THE OUTLOOK FOR OIL STORAGE IN A LOWER-CARBON ECONOMY

Columbia University's Antoine Halff examines the effect of changing policies under the Biden administration

JOE BIDEN'S election to the US presidency in 2020 has ushered in a period of renewed momentum for climate policy both in Washington and beyond. In a U-turn from Donald Trump's climate scepticism and rejection of the Paris Accord, President Biden from his first day in office has embraced a bold climate agenda, vowing to pursue an all-of-government approach to combatting climate change. Countries and companies around the world have greeted Washington's return to the Paris fold with a flurry of net zero targets and bold decarbonisation plans – a trend perhaps accelerated by the COVID-19 pandemic.

The potential implications of this green wave for the oil storage industry are momentous. Any drastic shift in the composition of the fuel mix, any bid to move away from fossil fuels in favour of renewable energy and clean electricity, is bound to have significant effects on the role of oil storage in our energy system. Yet the consequences of such a shift are not necessarily those one might expect.

Energy policy debates tend to focus on the two opposite ends of the supply chain – on the need to reduce upstream investment in fossil fuels and shift downstream energy use towards low-carbon fuels and electricity. But they give the midstream sector relatively short shrift. The current US policy debate is no exception: there are more calls to stop fracking, close down coal mines, electrify cars and ban ICE vehicles than to reinvent oil storage. Yet storage and transportation play a critical role in the incumbent energy system, and as such are bound also to play a pivotal role in any effort to overhaul it.

THE NEED FOR 'CLEANER' STORAGE

On paper, moving away from fossil fuels means less demand for oil inventories and more demand for 'cleaner' forms of energy storage: LNG storage to support low-carbon marine bunkering and long-haul trucking, hydrogen storage, biofuels tanks, and of course electric batteries.

There is certainly some of that. The IMO rules that drastically reduced the sulphur standard of marine fuels in 2020 offer a preview of the task at hand: as ships switched from high-sulphur to low-sulphur fuel, so too did storage demand at port terminals move from one type of tanks to another. Part of the marine fuel storage infrastructure had to be converted accordingly.

Decarbonising marine transport – a far greater challenge than desulphurisation – takes this overhaul to the next level. The goal here is no longer simply to shift from one grade of oil to another but to replace oil storage with an altogether new infrastructure: LNG and hydrogen bunkering facilities, and perhaps charging infrastructure for short-haul electric vessels. Oil bunkers would be expected to fall into disuse.

SHARP DISRUPTIONS

Yet there is another, less intuitive side to the effects of the energy transition on liquid storage, at least in the short to medium term. In an economy that remains in practice stubbornly fossil-fuel dependent, but where investment in fossil-fuel production capacity is increasingly discouraged, the importance of fossil-fuel storage, in particular oil storage, becomes paramount.

The so-called energy 'transition' is a misnomer. What the market faces instead is a series of sharp disruptions, whether due to the effects of global warming or to our efforts to contain it. The road to net zero is a bumpy one: climate policy moves in fits and starts, utility-scale solar and wind capacity gains are lumpy and

disruptive, consumer habits first evolve slowly then quickly... Not to mention the future 'game-changing' effects of assumed but still elusive 'breakthroughs' in electricity storage. With so many wild cards, uncertainty rules.

MORE IMPORTANT THAN EVER

In this increasingly unpredictable environment, tank storage is more important than ever. Moving to a greener fuel mix means facing an exponentially more complex energy system – one where arbitrage opportunities play out not just across time and location spreads but across the energy mix as well. With inter-fuel competition heating up as highly variable renewable fuels account for a growing share of the mix, demand for incumbent fuels becomes more volatile. Large weather-driven swings in solar, wind and hydro availability spill over into fossil fuels, sending demand for oil, natural gas and even coal on a roller coaster – even as production capacity for these fuels becomes increasingly constrained by lack of investment and stranded-asset concerns.

Just in the last two years, the oil market has experienced record swings in oil demand, and thus in oil inventories: first at the beginning of the pandemic, when the global lockdown – compounding the effect of the brief Saudi-Russian price war – came close to testing storage capacity. And more recently as shortfalls in solar, wind and hydro generation combined with a stronger-than-expected economic recovery caused inventories precipitously to draw down. Only 18 months ago, US traders were concerned that crude stocks at the Cushing, Oklahoma storage hub might overflow. Those same tank farms have now dropped to lows unseen in years.

Far from driving oil stocks out of the picture, the transition to a lower-carbon fuel mix thus increases their relevance. Swings in oil demand are getting too wide and unpredictable for production easily to adjust. With supply increasingly constrained, it is storage operators that are the first responders in balancing supply and demand.

REDUCING EMISSIONS

But the decarbonisation drive is also affecting liquid storage in other ways, notably via direct demands on the oil industry to reduce its greenhouse gas footprint and stomp out leaks from its operations.

Methane emissions, practically a non-issue at COP 21, have moved to the top of the agenda. The US government and the EU have joined hands to launch the Global Methane Pledge, an international initiative to slash methane emissions by 30% by 2030 that might well become one of the highlights of COP 26. The fossil fuel industry is a leading source of anthropogenic methane emissions, and the midstream segment accounts for many of these incidents.

At the time of writing, the US Environmental Protection Agency was said to be putting the final touches on new methane regulations mandated by Biden since his first day in office. Meanwhile the EU is pushing ahead with its Methane Strategy. Liquid storage operators will come under mounting pressure to reduce their methane footprint. Luckily, methane tracking technology has greatly evolved and is now empowering operators not only to cost-efficiently and effectively cut fugitive emissions, but also to document their progress in doing so.

Here too, the decarbonisation agenda could paradoxically give the tank storage industry and the broader oil and gas sector a new lease on life, by helping them reduce their greenhouse gas footprint and deliver the largest reduction in heat-trapping emissions since the Industrial Revolution. Technology that was at best in its infancy during COP21 is now mature and available to let storage operators remotely monitor their facilities, detect and eliminate leaks from their operations, and document their progress in quasi-realtime in a transparent, trusted and verifiable way.

NEW DATA TECHNOLOGIES

The unprecedented level of transparency granted by new data technologies is not limited to methane emissions. In the last few years, remote sensing tools have made great strides in lifting the veil of confidentiality that had long shrouded the oil and gas sector. This extends in particular to oil inventories, which satellites, drones and planes can now track in quasi-realtimes, allowing market participants an exhaustive yet granular view of global oil stockpiles that until recently would have seemed way out of reach.

As the energy system, both in the US and beyond, appears on the verge of deep transformation, so too is the tank storage industry facing a period of disruptive change. While in a lower-carbon economy the market share of oil and gas is expected to be eventually reduced, in the shorter term the importance of tank storage in helping balance an increasingly unpredictable market looks set to increase. With the growing market share of renewables increasingly subjecting oil and gas demand to sharp swings, the optionality value of oil storage is on the rise. Meanwhile, new demands for decarbonisation, combined with the unprecedented transparency provided by remote sensors, are changing the environment in which oil storage operates. These changes too will only serve to make tank storage more relevant and socially acceptable, by helping to increase the accountability of operators for their emissions, optimise arbitrage trading and empower stakeholders to better deal with an increasingly turbulent market.

For more information:

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01 US Capitol and Capitol Hill, Washington DC, US

02 Aerial view of Harbor Bridge from Bayfront Science Park in Corpus Christi, Texas, US with tank farms and wind turbines behind.