LONG WALKS & ANARCHO-PRIMITIVISM

a blog about change

Written & produced by Paul Mobbs – ramblinactivist{at}fraw.org.uk

Available free on-line at: http://www.fraw.org.uk/lwap/posts/07/

View the video for this post here: https://www.youtube.com/watch?v=ZHD-LZpdPgQ

Part 7: *Electric Shock!*: Technological Complexity and the 'Modern Lifestyle'

Hay Moon 2022

What inspired this post was a recent comment in response to another posts. To paraphrase: '*I'm not going to read that because other articles on that site are anti-technology*'. Their point was that as some of my work questions resource availability, or the net effects of green technologies when embodied energy or carbon are considered, then nothing I say can be considered valid because it questions 'technological progress'.

What I say in response is that I am not 'anti-technology', but 'pro-science'. 'Good science' requires that we are always critical of 'technology'.

There is a myth, accepted across modern society without question: *'Technology makes life better'*. It's a proposition treated as a 'rule', when in fact it is a 'function': A certain level of technology certainly improves human lifestyle; but beyond a certain point technology creates a 'trap' – where growing complexity creates a higher risk to our well-being should those systems suddenly fail.

Those who follow my work will know that the experience of being outdoors has a great influence on my work; and that I really enjoy walking, and if possible camping-out in extreme weather: Storms; floods; and Winter cold. There is, though, one type of weather I do not mess with: *Extreme heat*.

As I write this, Britain is on course to smash historic temperature records. What is missing from media debate, though, is the role that technological dependency, driven by the economic imperative of greater productivity and control, plays in accentuating the risks of the urban lifestyle under conditions of extreme heat.

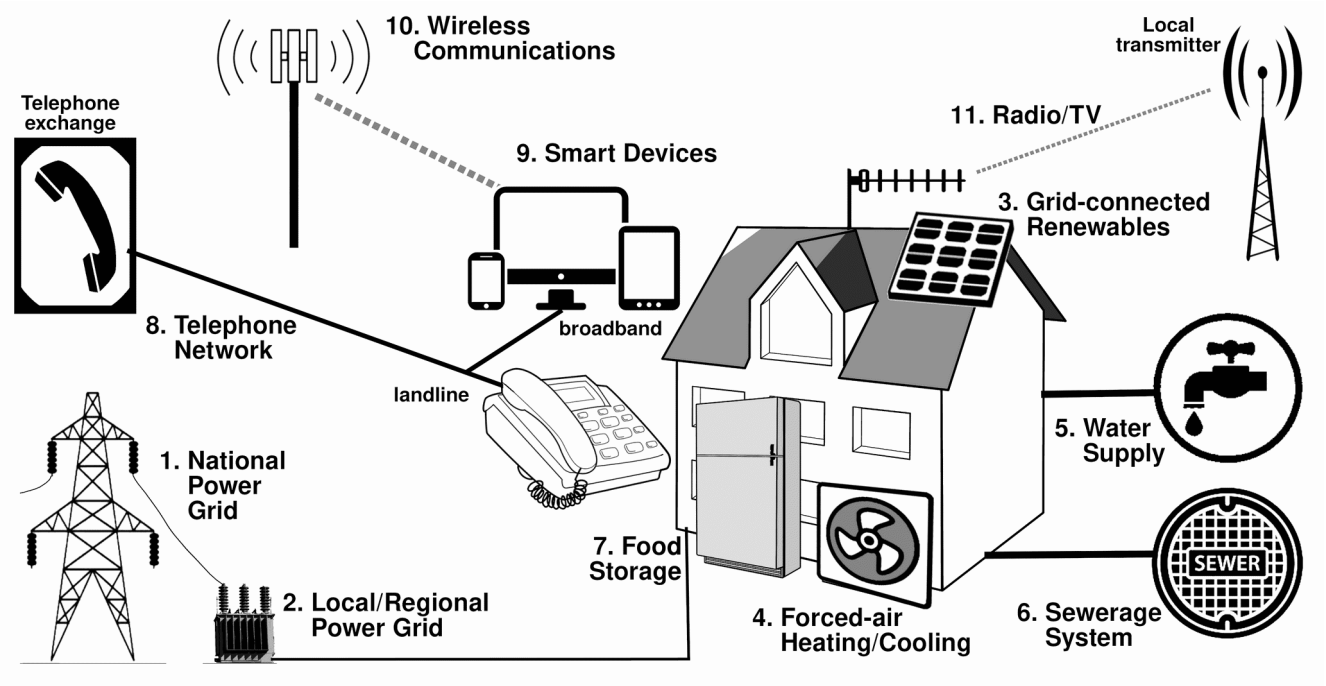
Today, 'technology' is not an evaluation of how to enhance our lives. It is variously an exploitative business model, a consumer fashion, a brand-led cult – and combining all of these, a religion of affluence and consumption.

Technology need not be 'bad'; but you have to understand the limitations of its application to ensure that it truly enhances your life. I look at technology from a perspective of the physical sciences – and in particular, engineering. And from that perspective there are no 'uncontested goods': Technology must be tested in terms of how it is made, how it performs, and how performance varies under probable yet uncommon conditions... *such as extreme heat*.

What we're talking about are so called, 'Black Swan', or 'low probability high impact' events: Events that are likely, and even more so under conditions of a warming climate; but are so relatively infrequent that when they occur it pushes people – and especially the technology that enables their lives – outside of their everyday experience.

If I spend time outdoors, practising and extending my 'primitive' skills, it is not because I 'reject' technology. It is because I understand modern technology, and its limitations. And I do not develop these skills to reject society. It is to create a more simple, stable, fall-back option to help others when the 'high-technology' model fails.

The response to climate change is too often accompanied by a call for more, or improved technology. I disagree. What I believe we need is *'less complex'* technologies.



A systemic flaw in modern society is the demand for electrical power

There are many systemic flaws in modern society: Interlocking processes which, because of the way they underpin systemic complexity, create a correlating risk of catastrophic failure when systems are disrupted. From supply chains, to critical minerals, any one factor may create a global crisis – such as the current 'cost of living crisis' as a result of the conflict in Ukraine.

For this analysis I'm going to focus on the biggest one – which is also easier to talk about because people can readily see it in their everyday lives: *Electrical power*.

In the most affluent industrial states power cuts are a rare event. In poorer states they are a fact of life. And in fact, the emergent effect of accessible and reliable consumer services – like power, water, temperature control, and communications – are the basis for the high-consuming affluent lifestyle that wealthy states enjoy.

Alongside increasing technological complexity there is a retrograde trend: The reliance upon high-availability grid power creates a potential crisis as people do not know how to react to a protracted loss of power. To see the complex interaction of electrical power with the average urban community, the diagram above illustrates how power pervades all facets of our 'modern' lifestyle:

1. National power grid

The root cause of any power crisis will be an imbalance in the national power grid. This can be caused by: Insufficient power from power stations to keep the grid balanced – which creates brown-outs or power surges – which can lead to blackouts; or excessive cold, heat, flooding, or storm damage affecting transmission lines or the power stations – all of which are certain under current climate change scenarios.

A critical factor here is called 'Black Start'. This is the capacity of a power station to start itself-up using its own back-up generators. The two types of plant which had this – coal and nuclear – have largely been closed over the last three decades. Many gas-fired plants do not have black start capability – and next to no renewable plants have it.

What this means is that after a general grid failure, plants with black start will have to power-on to start all the other power generating capacity. Only then can the grid start to supply regional power networks.

National Grid estimate that after a grid failure, there's a 50:50 chance that 60% of capacity might be restored after a day – but under extreme conditions, where infrastructure has been damaged, it will take longer.

2. Regional/local power grid

Regional grids bridge the national grid to consumers. Under extreme circumstances,

regional grid can institute 'load shedding' – whereby large energy consumers can agree to have cheaper electricity in return for being cut-off in emergencies. But as manufacturing and heavy industry has closed, Britain's shrinking power supply has less large-scale 'interruptible' capacity to shed before rolling blackouts are used to ration what power remains.

Apart from national grid issues, regional networks are more susceptible to flooding and storm damage. A significant problem is extreme heat. Large parts of the network are passively cooled. Lines and transformers heat-up during the day when demand is high, and cool overnight when demand falls. When night-time temperatures remain high, equipment can't shed as much heat, which progressively leads to a higher operating temperatures over successive days – increasing the chance of grid failures.

3. Grid-connected renewable energy

You may have solar panels on your home. What few realise, though, is that they do not work in a power cut.

Just like large renewable generators, home PV or wind installations require an external power supply to synchronise to the grid frequency. Unless you have your own independent battery back-up system and inverter, domestic renewable power sources do not supply power during a power cut.

4. Forced-air heating/cooling

The latest model of highly efficient houses are air-tight. This reduces air leaks, significantly reducing heat loss. As a result they must have powered forced air exchange system to extract and refresh the indoor air.

Without a grid supply these heating or cooling systems do not work. Then, because the building is so well sealed, indoor air quality declines rapidly, quickly creating health stress as carbon dioxide levels rise. If a heating or cooking stove is used indoors, air quality will decline much faster.

5. Water supply

For thirty years the UK water supply system has centralised around large plants designed to meet higher quality standards. As a result we now pump large quantities of water long distances to supply urban areas – using power from the regional grid.

In the early years of water supply, when areas were supplied with water for a few hours at a time, every building had a cold water tank. This would fill, and continue providing water during the hours when the supply was cut-off.

Since the 1970s Britain has ripped out most of its cold water systems. This means, should the supply fail, people run out of water immediately – and unless they have their own stored water they will have nothing to drink. This creates a clear danger during periods of extreme heat.

6. Sewerage system

Like water supply, sewage treatment systems have concentrated on larger plants – with many small local treatments works having been closed over the last three decades. Large volumes of sewage are now pumped, especially in areas with high-levels of new housebuilding where developments cannot always drain by gravity.

In a prolonged power failure, the lack of water supply will limit sewage generation. But with the pumps down, what volumes are produced will back-up and in many cases will overflow, untreated, into local watercourses. This of course creates a conflict if people are also trying to extract water from those watercourses during the emergency.

7. Food storage & cooking

There has been a major shift in food consumption over the last three decades towards frozen or chilled ready meals. Most people's food supply is now kept in the fridge – which, without power, will warm-up/defrost within 12 to 24 hours.

The above diagram doesn't include the gas network – but that too is dependent upon power for pumping and grid control. More importantly, most modern gas cookers, as well as solid fuel or heating oil boilers, will not work without an external power supply. In general, then, there will be no heat sources for heating or cooking.

In a situation where, without refrigeration, people keep most of their food in a readily perishable condition; and without heat to cook it thoroughly; that food has a higher probability of causing food poisoning.

8. Telephone network

When the 'local loop' of the 'phone network operated with copper wires power was supplied from the exchange; and most telephone exchanges had priority power supplies, and even back-up power generation.

The switch to fibre-optic cables, and BT's plan to eliminate all copper cables in the next few years, creates a problem in emergencies. Landline phones now require their own power supply to function. As a result, in a power cut communication with the emergency services will become difficult.

9. Smart devices

Smart devices must be charged; batteries cannot be 'replaced'. Without mains power they will soon die – and with them, many of the services most people take for granted.

In addition, without power, home hubs and wifi networks will not work – isolating the device from the network. And without that link, especially as many people keep information on cloud services rather than stored on the device or external back-up, information people may urgently need may be unavailable.

More simply: As many now keep important phone numbers stored on their device, and so do not routinely remember phone numbers, without the data on the device they may find it difficult to contact people.

10. Wireless communications

Many people do not have a landline, and are totally reliant on mobile networks. These networks are fragile: Many mobile towers have no, or a very limited power back-up on-site; more importantly, they routinely produce a lot of heat, so during extreme heat events they may shut down.

Again, with the demise of the copper wire landlines, many outlying communities are vulnerable to disconnection. In remote areas especially, where the plan is to roll-out extensive wireless networks, the complex problem of maintaining communications in extreme weather has stalled BT's efforts to eliminate the wired trunk network.

11. Radio & TV broadcasts

The media has gone digital. Problem is, most of those digital devices consume more power; and are in many cases combined with other gadgets like smart devices. Certainly compared to the transistor radios of 50 years ago, which might work for many hours on a standard, replaceable cell battery, rechargeable 'gadgets' with built-in batteries are nowhere near as resilient.

Recently the BBC announced the end of the long-wave service. FM radio services are also slated for closure in the near future too – meaning all those old transistor radios will be obsolete. What this means is that in future emergencies people may experience 'information blackouts' – where the failure of communication networks, and the lack of resilient devices to receive radio transmissions, limit their ability to receive information. Not only as to what is the situation locally, but more generally, advice on how to deal with the emergency for those who have never experienced such conditions.

Technology is making society less 'safe'

Power supply failure is but one of a number of similar flaws that pervade modern society. The engineering frailties in Britain's urban 'life support system' are well-known. Various experts have been commenting upon these problems for many years.

Is using science, engineering, and statistics to model the risk of failure, "anti-technology"? No! It's rational to evaluate the 'risks' of the gadgets in our life. If people are afraid of that, then I suggest it the result of their own failure to address their addictive dependency upon those fragile systems.

The solution is 'simpler technology'; skills, not gadgets. This is why I enjoy foraging, camping, and cooking food outdoors. These skills can sustain us 'when technology fails'. Such 'primitive skills' are valuable not only because they make us resilient; but because they can be easily and freely shared, person to person, in response to any emergency.