



FCM

Low carbs: the CO² emissions diet

Sustainable Travel Series – Issue 2



Are you a conscientious corporate traveller?

FCM has produced a series of five in-depth reports on sustainability strategies in the hospitality industry, detailing carbon and energy conservation, water scarcity and pollution, waste and community engagement.

The second piece in our series looks at how corporate travellers can reduce their carbon emissions and conserve energy while travelling for business. While much of this relies on changes in traveller behaviour, innovations in new heating and power systems, as well as more efficient processes to conserve energy in the transport and hospitality sector, all contribute.



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Tackling climate change together

Since 2016 there's been a little shining ray of hope in the war against climate change: the Paris Agreement. The Agreement saw some 195 countries unite to sign the world's first-ever universal, legally-binding global climate deal. In an attempt to alleviate greenhouse gas emissions, the Agreement set out a global action plan to put the world back on the path to avoiding dangerous and irreparable climate change. The aim was to limit global warming to well below 2°C, and ideally to no more than 1.5°C.

Each participating country submitted a comprehensive 'National Climate Action Plan', and agreed to re-convene every five years to set more ambitious targets. However, exceptions were made for developing countries as they would take longer to reach a global emissions peak before instigating a reduction programme.

China's aggressive plans to open multiple coal mines have slowed – the country's now the largest investor in electricity production from renewable energy sources



Carbon dioxide (CO²) is the main offender of 'greenhouse gases' – however the term also refers to methane, nitrous oxide, water vapour, chlorofluorocarbons (CFCs), hydrofluorocarbons and ozone.

These gases absorb and emit radiant energy and cause the 'greenhouse effect', which warms the earth's surface. The greenhouse effect becomes worse with deforestation and the burning of fossil fuels (used for electricity, heat and extensively in transportation, eg jet fuel) which contain carbon, as well as manufacturing and communications.

China is a great example of a country that has acted since signing the Agreement. Its aggressive plans to open multiple coal mines as sources of energy have slowed and it is now the world's largest investor in electricity production from renewable energy sources, such as wind and hydroelectric power.

Together China and the US represent almost 40% of global emissions. Yet following his election in 2017, US President Donald Trump withdrew the country from the Paris Agreement because he felt "it would undermine the economy".

Despite the President's action however, 29 US states have joined the United States Climate Alliance to advance the objectives of the Paris Agreement. Elsewhere around the world, countries are taking action. Spain has invested heavily in solar power stations, while the UK is harnessing power with wind farms.

Moreover, the UK has declared a climate emergency - the first G7 country to do so.

However, the country's 2050 goal of an 80% cut in greenhouse gas emissions has been mooted by lobbying groups, which are pushing for the UK to become a zero-carbon energy emissions country by midcentury - or sooner.

But as with many challenges, funding for innovation is often the stumbling block to revolution. But in May 2019 a grouping of the European Commission, European Investment Bank and Bill Gates' Breakthrough Energy Ventures launched a €100million fund to support investments in clean energy.

Companies will be eligible if they are cutting emissions in five energy sectors: electricity, transportation,

agriculture, manufacturing and buildings. The new fund reckons these five are the largest contributors to global greenhouse emissions and any innovations will have the most impact towards a future of zero emissions.

generation, renewables still have a long way to go. Last year, they represented 12.1% of electricity produced worldwide (up from 11% in 2016). Their contribution had the effect of preventing the emission of 1.8 gigatonnes of CO₂.

40%

**China and US
represent almost 40%
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**Global electricity
generated by renewable
sources rose from 11% in
2016 to 12.1% in 2017 –
saving 1.8 gigatonnes of
CO₂ emissions**

We can see the powers that be are already sitting up and taking note of what needs to be done to mitigate climate change – and the effects are being seen.

The 'Global Trends in Renewable Energy Investment 2018' report from Frankfurt School found a record 157GW of renewable power were commissioned in 2017, up from 143GW in 2016 and far out-stripping the 70GW of net fossil fuel generating capacity added last year. Solar alone accounted for 98GW (38% of the net 'new power capacity' coming on stream during 2017).

Meanwhile, the proportion of world electricity generated by wind, solar, biomass and waste-to-energy, geothermal, marine and small hydro rose from 11% in 2016 to 12.1% in 2017. This corresponds to approximately 1.8 gigatonnes of CO₂ emissions avoided. And global investment in renewable energy edged up 2% in 2017 to \$279.8 billion. This takes cumulative investment since 2004 to \$2.9 trillion. But in electricity



CHINA IS SETTING A BRIGHT SOLAR EXAMPLE

The leading country by far for renewable energy investment in 2017 was China, accounting for \$126.6billion, its highest figure ever and no less than 45% of the global total. An extraordinary solar boom in 2017 saw some 53GW worth of solar energy generated (more than the whole world market as recently as 2014), with an investment in solar of \$86.5billion (up 58%).

HOW DOES THIS COMPARE TO OTHER COUNTRIES?

US invested - \$40.5billion

Mexico invested - \$6billion

(810% increase)

UK invested - \$7.6billion

(65% decrease, reflecting the end of Government subsidies for wind and solar projects)

Germany invested - \$10.4billion

(35% decrease)

Australia invested - \$8.5billion

(147% increase)

Sweden invested - \$3.7billion

(127% increase)

Egypt invested - \$2.6billion

(600% increase)

UAE invested - \$2.2billion

(2.200% increase)

“Greening” our hospitality companies

So how is the hospitality
industry - spanning
airlines, hotels and ground
transportation -
contributing to cutting
emissions?

**Passenger numbers
will double to 8.2 billion a year by
2037. Boeing forecasts that 42,700+
new aircraft will be needed over the
next 20 years. Airbus predicts much
the same**

SOURCE: IATA

Airlines

Airlines contribute to about 2% of the world's global CO² emissions, a number which is only expected to grow. According to Bill Hemmings, aviation director at European campaign group Transport & Environment, "flying is the fastest way of frying the planet". Short of travellers flying less or only flying direct routes (which isn't always possible), the answer could lie in the airlines themselves. Having a more modern, fuel-efficient fleet, better air traffic management, slower cruising speeds, taxiing on one engine and using biofuels in their mix instead of exclusively using jet fuel, could help. But these actions alone won't be enough. The European Union wants the airline industry to reduce emissions of CO² by 75%, of nitrogen oxides by 90%, and noise by 65% by 2050. Moreover, next year, a new Carbon Offsetting and Reduction Scheme for International Aviation, agreed by 70

countries, comes into force. To date, the likes of BA, Lufthansa and Qantas already offer such schemes.

The world's major airlines are rising to the challenge; some more than others. Air China, China Southern, Korean Air, Singapore Airlines and Turkish Airlines have been tardy, but British Airways, for example, claims to be a leader in the development of the "waste-to-fuels" pathway. Scaling up any biofuel plant is key, and this will also bring the price down, which is currently higher than jet fuel. BA will start constructing a plant to convert household waste to jet fuel in 2021, and be producing fuel by 2024.

The airline will invest a total of \$400 million on alternative sustainable fuel development over the next 20 years.

It is estimated that this could deliver 3.5 million tonnes of jet fuel annually by 2050, resulting in negative emissions

and the equivalent of taking more than 5.5 million cars off the road every year.

Biofuel can reduce lifetime greenhouse gas emissions by up to 80%

Cathay Pacific has already made an average improvement in fuel efficiency of 1.5% per year between 2009 and 2020. The carrier has set a goal of achieving a 50% reduction in net CO² emissions by 2050 (relative to 2005 levels), and has committed to continuing fleet renewal and greater operational efficiencies to improve fuel efficiency. It also aims to reduce waste and improve recycling and re-use. Some 90% of the airline's retired planes are already recycled, for example. The airline's investment in sustainable biofuel developer Fulcrum BioEnergy in 2014 will help Cathay achieve its goal of carbon-neutral growth in 2020.



Blue sky thinking envisages electric-powered aircraft – something that EasyJet is developing with partner Wright Electric. But weight is the issue here as state-of-the-art lithium batteries are too heavy for aviation – they are some 40 times heavier than kerosene. For the moment, airlines are pushing biofuels - but all-electric or hybrid-electric aircraft may not be far away.

Qantas grabbed headlines earlier this year when it flew a zero-landfill commercial flight. Such a flight would normally generate some 34kg of waste, totalling 150 tonnes annually. And last year, Qantas operated the first biofuel flight (processed using mustard seeds) between Australia and the US.

In the air United Airlines has kept 30,000 tonnes of CO² out of the air by finding lighter weight items for printing its magazine, removing on-board dutyfree products, and reducing waste in its food and drinks service.

Qantas operated the first biofuel flight between Australia and the US – powered on mustard seeds

United pilots also shut down one engine and taxi on the other to save 5 million gallons of fuel per year. Continuous descent approaches also save fuel, as does towing aircraft between gates rather than taxiing aircraft. Its ground vehicles run on alternative fuels or are electric.

Air France/KLM has reduced CO² emissions by 21.6% since 2011 (equivalent to 4.3 million tonnes of CO²) by becoming more energy efficient. Some 50% of its ground support equipment is electric.

And the airline group has also partnered with Biojet to produce biofuels - to date more than 1,300 tonnes have been used across the group.

The Airbus A350 series of aircraft is 25% more fuel efficient compared with previous generations. Constructed from lightweight carbon composite material, with an advanced wing tip, they're designed to reduce noise and drag, thus increasing fuel efficiency

SOURCE: IATA

Cars, taxis and trains

On the ground, the land transport sector - covering our roads and railway lines - is fuelled almost entirely by petroleum products. What's needed is for cars, trains, trucks, mass transit systems and freight transportation to change to renewable energy resources and trigger a modal shift away from petrol and diesel to electric.

Shining examples of sustainable transport include the Swiss railways, where the majority of the standard gauge and narrow-gauge network are electrified. Sweden is another early electrifier of its railway network. The electric-motor Japanese bullet trains run on partially-electrified networks, while the German Deutsche Bahn trains are electric and 80% of its electricity will come from renewables by 2030.

Incentives to trigger a modal shift in consumers include Helsinki's novel gamification programme, MUV (Mobility Urban Values), rewarding consumers who choose to walk, cycle or use public transport with points on their mobiles which give both virtual and free prizes, such as free admission to a sauna.

Electric trains emit between 20-30% less carbon monoxide than their diesel counterparts

"Cities consider it important to find ways to reduce traffic emissions. In addition to technology, infrastructure and regulation, residents themselves play a key role, as they can influence emissions with their choices. The MUV project studies how the fun of mobile games can be brought to everyday

choices and sustainable choices can be made attractive," says MUV project manager Janne Rinne.

The UK government launched a £25million fund in May to help decarbonise transport in the UK. It will fund 22 projects to develop zero-emission vehicles in a bid to reach the UK's goal for all new cars and vans to be zero emission by 2040. The UK government initially offered grants of £4,500 to help drive a shift to electric cars, but had sadly cut it after a surge in applications.

Worldwide, the 1.1 million electric cars on the road still represent only 1.8% of world light-duty vehicle sales in main markets, and that in many countries - including China - electric car companies rely on tax breaks or other subsidies to encourage motorists to switch.

The modal shift will, of course, reach a tipping point - but not just yet. However hampering progress worldwide is the battery life of cars - until the issue is resolved it will act as a brake on further market penetration.

Overall, the electrification of transport has had a tiny effect on global emissions.

According to the Frankfurt School, the passenger electric vehicles on the road in 2017 are estimated to have displaced only 101,000 barrels per day of transport fuel, compared to world consumption of more than 90 million barrels of crude oil per day.

Overall, global transport demand for oil in 2016 resulted in 7.5 gigatonnes of CO₂ emissions, just over half that from power generation, according to the International Energy Agency.

Companies active in this sector include car rental giant Avis, which has been measuring and taking action against the company's CO₂ emissions for the last decade. It has been a carbon neutral operation accredited company since 2000, investing in carbon offsetting programmes which include HEP stations in China and Bulgaria and a power generation plant in India. It runs an earthfriendly fleet of hybrid gas/electric vehicles - known as Eco-Rides - and has instigated green practices to conserve energy. For example, it recycles and reuses at least 80% of waste water when washing cars, and runs a newer, well-maintained fleet which is more energy efficient.

Competitor Hertz provides a Green Collection of cars in Europe and North America which are more fuel efficient and offer a CO₂ output level of less than 120g/ km - a level below the 2008 voluntary levels set by the EU for the European Automobile Manufacturers Association. Berlin-based chauffeur company Blacklane also runs a Green Class of vehicles - including Teslas -

and a carbon offset programme to help protect the plant from its 300-strong city service.

“Ride services have a special obligation to take care of both passengers and the planet,” says Blacklane’s CEO and cofounder Dr Jens Wohltorf. “Quality rides without compromising the environment benefit travellers, drivers and the world. They also align companies’ business travel needs with their sustainability goals.”

For group and mass transport, there are other innovations. A five-seater, allelectric, air taxi made its maiden flight in May. The German start-up, called Lilium, takes off and lands vertically and is powered by 36 all-electric jet engines and has zero operating emissions. Uber is planning a similar aerial taxi service in 2023 in Dallas and Los Angeles.

It is clear that mobility will change radically in urban areas. By 2030, it is estimated more than 60% of the world’s population will live in cities, creating the need for innovative resource-efficient and climate-friendly transport.



11 million

**electric vehicles are
estimated to hit the
roads by 2030**

SOURCE: SIEMENS.COM

£1.3 billion

**Electric cars will
save France, Italy,
Spain and the UK up
to £1.3billion/yr by
switching to zero-
carbon transport**

SOURCE: IATA

Hotels and accommodation

Hotels, apartments, pubs and restaurants were early adopters of sustainable practices. That's no surprise as they are usually 24/7 operations and use a significant amount of resources.

Leading global hotel brands reached consensus in 2017 for a sustainable hotel industry and under the guidance of the International Tourism Partnership (ITP), four goals for 2030 were set focussing on carbon, water, youth employment and human rights. With regards to carbon, the goal is to embrace science-based targets and encourage the wider industry to join in reducing emissions at scale.

Aside from asking customers to keep towels if they've not been used, there have been reductions in food miles by focussing on local producers, as well as the installation of solar panels, bore holes, 'green roofs', HVAC systems (heating, ventilation and air conditioning) and combined heat and power systems in a bid to save energy. More energy-efficient and sustainable building design is easier in new builds than converting existing buildings - but

there are challenges here with what Inge Huijbrechts, Global Senior VP Responsible Business at the Radisson Hotel Group calls, "the complexity of an asset-light model, which means that we have essential and multiple stakeholders in our asset owners and developers". The bottom line is king.

Heating can account for 60% of total energy costs and lighting accounts for 25% of an organisation's electricity costs - so opportunities for energy saving are many and varied

Energy costs are a small percentage of turnover but according to the Carbon Trust, by reducing them hotels can directly increase revenue without the need to increase sales. "Money saved on energy goes straight to the bottom line," it says, while recognising that guests are becoming more discerning

about the green credentials of the businesses they patronise. A guest could easily vote with their feet, after all.

Grange Hotels, for example, ticks all the boxes, having installed solar panels, bore holes, green roofs, a HVAC system and combined heat and power systems across its 17 properties, all geared to reduce the group's environmental impact.

The 350-strong NH Hotels groups' ambitious sustainability goals began in 2007 and have resulted in reducing the carbon footprint per room sold by 72%, energy consumption by 34% and water consumption by 31%. Its hotels have to reach its Green Key certification eco label - 46 have done so across the Netherlands, Belgium, France, Mexico and South Africa to date.

Hotel giant IHG – which includes many big brands, like Holiday Inn to Regent Hotels - runs the group-wide Green Engage System which manages online the use of energy, carbon, waste and water.

Accor Hotels' sustainability strategy

50% CO²

Many of the world's biggest tourist and travel companies are on course to cut CO² emissions by 50% by 2035

SOURCE: IATA



(called Planet 21) embraces all areas of sustainability and encourages employees, guests, hotel owners and communities to change their behaviour. All 4,600 hotels must reach the minimum bronze level by 2020. To do this they can take actions such as recycling soap, purchasing sustainably, measuring energy consumption, rationalising the flow rate in showers and toilets and installing LED lighting. The UK hotels have already reached this goal.

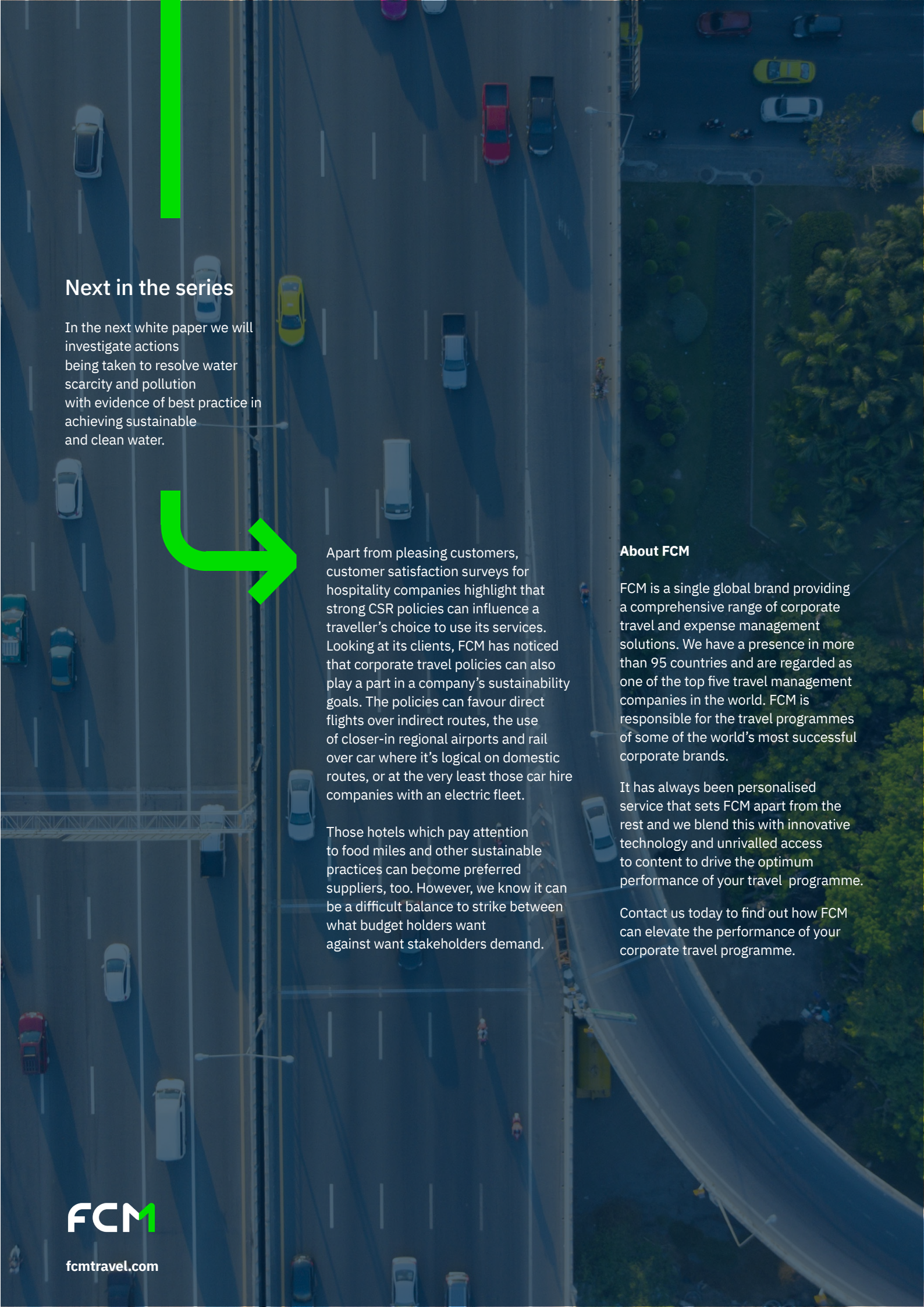
Accor notes that staff have embraced Planet 21, particularly Millennials, and that it is important to business guests. "It's a lot of hard work but the potential is incredibly high as it's amazing what can be achieved," said a spokesperson.

Radisson Hotels is another active member of the sustainability community, branding its actions under a Responsible Business programme that splits into 'Think People, Think Community and Think Planet', the latter aimed at preserving natural resources. Actions include holding carbon neutral meetings, better use of renewable energy resources and waste reduction. The hotel group has teamed up with First Climate to offset the carbon footprint of all meetings by supporting projects that combat climate change and have a positive, sustainable development contribution in Peru, Kenya and India or invest in wind energy in Turkey and the USA.

"We believe that the travel and hospitality industry and other partners together can be a force for good," says Sven Wiltink, Director Responsible Business at Radisson Hotel Group.

Savings of 15-20% for heating, 5-30% for cooling, 40-70% for hot water and 7-60% for lighting are possible.

SOURCE: XENIOS PROJECT



Next in the series

In the next white paper we will investigate actions being taken to resolve water scarcity and pollution with evidence of best practice in achieving sustainable and clean water.

Apart from pleasing customers, customer satisfaction surveys for hospitality companies highlight that strong CSR policies can influence a traveller's choice to use its services. Looking at its clients, FCM has noticed that corporate travel policies can also play a part in a company's sustainability goals. The policies can favour direct flights over indirect routes, the use of closer-in regional airports and rail over car where it's logical on domestic routes, or at the very least those car hire companies with an electric fleet.

Those hotels which pay attention to food miles and other sustainable practices can become preferred suppliers, too. However, we know it can be a difficult balance to strike between what budget holders want against what stakeholders demand.

About FCM

FCM is a single global brand providing a comprehensive range of corporate travel and expense management solutions. We have a presence in more than 95 countries and are regarded as one of the top five travel management companies in the world. FCM is responsible for the travel programmes of some of the world's most successful corporate brands.

It has always been personalised service that sets FCM apart from the rest and we blend this with innovative technology and unrivalled access to content to drive the optimum performance of your travel programme.

Contact us today to find out how FCM can elevate the performance of your corporate travel programme.