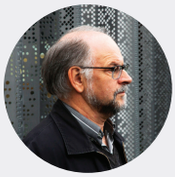
The legacy of a godawful year

Like all of us, Alan Pears is glad to show 2020 the door. But what does 2021 hold? A better approach to CO_2 accounting, a warning from the IEA, and... learning from ants?



Alan Pears, AM, is one of Australia's best-regarded sustainability experts. He is a senior industry fellow at RMIT University, advises a number of industry and community organisations and works as a consultant. He writes a column in each issue of Renew *magazine: you can buy an e-book of Alan's columns from 1997 to 2016 at shop.renew.org.au.*

What a year!

2020 will be memorable for many reasons. It is a year that will reframe priorities, lives and economies as we face economic and social recovery from a global pandemic, and confront the early stages of global heating, and an increasingly uncertain global political context.

There have been tragedies, pain and economic challenges—and still we face much more. However, we have also seen staggering progress, much of which could underpin transition—if our leaders act in the public interest and rise above ideology and petty politics. Our multi-layered "competitive democracy" model does seem to be mobilising with some worthwhile initiatives from states, communities and business, despite fragmentation and limited coordination.

In writing this column, I read over my 2020 Renew columns, which address many relevant issues and suggest paths forward: there is some worthwhile summer reading in them!

Embodied emissions, Scope 3 emissions, circular economies and economic transformation

The limitations of conventional carbon accounting are being exposed. This approach to accounting focuses on what are known as Scope 1 and 2 emissions from activities controlled by a company, such as burning gas or diesel fuel, and electricity purchased from grids. For most businesses, emissions from their supply chains and their customers' use of their products and services are far bigger. These indirect emissions (often described as Scope 3 emissions) are also associated with the vulnerability of a firm's supply chains and business models to physical, financial and reputational issues. So it's not surprising to see increasing numbers of major businesses such as BHP and banks publicly targeting these emissions.

Many commentators highlight that the burning of Australia's exported fossil fuels in customer countries contributes more than twice as much global climate impact as Australia's official emissions (see ab.co/3lOVpP9, for example.)

The other side of the cross-border equation is the climate impact created in other countries through production of materials, products and fuels we import. The government's quarterly emission update shows the climate impact of production of our imports in 2019-20 were 140 million tonnes of greenhouse gases, over a quarter of our annual emissions.

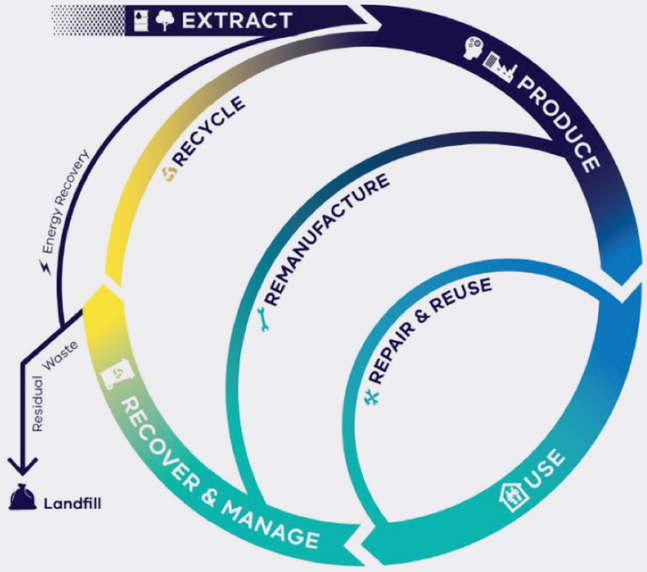
Local production of materials and products adds to this impact. One study[1] suggests that annual emissions from materials for buildings and infrastructure alone are over 40 million tonnes. As operating efficiency improves and use of renewable energy in new buildings increases, these indirect emissions become relatively more significant.

A response to this issue has been the emergence of circular economy strategies which see waste as a potentially valuable resource, not a disposal problem. An excellent research paper[2] published recently by WWF analysed the options for cutting embodied emissions in building materials, and proposed creation of a buyers' alliance to apply customer pressure to supply chains.

These are exciting developments, but we are starting from a low base. We need improved quantification of supply chain impacts, as well as enhanced transparency and accountability at the individual firm and product level. This is becoming more feasible as Building Information Management systems, real time tracking within supply chains, and blockchain techniques that can securely allocate costs and benefits to different parties in a supply chain spread and become cheaper. These changes will offer multiple benefits, including improved consumer protection, and optimisation and improved end-of-life material management.

One shortcoming of present approaches to circular economy and Scope 3 emission management is the lack of recognition of the enormous potential to avoid or reduce material (and operating energy) consumption through adoption of virtual solutions, digitalisation and connectivity.

What's missing is a focus on virtual solutions that bypass physical production by asking questions such as:



The Victorian government's model of a circular economy.

Source: *A Circular Economy for Victoria: creating more value and less waste Issues Paper 2019,* Department of Environment, Land, Water and Planning, Government of Victoria

Do I need the service? How much service do I need? Can I provide the service using 'virtual' solutions? Can I provide the service in different ways that use less material and have less impact?

Our new energy future: more disruptive change

In an interview with the *Australian Financial Review* in late November, Audrey Zibelman, departing head of the Australian Energy Market Operator, described the energy system of the future as "...an issue of managing millions of weather-dependent, zero marginal cost generators on people's rooftops.... As well as anticipating changes in the sunlight or wind, such a system has to know—in each five-minute interval, across the country—when people turn on their computers, change their thermostats, charge (or discharge) their electric vehicles, and so on."

This is certainly important. But despite all the talk about two-sided markets and distributed energy, this still sounds a lot like a centralised management system trying to adapt to accommodate emerging technologies. Of course we need to do this, but we also need to complement it with a stronger demand side focus.

Maybe we can learn from ants[3]! This involves reversing our thinking, so that each building and factory could store, generate, manage and export electricity with the consumer as the top priority, not the energy supply industry. Of course, it should also be responsive to signals from the supply system about supply limitations, so it can work around them or even help out—if the energy industry makes it worth their while. Without distributed intelligence and efficient, flexible technologies, proposed post-2020 energy models are, themselves, at risk of disruption.

This distributed model would rely on high energy efficiency, low peak demand buildings and appliances, smart on-site management and energy storage.

Some may claim this is economically inefficient. But, according to the 2016 ABS household expenditure survey4, weekly capital investment in energy consuming appliances and equipment exceeded total spending on energy. Investment in wiring and gas pipes and energy-related building elements add to this. This dwarfs supply-side investment. Repurposing existing consumer spending could access substantial capital if financed creatively. Energy policy ignores all this investment that is essential in delivery of energy services!

Consumers perceive value in ways that differ greatly from energy supply providers and analysts, just like the way thinking about the value of rooftop solar used to differ. I still recall many graphs ridiculing the high cost of rooftop PV by comparing it against the cost of base load coal fired generation at the power station instead of retail electricity prices, feed-in revenue, and a sense of independence and status!

So the capital cost of a battery, smart control systems, rooftop solar, efficient buildings and smart, efficient appliances should not just be compared with the reductions in energy supply costs, but should factor in the perceived value of a distributed, empowering solution. Long-term flexible finance combined with declining costs and simplified installation and management could overcome key barriers.

Many of the benefits valued by consumers are rarely considered by energy analysts. Almost all power outages occur in local networks, so reliable large scale generation with distribution networks does not guarantee reliable, high quality consumer supply, especially in rural and high bushfire risk areas.

If new solutions avoid appliance-damaging power surges and maintain consumer voltage at a lower, more stable level, and provide a degree of energy independence from supply failures, what is that worth? Avoiding a power failure in the early evening can be priceless for a household with young children. An elderly person living in a west-facing high-rise apartment could place high value on reliable supply to maintain health, or to run the lifts so they can escape. We are increasingly dependent on 100% reliability in our internet-dependent economy. Most gas appliances now require electricity to operate. Consumers could potentially control access to their energy data, an emerging privacy issue.

A warning from the International Energy Agency's World Energy Outlook 2020

One important point among many insights in the International Energy Agency's *World Energy Outlook 2020*[5] report stood out for me. If existing fossil fuel infrastructure is used for its economic life, it will drive 1.65 °C of heating. The reality humanity faces isn't just a need to stop investing in new capacity—it's to close down fossil fuel supply systems faster than natural attrition!

This also means that anyone investing in maintenance, new energy consuming equipment or buildings needs to consider cutting lifetime emissions—from raw materials to recovery/recycling at end of life. It also increases the significance of applying pressure to providers of materials, goods and services to demonstrate low carbon performance.

REFERENCES:

[1] Teh, SH; Wiedman, T; Crawford, R and Xing, K (2019), "Assessing Embodied Greenhouse Gas Emissions Emissions in the Built Environment", in Newton et al (2019), *Decarbonising the Built Environment*, Palgrave Macmillan, pp. 119-141

[2] Waters, B; Worsley, H and Richter, M (2020), *The Time Is Now: Tackling Embodied Carbon in the Building and Construction Sector*, WWF

[3] Rosenblatt, G, "The Amazing, Embedded Intelligence of Ants", The Vital Edge, bit.ly/3gkHq2A

[4] ABS (2016), *Household Expenditure Survey and Survey of Income and Housing, User Guide, Australia, 2015-16*, bit.ly/39RB1uj

[5] IEA (2020), *World Energy Outlook 2020*, IEA, iea.org/reports/world-energy-outlook-2020