



VODAFONE'S APPROACH TO RENEWABLE ELECTRICITY

Vodafone operates mobile and fixed networks in 21 countries across Europe and Africa and is a leading global IoT connectivity provider. We believe that business success should not come at a cost to the environment. We also see a key role for our digital networks and technologies in helping to address climate change. Digitalisation is key to saving energy, using natural resources more efficiently and creating a circular economy.

Building on our previous commitments, Vodafone has SBTi-approved science-based [carbon emission reduction targets](#) to reduce our own emissions to zero and halve our scope 3 emissions by 2030. We are also committed to reaching full value-chain net zero emissions by 2040. We are already running the [largest European network powered by 100% renewable electricity](#) and are targeting 100% renewable electricity globally by 2025.

The carbon footprint from our operations

Our total global carbon footprint from our own operations for FY21 was 1.4 million tonnes CO₂e, of which 1.1 million tonnes were associated with Scope 2 emissions (principally from purchased electricity) and 0.3 million tonnes were from Scope 1 emissions, including diesel and refrigerant gases. This represented a 36% reduction over the last two years.

Fig. 1: Scope 1 and 2 emissions FY19 to FY21

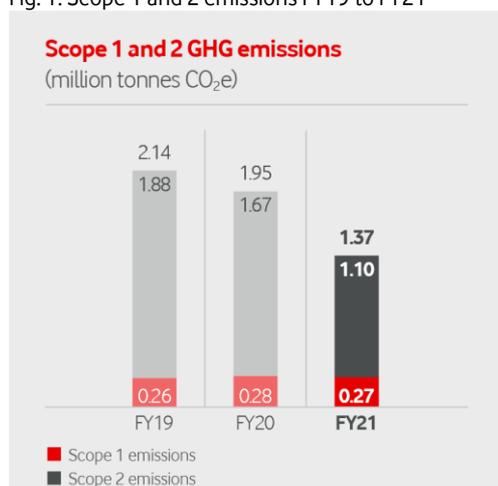
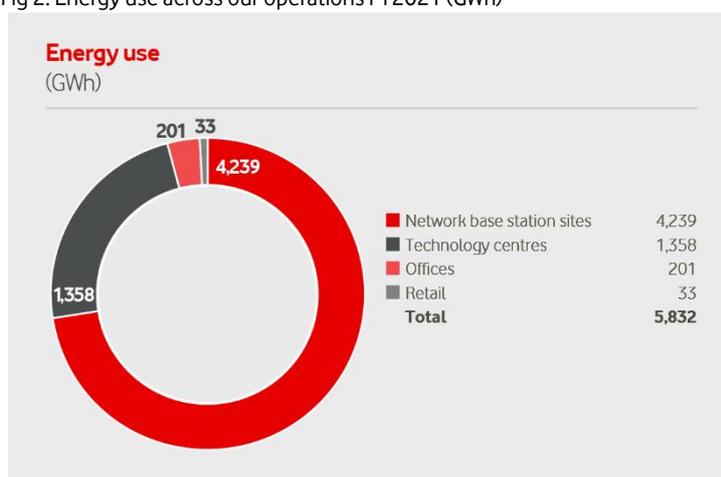


Fig 2: Energy use across our operations FY2021 (GWh)



Energy efficiency

[We continually innovate and invest in our network](#) to ensure that our energy use does not increase despite the massive increase in data demands. Vodafone has decoupled data growth from energy use and carbon emissions. We deliver this through a constant drive to improve energy efficiency across all areas of our business and address sources of carbon emissions.

However efficient we are, we still require energy to run our network and provide connectivity to society. The largest proportion of Vodafone's own carbon footprint comes from our electricity use. We are addressing this as quickly as technology and regulation allows.



100% renewable electricity

Our 100% renewable purchased electricity is exactly that: all our towers, data centres, shops, offices – anywhere we are responsible for electricity use - will be powered by 100% renewable sources.

Originally planned for 2025, we accelerated our plans to reach 100% renewable electricity in Europe and met the target in July 2021 in recognition of the role we play in supporting Europe to build back better.

We are now working hard to become fully 100% renewable globally by 2025. Our renewable electricity does not come from low-carbon alternatives but is generated from fully renewable sources powered by the sun, wind or water.

Notably, our targets include locations where we have our equipment within other landlords' buildings/sites. As we do not control the incoming electricity supply, often we cannot guarantee the origin of the electricity. We therefore ensure we purchase additional Renewable Electricity Certificates (RECs) to cover this proportion of our consumption.

Fig. 3: Source of energy FY19 to FY21 (GWh)

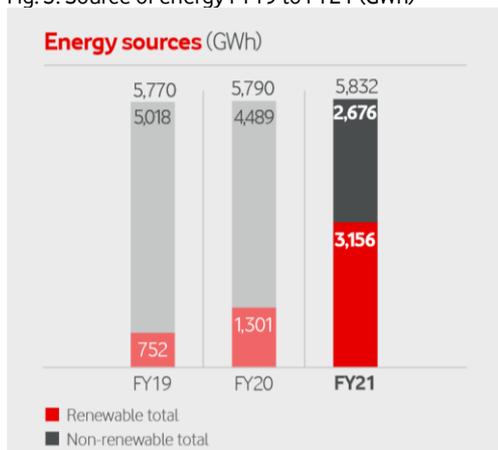


Fig. 4: Source of purchased electricity (%) FY2021 (Apr20 to Mar21)





Common terms and definitions

Additionality – our aim is to support new renewable generation through our purchasing decisions.

Additionality is actively sought by Vodafone when purchasing renewable energy. Put simply, “additionality” is renewable energy generation that wouldn’t have happened without a chosen action. Commonly, additionality means choosing renewable energy which facilitates production of new supply on the market, rather than older historic supplies or supplies built to meet legislated targets.

Renewable Energy Certificates (RECs) – method to track renewable generation and consumption

In essence, RECs (or equivalent) are an accounting method to track generation and consumption of a single MWh of renewable electricity. Without these, there is the potential for double counting. Such certificates have different names across regions and markets but in all cases act as evidence that renewable energy has been generated by a named source in a specified period and then retired (consumed) by a single party. RECs may be bundled with the actual consumption or electricity or unbundled and sold separately.

Any renewable electricity going through a shared grid must use a form of this accounting method – be it a PPA, renewable tariff or unbundled. The total balance of generation and consumption needs to match over a calendar year. Most significantly, it is the Certificate which carries the renewable zero carbon attribute, rather than the electricity.

Our Approach to renewable electricity

We believe the climate crisis requires us to act quickly and credibly, while also striving for continual improvement. We apply this approach across our global footprint, although the specifics may vary between countries due to unique legal structures, levels of market maturity and availability of opportunities.

In order to do this we **follow a hierarchy approach** as listed below. We follow best practice guidance and aim to continually improve our performance and move up the preference of options over time as feasible.

Hierarchy of Preference

Energy efficiency – The best MWh is that which isn’t consumed.

We are laser-focused on energy efficiency, including measures to reduce energy consumption. Our strategy to optimise energy usage and improve energy efficiency involves the latest technologies; high performance equipment for servers, storage and our network; highly efficient passive infrastructure for power conversion and cooling; and smart metering and controls using IoT technology and artificial intelligence (‘AI’).

Further examples are available in ‘Additional Information’ dropdown under ‘Environmental footprint of operations’ at <https://investors.vodafone.com/esg/sasb>

During FY21, we invested €65 million of capital expenditure in energy efficiency and on-site renewable projects across our business, which has led to annual energy savings of 135 GWh. Over the



next three years, we will continue to invest in passive infrastructure and renewable energy and benefit from cost savings as a result.

Self-supply – generating our own new clean renewable electricity.

We will continue to invest in generating our own electricity, harnessing the power of the sun and wind to directly provide energy across our own sites.

Our self-generation potential is constrained by physical and regional limitations, such as the strong and empty roof space to hold solar panels, or tower locations with sufficient sunshine. Self generation is most appropriate at large data centres or rural sites in our African markets. Due to these limitations, self-supply will only provide a small, although important, part of our renewable electricity supply portfolio, estimated at approximately up to 5% total supply. We continually assess and update the feasibility of solutions to maximise this potential and develop new solutions.

Power Purchase Agreements (PPAs) – contracts to buy electricity for a set period from a specific facility.

PPAs can offer long-term, cost-effective solutions for renewable generation and, if agreed during the development stage, have strong potential to create additionality. In our experience, electricity prices agreed under PPA contracts are broadly comparable to wholesale electricity prices and also provide us with more certainty. PPAs are a central part of our strategy to meet our renewable electricity targets longer term and we aim to procure 20 - 40% of our renewable electricity consumption through PPAs by 2030.

PPAs are now an established part of corporate renewable electricity strategies but are still an emerging solution. For example, in some markets including Egypt and South Africa, we have PPAs planned but are first engaging with local governments to develop the appropriate legislative environment to facilitate their delivery.

At present, we can only procure PPAs in a limited number of our markets. We currently have two large PPAs in Spain and the UK, both of which are mature PPA markets. We are working to conclude further PPA deals across our other markets as they become available. The early-stage nature of PPAs is not limited to Vodafone as only 5% of the electricity sourced by RE100 firms with European operations utilised PPAs in 2020.

Vodafone also supports improving renewable generation within the markets we operate. Where possible, we focus on signing deals with generators which own physical assets in the countries in which we operate.

Unlike other industries, telecom companies operate thousands of small individual sites spread across large areas. This adds a further challenge as consumption is not concentrated in a single location. We therefore rely on national grids to help distribute the renewable electricity we procure. This limits the availability of “direct wire” PPAs, where a generation facility is directly connected to the consumption. PPAs which utilise grid distribution, which therefore also require RECs to track generation and consumption.

Green tariffs – Electricity tariffs which are sourced from 100% renewable generation.



Green tariffs are comparable to standard electricity contracts, but with matching an equal amount of renewable energy production with that consumed. We always ensure that the electricity is supplied with credible associated RECs. We use green tariffs in most of our markets as other options are still under development or not yet available.

How do Renewable Electricity Certificates actually work? (RECs, GOs, REGOs, iRECs)

Once electricity is generated and inputted into a distributed grid, it cannot be directed to a specific end-user. There is no way for an end-user to know exactly where the electricity they are consuming has been generated. Consequently, renewable energy certificates have been created to prove that a MWh of electricity generated at a named source has been consumed by a named user within that year.

Users buying a REC may not get the actual electricity generated from the named source (e.g. a windfarm 100 miles away). However, with a REC from that windfarm, users can be sure that they are paying for 1 MWh of renewable electricity from the specific named windfarm, supporting new renewable generation and ensuring that no-one else can claim that specific MWh of renewable electricity.

Unbundled RECs – RECs certificates which are sold separately from the electricity.

This is similar to a renewable tariff, but users are purchasing electricity and RECs from two different suppliers. The electricity consumed is covered by an equal amount of renewable energy production elsewhere. This is the least-favoured option, but in some circumstances may be needed.

If completed well, this option can still have strong additionality as it can support renewable generation that may not otherwise have a market. Vodafone reserves this solution for challenging situations, for example where we are tenants and do not procure electricity directly or where national legislation is not yet compatible with our other preferred options.

Continually moving up the hierarchy

To support additionality and use our purchasing decisions to create the maximum benefit, we expect to continually move up the order of preference as renewable electricity markets mature.

We aim to achieve additionality when procuring RECs through sourcing new generation. This varies by market, but for Vodafone “additional” generation is commonly required to be less than 5 years old, from wind and solar sources, and as close to large consumption locations as possible.

Our preferred generation choice is not always possible to procure. In all cases, however, we expect at a minimum that RECs bought by Vodafone meet the following standards, and locally we set the minimum standard at a more ambitious level where more mature markets exist:

- RECs detail the location, date and source of the generation and evidence Vodafone as the company retiring the REC;
- RECs are retired within the year of their creation;
- RECs are sourced from the same electricity market as they are retired (with exceptions where no RECs market currently exists locally); and,
- RECs are sourced from a reputable national governing body.



We also follow external guidance from reputable bodies and organisations such as GHG Protocol, RE100, CDP, RECs International, SBTi, as well as local guidance in our markets.

Is buying RECs (GOs, REGOs, IRECs) just “greenwashing”?

In a perfect world, companies like Vodafone would be able to source every GWh of electricity consumption directly from renewable generation sources. In reality, companies must strive to take a holistic approach to renewable electricity where their approach to credible renewable energy consumption is based on improving additionality.

Vodafone follows a hierarchy of preference – through energy efficiency, self-supply, PPAs and credible RECs – consistently engaging and looking to improve. We think this is the best and most credible approach possible, given the reality of our operations and the varying degrees of maturity of renewable energy markets across our footprint.

But this is not just our opinion – our carbon and climate actions and transparency have also been recognised by the global environmental non-profit organisation CDP, and in 2020 we secured a place on CDP’s climate change ‘A List’.

Different solutions may be viewed as more or less credible, but there is significant range within – as well as between – renewable procurement options. For example, procuring high quality in-country RECs can still offer significant additionality over a single large PPA in another EU country. We also consider the purchase of additional unbundled RECs to cover landlord consumption to be better than excluding this electricity from our procurement decisions or environmental goals.

Our guiding principle is that Vodafone wants to play its role in reducing our carbon emissions while also supporting the additional creation of renewable generation in the markets where we operate.

In many markets, the additional income from PPAs and RECs supports new renewable generation and is starting to allow subsidy-free renewables. However, we also look to work with wider society, including regulators, industry and the public, to develop the systems and regulation which encourage low-cost renewable electricity in all of our markets.

Overall, individual companies have an important part to play in the low-carbon transition, but they must also work within the availability of the market they are in and have limited control over national energy strategies.

Through following our procurement hierarchy and using what is available at that point in time, we are seeking to support new and additional renewable generation, while also reducing our carbon emissions and following international recognised standards.

What about carbon offsets?

Carbon offsetting is not applicable to our 100% purchased renewable electricity goal and of limited use in our 2030 and 2040 Net Zero targets.

Carbon offsetting is the act of paying for a tonne of carbon to be removed/avoided elsewhere to offset a tonne emitted. In terms of hierarchy of preference, this is the least desired and should only be used when all other reasonable efficiency and low-carbon alternatives have been fully realised.



Offsetting allows continued emissions of harmful greenhouse gases but balances global totals through reductions elsewhere, rather than addressing the problem at source. There are arguments in support of this approach, but it is harder to prove a long-term reduction in global carbon as a result – and there can be more fraud and abuse.

For Vodafone, there may be a small place for carbon offsetting in the future as part of our actions to reduce emissions to zero across all areas, but only where we cannot take an action to avoid emissions in the first place. Specifically, carbon offsets will only ever represent a maximum of 5% of our total own emissions, and only as a last resort in the future.

How are you supporting others to save energy?

Connectivity and digital solutions support wider societal and industrial ambitions for climate action. At Vodafone, we have pledged to help our corporate customers reduce their emissions by 350 million tonnes by 2030 – the equivalent of Italy’s entire carbon footprint in 2019 – by implementing new technologies and digital solutions. In enabling low carbon solutions for ourselves and our customers, we can play a significant role in the global efforts to decarbonise societies.

Beyond minimising our own impact and supporting others to reduce theirs, we also work with our suppliers and customers to help them reduce their impact during manufacture and use, switch to renewable energy and set their own carbon reduction targets. And we continue to address our environmental impact from our redundant network equipment and our customers devices.