Submission No 304

INQUIRY INTO 'ENERGY FROM WASTE' TECHNOLOGY

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“Energy From Waste” - A Primative Moral Hazard, not a Technological Innovation

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1 Introduction

My thanks to the NSW Government for providing a small window of opportunity to submit some thoughts to its Portfolio Committe No. 6, the terms of reference being for an inquiry into matters relating to the waste disposal industry in NSW. I have the “Terms of Reference” with the Legislative Council letterhead in front of me as I write, squeezing in a few hours of reflection and typing, among the other activities I already have scheduled for this weekend.

For such an important topic, the limited window of submission opportunity, and limited notification provided by our government representives is not ideal. On average, most people are not checking everyday for whatever limited number of places that exist (that I don’t even know of) where such inquiries get announced. Perhaps an email list registration and notification system should exist or should be setup, for requests for public submissions.

1.1 Our Time is nearly up

The questions of sustainability, and of completing nature’s cycles are of such criticality that industrial civilization will not survive long in its present form, in its economics or ecological instability. Growth of the scale our present systems continues to increase the rates of waste production, and reduces the time over which these systems will be able to continue to operate the way they do.

1.2 My Time and Place

I live in the Parramatta Area, specifically Guildford West, and I share the concerns of many residents who are members of environment groups, that the widely distributed environmental harms of ”Waste to Energy Technology” (WtE), will far outweigh the “convenience” and “benefits” which have been

said to exist by the proponents of having an expensive waste incineration facility in the middle of Sydney.

If such a facility were to go ahead, myself, my family, and all the people I know, and all the residents of Sydney, will be breathing in, despite the best assurances of pricey Air Pollution Controls, accumulated quantities of Dioxins, Furans, and nano-particles, above and beyond the already toxic mix of Sydney's motor vehicle and industrial air pollution wastes.

In coming to this conclusion, I have taken heed of various online sources, and document links emailed to me by friends in local environment groups.

2 Our current waste disposal system is wasteful

My understanding of current provision of Waste Disposal industry, is that it is largely done by trucking to collection points, where there is a basic triage, as any one who has driven stuff to a waste disposal and recycling place in Sydney might be familiar with, or who is encouraged to put certain items, such as plastic bottles, glass, cans or paper/cardboard in special "recycling bins", in the presumption that these will be sorted and recycled in the best possible way.

2.1 Recycling is limited to easy stuff

There is some recovery of valuable metals, particularly from consumer white goods.

Known toxics, subject to regulation - eg Asbestos have special handling and disposal rules, regulations and costs, some of which need to be reviewed. Industrial wastes of various kinds require special collection and processing. The worst example I can think of right now, is the tank loads of waste water from Coal Seam Gas fracking, which are collected from still active gas wells, some of which are close to suburban housing developments. Legislation proscribed new fracking and horizontal drilling as being a reasonable distance away from domestic residences, for toxic gas diffusion and wind blown toxics, but conveniently for AGL and other corporations, forgot to close existing gas wells which flout the regulations, and cause ongoing health issues for nearby residents in the CampbellTown, Camden Area. I have seen just how close these are , and I have seen the daily tank loads of waste water going to private waste treatment facility in Homebush Bay. Just how these processes lead to system gains in net energy and positive outcomes for environment and people has yet to be justified.

2.2 Soil is inadequately restored

Larger amounts of organic food waste, and plant and garden waste, directly collected and processed as such, can be composted (bacterial, aerobic processes, earthworms), and help recycle essential

micro-nutrients, nitrogen and phosphorus back to soil. The tasks involved in restoring natures nutrient and chemical cycles are such that if all our time and energy were devoted to it, under our present system and lifestyles, we would little time for all our leisure distractions, and we might still fail in the long run.

2.3 Land Fill is a temporary option.

There is limited recovery of plastic containers, and paper/cardboard for recycling, and a large amount of unsorted waste still ends up in Land Fill. Land fill sites are limited, with pressure for other land uses, and ongoing growth of our residential, transport and recreation infrastructure. New suitable land fill sites are not likely to be found. Nearness to residences, agriculture, vanishing ecosystems, and distance from sources of waste all ensure that, if present growth trends continue, Land Fill becomes an impossible option. I recall there were proposals to truck waste to fill up disused mine excavations and tunnels from Sydney. Useful extraction of methane gases from ongoing organics breakdown from Landfill, has provided some energy, and reduced, but not abolished the climate change potential of these emissions.

2.4 Education about Waste Collection and Recycling is undervalued, and needs constant reinforcing

I am pretty sure the current education, and waste disposal practices of residents, and corporations could be vastly improved, by investment in repeated, intensive group, education, and involving more community participation. As before, the total magnitude of the required tasks still escapes our consumer society. We should be able to try harder, even given the capabilities of existing waste collection and recycling facilities.

3 Dispersed toxins bio-accumulate

3.1 Sources of dioxins [1, 2]

Dioxins (polychlorinated dibenzodioxins) are created in small concentrations when organic material is burned in the presence of any form of Chlorine. Polychlorinated dibensofurans have similar properties and effects. These groups together are often inaccurrately called dioxins. They are known teratogens, mutagens and suspected human carcinogens.

Since chlorine is in all living plants and animals, in ionic form, there is no chance of excluding it from waste incineration. Major sources included incineration of municipal or medical waste and private

backyard barrel burning. Regulations have helped reduce this from control techniques of temperature and exhaust management. Dioxin production cannot be eliminated. Backyard burning remains the largest source of dioxin emissions in the USA, and is fortunately somewhat more restricted than it used to be in Australia.

The tall chimney stack that is built to randomly disperse the polluting toxins high into the air, will do this more or less, but not under anyones control. Where it goes after that, what capitalist investor for incineration technology actually knows or cares. Despite the best attentions to operating technique and installed equipment, the best installed Air Pollution Controls and monitoring that money can buy, will be defeated by simple multiplication by the large volumes of waste required to be processed to bring waste incineration closer to profitable operation without government subsidy.

What does not fall on various parts of around the incinerator, on our soil, into our dams, into the ocean ecosystems, get distributed in ever decreasing concentrations with distance. Chemicals such as Dioxins, introduced by our materials processing, bioaccummulate in fatty tissues, move up the land and sea food chains, and so end up in our favourite wealthy consumation foods, of meat, fish and dairy products, a kind of poetic justice. Even small concentrations in water, get into the food chain.

As for air-bourne particulates, of ever-smaller sizes, our lungs have to accumulate for a lifetime those substances that cannot be chemically broken down, such as Coal dust, Asbestos fibres, nano-particles of plastic. The lungs of city dwellers already become saturated with indigestable residues over a lifetime. The return of “black lung” cases in Coal Miners, reminds us that economics and techniques of cleaning contaminated air are beyond our practical capability.

If it rains over the output of an incineration smokestack, or we have heat inversion conditions of high pressure systems in Summer, wind dispersal will fail. Otherwise the prevailing winds will favour some regions and not others, with higher fallout concentrations.

Waste incinerators threathen poisoning of food growing areas, even our backyard gardens. As this persists in soil, environment concentrations continue to rise over time.

3.2 Human remains - Cremation vs Aquamation [3]

The ideas of cremation or incineration come from our primative cultures, between the time when humans learned to control fire, to the recent times of science, when at last we have learned something about the chemical compositions of matter, its near-absolute immutability, and the recycling and reuse, biological and geological of all the elements of finite matter on earth.

Its about time, with global warming from burning coal, we moved on from primative notions of energy and waste disposal from burning.

When our bodies become organic waste after the end of life, cremation has been a traditional choice. Crematoria tend to be situated in densely populated areas, and tend to be operating frequently. It is

estimated that 0.2% of global dioxins and furans are caused by cremation. Converting our biological constituents to many noxious gases is definitively not the most efficient form of recycling.

Aquamation processes involve dissolving tissues in a strong Alkali corrosive solute, with chemical reactions similar to normal after death dissolution, leaving bones to be ground down as a residual "ashes". The produced liquid mix can be safely returned to the environment, or used as pretty good fertilizer. About 10 % of the energy of conventional cremation is used and no toxic emissions are released. Newcastle opened its first Aquamation facility in 2016. Such a facility is not yet available at Australias main crematoria centers, which I find surprising, given the high costs of their services, or perhaps it is because of them. Perhaps some government regulation could help here. Reflections on the recycling of the materials of biology of our fellow beings, during the ceremonies of life and death, is very educational.

3.3 We are already unhealthy

Levels of many variants of fat soluable industrial chemicals accumulate in us over our lifetimes. The most sensitive effects of dioxins are caused at body burdens relatively close to those reported in humans, therefore our health is already effected, and increasing the sources of environmental dioxins will lead to more sick people.

Dioxin accumulation is already happening throughout our environment and food systems. Health effects include our hormonal, immune and developmental systems. Epidemiology has found associations between tissue dioxin levels, clinical disorders, and nearness to incinerators. Developmental and long term environmental issues span multiple generations of people, as seen as the result of widespread spraying of defoliant Agent Orange, which was dioxin contaminated, in the prolonged USA war against Vietnamese People and their country. The Red Cross of Vietnam estimates that up to 1 million people are disabled or have health problems due to contaminated Agent Orange.

Waste incinerators do not belong in the same region as city water supplies and reservoirs, such as Prospect Reservoir or Warragamba dam.

3.4 The Waste To Energy Externalites are massively well documented.

The "National Toxics Network", NTW whatever its make-up, and I really don't know its story, has published detailed reasons why WtE is a bad idea. It gives 10 subheadings for why it is a bad idea, but I am not sticking exactly to the script, and I am just going to count 10 things that really striked myself.

1. On the production of toxins from waste incineration, it mentions that Australia is signatory to the Stockholm Convention, obliging us to reduce or eliminate sources of dioxins and furans.

Since Australia is lacking in regulation and monitoring, we haven't even established a research baseline of current population toxin burden, or sources.

2. Inceration leaves behind a more concentrated, friable, ash form of the non-gaseous components, maybe 20-25% of the original volume. This goes to land fill, gets blown around, of course given industrial penchant of Australian corporations avoiding the costs of keeping transports, trucks and rail cars decently covered. For example Coal Trains regular moving through our densely populated areas uncovered. The heavy metals, Lead, Cadmium, Mercury, and water soluable components will leach from land fill over time.

3. High CO2 emissions per unit weight occur from incineration techniques, far more than burning similar quantities of coal. Nature's natural long term carbon cycle is far too slow for our rapid growing rate of accumulated carbon emissions. Methane from land fills, yes it is strong, short term greenhouse gas, but carbon cycle scientists such as Dr Robyn Archer are most impressed by the centrality of our carbon dioxide problem for Global Warming, and Ocean acidity.

4. The materials thrown into the incineration pile, waste the embeded energy gone into the manufacture of those materials, and so loses the potential for recycling and resuse, since everying gets made from scratch, from depleting raw materials and energy sources. The need to have a "circular economy" for extracted and diminishing reserves of raw materials grows every day.

5. The above system inefficiencies defeat any subsidized short term profits made over the building and running of a state of the art WtE system. The WtE does not diminish the needs for the distributed collection of waste, rather it enhances these transport costs, as this becomes a "solution", instead of dealing with consumption and waste production, in a distributed, local way, with distributed local jobs. Large scale central, complete technology does not solve distributed behavioral complexity. The NTW document talks about Zero Waste Solutions, and this will require real long term thinking, problem solving, and large behavioural changes to industrial production, consumption, and waste production.

3.5 Stop making it for throwaway [3]

The video "The story of Stuff" (SoS) is globally famous, meaning that even I have seen it. I expect that every member of the WtE review panel in our government to have seen it, because lots of their better informed voters have. The SoS has a lot to say about our manufacture of stuff for throwaway, for built-in obselescence, for technological upgrade incompatibility, and a large number of capitalist competition behaviours and tricks that are too numerous and subversive of recycling to be explained. Eternal consumer dissatisfaction is a built-in part of our systems. If a capitalist built it, they need to own waste materials from it after it fails to satisfy, or nominate the destination of every component for recycling.

The entire purpose of making them throw-away, is to keep up the industrial production stream and pay capital owners sufficient profits, to pay off the bank interest on the accumulation of financial system debts. There is no material reasons why a lot of our throw-away stuff cannot be reused. There are deeply perverse incentives built into our industrial design and production.

We are going to run out of resources which are critical for our present time industrial systems.

Not everything can be recycled or reused effectively and such materials need to be rationed, and their time-line of extraction failure planned for. A broad outline of the longer term limits to many minerals we depend on now, is discussed in the book “Extracted” , authored as a Club of Rome report by Ugo Bardi.

3.6 Time and Oil is running out

My apologies for bringing this up, but Oil Imports are central to running of the Australian Economy, in Diesel Truck and Train transport, and powering most of our Mining Industries. It is also the chemical basis of much of our plastic packaging waste production.

The good news is that as cheap conventional oil production falls at a rate of at least 5% per year, all of this economic throughput of consumption and waste will decline, and we will be keeping our throwaway plastic bags and bottles for reuse, because they will become expensive, and even later, the chemical industry will not be making any more of them, so it might be worthwhile keeping your own reuseable collection.

To illustrate the absolute certainty of our rapid Oil-dependent Economic Decline, here are some notable quotes about this other part of our story of “Limits to Growth”. These are from the website blog of Steve Ludlum, known as “Economic Undertow”. As an economist and appreciator of Oil energy in the larger scheme of industrial affairs, he writes in a direct and humerous way. This is not an academic article or concern, it is about the real events going on around us now.

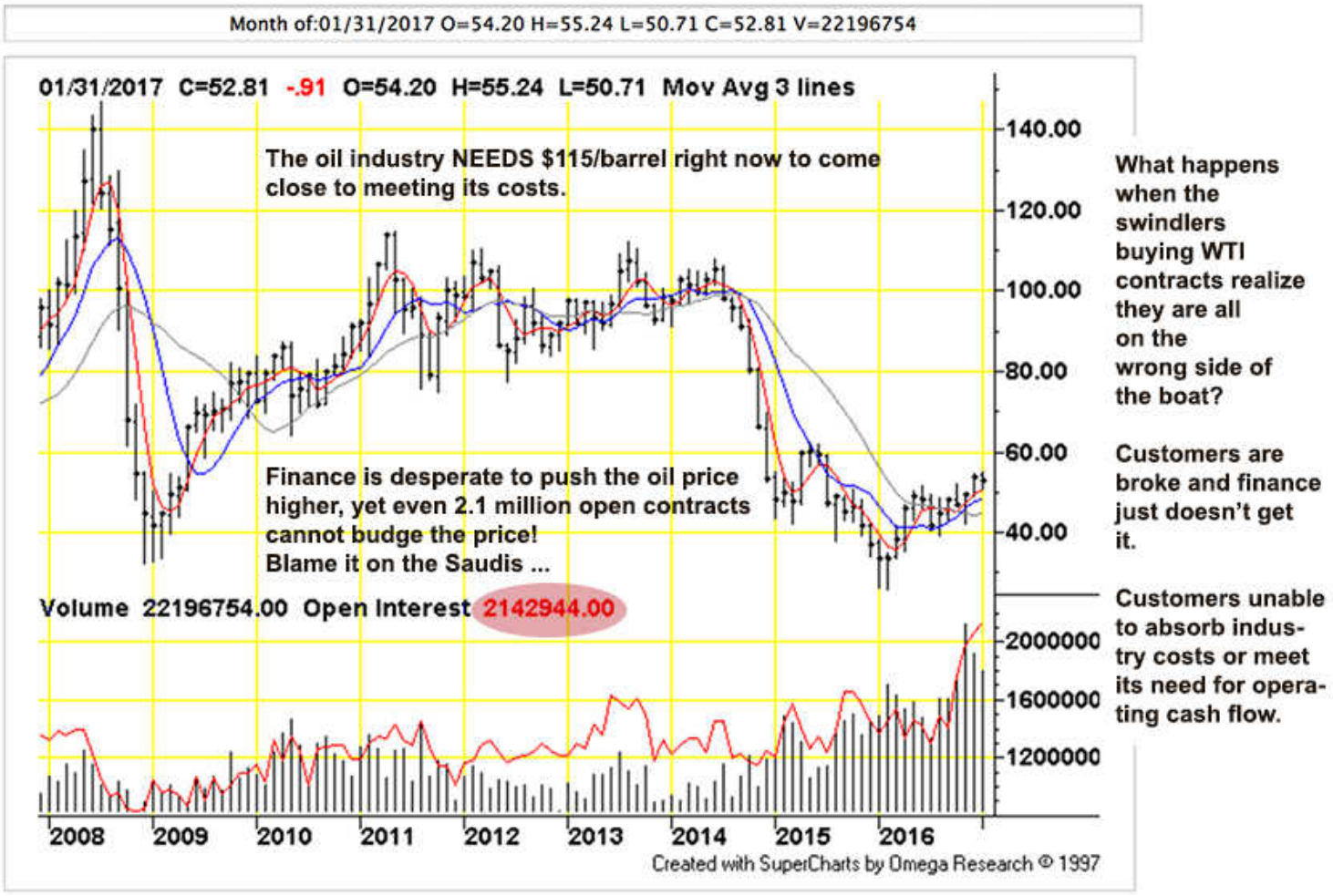


Figure 1: Unlike the equity markets, oil market is sputtering. Millions of bullish contracts @ WTI futures and the oil price is stuck below $60/barrel; (TFC Charts, click for big) Bad news: the oil industry's customer base is broke and cannot afford expensive petroleum.

More bad news: expensive petroleum is the only variety we have left. An oil price sufficient to satisfy the cash flow demands of the drilling industry and allow the extraction of the needed volumes is far out of reach. We have built our economy around the waste of cheap resources, fuel is a loss leader for expensive real estate and automobiles. Even a moderately higher 'low price' is enough to torpedo our non-remunerative, credit dependent, chest-bursting puss-bag of an economy.

The oil market prices both oil AND dollars. Both sides of the dollar-oil market are caught up in tightening positive feedback loops. When customers can only afford a modest price for fuel, how much reserves at that particular price are available? Not much because humans have been burning cheap oil for 150+ years and the cheap stuff is long gone! Meanwhile, lower oil prices mean the dollar is worth more. More costly dollars =¿ hoarding =¿ less borrowing (it costs too much in real terms) =¿ default.

3.6.1 When denial becomes toxic

The above graph and quotes are from http://www.economic-undertow.com/2017/03/03/when-denial-becomes-toxic/. Here is more.

> With industrial output becoming more a product of machines and vanishing petroleum, the ability of labor to do much of anything other than 'consume or die trying' is shriveling. There are millions of professional economists in this world but few- if any of them concern themselves with the absence of economic return on consumption.

3.6.2 Alarming rates of decline

> More cracks in the edifice of denial, from last September's research report by (HSBC):
>
> 81% of world liquids production is already in decline (excluding future redevelopments).
>
> – In our view a sensible range for average decline rate on post-peak production is 5-7%, equivalent to around 3-4.5 mbd of lost production every year.
>
> Anything like 5% or above is a kick in the pants. Since '08 increases have been meager but increases nevertheless. Even so there is the stumble into delinquency and default. It is hard to imagine the status quo shrugging off reduced fuel availability at any percent much less the declines suggested in this report. No wonder the bosses are panicking; they are passengers on the Titanic throwing deck chairs overboard and setting lifeboats on fire. They cannot think of anything else to do: panic, blame others and lie about everything.

3.6.3 In complex states of psychotic denial

> . . . we're in denial about resources and our limitless greed and rapaciousness, our business folly and waste; in denial about our relations to other nations and what these peoples mean (and don't mean) to us; in denial about our interrelationship- and absolute dependency upon a complex web of living organisms making up our life support system; also our relationship with reality and how that reality has transferred whole to our entertainments while it is stripped, pounded, genetically modified, cut, drilled and sold to nothingness on the installment plan outside our front doors.. .

3.7 System Default

A large, cascading default is looming for our systems of global debt. Our money system is based on the US dollar and that is where all the debt money pile up is, growing much faster the GDP.

4 Big Wasteful Projects are a Smoke Screen for Impending Default

As second and third-hand Cassandra's like myself are even more ignored and disbelieved than the original and derivative sources, I am going to go out all the way, in proposing something I must have read or thought as I read. Big projects of extravagance, large government sales of assets, are a true sign that our government and financial systems are heading for technical defaults, and failures of financial trust are going to lead to a distinct lack of finances, which will lead to running our economy on the lowest material and energy metabolism it can find. This has already happened for some economies, once regarded as being within the Ambit of developed nations, such as the EU debtor nations of Greece and Portugal.

Large scale investment projects like the famed M4 WestConnex project will never recover its costs. For one thing, private vehicle and usage is going to diminish, based on the reduced employment and average income of citizens, from a general system oil decline leading to economic decline To own a vehicle is now to become a driver for much richer, fewer employed people, whose jobs have not yet been replaced by automation or out-sourced.

4.1 The economics of service provision is undergoing a revolution[4]

Automous, self-driving vehicles, may become out-economized by driver-owner-rickshaws. Electric vehicles may be a transition step on the way down. Sorting of waste by human manual labor will become a full time occcupation, one of the new important kinds of local jobs, to help with growing local food in a reduced toxin and circular economy.

A sharing economy will be necessary for those services that can be made more energy and waste efficient when done at scale, and where "Services" will replace the duplication of ownership. Large scale out of home food provision is already a feature of life now, although the nutritional quality standards are dubious, and takeaway disposables are still uneconomic and wasteful. Real washable plates and cutlery can make a come-back, and instant convenience takeaways are going to decline. Financial incentives and regulations for this can easily be devised. Food and drink, its preparation , packaging, delivery, consumption, and left-overs, make up a large part of the necessities of life, and the scope for waste reduction is enormous.

Although I am yet sceptical of automous electric vehicles, it is interesting to see major corporations racing to develop that service provisions. What "Transport As A Service" predicts is that TaaS, will provide 95% of the passenger miles travelled within 10 years.

Renewable Energy infrastructure capital is increasing at about 7% global exponential growth, ie doubling every 10 years. As a transport fuel source it is not yet offsetting the decline in conventional oil

production, nor the need for drastic carbon emissions cuts required to have a survivable future global climate.

4.2 Waste to Energy creates more problems than it solves

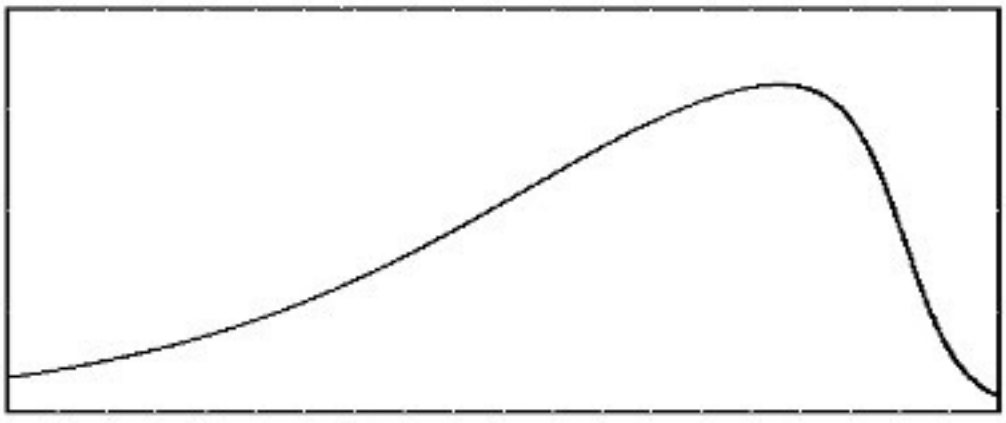
Diesel fuel will need to be rationed for big transport - trucks and trains, that will still deliver population sustaining goods and services, and take away essential wastes. Waste production will then be an expensive luxury, and the concept of burning fossil fuels to supply large Waste To Energy generator will be considered a toxic waste of energy. It has already proved itself to create more problems than it solves.

I find the blog piece on various components of rapid change in technology on the Cassandra's Legacy blog site very interesting.

> The economy is collapsing because it was based on cheap oil, which is no longer cheap to pull out of the ground — despite what you might pay for it at the pump these days. The public is understandably confounded by this. But their mystification does nothing to allay the disappearance of jobs, incomes, prospects, or purpose. They retreat from the pain of loss into a fog of manufactured melodrama featuring superheros and supervillains and supernatural doings.
>
> - James Howard Kunstler

4.3 The Seneca Effect[6]

> It would be some consolation for the feebleness of our selves and our works if all things should perish as slowly as they come into being; but as it is, increases are of sluggish growth, but the way to ruin is rapid.
>
> - Lucius Anneaus Seneca, Letters to Lucilius, n. 91



The demise of the automotive industry is an example of what I called the 'Seneca Effect.' When some technology or way of life becomes obsolete and unsustainable, it tends to collapse very fast.

- Ugo Bardi - http://cassandralegacy.blogspot.com.au/2017/05/the-coming-seneca-cliff-of-automotive.html

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