

# 5 SMART ENERGY

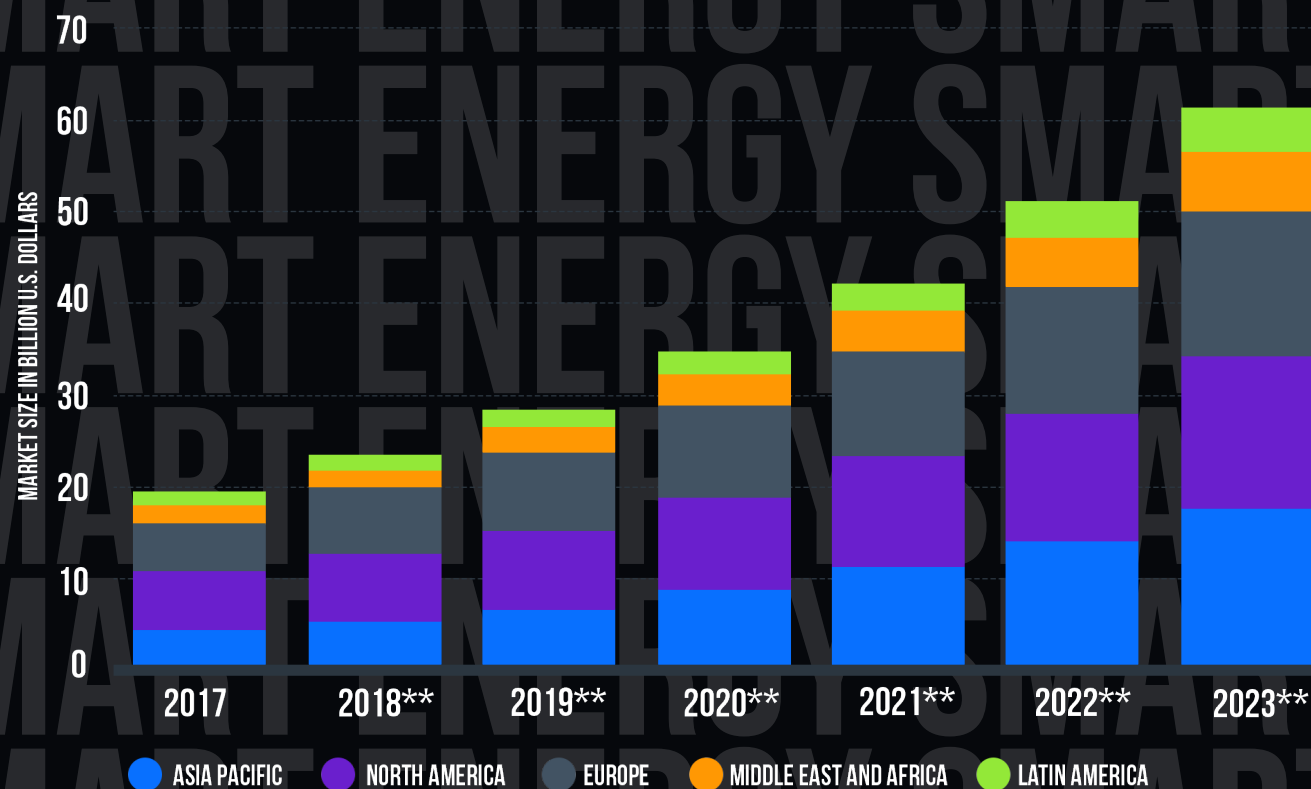
As we evolve to a carbon neutral energy infrastructure, the way we produce and consume energy must categorically change.

Smart energy encompasses smart metering, new forms of grid management, energy storage and a wide variety of other technologies that are enabling companies and consumers alike to use energy more efficiently, and therefore reducing their carbon footprint. Not only this, smart energy focuses on powerful and sustainable energy sources that promote greater eco-friendliness.

## GRID MANAGEMENT

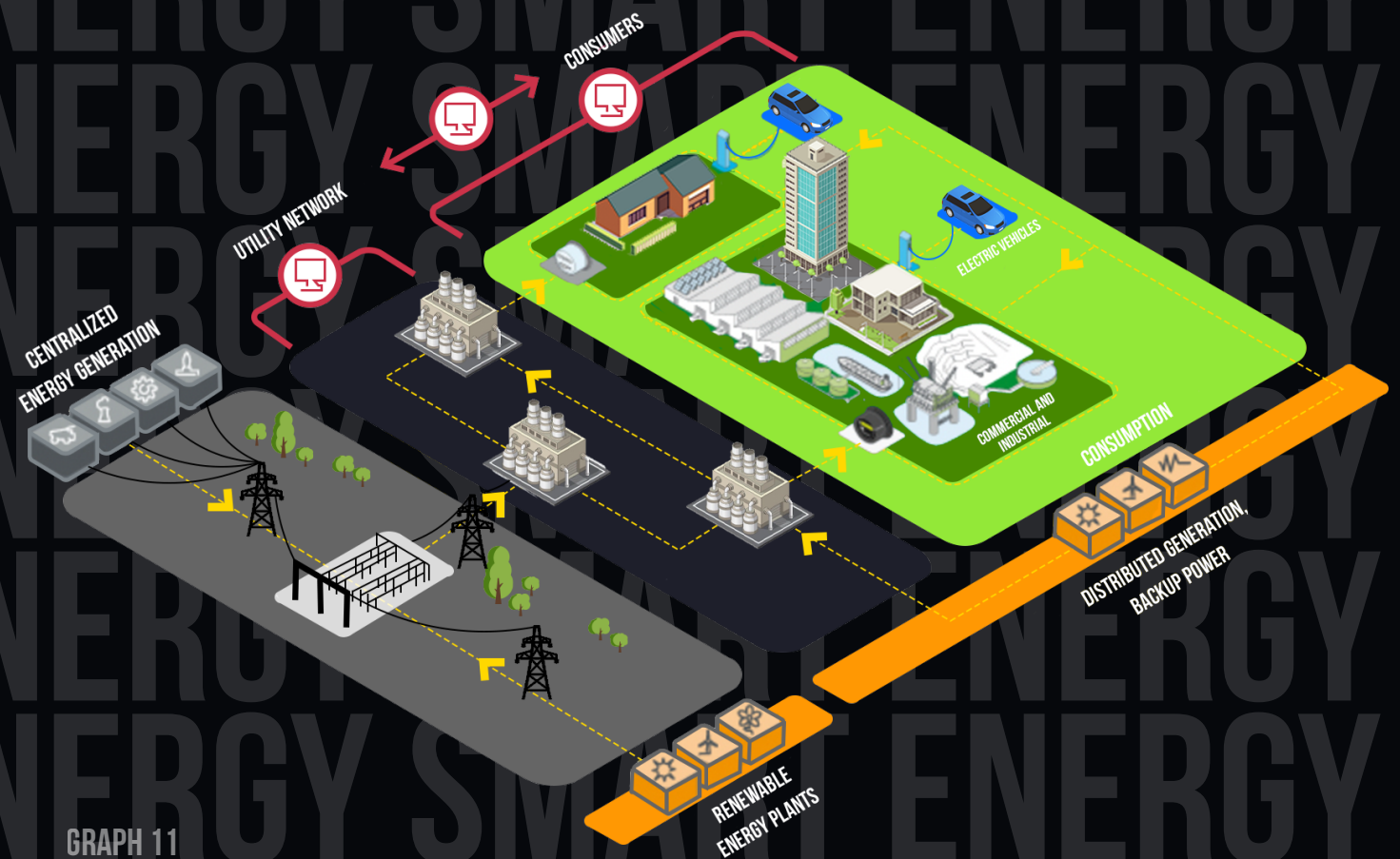
The current grid infrastructure and system cannot yet support the modern era of renewable energy and so new ways of operating, upgrading and implementing alternative infrastructures will become paramount to supporting the renewable energy transition.

To be able to effectively shift our energy supply, we must create a 'smart grid'. Essentially, a smart grid is an electricity network enabling a two-way flow of electricity and data, meaning the grid has greater visibility over current demand and for consumers to have greater control over consumption. A smart grid can detect, react and even pro-act to energy usage.



The market value of smart grids in Europe is anticipated to reach just over £15 billion<sup>29</sup> by next year. Driving factors promoting the upgrade of the current grid infrastructure are the adoption of more renewable energy sources, the EV charging point movement, decentralisation and the rise of microgeneration and microgrids.

To achieve this reactive energy infrastructure, big data analytics, IoT and smart metering are often applied to create a fountain of information. The innovative technologies are the ones that will be enabling the grid to modernise.



GRAPH 11

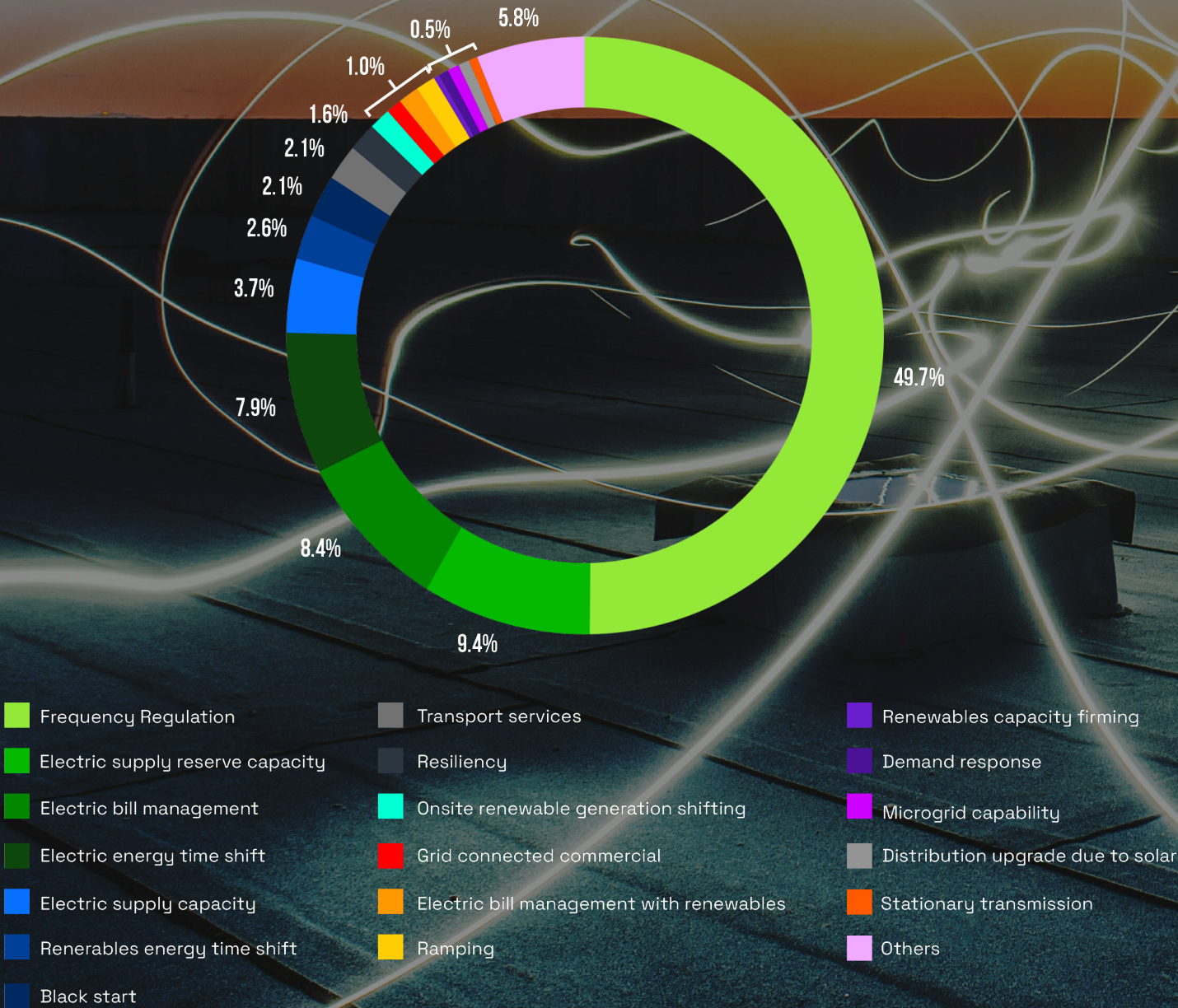


ENERGY STORAGE

The modernisation of the grid is not going to be plain sailing and energy storage is a critical element that will support the grid, decentralising energy production, consumption and storage.

According to Deloitte,<sup>30</sup> the most common use for battery storage globally is frequency regulation, followed by reserve and bill management.

GLOBAL BATTERY STORAGE CAPACITY BY PRIMARY USE CASE



**POWERSTAR**, WHO ARE PROVIDING RESILIENCE FOR A NET-ZERO WORLD EXPLAIN HOW THEIR POWER STORAGE CAPABILITIES CAN ENABLE BUSINESSES TO INSULATE THEMSELVES FROM EXTERNAL CHANGES.

Our core technology is a battery storage system that's used on a commercial or industrial site and a control system which then manages the electricity through that battery. It decides when to charge and discharge the battery in order to make the electricity for the site as reliable, as green and as cheap as possible. It can balance those different requirements however the customer wishes. The complexity of this is increasing as everybody strives towards net zero. Sites may now be generating their own electricity on-site with renewables, and adding in more electric technology. Electric vehicles and electrified heating, such as heat pumps, have big impacts on an organisation's electrical demand. We can help manage those big peaks in electrical requirements, we can help connect them to the grid and we can help make them as efficient as possible.

- Alastair Morris, CCO, **Powerstar**



# SECTION 14:

## IS THE UK READY FOR NET-ZERO?

ENCOMPASSING INNOVATIONS AND TACTICS  
ACROSS ALL INDUSTRIES. BUT AT THIS POINT IN  
TIME, IS THE UK READY FOR THIS TRANSITION  
AND WILL IT BE READY FOR THE ALL CRITICAL  
2050 TARGET?





Firstly, Don Scott explains how vast infrastructure improvements must be achieved to make net-zero possible.



Currently, we are not even close to a renewable transition. Generation, transmission, and storage all need considerable work. The infrastructure is behind the innovation and that needs to be flipped. When the infrastructure for the internet was being developed, there was a vision behind what it would be, and I think that's missing here. I think energy companies, in particular The Grid, are lagging and just following demand. They need to get in front of the demand.

- Don Scott, CCO, **Power Roll**

Karl Farrow delivers his insight on how we can effectively achieve carbon-neutrality.



I think to transition successfully we need to look at building a new infrastructure, and at the same time making a way to transition the old infrastructure to carbon-neutral standards. The infrastructure that we have today is certainly not suitable for the future. I am not sure we fully understand how to achieve this yet either, we are still very much in that learning phase. One of the big challenges we have in the UK is that the systems we distribute energy on are outdated and not designed to deal with the different types of energy. Even if you want to buy renewable energy you can't guarantee that the energy is coming from a renewable source.

Wind and solar are weather dependent, and that's why it's important to look at baseload energy like Geothermal to help support these. It's not to say that one is better than the other, it's all part of the same renewable mix which helps support the scalability of wind and solar."

I think the challenge we have today is the magnitude of the challenge we have ahead of us. It's been 100 years since the industrial revolution and to revert that it

will realistically take just as long. I think we are going to come against more issues in the next 20-30 years before people take it really seriously, as there is still too much of a commercial focus. If you want to solve a major catastrophe, the last thing you should be considering is making money.

- Karl Farrow, CEO, **CeraPhi**

Glen Fletcher, CEO of Tribosonics discusses how the integration of both government and business is going to be crucial to becoming carbon neutral.



I think the UK is absolutely capable of doing so, but that's a different thing from actually doing it. We have the technology, we have the people, and we have the ability to build it. But we've got to pull it all together, and this needs to be done quickly and we need to stop waiting for the government to get its act together, and get on with it in the business community and join the dots between collaborative innovation ecosystems and tech adoption and funding and businesses of all sizes working together to be more sustainable and hit the decarbonisation targets.

- Glenn Fletcher, CEO, **Tribosonics**

Conrad Langridge, Head of Marketing at Spherics describes how we need not only consider our current practices, but the harm that has been in the past.



Yes. We are in a privileged position to do so. Can we undo all of our historic emissions what have allowed us to get to the position that have allowed us to get to the position we are in? That's a much harder question. As with all things, we should all be looking at holistic emissions reduction, and we need to solve this globally. This might be one for the politicians.

- Conrad Langridge,  
Head of Marketing, **Spherics**