

Technologies that work for people, not profiteers, in the climate emergency

written by Simon Pirani | September 21, 2024



This post is based on a talk I gave at an on-line event on the Roadmap to Ecosocialism, on 10 September. I have added some points at the end, arising from the discussion there. Simon Pirani

How might we develop a socialist approach to technologies, in the face of the threat of rapid, potentially uncontrollable, climate change?

Consider, first, the responses to the climate emergency by capital, and by the most powerful governments that represent its interests.



Climate demonstrators in London, November 2021

On one hand, these responses continue and redouble the exploitation of people in the global south. On the other hand, these policies are designed to slow down the transition away from fossil fuels, and to perpetuate the dominance of energy provision by the fossil fuel producers and other big corporations.

Among the most dangerous weapons they deploy are narratives that portray the move away from fossil fuels as a simple switch of technologies, without any deep-going social change (so-called “technofixes”).

To counter these narratives, we need to develop our own approach to technologies.

The starting point, in my view, is that socialists stand not only for common, social or public forms of ownership of the means of production, but also for changing what those means of production do.

We are for the development of technologies that meet human needs, and against technologies that enhance the power of capital (or against machinery that is “hurtful to commonality”, as the Luddites put it).

It will not be enough to take the means of production, as they have been developed by capital, into social or public ownership. We must aim to change what those means of production produce, and the way they produce it.

What does this mean, politically, here and now?

First, we need to ask, in whose interests is the development of particular technologies.

For example, carbon capture and storage. This is a mechanism that captures greenhouse gases from a power station or industrial process, and stores them, to stop them going into the atmosphere.

Oil companies have tried for 40 years, with little success, to make this mechanism work. And they have now convinced governments, including the UK and US governments, to spend billions of dollars on it.

A variation of this theme is direct carbon removal from the atmosphere, a type of geoengineering being tried by tech companies who hope to finance it with so-called carbon credits.

State funds are invested in these problematic techniques, for mechanically taking greenhouse gases out of the atmosphere, instead of in changes aimed at stopping those gases going into the atmosphere in the first place.

The idea of “net zero”, in the way that it is used by leading politicians, implies a gigantic role for these technologies. This false discourse runs right through the international climate talks, which have in recent years increasingly been captured by the fossil fuel industry and its lobbyists. Climate scientists have exposed the duplicity involved.

In my view these techniques are anathema to a socialist approach to climate change, but some socialist writers embrace them. So this needs to be discussed.

Another approach strongly supported by the fossil fuel companies is adaptation of their infrastructure for supposedly low-carbon fuels, such as hydrogen.

This is a grand technological deception. Producing hydrogen from fossil fuels simply perpetuates the use of those fuels. And hydrogen produced without fossil fuels has a very heavy energy cost, and so

should always play a secondary role to genuinely zero-carbon technologies.

Again, governments are pouring money into hydrogen rather than into those genuine technologies. And a huge machinery of disinformation has been mobilised to greenwash this. Again, researchers have worked hard to rebut the falsehoods, and campaigners have raised awareness.

We need to go further, not only to reject the greenwash, but also to develop a coherent socialist approach to technologies. I do not think we have one yet.

I will suggest some starting points, with specific reference to tackling climate change – which is certainly not the only disaster in the making, caused by the deep rupture between humanity and its natural surroundings, but is for sure the most immediately threatening one.

Climate change is caused principally by the burning of fossil fuels. These fuels are consumed by, and through, big technological systems – by which I mean electricity systems; transport systems; built environments; industrial, agricultural and military systems, and so on. These technological systems are, in turn, embedded in the social and economic systems that we live in, which are dominated by capital.

Fossil fuel use needs to be reduced to zero in the next few decades, which will mean transforming all these systems.

It is useful, analytically, to break down exactly how fossil fuel use can be cut. There are essentially three ways to do it.

1. To reduce the final use of energy, by doing things differently.

This is not about individuals tightening their belts. It is about systems working better, with less.

For example, cities with more public transport and fewer cars are not only more socially equal, more healthy and less polluted. They also emit far fewer greenhouse gases.

Replacing cars with public transport gets people where they want to go in a better way, using less, and potentially no, fossil fuel.

There are many other examples, from cutting waste in construction and industries, to reducing the throughput of needless junk – plastic packaging, luxury jets, make your own list.

2. To reduce the throughput of energy, by changing the technological systems.

A good example of this is: insulating homes properly, and heating them with electric heat pumps instead of gas-fired boilers. This keeps people just as warm, with about one fifth of the amount of energy.

In the UK, with our cold winters, engineers have been recommending it for years and gas companies have lobbied hard against it.

3. To produce energy without burning fossil fuels.

The best ways, as you know, are to generate electricity from solar panels and wind turbines.

Once we have identified those three broad approaches, we still face a host of questions.

For example, when I say: reduce the throughput of energy, by changing technological systems, does

that mean replacing petrol cars with electric cars? Does it mean switching steel making to electric arc furnaces?

In both those cases, because of the heavy material costs of those electrified techniques, it is better wherever possible not to switch technologies, but to reduce the final energy use by doing things differently – to promote public transport; to practice material-light construction.

When I say: produce energy without burning fossil fuels, does that include nuclear power, as well as renewables?

In my view, nuclear is inherently bound up with strong state machines and the military. So renewables should be preferred.

Again, there are socialist writers who argue differently. We need to have that discussion, too.

We also need to consider ways in which technology, even under capitalism, can better facilitate just and equitable ways to live.

In my view, decentralised renewable power generation has great potential: it is well-suited to municipal and local development, and to forms of common ownership, and is compatible with more effective, and lower, levels of final use of electricity.

We need to know more about the potentials of, and constraints on, such technologies.

To conclude. Public ownership of energy systems is not enough to deal with climate change.

Take China, where the energy technologies are overwhelmingly state owned.

China is the world leader in producing solar panels and wind turbines, and the world leader in generating renewable electricity. But it is also the world's leading consumer of coal. China consumes more coal than all other countries combined; in recent times it has consumed as much coal every three years as the UK consumed in the 19th century.[1]

This disastrous misuse of fossil fuels (that some “ecosocialists” are reluctant to face up to) is not due primarily to energy use by Chinese people, but to energy use by industries oriented to exporting goods to rich countries.

Public ownership is not enough. It needs to be combined with a liberatory vision of the future, and of the ways that technologies, liberated from capital, can be re-made.

□ *At the Roadmap to Ecosocialism meeting, I also said a little about political strategy, based on our experience here in the UK. (You can read what I think about that e.g. [here](#) or [here](#).) Look out for the recording, which the organisers said will be available soon, and for many important points by the other speakers Sabrina Fernandes, Howie Hawkins and Rehad Desai. Here, I will pick up on points from the discussion at the meeting.*

□ The claim was made, in discussion, that “we need direct carbon capture” to avert catastrophic climate breakdown. I said I did not agree, and that, if ecosocialism is to take on real meaning, this type of question, which is both political and technological, should be discussed in more detail. Here are some points for such a discussion.

First. David Schwartzman, who raised this issue, has written previously that direct carbon capture is “absolutely imperative”, and that the gigantic quantity of energy needed can be supplied by “a

global solar power supply” that will replace fossil fuels.

Of course the word “gigantic” is not strong enough here, at all. Let’s suppose direct carbon capture is used, at some time in the future, to suck a noticeable amount of greenhouse gas from the atmosphere – say, 5 gigatonnes of carbon dioxide (CO₂) equivalent per year, i.e. slightly less than one tenth of current annual global emissions. Not a game-changer, but helpful.

Using figures in a recent article that David co-authored, I reckon you would need up to three times the current global solar and wind capacity to remove that 5 gigatonnes/year.



A direct air capture plant in Iceland, owned by Climeworks

But David’s estimates of how much energy the carbon capture process would use are significantly lower than the consensus. A big, well-resourced team of climate scientists published estimates implying that not three times, but 12 times the current solar and wind capacity would be needed to remove 5 gigatonnes/year of CO₂ equivalent. The difference seems to be largely down to the fact that they looked at life-cycle emissions of the whole process, including energy used in mining, energy and transport. David’s numbers refer to the chemical extraction process only.[2]

Certainly, these numbers should be interrogated, and updated, because technologies change. But, in any case, it is obvious that, because carbon capture is so devastatingly energy-intensive, it is never going to play any big part in preventing dangerous climate change. There would be huge land and infrastructure costs too.

Moreover, it could make no sense to use this process at any significant scale, unless and until humanity has almost unimaginable amounts of spare renewable electricity generation capacity.

And the reality is the very opposite. Now, and for the foreseeable future, renewable electricity generation is in desperately short supply. It will have to expand at mind-numbing speed, if it is to be substituted for fossil-fired power stations quickly enough to help avoid dangerous warming, let alone do anything else.

There ARE technologies that, combined with reducing throughput and in the context of social and economic change, can help to push fossil fuel use down fast. They are well known, and I mentioned some of them above. Insulation, and electrification of home heating. Building homes that do not require much heating and cooling in the first place. Public trains, bikes and walkways instead of private cars.

The substantial decarbonisation potential of such methods have been researched by climate scientists, alternative technology specialists, energy researchers, engineers, transport experts and others.

For ecosocialism to take on real meaning, it should engage critically with this discussion of actual carbon reduction technologies, and distance itself from the fantasies dreamed up by techno-modernists and beloved of tech and fossil fuel companies.

Second. In David Schwartzman's view, ecosocialists should acknowledge that carbon removal needs to happen, in the first place, under capitalism; it "can not wait until fossil capitalism is replaced globally by ecosocialism", he wrote. The writer Andreas Malm, by contrast, sees geoengineering as part of the transition to socialism: according to him, the "central transitional demand for the coming years" should be "for nationalising fossil fuel companies and turning them into direct air capture utilities".

In my view, these are two sides of the same worthless coin. If society does not grow strong enough to nationalise fossil fuel companies (as Schwartzman fears), then encouraging social support for geoengineering technofixes simply reinforces those companies' power. If society does become strong enough to deal with the companies (as Malm contemplates), why would it use their resources for carbon capture? Why not for geothermal heat production? For zero-carbon infrastructure? For offshore wind and/or tidal? Why not for the development of other techniques that undo the rupture between human society and nature?

Third. There is no *immediate, near-term* prospect either of society having an abundance of renewably generated electricity (on which Schwartzman's argument entirely depends), or of it reaching a point where, globally, it has vanquished the fossil fuel companies (on which Malm's argument entirely depends). I am almost irrationally optimistic about the medium- and long-term prospects for social change, and I think the latter (triumph over the companies) could happen much sooner than the former (spare terawatts of solar power) ... but I don't think either are the substance of near-term political concerns.

For that reason, the whole conversation about carbon capture can tell us nothing about what ecosocialists, or anyone else, should do in the coming months and years, to avert climate disaster.

It appears to me as a form of political displacement activity ("things that you do, in order to avoid doing what you are supposed to be doing" says the Oxford Learners Dictionary).

Maybe this is, in part, because climate change is probably the most difficult, intractable problem, with so many complexities, that my generation of socialists - and a couple of later generations - have faced.

To find ways out of this, we need not only to have a worked-out understanding of the relationship of socialism and technology, that I argued for above, but also to distinguish more critically between the different types of aims that we express.

This is a problem for socialists not only with regard to climate, or to cutting fossil fuel use, but more generally - a problem brought into sharp relief by the fantastic geoengineering narratives mentioned.

I see three fundamentally different types of aims, expressed by socialists:

(i) Aims that are attainable under capitalism, around which to mobilise broad alliances of working people and society more generally, bringing together climate issues and social justice issues and

negating the right-wing myths that climate policies hurt ordinary people, e.g. “free public transport”, “a programme of insulation and heat pump installation”, or “support for municipal renewables”.

(ii) Demands for action by the state under capitalism that we can meaningfully make upon social-democratic, liberal, “Green” and other politicians, e.g. “no new oil production”; “stop road building”; or “a crash programme of state investment in renewables”.

(iii) Broader aims that express our hopes for social transformation, that take society past capitalism, e.g. “stop looting the countries of the global south”, “drastically curb material throughput to improve our lives”, or “supersede industrial agriculture with food production that serves human need in harmony with nature”.^[3]

Clearly there are complex relationships between these three categories; they overlap and run into each other. But all too often I witness discussions about “ecosocialism” that pay little or no heed to the distinction between, and connections between, these different types of aims, nor to the timescales and geographical scales on which they might be achieved.

Enthusiasing about carbon capture – or other types of geoengineering, or mining other planets, for that matter – without thorough and careful reference to the timescales and social contexts in which we are operating, is a good example of how not to do things.

Another question raised at the Roads to Ecosocialism session underlined just how much these things matter. It was (roughly, according to my notes): can we look to non-fossil sectors of capital as allies, albeit temporarily?

I responded to this question with reference to tech companies. Not long ago, Google, Amazon, Meta and others claimed that the ubiquity of the internet and computerised communication would be a key to reducing energy consumption and “green growth”. So did many politicians.

I do not think many people in social movements or the labour movement were taken in by this guff. But then came crypto currencies and “artificial intelligence”.

The tech companies, along with data centres and others, rapidly and aggressively expanded their electricity use: in Ireland, data centres now consume more electricity than the country’s homes, and many similar shocks are on the way. Google et al’s carbon footprints are soaring, and they are fighting a Kafkaesque battle to redefine how they are calculated.

As far as I understand, this criminal misuse of technology carries a threat to climate action that has caught much of our movement unawares.

If ecosocialism is to become a social force, it will have to present effective responses to such frightful developments, rather than focusing on geoengineering technologies that – given the actual social and economic context in which we live – can only serve the interests of our enemies.

□ I thank the organisers of the Roadmap to Socialism session for initiating this discussion. I hope it will continue. SP, 13 September 2024.

[1] China burned 260.2 exajoules of coal in the three years 2020-22. In the decade 2013-22 it burned, on average, 247.5 exajoules every three years (according to the Energy Institute Statistical Review of World Energy). Historians estimate total UK coal consumption 1801-1900 at 225-270

exajoules (5-6000 million tonnes of oil equivalent). See: Roger Fouquet, *Heat, Power and Light: revolutions in energy services* (Edward Elgar, 2008) and Bouda Etemad and Jean Luciani, *World Energy Production 1800-1985*

[2] Schwarzman and Schwarzman, citing Snoebjornsdottir et al, "Carbon dioxide storage through mineral carbonation", use energy input estimates of 3.4-10.7 gigajoules (GJ) per tonne of CO₂ removed. Smith et al, in "Biophysical and economic limits to negative CO₂ emissions", estimate up to 45 GJ per tonne of CO₂ removed. In a previous blog post, I also cited the National Academy of Sciences, who published a figure of 5-10 GJ/tonne, and Climate Advisers, who estimated 12.3 GJ/tonne. Assuming a 25% capacity factor (around the current figure for solar, while wind's is higher), and some to spare, Schwarzman and Schwarzman's numbers imply 2-6.5 TW of solar and wind capacity, Smith et al's, 3-28.5 TW, for 5 Gt CO₂eq removal annually. Current global wind capacity is 0.9 TW; solar, 1.4 TW (assessments by the International Renewable Energy Agency and Global Wind Energy Council)

[3] If any Trotskyists are reading, and object, "what about transitional demands?" – well, that is part of the discussion we need to have. The idea of "transitional demands" took shape in the framework established by Trotsky in the late 1930s, that assumed that the way forward for society out of capitalism was for revolution, modeled on and building on the Russian revolution of 1917, to spread. It had failed to do so in the 1920s, leading to the tragedy of Stalinism, but could do so in future, according to Trotskyism's central political assumptions. I don't think this schema works in the 21st century, for reasons I will not expand on in a footnote. Without it, the idea of "transitional demands" that cannot be fully achieved under capitalism and can then help to break it, must likewise be questioned.

First published at People and Nature.