Pop-up power: CAPEX free energy solutions in times of uncertainty

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Have you seen pictures of Berlin, Paris or London lately? Or perhaps Bogotá, Boston or the Philippines? One thing they all have in common are 'temporary' bike lanes, which have suddenly appeared all across these cities. But it doesn't stop with bike lanes. We've seen things like data centres and hospitals pop-up all over the world in recent months, just think of the 1000 bed hospital that was built in Wuhan within only eight days. Each one has something in common; they show how the COVID crisis, and the unprecedented containment measures it set off, has changed the bar on what was once thought possible, with changes, thought to require years, now happening overnight.

The energy industry is no exception to the sweeping impacts of the pandemic. According to the International Energy Agency (IEA), the global lockdown and subsequent dramatic slow-down in economic activity could lead to the biggest fall in energy demand in 70 years.[1]

It also sent the price of raw materials, and fossils fuels in particular, tumbling. Because of an excess of supply, oil prices even briefly went negative in April[2]. Coal also saw its largest decline since the end of the Second World War[3]. Demand, and with it, prices, have recovered since the lockdown lows, but the future remains uncertain.

In the short term further possible demand shocks because of potential second and third waves of COVID-19 infections loom. Even more critically, the long-term outlook remains uncertain. This present level of ambiguity is making it even harder to invest in energy infrastructure, despite a safe, secure, and affordable supply being in many ways more critical than ever. This is where 'pop-up' or temporary mobile and modular power could be a gamechanger.

Temporary power in action

At Aggreko we understand this uncertainty. It particularly makes it difficult for businesses to commit and invest capital in assets that may not be needed, be regulated or quite simply not be competitive in the future. Our promise is to help our clients react faster to a changing environment. So, just as cities around the world have created new infrastructure overnight, we provide 'pop-up' power, CAPEX free rental solutions that help clients to react to changing requirements within days.

We've seen the importance of rental power with data centres, which are under a lot of extra pressure in the current climate. They require large amounts of energy and are often built much faster than they can be connected to existing grids. At the same time, the processors running in data centres are also very sensitive, even to small fluctuations in voltage and frequency and therefore require a very high-power quality.

By combining our next generation gas engines with our battery systems, we are able to provide data centres with reliable, highly precise and affordable power quickly. We have successfully deployed such solutions for clients in both Ireland and France within weeks, rather than waiting for grid access which can take years.

We have also provided temporary grid support to clients in Asia, Europe and Latin America helping them deal with the increasing pressure induced through the pandemic. This included transforming a university soccer field into a temporary hospital in New York, one of the worst affected states in the US. In just eight days Aggreko put in place a bespoke solution which resulted in the provision of reliable power and cooling for a piece of critical infrastructure.

We've also seen how powerful temporary power can be in a crisis in Singapore, where we helped power and cool two community facilities for migrant workers recovering from COVID-19. We delivered the full solution in one week, including conducting site surveys, planning, logistical deployment, installation, and commissioning. This meant that the facilities were able to start accepting the first patients in a matter of days.

Making bold choices in the face of transition

These temporary solutions seem appealing when the only thing that seems certain at the moment is that things won't go back to the way they were. Both independent experts and travel providers agree that the lockdown uptake in video conferencing and home office will reduce demand for business travel and therefore a significant portion of global energy demand permanently[4]. British Airways and Qantas have announced the retirement of their entire 747 fleets[5]. At the

1 https://www.iea.org/reports/global-energy-review-2020

2 https://www.bbc.co.uk/news/business-52350082

3 https://www.weforum.org/agenda/2020/05/covid19-energy-use-drop-crisis/

4 https://www.nytimes.com/2020/04/20/business/business-travel-coronavirus.html

5 https://www.businessinsider.com/coolest-features-of-the-boeing-747-queen-of-the-skies-2020-7?r=US&IR=T

same time the OECD's International Transport Forum expects the economic slump to reduce global freight transport by more than a third[6]. The crisis also laid bare the vulnerably of global supply chains which has led to calls for greater regional independence. As a consequence, efforts to decentralise not only the production of critical equipment but also potentially the entire energy sector has accelerated.

This is on top of the regulatory and technological uncertainty that existed before COVID-19, which is likely to get a boost through the pandemic. This is due to the recovery programs that are underway around the world which explicitly target investments in green technologies as part of the 'green recovery', but also because the pandemic has shown what is already (technically) possible.

Take wind and solar electricity, both fared extremely well during the lockdown and the subsequent drop in demand, driven both by policies such as privileged grid access as well as by market forces, since their very low operating costs enabled them to remain highly competitive. As a result, renewables made record high contributions to electricity generation in Belgium, Germany, Hungary, Italy and the United States. In the UK, for the first time since the industrial revolution[7], coal-fired power plants went offline for weeks.

In many ways the COVID-led drop in demand provided us with a glimpse into a future. On the one hand it demonstrated that much higher shares of renewables in our grids are possible from a purely technical point of view. On the other hand, the steep drop in the price of electricity, often deep into negative territory, across all of the 'high-renewables countries' showcased just how economically disruptive low-marginal cost wind and solar energy may become.

The crisis and government interventions also moved the bar on what seemed possible from a regulatory vantage point. Policy makers across the world have learned that sometimes they must, but also that they can, make bold choices, changing rules that were thought unalterable.

Indeed, just like those pop-up bike lanes, we've seen that changes thought to require years, can happen overnight; investing CAPEX in such a fast-evolving word therefore seems less appealing.

Bridging the gap to a decentralised future

During the pandemic electricity networks had few problems coping with the sudden surge in home-working, after all, a laptop doesn't require massive amounts of power. But internet networks, not built for eight-hour Zoom days, didn't fare so well. This potentially provides a glimpse of what is in store for distribution networks once the uptake of Electric Vehicles, and in parallel distributed generation, accelerates.

The result will be a much more decentralised system, but also a more volatile grid, which will oscillate between periods of abundance of clean energy and periods when clean energy is not readily available. When there are periods of abundance, the challenge will be to keep the grid stable using just the power electronics of wind and solar generators as well as batteries paired with intelligent control algorithms. During the periods of relative scarcity, this system will also need to integrate the rotating mass of the back-up generators.

Our 10 GW strong fleet of flexible generation and battery storage can help address those challenges until power lines can be extended or until there is an increase in the utilisation rate of existing infrastructure by providing local flexibility. We understand the new decentralised control architecture that will increasingly be required: our track record with battery and storage solutions show that it is not only feasible, but eminently doable. In fact, we have the necessary algorithms already implemented in our equipment.

Of course, many challenges still lie ahead on the road to a much more decentralised grid; both its exact architecture and the speed of the required transition remain unknown. By hiring mobile and modular 'pop-up' power solutions instead of purchasing them, companies can enjoy the benefits of decentralised energy without being bound by CAPEX restrictions. This enables Aggreko to help bridge the gap between current overreliance on grids and a future where the majority of electricity is generated on-site.

This is particularly important as we come out of the coronavirus crisis and at the same time transition to a less centralised, more decarbonised and digital grid as this makes it difficult to predict where exactly, when exactly and what kind of power will be required. In many cases such power needs will arise in the very short-term. But one thing is for sure, Aggreko will be ready to pop-up just the right solution to our client's requirements.

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6 https://www.itf-oecd.org/sites/default/files/global-freight-covid-19.pdf

7 https://www.independent.co.uk/environment/coal-free-power-generation-grid-climate-crisis-fossil-fuels-coronavirus-lockdown-a9487571.html