

Introduction: Where We Went Wrong

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This book grew out of a conference in 2009 called the “New Emergency.” What emergency was that? Most people didn’t think that there was an emergency then and they don’t think there is one now. They know that the world is facing a lot of problems at present but they probably would not elevate any of them even to the status of a crisis, still less an emergency. The world has always had problems, they think, and it always will. Very few of them think that there’s anything going on at present that requires Ireland to mobilize all its resources in the way that it did in response to the Old Emergency, the Second World War.

However, once you recognize that most of the worst problems the world faces have a common cause and that time is running out to solve them, you have an emergency. That’s my position. I believe that the “development” path that the world has followed for the past three centuries has led to a dead end and that immediate action is required if humanity is to have any chance of getting on to a more sustainable path. Every day lost makes a satisfactory future less likely for billions of people, both born and yet-to-be-born, because our options are trickling away with our lifeblood, natural resources.

That’s the emergency. We need to apply a tourniquet immediately to give us time to take more drastic action. But who is conscious of this? How many people really grasp the severity of the climate crisis? Or the fact that the production of conventional oil has almost certainly peaked and the amount of energy that is going to be available for the world to use is going to shrink rapidly? Or that energy and water shortages are going to curtail the world’s food supply? What proportion of the general public is really worried about the rate at which species are being lost?

True, everyone knows that several countries have problems with debts or with their banking systems (or, like Ireland, with both), and that they,

or people they know, are losing their jobs because of them, but they might not elevate these problems to the status of a crisis unless they live in Greece. They think that, in Ireland's case, these financial problems began when the housing bubble burst and that the burst was somehow linked to the credit crunch that began when worthless securities generated by the sub-prime mortgage fiasco in the US triggered what was, for a time, an international banking crisis. There's been almost no recognition that resource depletion was the underlying cause of that international banking crisis and there probably won't be for as long as the conventional wisdom is that the world economy is looking up and the crisis itself has come to an end.

Even at its height, the financial crisis was only an emergency for those responsible for handling it. A country faces an emergency if an enemy is mobilizing on its border to invade, or if its people are dying in thousands from a plague. A family faces an emergency if its house is on fire or if one of its members has been hit by a car and needs to be rushed to hospital. An emergency is a period in which everything else is ignored in favor of immediate action.

From time to time, the chronic problems that face the world erupt and cause a minor emergency such as that on the evening in September 2008 when the Irish banks told the government they might be unable to open the following day. When something like that happens, people stay up late, the eruption is dealt with and then life goes on until the next eruption occurs. Few of us think that anything radical has to be done. We assure each other that minor tinkering, like holding an inquiry, beefing up the regulatory system and limiting bankers' bonuses, will be enough to allow us to carry on living pretty much as we do now for the foreseeable future.

We are ignoring these eruptions in the way the inhabitants of Pompeii ignored the earthquakes which preceded the volcanic blast that destroyed them in 79 AD and which had been doing considerable damage for at least the previous sixteen years. Some of the earthquake-damaged houses were actually under repair at the time Vesuvius erupted, with piles of plaster and tools lying where the workers had left them. Rather than moving out, the Pompeians wanted to carry on with life as usual. They had every reason to do so. The whole Bay of Naples area was booming and the holiday villas of the rich provided a lot of work. Interestingly, those who dropped everything and fled immediately when ash and pumice started raining down probably survived. However, many thought their best chance was to take shelter. They

died when the avalanche of hot ash, pumice, rock fragments and volcanic gas began.

The common cause of all our crises today is our use of fossil fuel. Just as addictive drugs alter the metabolism of the human body in ways that create dependency and make it difficult to give them up, fossil fuels have profoundly altered the metabolism of economies and societies. As a result, the systems of production and distribution we have now, and the types of relationship we have with other people, including those within our own families, will be changed out of all recognition as the energy drug is withdrawn. The withdrawal period will be particularly painful in countries that fail to ensure that they have a decent supply of renewable energy methadone available to them. Cold turkey will mean that many people die. Thinking of Pompeii, if we leave it too late before we rush toward a new type of civilization, we will have to leave behind all our hi-tech, high-energy tools, and we may not survive without them.

Here are some of the ways in which fossil energy use has perverted our economies and our lives.

1. It has transformed manufacturing methods by displacing human labor.
2. It has transformed agricultural methods, replacing human labor, animal power and sunlight.
3. It has enabled the world population to grow to a level that may well be unsupportable without its use.
4. It has devalued human labor and led to widespread unemployment.
5. It has made the economy reliant on economic growth to avoid collapse.
6. It has enabled extremes of wealth and poverty to develop.
7. It has led to the development of industrial capitalism.
8. It has produced profits that had to be recycled. This led to the growth of the banking system and debt-based money.
9. By fueling powered transport, it has destroyed self-reliant local economies and the nature of local relationships.

Once fossil energy began to be used, these perversions were inevitable. About seven years ago, I wrote the concluding essay for *Before the Wells Run Dry*, a book about future energy supplies which emerged from a previous Feasta conference called Ireland's Transition to Renewable Energy. That conference was the forerunner for a lot of the thinking in Feasta that laid

the foundations for the New Emergency event so I'm going to draw rather liberally on what I wrote in 2003. The essay asked where humanity had gone wrong. When did we take a path which, because "one path leads to another" in Robert Frost's phrase, inexorably led us to becoming totally dependent on a grotesquely unsustainable energy system?

I argued that the wrong turn was taken in England in the 16th Century as the population began to recover from the Black Death. The increased numbers — a rise from 1.6 million to 5.5 million in less than 200 years — naturally put greater pressure on resources and caused communities to have problems living within the limits imposed by their local environments. In 1631, Edmund Howes described how this had forced them to start to burn coal:

Within man's memory it was held impossible to have any want of wood in England. But... such hath been the great expence of timber of navigation, with infinite increase of building houses, with great expence of wood for household furniture, casks and other vessels not to be numbered, and of carts, wagons and coaches, besides the extreme waste of wood in making iron, burning of bricks and tiles, that at this present, through the great consuming of wood as afore-said, and the neglect of planting of woods, there is so great scarcity of wood throughout the whole kingdom that not only the City of London, all haven towns and in very many parts within the land, the inhabitants in general are constrained to make their fires of sea-coal or pit coal, even in the chambers of honourable personages and through necessity which is the mother of all arts, they have in late years devised the making of iron the making of all sorts of glass and the burning of bricks with sea-coal and pit-coal.¹

That was it. The thin end of the wedge. The slippery slope. For the first time, humanity was starting to depend on a nonrenewable, and hence unsustainable, energy source for its comfort and livelihood. It was understandable that it did. Which of us would have worried about the long-term consequences of burning black stones collected from beaches in Northumberland, or which had been dug out of shallow holes in the ground?

I then pointed out that as the demand for coal increased, the easiest, shallowest mines were soon exhausted, and deeper and deeper pits had to be dug. This posed enormous problems since a shaft floods if it is sunk below the water table and a pump has to be installed to keep things reasonably dry.

The early pumps consisted of rags or buckets on continuous chains which were turned by horses or, if a stream was handy, a water wheel. However, the deeper a shaft went, the longer the chain had to be and the more friction the horse or the wheel had to overcome. As this placed a real limit on how deep a mine could go, mine-owners were keen to find other ways of powering their pumps. Around the time Edmund Howes was writing, coal-fired steam power began to be used for the first time for pumping water out of mines. In a somewhat incestuous way, coal energy was being used for mining coal.

The Transformation of Manufacturing Methods

The first steam engines just moved a piston back and forth, which was all that was required to work a cylinder-type pump. It was only during the following century that the piston was attached to a crank to turn a revolving shaft, an innovation in response to a demand for rotary power from cotton mills unable to find additional sites for their waterwheels. This was the type of engine, of course, that powered the industrial revolution and, in my view, led with an alarming inevitability to the problems we have today. It was steam power, in fact, which made the widespread use of machines possible and then, for competitive reasons, absolutely necessary.

The essence of industrialization is that it produces lower-cost goods by using capital equipment and external energy to replace the skilled, and thus relatively expensive, labor used in handcrafts. Since less labor is used per unit of output, unemployment develops unless sales expand. The mechanization of sock and lace production in the English midlands led to such widespread job losses that riots broke out in 1811 and 1812. Troops were sent to the area to stop the Luddites, as the bands of destitute working men were called, from breaking into the new factories and destroying the machines. Indeed, had the Napoleonic War not ended in 1815 allowing the factories to increase their sales in Europe and elsewhere, the disturbances might have become serious enough to kill off the industrial revolution. Without wider markets, firms using powered machinery would have either consumed themselves in a competitive frenzy, or seen their technologies banned as a result of popular unrest.

Eventually, however, British exports put most continental craft producers out of business and left the remainder with no alternative but to adopt more fossil energy-intensive methods too. A sales pyramid developed. The early participants in a sales pyramid get rich because they receive commis-

sion on the goods they sell to people whom they have persuaded to become dealers too; dealers who, in turn, can earn a commission from others they induce to join the pyramid as dealers later on, who themselves recruit and stock further dealers. And so it goes on, setting up a situation in which everyone in the pyramid can only fulfil their income aspirations if the pyramid does the impossible and expands indefinitely, eventually involving infinitely more people than there are in the world.

The fossil fuel-based production system became dominant by expanding on exactly the same lines. Just as British factories had needed to take over the markets previously served by craft-scale manufacturers in Europe to survive, industrial Europe had to oust artisanal producers elsewhere in the world, and the British sold them the machinery to do so.

Tariff barriers were maintained to allow the new continental industries to build themselves up until they could not only compete with their British rivals but had acquired export markets in which to sell themselves. It was the need for exclusive external markets to solve the problem of mass unemployment at home that led the European powers to scramble to assemble competing empires and eventually to confront each other in the First World War.

As each successive group of countries was forced to adopt mechanized production methods themselves in the hope of escaping poverty, so those who had mechanized earlier sold them the equipment. The pyramid this created grew and grew until it reached the point some years ago when there were no more markets supplied by craft producers to take over. This left firms in the pyramid with no-one to displace but each other, and since then, international competition has become so intense that only certain specialized types of manufacturing such as armaments, aerospace and pharmaceuticals thrive in high-wage countries, arguably because of the subsidies they receive through government contracts or patent protection.

How the Economy Came to Rely on Economic Growth to Avoid Collapse

The use of fossil energy not only displaced sustainable manufacturing methods, it also made the economy dependent on economic growth. In a stable, stationary economy, there is no net investment and no net saving. Everything produced in the course of a year either gets consumed or goes to replace things that have worn out. The return on capital is so low — somewhere

between 2 and 3% — that it's only just worth using part of the sales income to maintain the buildings and equipment rather than the business owners spending it on themselves. In other words, the average rate of profit is just enough to balance the society's desire for income now against its desire for income in the future.

Suppose a new technology — steam power, perhaps — is introduced to this stable economy which enables much higher profits to be made in a particular business sector. The firms in the sector will race to adopt it because those that get it first will be able to cut prices a little and drive the laggards out of business. The would-be leaders won't be content to wait until they have saved up enough of the money they would normally have spent on maintaining the old equipment until they can afford the new type. No, they will want to borrow the money they need to get ahead. But where is the money they wish to borrow to come from, since their society has no net savings and no spare resources? The answer is that the money and resources can only come from those that would have been spent on maintaining capital equipment in other sectors. The output from the other sectors will therefore shrink, shortages will develop and prices will rise, putting up the return on the remaining capital until it reaches the rate that the sector with the new technology is able to offer.

The arrival of a new technology in one sector therefore increases the rate of return on capital in all sectors. Profits in excess of those needed to maintain production appear for the first time and workers get a reduced share of the amount the society produces. Moreover, the profits belong to the business owners. This creates a capitalist class with potential investment power. I say potential because what happens next depends on whether other innovations follow the first. If they don't, once the investment needs of the new technology are met, prices will fall and profits drop to the level set by people's time preference, the 2 or 3%. If, on the other hand, there is a stream of innovations, profits could grow to become a substantial part of national income.

This creates the problem noted by Major C. H. Douglas, the founder of the Social Credit movement, who realized that the wages paid to workers could not buy everything that they had produced and that if there was to be full employment, the profits firms produced had to be spent back into the system. It doesn't matter how it is spent, but people whose lifestyle is already satisfactory will probably either save it or use it for more investment. If they save it, someone else needs to borrow it and spend or invest it instead.

The situation in a typical country today is that just over 20% of its income needs to be invested back each year as, if it was all saved, 20% of the workforce would find themselves without jobs. But the people doing the investing demand a satisfactory return and only if economic growth takes place and incomes increase will they be able to get one. If the broad mass of investors fails to get a return one year, they will not invest the next. Unemployment will increase and prices will fall, pulling profits down with them. The amount available for investment will be reduced and the economy will move along a low-growth or no-growth path until another series of innovations comes along.

For the past 200 years, however, a flow of innovations has brought about rapid growth. Many of these innovations have involved the substitution of fossil energy for energy from human, animal and solar sources because, if a worker's efforts can be supplemented in this way, he or she can produce much, much more. An averagely fit man can apply about 75 watts to his work. If he is assisted by a one-horsepower motor, the sort you might find on a hobbyist's circular saw, he can apply ten times more power to the task and consequently work much faster. A positive feedback develops, with the greater productivity leading to higher profits and incomes and additional investment and energy use. The income gap between those using fossil energy and those who don't gets wider and wider. In 1960, the average income in high-fossil-energy-using countries was 30 times that in low-energy countries. By 2001 it was almost 90 times larger. Moreover, the 20% of the world living in high-energy, high-income countries enjoyed 80% of world income, investment and trade.

It is therefore reasonable to say that the use of fossil energy facilitated a greater division of income and wealth than was usual between worker and business owner in artisanal societies. It also led to industrial capitalism and the development of the banking system because, once some enterprise owners were making more profit than they needed to plow back into their own companies, a mechanism was required to take their savings and lend them out to people who did want to invest. A structure was also needed to handle the profit-sharing part of those investment funds—the limited liability company.

I need hardly say that, just as the use of fossil fuels drove people out of manufacturing, it also drove them off the land. The use of fertilizers, tractors and sprays made each farm worker much more productive so less labor was required. In 1790, at least 90% of the US labor force worked in agriculture. In

the year 2000, less than 1.4% did while still producing enough to meet home and export demand. The average American farmer produced 12 times more an hour in 2000 than his predecessor did in 1950.² Again, these changes were irresistible. Food prices fell by about 90% in relation to average incomes between 1920 and 1990. This meant that farmers had to increase their output by at least 1,000% for their income to keep up with the rest of society. As this could only be done by using fossil energy and industrial sector inputs, their output had to increase further to pay for them.

In May 2005, however, this period of rapid income growth for some and the displacement and poverty for others came to an end when world oil production ceased to increase. Indeed world energy supplies, and the supplies of other commodities, had been struggling to keep up with growing demand for two years previously and their prices had begun to rise. In dollar terms, the price of oil had risen to five or six times its 2003 level by 2008, while there was, on average, a tenfold rise in the price of other commodities over the same period. To give two examples, the price of copper quadrupled between 2003 and 2006, while the lead price peaked in 2007 at eight times its 2003 value.

These price rises caused the international financial crisis, as I explain in a later chapter. They were a signal that we should stop doing our Pompeii-style repairs and move away from the present system by devoting all our resources to building a civilization on a different basis, just as we would in a military emergency.

This book is all about how such a new civilization might be built, the resources that might be available for the transition and how our attitudes will have to change to bring it about. Many of the perversions listed at the top of this article need to be undone. Some we can do for ourselves and our families. Some can only be achieved on a community scale. In other cases, national and/or international action is required. Suggestions for action are given in the final chapter.

The task is immense and, on a global level, our version of Vesuvius will probably overwhelm us while we are doing it. Only those countries and communities that have made a determined break with the past will have a chance of surviving at a comfortable level. The rest of us will find that the systems on which our lives and livelihoods depend are overwhelmed and break down entirely, never to recover, and that we have no alternative support systems upon which to fall back. We cannot expect to get any clearer

warnings of impending disaster than the people of Pompeii received. There are already financial fires around the economic cone. If we are to survive we need to move out quickly. Now.

But which way are we to go? Is there a map? It would be a poor book about an emergency situation which did not provide one. So, for the final chapter, my co-editor and I asked the contributors to suggest actions which readers could take or support at four levels — personal, community, national and global. In general, it is only at the national and global levels that fairly firm suggestions can be made and these are exactly those over which our readers have least influence. There is, in fact, a continuum. Influence diminishes the more people are involved. Readers can do a lot to change their own behavior and probably have appreciable influence over their immediate families. They have less influence over what they could do, or try to get done, in their communities, and at a national and international level they have almost no influence at all.

There are two problems with this. One is that, at the personal level, circumstances vary so much that it is hard to find even broad general principles which apply to everyone. For example, should people spend their resources on cutting their household's energy use or would it be better to invest the money involved in a community renewable energy project? And the answer is... it all depends. There is no single right answer.

The other problem is that the key actions to ensure our survival can only be carried out at the national and international level. This is where the Pompeii analogy breaks down. The workmen who left their tools when the ash began to fall had somewhere they could run to with their families to be safe. People today don't. Nowhere on the planet will be left undamaged by the environmental and economic catastrophes that will occur if the nations of the world continue on their present path. So it's not just a question of some of us heeding the warning fires and running away, leaving the rest to their fate. We have to convince the majority of the world's population to come along too.

We should therefore adopt collective solutions wherever possible rather than personal ones. This does not mean that individual acts are unimportant, of course. Indeed, they often ease the way for everyone else. The more individuals who decide to cycle to work, for example, the better the collective provision that is likely to be made for them. Similarly, the more people who fit triple-glazed windows, the easier and cheaper such windows are likely to

become for others to obtain. However, it would make no sense for you to buy your own single-house wind turbine unless you cannot get a connection to the electricity grid. Its cost would be high in relation to its output and the energy and materials used in its construction would have been more productive had they been used to make a bigger machine. Nor would you be able to regard yourself as a worthy eco-pioneer because your solution could never be adopted by everyone else. Power needs are better met collectively; and it was three neighboring families' battle to develop a collective supply that led to the development of the Danish wind energy industry.³ The Transition Towns movement is potentially so important only because it has adopted a collective approach to energy, food and money supplies.

So Gill and I suggest that you should ask yourself three questions as you work your way through this book. The first is "What can I do myself?," the second "What can I do with other people?" and the third is "What can't I do anything about at all?" Each person will gather his or her individual set of answers because of their particular circumstances and we expect that they will find it interesting to compare them with those suggested by our authors in the final section.

Overall, we think you will find that this is an optimistic book because, although the world is facing huge problems, there are also a lot of potential solutions. Consequently, there's a lot that can be done. We hope that, by the time you have finished reading, you have found there are some things which you, personally, are in a better position than anyone else to do or to help others do.

Endnotes

1. Quoted by Richard G. Wilkinson, *Poverty and Progress* (Methuen, 1973), 115.
2. Keith O. Fuglie, James M. MacDonald and Eldon Ball, *Productivity Growth in U.S. Agriculture* (September 2007), downloadable at ers.usda.gov/publications/EB9/eb9.pdf
3. See "How three families started a movement and created an industry" at feasta.org/documents/shortcircuit/index.html?sc5/windguilds.html or pp. 203–7 in my book *Short Circuit* (Green Books, 1996).