Institution Sainte-Marie d'Antony

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Épreuve de LVA
Anglais

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Ce sujet comporte les 5 documents suivants et sont d'égale importance :

- **document 1** – Un article de presse adapté du Guardian, intitulé "US Scientists Turn Old Plastic into Soap after Fireside Inspiration", août 2023.
- **document 2** – Un article universitaire adapté de *Nature,* intitulé "The co-evolution of technological promises, modelling, policies and climate change targets", publié en 2020.
- **document 3** – Une critique littéraire intitulée "The Deification of technology", publié en septembre 2019.
- **document 4** – Un dessin de presse publié dans *le Denver Post*, intitulé "Greenish Technology", publié le 14 août, 2010, par Mike Keefe.

  Document 5 – Un graphique de *Pew Research Center i*ntitulé "Technological change and future", publié en février 2014

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DOCUMENT 1: US Scientists Turn Old Plastic into Soap after Fireside Inspiration

Team converts polyethylene into fatty acids, soap's main ingredient, but say it is not panacea for plastic pollution. Scientists have discovered a method to give new life to old plastic – by converting it into soap.

Plastics are chemically similar to fatty acids, which are one of the main ingredients in soap. For Guoliang Liu, an associate professor of chemistry at Virginia Tech and author of the paper published in the journal Science, this similarity suggested it should be possible to convert polyethylene into fatty acids, and then into soap. The problem was size: molecularly, plastics are very large, about 3,000 carbon atoms long, whereas fatty acids are much smaller.

The solution came to Liu in an unusual way. "It was Christmas. I was watching the fireplace," he said.

When firewood burns, it gives off smoke, which is made up of smaller particles of the firewood. Liu wondered whether burning plastic would work the same way.

"Firewood is mostly made of polymers such as cellulose. The combustion of firewood breaks these polymers into short chains, and then into small gaseous molecules before full oxidation to carbon dioxide," he said. "If we similarly break down the synthetic polyethylene molecules but stop the process before they break all the way down to small gaseous molecules, then we should obtain short-chain, polyethylene-like molecules."

Liu and colleagues built an oven-like reactor that could be used to safely burn plastic. The temperature at the bottom was hot enough to break up the polymer chains, while the top was cooled low enough to stop them breaking down too far.

The scientists collected the residue and found the product they had created was short-chain polyethylene, a type of wax. They then went on to turn the wax into soap.

"It's the first soap ever made from plastic in the world," Liu said. "It has a bit of a unique colour. But it works."

Liu's method works on polyethylene and polypropylene, which are the two most common types of plastic. Together, they make up about half of all plastic waste: close to 200m tonnes every year. More than 80% of plastic waste goes to landfill, while less than 10% is recycled. One of the benefits of Liu's method is that it works on "end-of-life" plastics, which cannot be recycled through normal means. The method was also designed to be able to be scaled for use in an industrial setting.

Liu urged caution, though. "Plastic pollution is a global challenge," he said. "It's one of the major problems facing our society, and this is one piece of a bigger puzzle. We need a joint effort between the research and industrial communities. And the best way to avoid plastic pollution is to minimise the use of plastics."

As a reminder, OECD countries alone are responsible for almost half of all plastic waste produced. Yet these countries account for only 20% of the world's population.

Annalise Murray, Thu 10 Aug 2023

DOCUMENT 2: The co-evolution of technological promises, modelling, policies and climate change targets

From initial ideas of climate stabilisation, suggested approaches have focused on percentage CO2 emissions cuts, atmospheric CO2 concentrations, carbon budgets and today's dominant framing of temperature rise limits.

It might seem that this successive reframing reflects an improving scientific representation of what it means to avoid dangerous human-caused climate change, interpreted through enhanced modelling power and capacities, and in the light of better scientific knowledge regarding climate impacts. However, our

research suggests that the process has been much less rational – and more problematic – than this explanation might imply.

In particular, our analysis highlights that each shift in target framing has opened the door to new hopes of future technological solutions, such as widespread nuclear power or carbon capture and storage. Yet, while these technologies have promised much, as promises they have instead delayed the immediate acceleration of action to change behaviours or transform economies.

Our analysis highlights a persistent co-evolution of climate politics and climate science, which still continues. Rather than stimulating the development and practical deployment of new technologies which help mitigate climate change, the climate policy system tends to conjure promises of future technologies. These promises both respond to, and enable, continued delays in mitigation, yet rarely deliver in practice. We call them "technologies of prevarication".

Unless this tendency is recognised and addressed, it is likely to continue, with the most obvious candidate for a new technology being solar geoengineering.

One contributor to this problem, which remains unresolved, is that IAMs focus on "cost optimisation" with time discounting. This means they favour future promises of action over plausible, but potentially costly, near-term interventions.

A similar mechanism boosted early promises of nuclear power and then fossil CCS. In each case, the delays in mitigation made the overall outcome appear cheaper to deliver, but as time passed, neither significant emissions reductions nor the promised technological developments emerged.

Technological promises that had been adopted in models for cost-optimisation reasons became unavoidable essentials in delivering climate targets, even when practical or political shortcomings were revealed.

Our analysis shows how prevarication can emerge from the coevolution of technological promises, modelling techniques and political aspirations, especially around the framing of targets.

This does not rely on deliberate efforts to slow action, although technological solutions are often favoured by industries involved in producing fossil fuels. Oil companies, for example, are enthusiastic investors into direct air capture technologies to recover carbon from the atmosphere.

We also recognise that it is a challenging problem for modellers and engineers, particularly when there is the possibility of a very useful new technology and the restrictions of tight carbon budgets. There are good reasons why we might overlook or postpone consideration of such complex interactions and simply advocate for new technologies as a way to broaden our climate arsenal.

But we believe it is essential to acknowledge this problem and seek to break the pattern, for two key reasons.

First, merely adding new technologies is unlikely to bring the climate challenge under control, unless we also deliver behavioural, cultural, and economic transformations.

Second, technological promises allow those benefiting from the continued exploitation of fossil fuels and the comfortable lifestyles it enables to justify those practices to themselves. This allows their activities to impose ever greater burdens and risks on those most vulnerable to climate change – today's poor and future generations.

Adapted from *Nature,* McLaren, D. & Markusson, N. 2020, Vol 10, p. 392-397

***IAMs:** Integrated Assessment Model(s) is to quantify the interactions and trade-offs between societal demands for energy, economic and environmental services.*
***CCS:** Carbon Capture and Storage*

DOCUMENT 3: The Deification of technology

Technology has been deified. By that, I mean technology has positioned itself as integral in society to such a degree that it has crafted an immense mythology around its existence.

This mythologized integration can be compared with Christianity's full cultural integration in Europe for several centuries. Where science once submitted to religion, it is now reversed. Cultural symbols, once a reflection of the power and piety of the Catholic Church, are now a reflection of the supremacy of scientific truths. Galileo was persecuted for failing to fall in line, the subordination of scientific discovery to religious doctrine. Nowadays, religion must continually fight for existence, on science's terms, as if both existed on the same plain.

This mythology of technology requires all sectors of culture to submit. Total domination. A perfect example of this subordination of culture to technology is the proliferation of tests. Everything is testable, nowadays. Want to know how creative you are? There's a test for that! Want to know what job you will be good at? Take a test! A test exists for every aspect of our lives: how we like to love, who's compatible with us, how we learn best, what personality-type we are, what pet works best for us, how mentally and physically healthy we are, how we interact best with others, and the list goes on ad nauseum.

We have fooled ourselves into perceiving our technology as neutral, detached from our own biased and irrational ways. The integration of algorithms, Big Data and A.I. into security and law enforcement systems is an especially disturbing trend of the supremacy of technology. Plenty of research has focused on the inherent biases of algorithms and Big Data. If the engineer, who is constructing the algorithm, is racist, sexist, or otherwise prejudiced, those biases will go into the tech. The same goes for data. The individuals and/or algorithms that collect data are not neutral actors in this vast system. The data is not neutral, because the data collectors aren't neutral.

The infinite accumulation of our data is justified because of the supposed benefits that it entails. Data is supposed to free us, protect us, feed us, heal us, and provide us direction both individually and collectively.

The first is that we should focus on teaching comparative religion:

"Such a course would deal with religion as an expression of humanity's creativeness, as a total, integrated response to fundamental questions about the meaning of existence. The course would be descriptive, promoting no particular religion but illuminating the metaphors, the literature, the art, the ritual of religious expression itself."

The benefits of such a course would be worthwhile. Religion has exerted a tremendous effect on humankind. It is an amazingly diverse history; helping us further understand the reality of various times and cultures.

Efficiency is not the end all be all. Science is not the only path toward truth. Technology is not the ultimate human achievement. Nor is it the natural order of things. As Postman writes: "technology…is a product of a particular economic and political context and carries with it a program, an agenda, and a philosophy that may or may not be life-enhancing…". Our perception of technology requires a revolution.

John-Pierre Maeli, a book review published in *Ordinary Times,* September 16, 2019

DOCUMENT 4: ***Greenish Technology,*** **Mike Keefe,** ***The Denver Post,*** **August 14, 2010**

DOCUMENT 5: **Technological change and future, February 2014,** ***Pew Research Center***

Technological change and the future

% who feel that technological changes will lead to a future where people's lives are ...

	Mostly better	Mostly worse
Total	59%	30%
Gender		
Male	67	25
Female	51	36
Age		
18-29	59	29
30-49	60	32
50-64	59	30
65+	56	28
Education		
HS grad or less	56	35
Some college	56	33
College graduate	66	21
Household income		
Less than $30,000	52	38
$30,000-$49,999	63	27
$50,000-$74,999	63	28
$75,000 or more	67	22

Pew Research Center, February 13-18 2014 survey, n=1,001.

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