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Welcome to the Tortoise QuickTake podcast. Thank you for joining us. Today, Tortoise provides a timely update on trending topics in the market.

Hello, this is Michel Sznajer, portfolio manager at Tortoise – Ecofin. In this podcast, I would like to discuss the potential implications on the electricity market of a change in the globalisation of trade.

Until recently, a scenario in which ever-expanding globalisation would slow down or stop was unthinkable. Yet it has become a real possibility and is therefore worth analysing in terms of the potential implications for our investment universe. We believe that this is an additional factor supporting the case for electricity growth in the U.S. and Europe going forward. As the sector has experienced no demand growth for the past decade, a shift to growth would be a structural change leading to substantial investment opportunities.

World trade, even in volume terms, has grown faster than GDP growth for decades. Against this backdrop, it seems to us that unrelenting globalisation is now under heavy scrutiny. Indeed, globalisation of trade is now confronting three substantial tests which taken together have the potential to dramatically alter corporate behaviour and investment decisions for a long time.

The first wave against globalisation of trade came from the U.S. administration's decision to reduce the U.S.'s trade deficit with some of its largest business partners. Tariffs have awakened many companies to the risks embedded in their supply chains. Evidence from conversations with companies in which we invest and public statements suggest that diversification of origin of supplies is happening and is now integral to every supply decision.

The second wave is related to COVID-19. Global trade will be impacted as a consequence of the following issues: 1) people and businesses will remember the virus originated in China, the manufacturing hub to the world 2) in the absence of a cure or vaccine, the only way to stop the spread of the virus is to isolate clusters and close borders 3) businesses and people cannot be dependent on international supply chains for a prolonged period of time. In the future, the world cannot be cut from a sole source of supply. Here again, onshoring/nearshoring and diversification of supply are the solutions.

The third wave was building up before the onset of COVID-19 and will return to the forefront as soon as the pandemic is under control. We are referring to a climate border tax or any climate-related action to favour clean power and clean product manufacturing. The idea of supplying products from anywhere around the world irrespective of their carbon footprint will have to change. We have previously discussed the E.U. Green Deal and firmly believe that climate change mitigation will be central to E.U. policies going forward. The E.U., COP meetings, government and corporate actions will produce a relentless stream of attacks on Green House Gases (GHG) that will impact imports of products manufactured using high carbon-emitting power.

Considering these three waves together, even if it is difficult to forecast their impact, it becomes undeniable that behaviour will change to ensure a more resilient and cleaner supply base than most companies have today. This means a higher share of onshoring and nearshoring for U.S. and European companies. It also means a higher rate of automation in factories around the world to reduce the human risk factor related to pandemics. We believe that both factors will converge to boost demand for electricity.

Why is this important?
Over the past decade, electricity consumption in the U.S. and Europe has been stagnant despite real GDP growth and population growth. This is because gains in efficiency have been so great that they have managed to offset underlying demand growth. For example, LED lights replacing incandescent lightbulbs, regulation forcing the replacement of electricity-hungry household appliances by energy efficient products, low electricity consuming air-conditioning coupled with better air circulation technology replacing giant air-conditioning systems in factories. Many of these offsetting factors have taken place and even if innovation is relentless, the quantum benefit of past innovations cannot be repeated.

We believe, that electricity demand is on the cusp of accelerating growth as electricity takes market share from other sources of energy (e.g. electric vehicles, electricity replacing heat in industrial processes). We call this theme "Electricity Wins". An

additional argument is that a change in the dynamic of globalisation can be another leg of demand growth for the sector. This could play out through relocation of manufacturing facilities, known as nearshoring or onshoring, adding capacity locally, or more evenly distributing the sources of products.

Why is this important for electricity demand?
First of all, taking the example of the E.U., industrial use of electricity in the E.U. represents 38% of total electricity consumed. Therefore, any increase in industrial activity, even of a few percentage points, would be visible in overall electricity demand growth relative to a baseline of flattish demand. As an illustration, if 10% of goods manufactured overseas were to be manufactured domestically, this would represent an increase in domestic manufacturing in the E.U. of 8.6%. Applying this percentage to the industrial share of electricity consumption leads to an increase in total electricity consumption of 3.3% in the E.U. That would be the direct increase; there would also be ancillary expansion and the indirect positive impact on the domestic economy adding to electricity demand.

This, of course, all assumes that new factories are identical to old factories. Assuming however the normal course of modernization of the industrial tool, and keeping in mind the trauma created by COVID-19, we can expect an increase in automation-content in new factories to support "work distancing" and ensure a higher reliability of supply chains. As such, we can confidently forecast that the electricity consumption of new factories will be higher (than for old factories) and add to electricity demand growth.

In Conclusion
We believe that a reshaping of the globalisation of trade is an additional driver that will return the electricity sector to growth in the U.S. and Europe. Electricity will gain market share in a few areas: 1) transportation from broad adoption of electric vehicles and electric trains 2) homes with the migration away from fossil fuels 3) industries with the move away from energy-intensive and carbon-emitting processes to green hydrogen, carbon capture and the rise of automation, onshoring and nearshoring. We believe all of this will further support the case for electricity increasing its market share at the expense of other sources of energy and that we will witness an acceleration of growth in the sector. In this context, renewable developers and power generators, which are migrating quickly to clean power will capture a larger share of this growth in electricity and value creation for investors.

As I conclude, let me extend my support to all the people facing distressing situations as the world tackles multiple crisis, and express my heartfelt thank you to the heroes who protect us against viruses and stand up against social diseases.

Thank you for joining us. And stay tuned for our next cast. Have topics you want covered or other feedback to share? Write us at info@tortoiseadvisors.com.