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## However the pandemic unfolds, it's time for oil use to peak—and society to prepare for the fallout

Yonatan Strauch, Angela Carter and Thomas Homer-Dixon

### ABSTRACT

The decline of oil's dominance will start with a peak in demand. Reaching that peak quickly is an essential goal, even if things will likely spin out of control from there. If humanity is to avoid staggering harm from climate change, carbon emissions must fall sharply very soon, which implies that humanity's use of fossil fuels must start to decline soon. As people grasp this imperative, they'll work to seize this moment when the oil industry has stumbled. The coronavirus pandemic presents activists with several openings to keep oil demand from ever returning to its pre-pandemic peak.

### KEYWORDS

Fossil fuel demand; fossil fuel supply; coronavirus; climate change; coal; tipping point; petro states; fossil fuel subsidies

The hydra-headed chaos unleashed by the coronavirus pandemic is producing a myriad of cross-cutting impacts on the political and social battles over climate change and on the transition from fossil fuels to clean energy. It has, for example, reduced oil demand and simultaneously spurred governments in the United States, Canada, and elsewhere to sustain supply by boosting subsidies (Farand 2020) and providing other favors to the oil industry. What will be the cumulative effect of these impacts on oil's trajectory? Could sustainable transportation policies that emerge from the pandemic further limit oil demand? Will weak oil prices destabilize petro-states and, in turn, global geopolitics? Or could cheaper oil instead increase consumption, derailing the low-carbon transition and giving petro-states a reprieve?

The enormous complexities of the pandemic's impacts on the global petroleum system make it impossible to offer definitive answers to such questions. But under almost any scenario going forward, one critical factor deserves much more attention than it has received so far: a peak in oil demand after decades of growth.

Peak demand doesn't receive the attention it deserves partly because of a mistaken interpretation of the peak oil arguments prevalent in the mid-2000s. During that time, some analysts predicted that an impending peak in conventional oil supply in the face of steadily rising global demand would produce surging oil prices (Homer-Dixon 2006). Conventional supply did indeed peak globally around 2008, but a peak in overall oil supply didn't materialize. More expensive and polluting and less profitable unconventional supplies – especially “tight” oil from hydrofracked shale fields in the United States and “heavy” oil from the Canadian oil

sands – came on line to fill the demand gap (Bardi 2019). And for oil boosters and many casual observers, a lesson had supposedly been learned: if peak supply never materialized, then growth in both supply and demand could continue indefinitely.

### Peak oil demand: A tipping point

But peak demand must happen and is arguably on the cusp of happening – and much sooner than nearly all analysts realize. Why? Most obviously, if humanity is to avoid staggering harm from climate change, carbon emissions must fall sharply very soon, which implies that humanity's use of fossil fuels (including oil) must peak very soon, too (Rogelj et al. 2018). As more people grasp this imperative, they'll devote more effort to turning necessity into reality. Less obviously, peak demand is likely to happen soon because the multiple factors needed to produce that outcome are already in place.

Peak oil demand is much more than just an apparent end to decades of growth. Rather, it represents a crucial tipping point in the global clean energy transition – the moment when an accumulation of forces unleashes a torrent of change. Indeed, this re-orientation hinges on the conjunction of the peak with those other forces.

One such force is the increasing availability and falling cost of direct replacements – in the case of oil, electric cars, trucks and other vehicles powered by lithium-ion batteries. Without a peak in demand, electrified transportation by itself is not particularly disruptive; if oil companies can sustain their decades-long record of growth, they'll have profits enough to reinforce their investor relationships and their political and economic clout. But at the same time, without transportation

alternatives, investors and governments will assume that an apparent peak in demand is temporary and that consumption will rebound after the pandemic subsides. In other words, without society reaching a peak in demand for fossil fuels, oil companies will have the financial resources to succeed even if there are alternatives to their products, but without those alternatives to fossil fuels, investors and policymakers will never believe demand has peaked.

More generally, as a tipping point, peak demand involves a synchronization of worsening climate change, the fading political power of fossil incumbents, and the rising attractiveness of alternatives. As climate change intensifies societies' motivation for a zero-carbon transition, political and technological progress can start to reinforce each other. It's more than mere happenstance that, in the electric power sector where the transition is more advanced, peaking global demand for coal in 2013 coincided with the rise of renewables (wind and PV solar) and heightened climate concerns. These concerns helped motivate public support for scaling renewables and, in turn, the success of renewables lowered the political and economic costs of the transition (Strauch 2020). It also contributed to lower demand and thus undermined the economics of coal (Hausfather 2020).

If clean energy alternatives to fossil fuel had matured a decade or two earlier, long before the current climate emergency, then, arguably, more political actors would have had an incentive to admit that climate change was a problem when the science became clear, which would have allowed political support to build more rapidly for decarbonization. A confluence of factors helps turn peak demand into a tipping point because when all the contributing forces are sufficiently powerful, and growth in demand ends, the full impact of these combined forces will begin to finally bear down on the fossil fuel sector.

For nearly a decade, the Carbon Tracker Initiative has studied the financial fallout for fossil fuel industries when their growth ends, recognizing that those industries may still dominate market share for a period afterward. In a new report, the initiative identifies a set of factors that compound each other, describing how they've already affected the coal industry, where demand peaked in 2013, and how they are beginning to impair the oil industry as well (Bond 2020, 2018).

The process works this way: As demand peaks, firms that only service growth (those building new coal plants or oil pipelines, for instance) see their business quickly dry up. At first, those firms that supply coal or oil don't lose business, but they too become increasingly unprofitable as prices fall. These companies have invariably over-invested in growth and are heavily indebted. In a suddenly over-supplied, stagnating market, the

industry experiences a financial crisis when it can't service its debts – a crisis that seems underway now in the oil sector in the wake of the pandemic's impact on demand (Phillips and Krauss 2020). Analysts estimate that by the end of 2020, nearly 250 oil and gas companies in the United States could seek bankruptcy protection, exceeding the combined total of the previous five years (Tabuchi 2020).

As alternatives to fossil fuel have gained traction, the sector's crisis has been further compounded. The rise of alternatives is signaling to customers, regulators, and governments that a wholesale change is emerging. And as energy investors, lenders, and insurers have begun to see which way the wind is blowing, they've started limiting their ties to the fossil fuel industry (Strauch, Dordi, and Carter 2020), creating further downward pressure on company valuations – and upward pressure on operating and borrowing costs (Bond 2020).

### **Past the tipping point: A political and economic death spiral**

Peak demand also initiates a similar process of shifting expectations and fraying links in the political arena. The host of US coal companies that declared bankruptcy after coal demand peaked, many having bet heavily on rising demand for coal from steel production, lost both the financial resources that allowed them to aggressively lobby governments and much of the economic sway that made this lobbying effective (Downie 2017). A death spiral can form as political and economic clout decline reciprocally. When a fossil fuel industry loses political clout, environmental groups and economic actors challenging the industry have relatively more political power to change favorable market rules and subsidies. These changes in turn worsen the industry's economic outlook, further eroding its political clout.

Successful campaigns for fossil fuel divestment have benefited from this kind of industry weakening. These campaigns achieved nearly all their major wins up to 2016 against the reeling coal industry, as the death spiral drained political and economic power from the sector in the United States and Europe (Strauch, Dordi, and Carter 2020). Coal now stands brutally exposed in the pandemic; even the Trump Administration's over-the-top support cannot stop the coal plants from shutting down at an increasing rate (Hausfather 2020). Closures are also accelerating in Europe; in many cases, they're occurring far before dates set out in policy timelines (Binnie 2020).

The pandemic has also triggered broad changes in how people move around. Air travel has plummeted,

while bicycle use has soared in our cities – all shifts likely to hasten the peak demand for oil. Even before the pandemic, much of the oil industry – especially unconventional tight and heavy oil production – wasn't profitable. Companies in these sectors sold expensive-to-produce oil too cheaply, with the resulting deficit subsidized by massive amounts of low-interest debt, an eventuality that many peak supply analysts had anticipated (Phillips and Krauss 2020). Now, the pandemic has created an essential moment to focus on peak demand.

### Rethinking peak oil: Challenging assumptions

If we're to fully appreciate the gravity of the impending tipping point and prepare for its fallout, energy transition researchers and analysts must conceptualize peak oil in a new way. Two subtle but powerful assumptions hinder current transition thinking: first, that system change is usually linear and slow and, second, that the distinction between measures targeting oil demand and those targeting oil supply is dichotomous.

Analysts tend to assume transitions from one system to another proceed in a steady continuous process, so they generally project the status quo into the future, with only incremental adjustments. To take just one example of many, the Bloomberg publication *New Energy Outlooks* forecasts that electric vehicles will begin outselling oil-powered vehicles around 2035 (BNEF 2020). As a business-as-usual forecast, this outlook projects today's reality forward. Yet there's no reason to believe that Bloomberg's – or anyone else's – business-as-usual assumptions represent the most likely scenario, or even a likely one at all. Rather, a world ravaged by climate turmoil in 2035 will probably be radically different, and almost certainly not a world in which citizens tolerate a slow and orderly market phaseout of oil-powered cars.

We lack forecasts that contemplate an accelerated but highly disorderly energy transition driven by feedbacks between political, economic, and climatic upheaval. Specifically, we lack ones that consider the potential tipping-point impact of peak demand. Although linear thinking about the energy transition is deeply ingrained, the pandemic's shockwaves are now creating an opening for more creative ideas. Today's extreme uncertainty erodes the credibility of images of the future that are only incrementally different from the present. If our societies are to prepare for a transition likely to be far more dramatic and messier than most expect, we urgently need to recognize that system change is often non-linear.

### Supply and demand, not supply or demand

The second limiting assumption about the transition is a false dichotomy between measures to limit fossil fuel supply (from additional drilling for oil, for instance) and those meant to limit fossil fuel demand (for gasoline, for instance). Efforts to constrain oil supply explicitly target the oil industry and are therefore highly political, as we see in campaigns against pipelines or fracking, or movements calling for divestment from fossil fuel stocks. In contrast, measures focused on demand are, so far, technocratic and tangled up in policy debates over carbon taxes, carbon trading, and pollution controls. Yet citizen mobilization to politicize and constrain demand is both possible and essential if oil's peak is to arrive soon.

To understand this false supply-demand dichotomy, we need some background. Until the climate negotiation debacle in Copenhagen in 2009, negotiators tried to reduce emissions by focusing on fossil fuel consumption – that is, on the demand side. Civil society groups lobbied governments to adopt and abide by more ambitious demand-side commitments, including carbon taxes and regulations to improve car and truck fuel efficiency. But as emissions continued rising and negotiations stalled, these groups adopted a new and far more successful strategy: they focused on oil supply, the infrastructure to deliver it, the leadership of marginalized communities most harmed by oil projects, and the industry responsible for it all (Carter and McKenzie 2020). At the same time, climate think tanks articulated a clear rationale for limiting oil supply – that investments to boost supply simply flood the market with oil, drive down its price, and thereby create more demand.

The new strategy worked. In just a decade, pipeline protests, financial divestments, and the idea that fossil fuels are risky investments have all migrated from the fringe to the mainstream (Strauch, Dordi, and Carter 2020). Even global majors like BP and Shell now admit that growth won't last and have reduced the posted value of their oil assets by \$13 to \$17 billion and \$15 to \$22 billion respectively (BP 2020; Shell 2020). Just this July, companies behind a proposed East Coast pipeline in the United States abandoned it, while two other pipelines – the Keystone XL and the Dakota Access – were delayed yet again by the courts, signaling that pipelines are becoming unbuildable (Adams-Heard 2020).

This supply-side approach has created a space for more balanced climate policy. Scholars and analysts alike now realize that reducing emissions requires "cutting with both sides of the scissors" (Green and Dennis 2018) – that is, supply and demand policies must complement each other. Perhaps due to the success of

supply-side pressure and the lingering impression that demand-side efforts are technocratic, activists haven't adopted the same double-sided approach. To be fully effective, however, citizen-driven campaigns that have constrained supply must be matched by similar campaigns to limit demand. Relying primarily on policy solutions on the demand side, such as emissions standards and carbon taxes, hasn't been, and won't be, enough.

Now is a key time to adopt or augment demand-side political mobilization. The automobile industry is an obvious place to start. The sector has so far escaped the attention of climate advocates, even as these advocates' campaigns expand to target banks that fund fossil fuel extraction. And yet curtailing the automobile sector and related infrastructure is essential to achieving peak oil demand (Noor 2020). Pre-pandemic, global investments in road transport were estimated to be at \$2.9 trillion per year, far exceeding those in oil and gas supplies, which were running at \$0.8 trillion per year (Bond 2020). Like the oil industry, the automobile industry has been disrupted by the pandemic and is even more dependent on financial support from governments, now in the form of economic recovery investments. This gives activists a political opening to push for oil demand reductions – not incremental, linear change, but systemic transformation.

### **An oil decline, managed or not**

Proposals to manage the decline of fossil fuel production – to phase out extraction in an organized fashion over a couple of decades – are certainly worthwhile. Some countries with limited oil reserves are implementing policies to keep fossil fuels in the ground (Carter and McKenzie 2020). Each is a victory for the climate that reinforces the growing perception that fossil fuel extraction is so risky that it merits constraint by states (Green 2018). The campaign to get countries to sign a Fossil Fuel Nonproliferation Treaty can have the same effect (Newell and Simms 2019).

But no national government of a major fossil fuel producer, except for Germany, has mandated fossil fuel production cuts for climate reasons (Gaulin and Le Billon 2020). Indeed, the resistance of major oil producing countries to these efforts suggests that decline is less likely to be orderly than chaotic. In response to the COVID-19 crisis, the United States and Canada have boosted support for fossil fuel extraction by, for instance, increasing subsidies to the sector (Farand 2020). The budgets of most producing countries are highly dependent on the sector, so these countries are motivated to accelerate extraction, especially as the future value of oil assets becomes increasingly uncertain. This “get it while you can” attitude (Sinn 2008, 2012) will produce the antithesis of managed phaseout.

A vital implication is that activists and policymakers should complement their focus on managing a decline in oil production with efforts to achieve peak oil demand as soon as possible – an outcome that will require demand- as well as supply-side pressures.

The climate campaigns to constrain oil supplies offer lessons on how to apply effective demand-side pressure to, for example, the automobile industry (Carter and McKenzie 2020). Climate activists successfully painted the oil industry as the enemy of the climate because its business model depends on burning far more fossil fuels than possible if warming is to be capped below 2 degrees (Strauch, Dordi, and Carter 2020). The automobile sector also has core interests that make it a climate enemy because it's impossible to meet climate goals without greatly reducing car use (CARB 2017).

Climate activists also successfully turned the focus from distant and somewhat abstract risks (to polar bears, for instance) to more immediate harms, including those affecting the marginalized communities most negatively impacted by oil development. This turn helped expand and diversify the cadres of predominantly white climate activists into coalitions that now include more people of color as well as labor, health, and faith groups. To date, the urbanist political lobby for reducing car use has also been predominantly white (and male). If it shines a spotlight on the disproportionate impacts of cars and road infrastructure on communities of color (Schmitt 2020; Poon 2020; CREA 2020), this lobby could similarly expand and diversify its ranks – and become more successful. But in doing so, it should keep in mind, and be prepared to address, the implications for labor of constraining the auto industry. The industry employs around 8 million people in the United States, many more than the oil industry, which employs about 1.5 million people.

Campaigns to hold the automobile industry accountable could also be designed to grow from local to global activism and from political to financial action. The fossil fuel divestment campaign, for example, began with local objections to mountain-top-removal coal mining and then escalated to an international campaign backed by the Rockefeller Brothers Fund, heirs to the famous oil fortune, and activists such as Naomi Klein. The pandemic has created a similar opening to forge a bold campaign to constrain car use, now that the automobile industry is disrupted, cities are restricting use of cars on streets, and governments are deciding how to spend stimulus funds.

### **Look out for the fallout**

Managed decline proposals can fall into the trap of linear thinking. When they do, they clash with the far messier history of energy transitions – and with our emerging

reality. The hope that we can manage a wind-down of fossil fuels is based on the idea that our societies rationally determine what is best for them, and then act on that information. But there's little reason to believe this rational process will unfold in more than a handful of jurisdictions, particularly if oil's decline follows the shocks produced by the pandemic and peaking oil demand.

Vested fossil fuel interests won't act out of the best interests of society as a whole, but will instead resist change as long as possible, torquing government policy in the process. Consider Australia's ideological and profoundly irrational response to the decline of the coal industry. The country is promoting and building new mines and increasing subsidies, defying both economic and climate reason (Nicholas 2020; Szmer 2020). And that kind of delay makes a sudden and disorderly downturn more likely, as suggested by the rapid demise of US coal companies that didn't anticipate peak demand.

In the case of oil, key actors already have a long history of delaying climate policy (Oreskes and Conway 2010), and jurisdictions such as Alberta, Canada, are now responding to falling demand by ramping up subsidies and other supports (Carter 2020). This period of delay could extend for a while, as the global fossil-fuel system flickers back and forth between its old state and a new, emerging post-carbon equilibrium. For example, if low prices stimulate new oil demand while simultaneously triggering political disruption in central oil producing states, the resulting sudden supply shortfall and price spikes could induce cash-strapped oil exporters to recommit to oil. But this could also simultaneously induce oil importers, particularly China and India, to accelerate the electrification of their transport fleets. Add on top of these changes possible geopolitical conflict – as oil producers threatened by internal crises try to distract attention by picking fights with other countries – and we have a recipe for global havoc.

The coming disorderly transition from oil could unfold along countless different pathways. But it is much more likely to trigger cascading instabilities than peak coal. For unlike coal, oil plays a central role in global finance, monetary stability, geopolitics, and the political coherence of states such as Venezuela, Mexico, Nigeria, Russia, Iran, Iraq, and Saudi Arabia. The pandemic is placing all these systems under staggering stress and bringing them closer to the breaking point.

Our societies likely have only limited control over which pathway they follow. But without grasping the essential nonlinearity of energy system change, we will be entirely unprepared for whatever happens – and then left scrambling to respond. Yet perhaps the COVID-19 crisis can be a turning point. The pandemic and our

societies' responses to it mark a critical juncture. The collapse of oil demand dealt yet another blow to oil producers and underscored the economic risks of doubling down on a paradigm of growing extraction and consumption. Meanwhile, the climate emergency worsens, and the need for immediate, bold climate action intensifies.

The moment has revealed a clear priority for the global community: We must forestall a rebound in oil demand – never again should it reach 2019 levels – and also prepare for the fallout as oil's dominance ends.

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