years. It reflects the kind of society we live in. Therefore as the Third Industrial Revolution develops we can expect that our identities so tuned to a world where economics dominates everything will evolve as well.

Already our language is changing from that of the machine to the language of networks and ecologies. Our behaviours will change from bounded competitiveness to boundary-less collaboration. Our interests are changing from owning things to having access to them. Our consumption patterns will shift from supply push to demand driven, our cities will reconfigure from hub and spoke design to nested ecologies and our world views will shift from those as uncaring even arrogant masters of nature to caring restorers of the planet. Finally our governance systems will free themselves from the myopia of nation states in order to facilitate synergistic action and promote abundance thinking with those that understand the challenges that imperil the very survival of humanity must be confronted sooner not later.

As has already been intimated, many have already discovered this future. They are like hermit crabs who know that they must hide in conventional shells. They look the same as everyone else but the reality is that they are very different. As the story of what a future Collaborative Age becomes more widely known and accepted (an escape from the machine!) these new economic and social endeavours will move from the fringe to the centre. In the process a new way of thinking, a common philosophy for the future will emerge to replace the emptiness of 20th century socialism, liberalism and neoconservatism.

### References.

1. Rifkin J, *The Third Industrial Revolution*. 2011, Palgrave MacMillan
2. Rifkin J, *The Zero Marginal Cost Society*. 2014 Palgrave MacMillan
- 3 The Third Industrial Revolution <https://www.youtube.com/watch?v=9e0UofNMzKM>

### The Age of Progress is Over.

The shift from the Mechanistic Age to a Collaborative Society is both systemic and of seismic proportion. It provides an escape from a world that increasingly provides little happiness for many and is disastrous for the life support systems we depend upon. This is a time when those that accept the mantle of leadership need to think deeply about what it is that they are leading and for whom. It demands a rethinking of what constitutes value and how that is curated or looked after. This requires foresight, deep design and a willingness to step away from an over reliance on successes of the past. In short this is not a time to have a crisis of imagination.