
Article:
Antal, M (2018) Post-growth strategies can be more feasible than techno-fixes: Focus on working time. The Anthropocene Review, 5 (3). pp. 230-236. ISSN 2053-0196

https://doi.org/10.1177/2053019618794212

Post-growth strategies can be more feasible than techno-fixes: Focus on working time

Geophysical processes on Earth are increasingly influenced by humans in the Anthropocene. A possible next step towards the dominance of our species is geoengineering. Deliberate global-scale interventions in natural systems to counteract climate change are very controversial and have very limited public support (Anshelm and Hansson, 2016; Preston, 2013; Scheer and Renn, 2014). Nevertheless, current climate-economy models and the rapidly growing academic and policy interest in geoengineering (Huttunen et al., 2015; Macnaghten and Szerszynski, 2013; Minx et al., 2017) suggest that humanity will start to manipulate the planetary atmosphere before considering strategies that would cut emissions by limiting consumption. Such strategies have long been dismissed as less feasible and less desirable than technological solutions. But are all those strategies really so far-fetched? Because if not, then key assumptions in climate-economy models and the mitigation discourse have to change.

In current scenarios that limit warming below 2 ^{o}C, atmospheric CO_2 removal is generally assumed to surpass global emissions in the second part of the 21st century (Anderson and Peters, 2016). This requires the large-scale deployment of negative-emission technologies, which has very severe risks and limitations (Hansen et al., 2017). For instance, capturing CO_2 from ambient air looks prohibitively expensive and energy intensive, effects of ocean iron fertilization are highly uncertain, and bioenergy with carbon capture and storage at a sufficient scale would require millions of square kilometres of productive land (Smith et al., 2015). To keep warming below 1.5 ^{o}C, even more controversial technological fixes have to be discussed. Solar geoengineering, i.e. spraying millions of tons of tiny reflective particles into the upper atmosphere to reduce incoming sunlight, is one such technology. It is argued that neither completely ignoring this option nor burying it in scenarios as it happened with negative emissions is acceptable (Parker and Geden, 2016). While ethical, political and environmental concerns are clear (Huttunen et al., 2015; Preston, 2013), weighing the risks of this technology against the risks of rapid and possibly self-accelerating climate change might still be necessary. The first atmospheric experiments are being prepared by Harvard scientists for 2018 (Keutsch et al., 2018; Temple, 2017).

With both the large-scale deployment of negative emission methods and solar geoengineering on the table, technological responses to climate change are pushed to the extreme. To say that

these strategies might have global ramifications is an understatement. At the same time, key economic assumptions for the same scenarios are basically unchanged. Consumption growth at all income levels is part of the vision (New Climate Economy, 2014), which means that even rich people are expected to consume more at the cost of additional emissions. Is this not perplexing? It might be that both new economic strategies and controversial technologies will be needed, but which ones should we try first? Does it not make more sense to study and experiment with reversible economic policies before we bet our future on uncertain and potentially devastating technologies?

In sharp contrast with most climate economists (Stern, 2007) and policy makers (Obama, 2017), energy and climate expert Kevin Anderson (2015) agrees with most ecological economists (Drews and van den Bergh, 2017; Victor, 2010) and rejects universal consumption growth. The call to proceed with mitigation on the premise that unproven technologies will not work at scale (Anderson and Peters, 2016) also implies the need for new economic strategies that relieve the binding condition of GDP growth – otherwise chances of achieving internationally agreed climate targets would be minimal (Antal and van den Bergh, 2016; Peters, 2015). Perhaps the most straightforward strategy in line with this vision is translating productivity growth into more free time instead of higher consumption. For the workers involved, this would mean a systematic reduction of working time. Despite the pedigree of this strategy within economics (Keynes, 1931) and its potential welfare and climate benefits (Schor, 2010), working time reduction (WTR) is almost completely ignored in climate discussions and models that inform policy decisions. Unlike geoengineering, WTR as a climate strategy does not receive significant research funding, has no coverage in IPCC reports, and no role in UN climate negotiations. As the mitigation challenge is all about speed, ignoring sensible options that could accelerate emission reductions is indefensible.

The first step is to recognize the potential importance of WTR. Like in the case of technological strategies, there is much to be explored. For example, can we realistically expect significant emission reductions if rich people start to work less, or they will just have more time for resource intensive activities? The answer depends on changes of income and of the composition of consumption. Assuming a salary cut that is proportional to the reduction of working hours, the effect of reduced consumption is found to be significantly stronger than the effect of a potential shift towards more resource intensive consumption (Devetter and Rousseau, 2011; Nässén and Larsson, 2015; Pullinger, 2011). In other words, emission reductions and broader environmental benefits look possible.

Whether WTR can become an important climate strategy depends on participation rates and the level of emission reduction in the case of each participant. Both depend on conditions of the WTR scheme. In rich countries where WTR with fixed hourly wages is most feasible, the share of the population that would choose to work fewer hours and earn less money has been estimated between 5% and 50% (Eurofund, 2012; Golden and Gebreselassie, 2007; ISSP, 2013). Stated preferences are unstable due to conflicting beliefs and emotional ambivalence, and because responses involve judgments of feasibility. A desire for hours reduction requires an ability to imagine such change, including its conditions and consequences (Campbell and van Wanrooy, 2013). A further reason for which people rarely voice demand for fewer hours at the workplace is that within a range preferences can adapt to actual levels of income and working time: workers can end up 'wanting what they get' instead of 'getting what they want' (Schor, 2005). Nevertheless, even WTR of 10% of the population can have substantial effects if participants belong to the upper income brackets. Exactly those people who can afford to work and earn somewhat less are responsible for the bulk of global emissions: the contribution of the richest 10% is estimated at 35–50% (Hubacek et al., 2017; Oxfam, 2015). While the super-rich whose income comes mostly from capital gains might get less involved, other high earners can be the main targets of WTR policies.

Employees in the best paying sectors such as banking and IT often have time-based contracts, which makes hours reductions relatively straightforward. Yet there is no reason to exclude workers with performance-based contracts: in their case, actual working hours can decrease by lowering workloads and salaries. What employers would think about their well-paid employees working less is another question. On the one hand, demand for the knowledge and skills of these people in labour markets is usually high, so finding any replacement for the lost hours can be difficult. On the other hand, keeping these workers satisfied can be crucial for companies, which can make voluntary WTR schemes attractive for them. Whether reductions will be allowed can strongly depend on firm cultures.

Due to the adaptation of preferences, mandated reductions of working time might also play some role. To prevent the perception of loss to which people are averse, the best option might be substituting future income growth with more free time (Golden and Gebreselassie, 2007). Giving 4 or 5 extra days off instead of a 2% salary rise (of which the net effects for companies are similar if someone works 220 days a year) might not cause too much discontent among upper middle class workers. Note that creating incentives for companies to reward employees with time instead of money is not the same as forcing them to increase hourly wages through

working time regulations. The latter is a hotly debated strategy that has redistributive effects (Askenazy, 2013), which is not necessarily a goal of WTR as climate strategy. Due to the power of existing regimes, the feasibility of a WTR scheme might be inversely related to its level of ambition to trigger social change.

It is also important to acknowledge that even voluntary WTR with a proportional salary cut might have unintended consequences. For instance, lower consumption of participants means reduced demand for various goods and services, which will reduce prices, thereby increasing demand by other people (Alcott, 2008). This rebound is particularly important for products and services that have large and integrated markets, such as fossil fuels. Fortunately, the other condition of high rebound, namely a combination of inelastic supply and elastic demand does not generally characterise energy markets. Nevertheless, this effect calls for a cautious interpretation of country level analyses showing that countries with shorter working hours emit less carbon (Knight et al., 2013).

Furthermore, there might be trade-offs between different objectives that make WTR an effective environmental, social, and economic policy. From a climate perspective, an important question is whether we aim for high participation rates or large per capita emission reductions. The popularity of WTR can be increased by giving people much freedom to control their time use, which means flexibility in terms of workload in given days, weeks, years, and career stages (Pullinger, 2014). A competing vision is to achieve larger per capita emission reductions by coordinating people's time use, thereby increasing energy efficiency in the transport, building, and production sectors (King and van den Bergh, 2017). Such coordination might also have social benefits because people especially enjoy leisure time that is shared with others (Alesina et al., 2006). However, if lower flexibility reduces the number of participants, then individuals' perceptions of status loss associated with WTR can be stronger (Buhl and Acosta, 2016). General reductions affecting all workers would probably be very unpopular without increasing hourly wages, which points to interactions between WTR and economic policies addressing inequality. One might imagine scenarios in which economic inequality is partly replaced by working time inequality through WTR for the rich, but wider participation might also be possible if inequality is reduced or income is partly decoupled from work. Whether wage compensation at lower levels of pay or a basic income would increase or decrease social acceptance depends on perceptions of fairness. The political feasibility of different WTR schemes will vary between countries: sharing dividends of productivity will remain a contentious issue even if these dividends are units of free time, not money.

Despite all complexities, WTR is likely to be one of the key strategies to move away from universal consumption growth without increasing social tensions. In fact, fewer working hours will become inevitable to avoid unemployment in capitalist economies if labour productivity grows faster than consumption (Antal, 2014; Jackson and Victor, 2011). Empirical evidence suggests that this transition can open up new opportunities for prosperity: having more time for relationships and passions while consuming less can directly improve health and psychological well-being (Golden and Altman, 2008; Kasser, 2002; Milner et al., 2015). Unlike in the case of technological strategies of climate change mitigation where the solution to one problem usually creates other problems, economic strategies such as WTR might well turn out to be win-wins. Instead of trying to avoid something bad, people might start to see the benefits of WTR and aim for it as a positive goal (Reiter et al., 2018). The least one can conclude is that the promise of a low-cost pathway for reducing emissions that could have co-benefits for other areas of life deserves research and policy attention.

Rethinking the future of work must start immediately. Due to the rise of artificial intelligence and growing work-related frustrations, some sort of transformation looks unavoidable. Over the next few decades, computerisation can put around half of total employment at risk in rich countries, especially in low-skill, low-wage occupations (Frey and Osborne, 2017). To avoid dystopian outcomes, policy intervention will be necessary (Korinek and Stiglitz, 2017). The question is whether changes will be made with environmental and climate justice in mind. Identifying the geographical locations, sectors, job categories, organizational characteristics, and worker profiles ideally suited for WTR will be very important research directions in this field. Such studies might even shift preferences towards WTR by helping people imagine how it could work in practice. Another crucial objective is to better understand the role of unions (Rigby and O'Brien-Smith, 2010) and how WTR affects productivity (Golden, 2012). Furthermore, it is essential to learn from experiments, such as the 'leisure option' (Freizeitoption) in Austria that allows workers of certain industries to choose between a wage increase and additional leisure time (Gerold and Nocker, 2018). Studies at the system level should assess the extent to which WTR can reduce the need for negative emission technologies and solar geoengineering.

In summary, certain strategies that would limit consumption are probably more feasible and surely more desirable than geoengineering. Therefore, it is no longer acceptable to let economists and policy makers ignore these options – otherwise they will keep radiating optimism without addressing the issues that make climate researchers desperate. The 'bright

future is still possible [without changing key assumptions] if we act now' message has been repeated for too many years. It is disheartening to see the devotion to ever more consumption and to always hear that the 'next 15 years will be critical', regardless of what happened since the last warning of this kind (New Climate Economy, 2014; Stern, 2007). If Stern was right in 2007, then we have already missed key opportunities to make the world economy sustainable without systemic changes. As-yet-hypothetical technologies are not to be considered saviours of the economy based on indiscriminate consumption growth. Unprecedented interference with the planetary systems on which we depend, including strategies widely seen as 'playing God', should not be higher on our priority list than reducing working hours in the upper income brackets. The real hope now is that all strategies, including social, economic and technological innovations once considered unthinkable, will be openly discussed. Starting a new chapter of economics with the reduction of working time at least at high income levels is one of the most urgent tasks to broaden the range of climate strategies.

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