ACCORHOTELS

Feel Welcome

PLANET 21, ACTING FOR POSITIVE HOSPITALITY

ACCORHOTELS' ENVIRONMENTAL Footprint

April 2016

In partnership with

Quantis

Editorial

GIVING A BREATH OF FRESH AIR TO OUR ENVIRONMENTAL PLEDGE

Washing 140 million towels and serving 56 million breakfasts each year definitely takes its toll on the environment.

These figures represent our group's environmental impact, but they could also equate to a city of 500,000 inhabitants on the go round-the-clock.

By analysing our impact, we wanted to understand it so that we could improve. This goal was already evident when we conducted our first study in 2011.

Our approach was groundbreaking. Never before had an international hotel group measured their environmental footprint in such detail. It was also practical, as we wanted to map out our hotels' direct and indirect impacts.

We therefore wanted to continue this study to contribute to the 2020 commitments for our sustainable development programme, Planet 21. This document complements the study on the group's socio-economic footprint, which was published in January 2016.

This new edition will help measure what we have accomplished since 2011 in areas such as water consumption and CO_2 emissions.

It will also help present results that are more complete and closer to our actual performance, thanks to a comprehensive approach to the issues.

The results of this study are available on our Planet 21 Research platform. We are committed to sharing knowledge, supporting progress and embracing our status as the world's leading hotel operator.

Sébastien Bazin
Chairman and CEO of AccorHotels

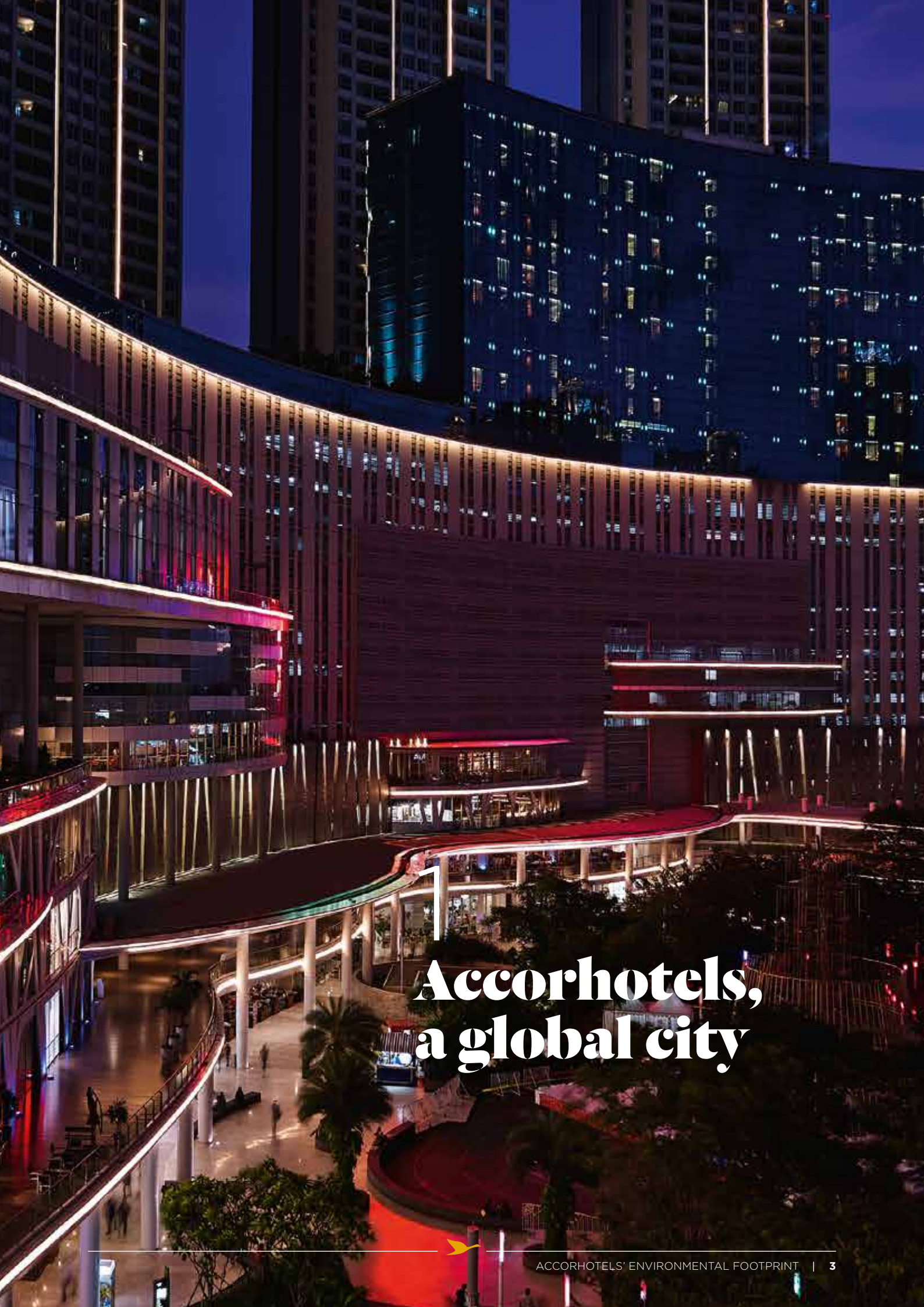
Contents

1 ACCORHOTELS, A GLOBAL CITY p3

2 2015, A NEW AND REFINED STUDY p10

3 RESULTS p17

4 AREAS FOR ACTION p24



1 Accorhotels, a global city

AccorHotels, a global city

Imagine a city with a half million inhabitants. Imagine thousands of lives coming into contact every day. Imagine a city that feeds itself, heats itself, controls its own heating and air conditioning, lights itself, cleans itself, and supplies itself. This city is what the AccorHotels Group represents as the world's largest hotels operator, present in 92 countries, with 190,000 employees, and 3,900 hotels.

Just like a modern megalopolis, an enormous logistics effort ensures that the raw materials are delivered for the more than 130 million pastries that are served every year. For their part, laundries ensure the cleanliness of more than 140 million towels and 130 million bath towels.

This state of affairs leads to water and electricity consumption, CO_2 emissions, waste production, and also to changes in biodiversity. These factors all have an impact on our planet. Aware of its role in protecting the environment, AccorHotels has been pushing for a more sustainable hotel industry for more than 20 years.

The AccorHotels Group is present in

92

COUNTRIES,

with 190,000 employees and

3,900 hotels

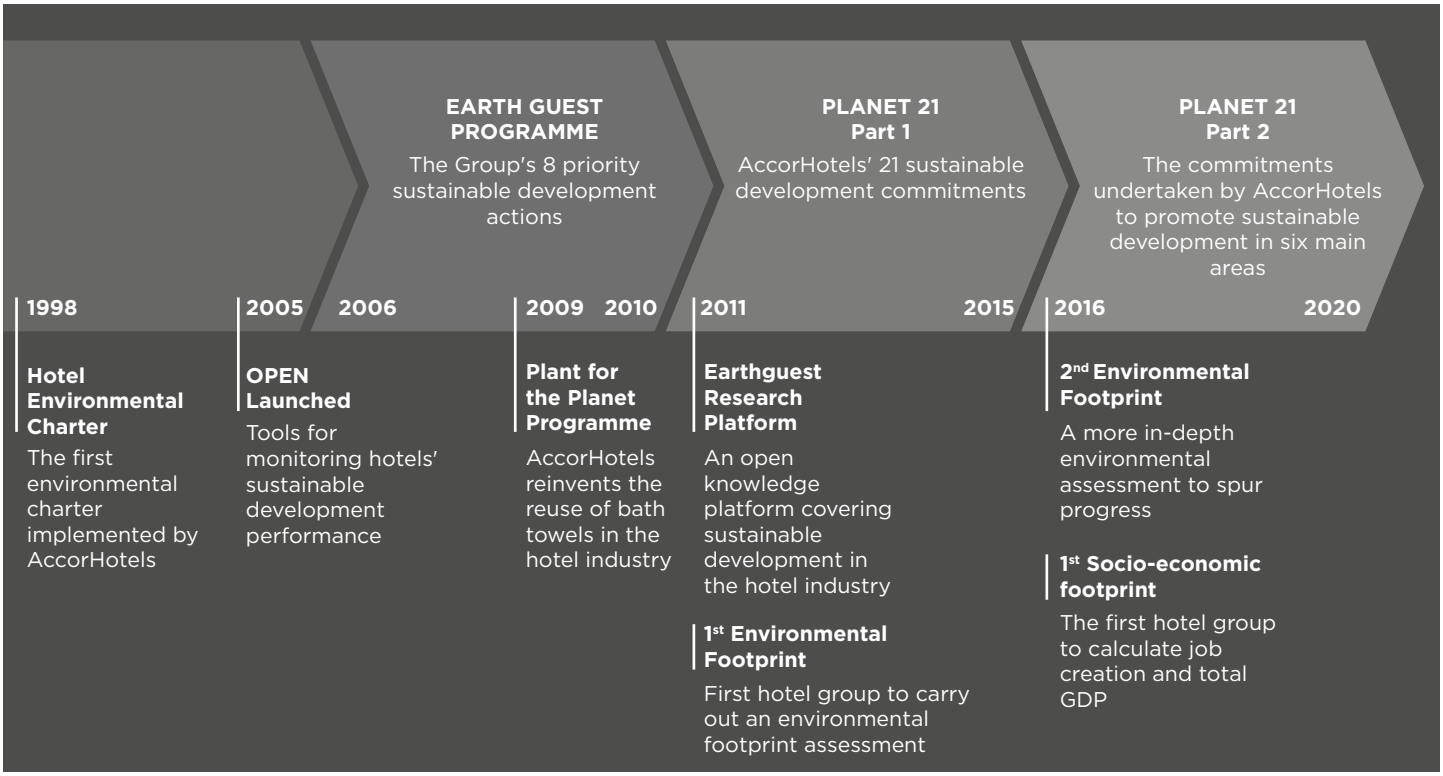
A PIONEER IN ENVIRONMENTAL FOOTPRINT STUDIES

To continue progressing towards more sustainable development, more understanding is necessary. To reach this understanding, we need more measurement data. At the end of 2010, AccorHotels launched a project to measure its environmental footprint in order to create a precise and complete map of the environmental impacts of its activities. This report has allowed us to evaluate the impact of our CO_2 emissions, water and energy consumption, and waste production.

The study covered a wide perimeter, not limiting itself to the direct impact of a single hotel, but also taking into account indirect impacts such as the impact of raising the cows that wind up on restaurant menus and the impact of the shipping of goods that are necessary for a hotel to operate.

This project was a world first for the hotel industry and it positioned AccorHotels as a pioneer in management-oriented environmental impact assessment. AccorHotels chose to quantify 5 priority impacts across 11 activity areas: water consumption and waste, on-site energy consumption, hotel air climate control, waste management, external laundry services, restaurants, construction and renovation, room furniture, cleaning products, office supplies, and employee transportation.

A LONG-TERM COMMITMENT



THREE KEY LESSONS FROM THE 2011 STUDY

1

CARBON AND ENERGY ARE THE PRIMARY AREAS FOR GROUP PROGRESS

AccorHotels consumes 18 million MWh of energy per year, the equivalent of a European city with 386,000 inhabitants. 75% of this consumption comes directly from the hotels themselves.

2

FOOD PURCHASES ARE THE MAIN SOURCE OF WATER CONSUMPTION AND POLLUTION

Every year, the Group consumes as much water as 438,000 Europeans. Of the 544 million m^3 of water consumed by the Group, 86% is used for agriculture and 10% is directly consumed in hotels.

3

CONSTRUCTION AND RENOVATION ARE A CENTRAL PART OF WASTE PRODUCTION

The Group's activities result in more than a million tonnes of waste every year, as much waste as is generated by 219,000 Europeans. 70% of this waste comes from building construction and renovation.

1st Environmental Footprint Study (2011)

PLANET 21, ACCORHOTELS' RESPONSE TO PROMOTE SUSTAINABLE DEVELOPMENT PROGRESS

While the environmental footprint study allowed AccorHotels to understand the impact of its activities, it was only the beginning of a long reflection process that will lead to action and progress in terms of sustainable development. Launched in April 2012, the Planet 21programme was created on the basis of a robust study and it defined the Group's action plan through 2015 across 21 commitments and goals grouped around 7 fundamental pillars: Health, Nature, Carbon Emissions, Innovation, Local Development, Employment, and Dialogue.

This programme drew on the lessons produced by the 2011 study, but also includes a participatory dimension. Since it is eager to better engage with its stakeholders, the Group carried out a study of guests to better understand their expectations and concerns related to sustainable development.

ENERGY CONSUMPTION AND CO_2 EMISSIONS... FROM LESSONS TO ACTION

Managing hotels' energy consumption requires reliable and precise performance monitoring. This monitoring took on a new dimension in 2005 with the implementation of OPEN, an online tool that allows hotel energy consumption to be tracked with great precision. The Group has been able to monitor consumption on a monthly - or even daily - basis, along with an in-depth year on year analysis based on criteria such as variations in building occupation rates, changes in the weather, or even specific criteria related to each brand or establishment. In 2015, a third of hotels used Building Management System software to monitor their energy consumption.

A total of 531 establishments (i.e. 15% of Group hotels) used renewable energy in 2015, thanks to the installation of solar thermal panels that produce hot water, or photovoltaic panels that generate electricity. Also, almost three quarters of hotels are equipped with energy efficient boilers.

With the same goal of promoting energy efficiency, AccorHotels recovers heat energy from the ventilation systems in 35% of its hotels, and insulates hot and cold water pipes to limit heat loss as much as possible in 95% of its hotels. Over 98% of Group hotels, nearly all of them, are also equipped with energy efficient lighting.

BETWEEN 2006 AND 2010,
WITH THE EARTHGUEST PROGRAMME

-5.5% energy consumption

BETWEEN 2011 AND 2015,
WITH THE PLANET 21 PROGRAMME

-6.2% CO_2 emissions

-5.3% energy consumption

AN INNOVATIVE HOTEL COMPLEX THAT'S BETTING ON SOLAR ENERGY IN SYDNEY

The Pullman hotel in Olympic Park, Sydney, is leading the way in innovation with vacuum tube solar collectors, a technology that has been recognised for its particularly high yield when heating water. The combined Novotel-ibis Sydney Olympic Park has almost 140 solar panels to heat water and 300 photovoltaic panels to generate electricity.

WATER CONSUMPTION... FROM LESSONS TO ACTION

Like energy consumption, managing water consumption has been made easier with regular monitoring using the OPEN tool.

In order to conserve as much of this resource as possible, in 2015, 97% of hotels were equipped with water regulators on showers and taps. Two-thirds of Group hotels have dual flush toilets and water saving laundries. 8% of hotels are also equipped with systems to recover rain water and 8% also recycle grey water (soapy water from sinks, showers, and baths).

PLANT FOR THE PLANET: A PROGRAMME TO IMPACT UPSTREAM AGRICULTURE

The "Plant for the Planet" programme aims to incentivise guests who are staying more than one night in a hotel to reuse their towels. In return, AccorHotels makes a commitment to planting trees. This programme has several advantages: it prevents the needless consumption of water, energy, and detergent at laundries, and it also improves the environmental performance of agricultural production covered by the programme thanks to agroforestry.

AccorHotels has chosen to invest in agroforestry, a local and eco-friendly mode of agricultural production. Trees that are planted in the middle or along the edges of agricultural fields retain water and create environments that support greater biodiversity. Agroforestry has a varied array of benefits for the environment: trees enrich soils, clean water, regulate micro-climates, sequester carbon, limit erosion, and help to preserve biodiversity.

In 2015, the programme had more than 2,000 participating hotels, making it possible to plant 570,000 trees with only €3.7 million, with more than 4.5 million trees planted since it began in 2008. Through this programme, the Group supported 150 reforestation projects in 25 countries.

BETWEEN 2006 AND 2010, WITH THE EARTHGUEST PROGRAMME	**-12%**	**water consumption**
BETWEEN 2011 AND 2015, WITH THE PLANET 21 PROGRAMME	**-8.4%**	**water consumption**

WASTE MANAGEMENT... FROM LESSONS TO ACTION

The Group's waste management efforts are currently focused on using the proper waste disposal streams for hazardous waste and on optimising waste sorting, thereby increasing the proportion of waste that is recycled. In 2015, hotels' recycling participation rate was 98% for ink cartridges and batteries, 97% for neon bulbs, 92% for cardboard and paper, 89% for glass, and 75% for plastic packaging.

AccorHotels also promotes the proper management of waste from construction and renovation projects by applying eco-design principles. This means integrating environmental protection from the very beginning of a project, starting with the design phase, in order to reduce the environmental impact throughout a product's entire life-cycle. Future Novotel hotel rooms were eco-designed in this way. While bearing in mind that guests' comfort is essential for an enjoyable stay, the Group is using materials and technologies that are more environmentally friendly: GUT certified eco-friendly carpets, energy efficient bulbs (LEDs), upholstery, quilt batting, and pillows made from recycled bottles, energy efficient TVs (A++ label), eco-designed beds, and eco-labelled paints.

2

2015, a new and refined study

2015, a new and refined study

From the time that the Hotel Environmental Charter was signed in 1998 until the end of the first PLANET 21 cycle in 2015, every year AccorHotels strengthened its commitment to sustainable development, deepened its knowledge of the issues involved, and optimised its areas for action and keys to success. AccorHotels understands its environmental impact and has the advantage of hindsight and clear vision, allowing it to go further.

THE ACCORHOTELS STUDY ACROSS 7 ACTIVITY AREAS

AccorHotels' goal is to evaluate all of the activities that are a significant part of the Groups overall environmental impact. In order to maintain coherence with the last Group evaluation, the decision was made to cover the same perimeter as the previous study. This perimeter was divided into 7 activity areas that represent the Group's operations and offered services:

INFRASTRUCTURE

HOTEL ENERGY CONSUMPTION

HOTEL WATER CONSUMPTION

HOTEL MANAGEMENT

LAUNDRY

FOOD AND BEVERAGE

WASTE PROCESSING

This new study has the advantage of using the latest methodological advances in life-cycle assessment, as well as Quantis' considerable expertise. Furthermore, it will allow the Group's results to be correlated with its actual current performance.

With this new project, AccorHotels has decided to go further than before by bringing together data that had previously been missing:

CHANGES TO THE AREAS AND IMPACTS INCLUDED IN THE LIFE-CYCLE ASSESSMENT BETWEEN 2011 AND 2015

AREAS	IMPACTS				
	Energy	Water	CO_2	Eutrophication	Biodiversity
Temperature control and cooling system	✓	✓	✓	✓	✓
Construction and renovation	✓	✓	✓	✓	✓
Room items: Towels and paper products, bath products, televisions	✓	✓	✓	✓	✓
Hotel energy consumption	✓	✓	✓	✓	✓
Consommation d'eau des hôtels	✓	✓	✓	✓	✓
Hotel management: cleaning products, pesticides	✓	✓	✓	✓	✓
Office management: Printers, paper products, IT hardware, and telephones	✓	✓	✓	✓	✓
Employee travel	✓	✓	✓	✓	✓
Laundry	✓	✓	✓	✓	✓
Food and Beverage	✓	✓	✓	✓	✓
Waste processing	✓	✓	✓	✓	✓
Customer travel	✗	✗	✗	✗	✗

✓ Impacts assessed in 2015 but not in 2011

✓ Impacts assessed in both 2015 and 2011

✗ Non-assessed areas in 2015 and 2011

Water and energy consumption data are from 2014 and come from the information hotels report each year. The rest of the data are from 2013 and come from Group purchasing information related to hotel renovations, food, laundry, employee travel, and hotel supplies.

WHAT IS LIFE-CYCLE ASSESSMENT?

Life-Cycle Assessment (LCA) is a tool for scientifically and objectively assessing the environmental impacts of a structure, product, service, or industrial process.

LCA is a methodology laid out in International Organization for Standardization (ISO) standards 14040 to 14044. It meets these criteria by examining the environmental and human health impacts linked with products and services throughout their life-cycle, from the extraction of raw materials to how the product is disposed of at the end of its life, and all of the stages in between:

• **FIRST PHASE OF LCA: COLLECTING DATA.**
This phase entails exhaustive research to collect precise data about the activity in question. For the "food and Beverage " area of activity, it was necessary to collect data about all of the purchases made by AccorHotels' restaurant kitchens.

For this AccorHotels study, water and energy consumption data for hotels is from 2014 while the rest of the data is from 2013.

• **SECOND PHASE OF LCA: MODELLING BASED ON THE DATABASE.** The collected data is cross-referenced with databases (ecoinvent V2.2, AGRIBALYSE V1.2) that help to model supply streams. This stage gives a precise understanding of the information behind each element collected. For example, the ecoinvent database provided the amounts of water, energy, fertiliser, and other resources needed to produce 1 kg of wheat.

• **THIRD PHASE OF LCA: CALCULATING IMPACTS.**
A specialised software tool calculates impacts based on the information obtained from the database by a certain chosen method. The Quantis SUITE 2.0 tool, for example, shows that to produce 1kg of sugar results in the emission of 500Gt CO2e in the entire supply chain.

A MORE TRANSPARENT WATER INDICATOR

Previously, the Group's water consumption indicator only measured the amount of fresh water used. The new 2015 methodology, however, **takes into account the difference between the total quantity of freshwater removed from rivers and aquifers and the quantity that is returned to the environment**. The results now show the real amount of water consumed by the entire hotel Group. This indicator is measured in m^3.

Eutrophication is a pollution process where a body of water has excessively high levels of nutrients that can be consumed by algae, leading to their proliferation. This leads to a drop in biodiversity and diminished water quality.

Algal growth is stimulated by different nutrients depending on whether the body of water is fresh or salt water. The 2015 study goes further and distinguishes between both types of pollution with marine eutrophication expressed in g N-eq since it is linked to nitrogen-based nutrients, and freshwater eutrophication expressed in g N-eq since it is linked to phosphorous-based nutrients.

WATER CONSUMPTION, A LOCAL ISSUE

The issues surrounding water are growing in number and complexity. Supply of and demand for this resource can vary significantly from one region to another. An indicator called water scarcity calculates the ratio between how much water is used for human activity and how much is available locally in a given region.

In 2011, AccorHotels issued a comprehensive report on its water consumption, but the study recommended examining the question of water on a more localised scale. That is what was done in 2014: AccorHotels began to use this particular indicator through the Aqueduct tool developed by the World Resource Institute (WRI). This "risk map" for water issues helps AccorHotels to position all of its hotels on a world map and assess the water access risk they might potentially face.

The Aqueduct tool unites several different sources of data. Water use data are estimated from different international data sources based on parameters such as irrigation requirements, population density, and industrial activity level. Water availability data are derived from models developed by NASA.

BIODIVERSITY FOOTPRINT, NEW IN 2015

Biodiversity measures the diversity of ecosystems, living things, and genes by examining the interactions that exist between the different organisms living in a habitat. The balance of natural biodiversity is greatly threatened by human activity.

The biodiversity footprint assesses how many species are potentially lost in a given area over the course of the year after the area is occupied. The pressure put on fauna and flora is strongly linked to the human occupation of natural spaces and the emission of toxic substances.

In this new study, AccorHotels wanted to use this more recent indicator to understand the real impact of the Group's activity on biodiversity. It is expressed in PDF.ha.yr (PDF: Potentially Disappeared Fraction of species).

A COMPLEX AND SUBTLE INDICATOR

This indicator is not based, as one might think, simply on how much land is deforested or on a certain quantity of toxic emissions. It represents the changes in the balance of an ecosystem compared to its natural state. Deserts, for example, have their own balanced ecosystem, even if the richness of their biodiversity may be hard to see. Introducing crops to a desert would change its ecosystem and would have an impact on the biodiversity footprint.

There are several degrees of impact on the biodiversity footprint, with one of the highest degrees coming from the agri-food industry's intensive cultivation of agricultural fields. The goal for this kind of agriculture is to devote the area occupied entirely to the cultivated species: all other species are therefore eliminated.

Raising cattle is also one of the practices that have the most significant impact on biodiversity. Raising livestock is actually a kind of double occupation of the land: on one hand there is the space that is dedicated to the livestock itself, but on the other there is also the space used to grow food for the cattle.

THE IMPACT OF DIFFERENT USES ON LAND COMPARED TO ITS NATURAL STATE

NATURAL STATE	USES ON LAND		
Virgin forest Natural desert or Siberian tundra	Urban park	City	Intensive agriculture or cattle raising
0 PDF.m^2.yr	0,84 PDF.m^2.yr	0,96 PDF.m^2.yr	> 1 PDF.m^2.yr

MORE PRECISE ENERGY CONSUMPTION AND CARBON FOOTPRINT MEASUREMENTS

Carbon footprints measure the potential impact of the Group's activities on climate change. It **takes all of the greenhouse gasses emitted by the Group** into account, weighted for how much they can contribute to climate change over the next 100 years. This indicator is expressed in kg CO_2eq. CO_2 emissions are closely linked to energy consumption, in particular when one focuses solely on non-renewable energy consumption. For the 2015 study, the emissions factors used to calculate the **carbon footprint** of each supply stream were updated.

For this new study, AccorHotels decided to only measure non-renewable (NR) energy consumption. NR energy is generated using nuclear or fossil fuels such as oil, natural gas, and coal. More than just the primary consumption of the fuel, this indicator also takes into account the potential impact of running out of these resources. This indicator is expressed in MJ.

ACCORHOTELS SHARES ITS STUDIES: STRIVING FOR TRANSPARENCY

As a company that is committed to sustainable development, AccorHotels wanted this report to openly communicate its environmental performance. The environmental quantification expert who conducted this s study used the latest methodological techniques for analysing life-cycles. AccorHotels believes that it has a duty to help spread knowledge and to promote progress among all players in the hotel industry. In 2011, AccorHotels launched PLANET 21 Research, a shared knowledge platform full of sustainable development information. This is platform is open to anyone interested in the topic.

The platform is used by AccorHotels to publish new studies, research, and best practices analyses that can inspire the hotel sector and contribute to better sustainable development integration. AccorHotels also makes all of its methodologies available so that other hotel industry players can replicate this kind of study.

3 Results

ACCORHOTELS' ENVIRONMENTAL FOOTPRINT AT A GLANCE

Definition of the three AccorHotels footprints

Carbon footprint and energy consumption represents the quantity of greenhouse gases generated by all the activities of the AccorHotels group and its consumption of fossil fuels.

Water consumption and eutrophication represents the difference between the quantity of water taken from the environment and the quantity returned as well as the different types of water pollution.

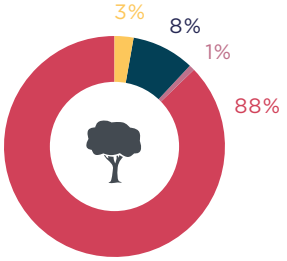
Biodiversity footprint represents the impact on ecosystems (biodiversity, species and their environment) caused by human activity on a given surface area (ha) over a given period (years).

BIODIVERSITY FOOTPRINT

Impact on ecosystems

351 Thousand **PDF.ha.year**

which is equal to the surface area of 530,000 football pitches covered in concrete



The main activities assessed:

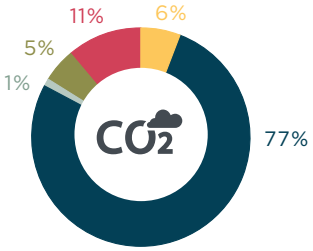
- Infrastructures (real estate and furnishings)
- Energy consumption of the hotels
- Water used directly in the hotels
- Hotel management (administration and upkeep)
- Laundry
- Food and drink
- Treatment of waste

CARBON FOOTPRINT AND ENERGY CONSUMPTION

Carbon footprint

4,5 Million **tons CO_2-eq**

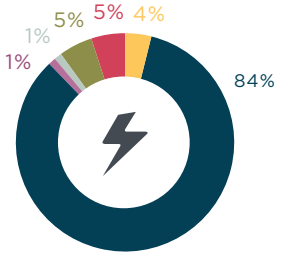
i.e. the total annual emission of a small coal-fired power plant



Consumption of non-renewable energy

70 Thousand **TJ**

i.e. the annual production of 2.5 French nuclear reactors

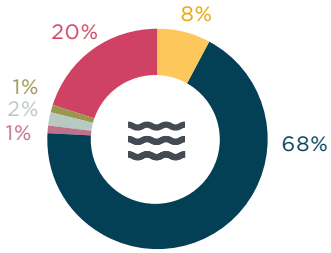


WATER CONSUMPTION AND EUTROPHICATION

Freshwater eutrophication

1 Thousand **tons P-eq**

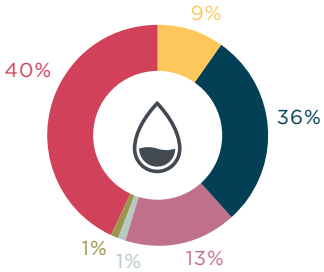
i.e. the volume of fertilizer * in 70 containers of 68 m³



Water consumed

30 Million **m³**

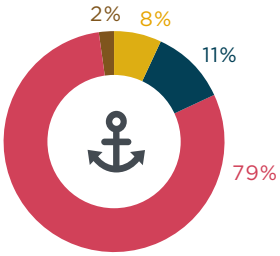
which is equal to the consumption of an European city of 410,000 inhabitants



Seawater eutrophication

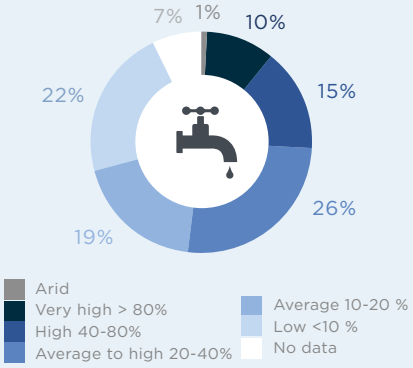
4,5 Thousand tons **N-eq**

which is equal to the quantity of manure produced in 1 year by 380 pig farms



Current water stress

Percentage of hotels located in the different hydric stress zones



The figures indicated represent the total impact for the year 2014 *Triple superphosphate fertilizer

CARBON FOOTPRINT AND NON-RENEWABLE ENERGY

The results showed **two priority issues: first, non-renewable (NR) energy consumption and CO_2 emissions come mainly from hotels directly, with respective shares of 84% and 77%**. The second area linked to carbon emissions is the food and Beverage served in hotels, with a share of more than 10%.

NR ENERGY CONSUMPTION AND CO_2 EMISSIONS: CORRELATED RESULTS

It is important to understand the link between energy consumption and the carbon footprint. Energy production often creates a significant amount of carbon emissions. Consuming energy therefore involves indirectly emitting CO_2. With the current state of energy production around the world, these two results are therefore correlated.

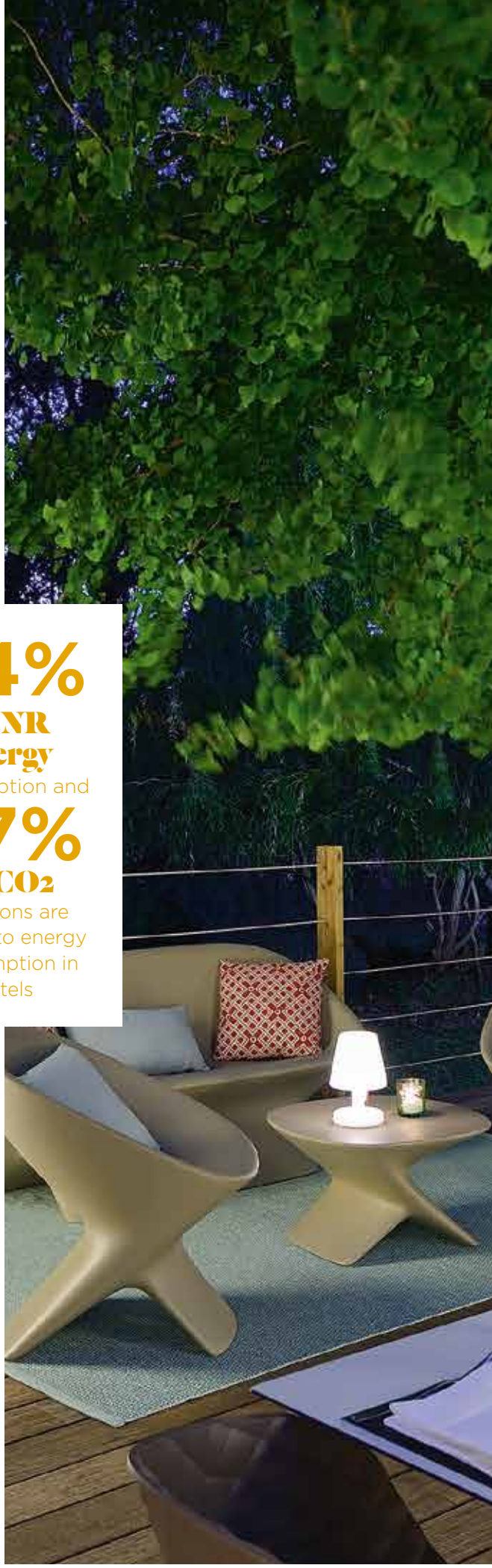
Each mode of energy production, however, has a very different impact. For example, a coal-fired plant emits much more carbon than a nuclear power station. The proportions of the different electricity generation methods used also vary from one country to another. Energy production in France, for example, relies on nuclear for 75% of generating capacity, so the country emits 10 times less CO_2 than Poland, which generates 96% of its electricity from coal.

This shows the importance of taking a country's energy mix into account when assessing the energy consumption of hotels in that country, so that carbon emissions can be calculated in a more localised manner.

84%
of NR energy
consumption and
77%
of CO2
emissions are related to energy consumption in hotels

OUR FOOD AND BEVERAGE ALSO EMITS CO_2

The study reveals **that food and beverage also have a considerable impact on the Group's carbon footprint**. These emissions arise mostly from the transport of goods and from the agricultural production of the meat (29% of food-related emissions) and dairy products consumed in hotels.



WATER CONSUMPTION AND EUTROPHICATION

AccorHotels' water consumption comes mainly from three activity areas, namely **food and beverage consumption, with 40%, energy consumption in hotels, with 36% and finally, direct water consumption in hotels, with 13%** of the Group's total consumption.

The link between food consumption and water consumption can be explained through the irrigation needed for growing crops and raising livestock. As for energy consumption in hotels, producing this energy can consume a large volume of water, especially if the electricity is generated hydroelectrically or at a nuclear power station. Most of this consumption arises from the evaporation of water stored behind dams and the water used in cooling circuits.

Food and Beverage consumption represents **40%** of AccorHotels' **water consumption**

EUTROPHICATION AND AQUATIC ECOSYSTEMS

Water eutrophication is a process brought on by an excess of nutrients in bodies of water, leading to the growth of certain kinds of algae and possibly to ecosystem destruction. In terms of AccorHotels eutrophication impact, freshwater eutrophication was the equivalent of the pollution from 70 68m^3 containers of fertiliser, while marine eutrophication was the equivalent of the amount of liquid manure produced in 1 year by 380 pig farms.

68% of freshwater pollution is caused by energy consumption, including fuel production for coal-fired and nuclear power stations, which indirectly produces phosphate-rich mining waste. 79% of marine eutrophication comes from the food and drink area of activity, where production often involves the use of nitrate-rich fertilisers.

A GLOBAL AND LOCAL ISSUE

Water scarcity is when demand for water outstrips the available resources. It is absolutely necessary that a hotel's location be taken into account when assessing water stress. A complementary study was carried out to identify the vulnerability to water shortages of hotels and their environment, and to better focus the Group's actions in a more meaningful way.

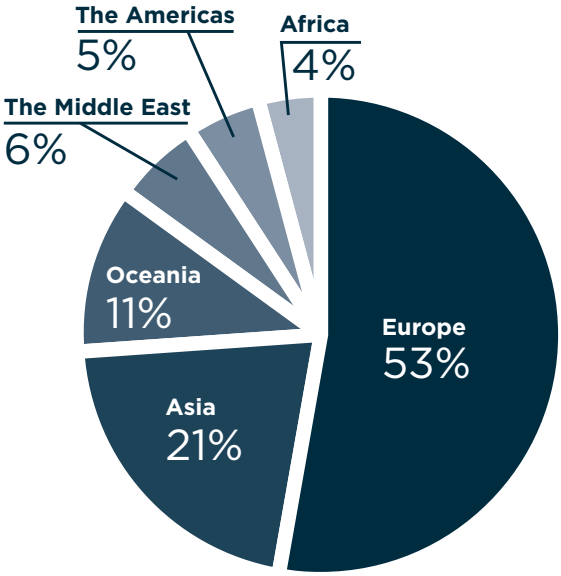
About a quarter of the Group's hotels are located in areas where the level of water scarcity is considered to be high to very high, and in arid areas. These hotels are mostly located in Europe and Asia. The Group's efforts should focus mainly on China, as average water consumption there is roughly 800 litres per overnight stay in the hotel. There are also significant water scarcity problems in the country, especially in the north:

the region is home to 45% of the population as well as significant agricultural activity, but it has only 15% of the country's available water resources.

There are also several hotels in water scarcity areas in Australia, the Middle East, North Africa, and in Europe, particularly in Spain and Italy. In these regions, however, average water consumption is less than 200 litres per overnight stay in the hotel.

In light of these results, the goals of reducing water consumption have been modified: they are more demanding in areas with high levels of water scarcity. Nevertheless, efforts must be made to reduce water consumption at all Group hotels

DISTRIBUTION AROUND THE WORLD OF HOTELS LOCATED IN HIGH OR VERY HIGH WATER SCARCITY AREAS



BIODIVERSITY FOOTPRINT

The biodiversity footprint measures the pressure put on flora and fauna by the Group's activity. AccorHotels' impact is 351,000 PDF.ha.yr. This figure is the equivalent of the impact of building 530,000 concrete football pitches, i.e. an average of 139 pitches per hotel. A significant finding from the study was that **the food and Beverage consumed by AccorHotels guests are responsible for 88% of the impact on biodiversity**.

The Food and Beverage consumed by AccorHotels guests are responsible for 88% of the impact on biodiversity

THE IMPACT ON ECOSYSTEMS IS MAINLY LINKED TO UPSTREAM AGRICULTURE

The impact on ecosystems is inextricably linked to land use and to toxic emissions. By its very nature, the agri-food sector has a strong impact on this indicator. Agriculture and raising livestock often involve fundamental changes to the land used in the process. Furthermore, the use of insecticides, herbicides, and fertilisers for agriculture, as well as animal waste from raising livestock, lead to the introduction of harmful substances into the environment.

In order to see AccorHotels' results in context, giving full importance to the impact that upstream agriculture has on this indicator, we must compare the impact that an average European has on their surrounding ecosystem in a day, and the impact that the Group has on any given overnight stay. The average European's impact is 38 PDF.m^2, while AccorHotels' is 22 PDF.m^2, almost two times less. This gap is not due to Group performance, but rather it reveals the considerable impact of upstream agriculture. Group guests do not always eat at the hotel, and when they don't the environmental impact of a night's stay is greatly reduced.

A first study on the Plant for the Planet programme shows the positive impact the initiative has on biodiversity and climate change.

The first results from this study, which will be enhanced by collecting more specific data on our projects, indicate that in a reference period of 100 years, the Plant for the Planet programme will absorb 400,000 tonnes of CO_2eq and save around 500 million PDFm^2.yr.

FROM 2011 TO 2015, A CHANGING STUDY

- The differences in environmental impact results between 2011 and 2015 are not only due to changes in the Group's activities. Actually, the internal mechanisms for calculating environmental footprints have changed between the 2011 study and the last one as the 2011 study covered a smaller area of activity. For example, unlike the prior study, the 2015 study took the impact that climate control and cooling systems have on water and energy consumption into account.
- The methodologies for calculating impacts have changed. The calculations for water consumption no longer simply consider the volume of water provided, but rather they differentiate between consumed water and water that is disposed of.
- The databases, which are essential LCA tools, allow each activity or product to be assigned a quantified impact. The database used for the 2015 study is larger and more homogeneous, which also lead to different results.

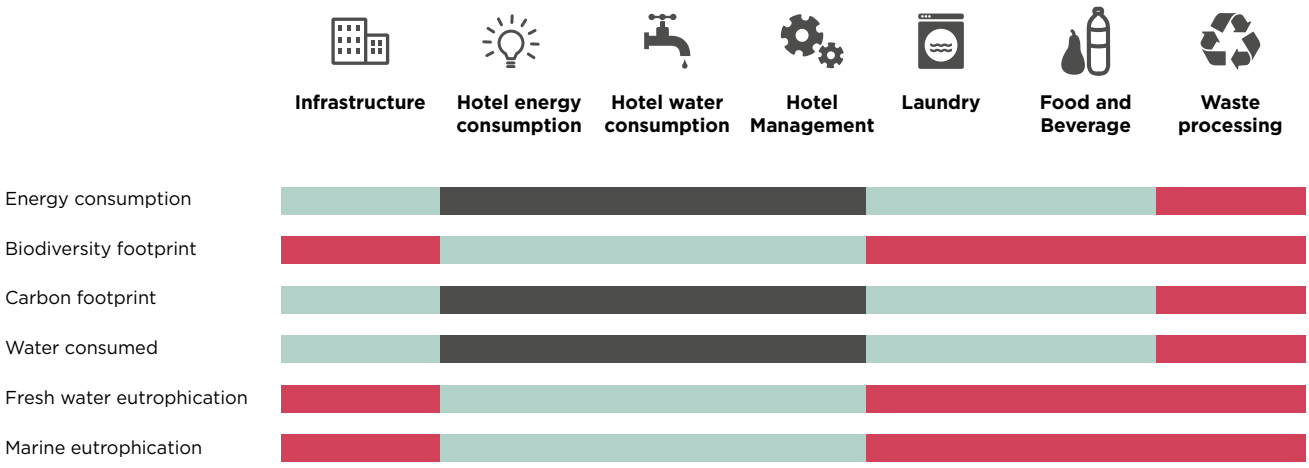
Finally, it is still difficult to compare the 2011 and 2015 results because the different methods used affect the Group's environmental performance. The 2015 study is more reliable and robust, which will be a solid base for comparisons in the future.

UNCERTAINTIES AND LIMITATIONS

As with any environmental assessment, the work carried out by AccorHotels and Quantis will always be subject to some uncertainties. On one hand, the size of the Group makes collecting primary data a complicated affair. It was sometimes necessary to estimate or to use secondary data from world-recognised databases to assess some of the Group's impacts. On the other hand, with the current state of life-cycle analysis methodology, supply stream modelling and impact calculations do not always lead to entirely reliable results.

The results obtained are not exhaustive; the goal is to identify the main areas of activity that contribute to the Group's environmental impacts and to determine how to improve the worst of them in order to reduce the Group's impacts.

TABLEAU DE FIABILITÉ DES DONNÉES ET MÉTHODOLOGIES



HIGH RELIABILITY: Highly reliable data collection AND methodology
AVERAGE RELIABILITY: Highly reliable data collection OR methodology
LOW RELIABILITY: Less reliable data collection AND methodology

THREE AREAS FOR ACTION IN 2015

AccorHotels is learning more about key subjects across these three areas for action, and is ready to go beyond simple intuition.

1

HOTEL ENERGY CONSUMPTION

84% of non-renewable energy is consumed directly in hotels and is responsible for 3/4 of CO_2 emissions.

2

HOTEL WATER CONSUMPTION AND POLLUTION

Water consumption should be optimised and taken into account in accordance with the water scarcity level in the local region.

3

RESTAURANTS

The food and Beverage consumed by guests are responsible for 88% of the impact on biodiversity and for 79% of marine eutrophication.

ACCORHOTELS HASN'T FORGOTTEN ABOUT ITS WASTE!

Because of the nature of its activities, AccorHotels pays special attention to waste management.

Unlike in the 2011 study, waste is no longer measured simply by volume or weight. To contextualise this choice, it is important to understand that, for example, the environmental impact of a tonne of uranium waste is not equal to the impact of a tonne of waste cardboard. The methodology used in this new study takes waste's impact into account by sorting according to its assessed environmental impact.

There are many sources of waste—building construction and renovation generate the majority of waste. Waste is also involved in the simple use of energy, especially in countries that generate most of their electricity from coal. The last main source of waste is waste that is directly generated at hotels. This kind of waste can be divided into 4 categories:

- Food waste
- Packaging waste
- Hazardous waste
- Other (green spaces, etc.)

The issue for the Group is reducing its volume of waste, especially food waste, while also increasing waste recovery (recycling, composting, or energy recovery).

4 Areas for action

Areas for action

1 HOTEL ENERGY CONSUMPTION

*0 if not present in the hotel

MAIN ENVIRONMENTAL CHALLENGES AND EFFECTS OF ENERGY CONSUMPTION

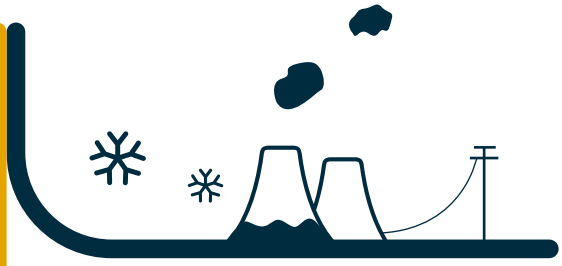
BIODIVERSITY

CARBON DIOXIDE

WATER

Dam construction

Hydroelectric dam construction and the subsequent flooding of the reservoir can cause entire ecosystems to disappear and thus affect endangered species populations.



Plant coolant systems

The annual volume of water needed to operate the coolant circuit of a nuclear plant ranges from 50 million to 1 billion cubic metres.

Coal and uranium mines

Coal and uranium mines can be a significant source of heavy metals that can enter waterways and impact aquatic species.

Fossil fuels (natural gas, coal, petrol)

The impact of energy consumption on climate change is strongly linked to fossil fuels use.

Worldwide energy mix

In the world, 41% of electricity is generated from coal, 22% from natural gas, 16% from hydropower, and 6% from new renewable energies (e.g. wind, solar, geothermal, biomass).

ENERGY AND CARBON: HOW TO GO FURTHER?

Two of AccorHotels' areas for action are reducing energy consumption and transitioning towards a low-carbon energy mix. AccorHotels continues to act to make this a reality, particularly by using the latest technology, which has led to substantial gains.

MONITORING EQUIPMENT CONSUMPTION AND PERFORMANCE

The foundation of proper consumption management is reliable, precise, and regular measurements. Sensors and sub-sensors should be installed in more hotels and automatic sensors should be used to make monitoring easier and also to provide real-time warnings of any possible malfunctions.

Such monitoring requires the promotion of best practices on a daily basis and proper facilities management. For example, limiting the temperature and flow rate of hot water and turning the heating system on and off according to the season.

Limiting energy use depends on installing less energy intensive appliances. AccorHotels has therefore identified the equipment that has high energy efficiency potential. Simply insulating hot water pipes and tanks is an easy way to potentially reduce consumption. Installing motion detectors to control the lighting in certain areas not yet equipped could lead to reduced energy consumption. In the rooms, installing more energy efficient minibars could also reduce energy consumption.

AccorHotels wants to avoid wasting any energy by installing automatic shut-offs for equipment that is not in use. Using automation in hotels makes the building a smart structure by linking a series of sensors (for example, empty room detectors) with actuators (motors to close curtains, "circuit breakers"). This automation will also control guests' equipment, for example, TVs in rooms and coffee machines in meeting rooms, as well as employees' equipment, such as the cooker hoods in the kitchens.

CARBON-FREE ENERGY SOURCES

Purchasing and generating carbon-free energy is a powerful way to reduce CO_2 emissions. Carbon-free energy is energy that does not directly emit carbon dioxide when it is produced. In 2015, about 300 Group hotels were producing and using renewable energy (solar thermal or photovoltaic panels, Anaerobic digestion, hydroelectricity, or geothermal energy). In 2015, solar hot water production for domestic use was estimated at 9.46GWh, i.e. the equivalent of the annual consumption of 2,400 French households.

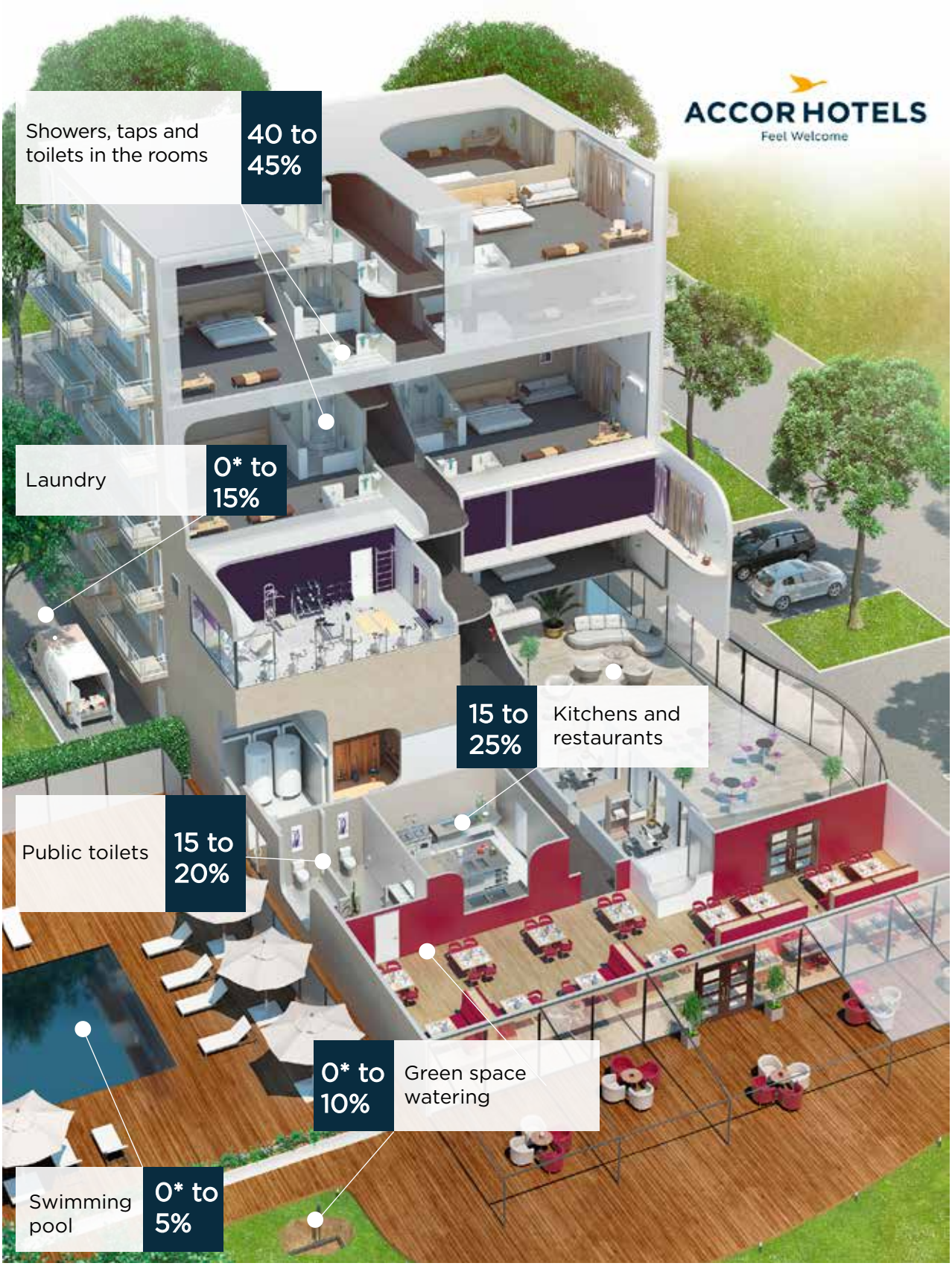
AccorHotels wants to extend the range of actions that reduce its carbon footprint. By establishing a partnership with the Energy Observer boat and CEA tech, a French laboratory on the cutting edge of renewable energy technology, AccorHotels is getting ready for the future. This partnership will provide access to better energy production and storage technologies. After a real-world conditions test in a hostile natural environment on the catamaran, these technologies will be rolled out in hotels. Such technologies include high-grade insulation, optimising air tightness, relying on a design that makes effective use of passive solar heating, and recovering the heat produced by guests and equipment.

GUESTS TOO HAVE A ROLE TO PLAY

With 170 million guests welcomed every year to its hotels, the Group has a responsibility to raise awareness and promote best practices among this captive audience. The goal is to create internal environmental benefits, but also and above all to teach behaviours that guests will take with them even after they leave the hotel.

Signs are posted in hotels to encourage guests to turn out the lights when they leave a room. The Group also provides **bikes and recharging stations for electric cars**, thereby promoting the use of means of transport that don't emit CO_2. With the **Carbon Optimizer**, AccorHotels offers its business clients the opportunity to know (and then to reduce) the direct and indirect carbon footprints of seminars or meetings held at their hotels.

2 HOTEL WATER CONSUMPTION AND POLLUTION



*0 if not present in the hotel

MAIN ENVIRONMENTAL CHALLENGES AND EFFECTS OF WATER CONSUMPTION

BIODIVERSITY | CARBON DIOXIDE | WATER

Water withdrawal

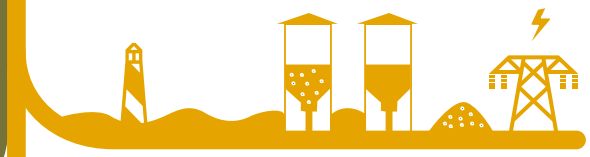
Due mainly to greater water withdrawal, riverbeds are drying up with increasing frequency, thus disturbing the balance of aquatic ecosystems and more specifically increasing fish mortality.

Waste water management and treatment

Poor management of sludge derived from waste water purification can lead to soil contamination. This sludge contains heavy metals such as copper, chromium, and lead.

Worldwide water stress

Water stress already affects all continents. Around 1.2 billion people, or nearly one-fifth of the world population, live in areas with physical water scarcity.



Desalination, a future challenge for arid regions

Techniques used to desalinate water consume large quantities of energy. They can emit up to 680 grams of CO_2 per cubic metre of desalinated water.

Waste water pumping and treatment

Pumping and treatment are processes that consume large quantities of energy and thus produce high levels of CO_2 emissions. In the United States, water treatment plants emit 45 metric tonnes of CO_2 equivalent into the atmosphere each year.

WATER: HOW TO GO FURTHER?

To meet this challenge, AccorHotels is doing its best to reduce its water consumption through monitoring, management, and the installation of ever more efficient appliances. Reusing grey water and rain water is also an important area for action. In order to prioritise these actions, it is necessary to pay particular attention to the hotels located in water scarcity areas.

MONITORING EQUIPMENT CONSUMPTION AND PERFORMANCE

Just as is the case for energy, **water consumption performance relies on effective and regular measurements taken on installed equipment**. Thanks to the OPEN tool, AccorHotels can measure and analyse its consumption on a monthly, or even daily basis. This monitoring can help detect leaks as quickly as possible.

To consume better, **better equipment** is necessary. Simple things like water flow regulators on sinks and showers, choosing high efficiency washing machines, or dual flush toilets can help to significantly reduce water consumption.

However, equipment's technical performance can't solve every problem. AccorHotels is also acting to raise awareness among employees and to pass on good habits by asking them to not leave water running (cleaning staff, kitchen staff) or to encourage moderation when watering green spaces.

REUSING GREY WATER AND RAIN WATER

On the scale of an entire hotel, it is possible to recover rain water and to reuse the waste water from showers, dishwashers, or washing machines (grey water). Reusing waste water involves recovering the waste water after several treatments to remove impurities, pollutants, and pathogens. For example, the Mercure Madrid Santo Domingo installed a grey water recycling system that has allowed it to reduce water consumption by almost 30%.

NEW SOLUTIONS EXIST

- The OrbSys shower of the future is equipped with a water treatment and reuse loop feature. The shower uses only 5 litres of water for a ten-minute shower
- The smart Vapo shower could also end water waste by using a hot steam mechanism while the user is soaping up

MANAGING WATER SCARCITY

The results of this study show that some Group hotels need to be prepared to run in a limited water environment. This will involve both preventative actions (limiting water consumption as much as possible) and proactive steps (ensuring that the hotel can still operate if the water is temporarily shut off).

In India, a region particularly affected by water scarcity, hotels have systems to recycle and treat grey water. This water is reintroduced into irrigation systems, cooling towers, or even into toilet tanks. Hotels in India are fully equipped with flow regulators on their taps and showers. As for the laundries, choosing specific cleaning products and controlling how much is used has led to reduced water consumption.

AccorHotels also knows how to handle crisis situations, such as in Brazil at the beginning of 2015, when several dozen hotels had to cope with periodic water shut-offs. A crisis management centre was activated to coordinate the necessary actions for handling water shortages: organising parallel resupply logistics for drinking water, creating a reservoir, collecting rain water, reusing sheets for guests staying more than one night, and cutting or reducing non-essential services like the pool.

GUESTS TOO HAVE A ROLE TO PLAY

AccorHotels involves its guests in its environmental efforts through its **Plant for the Planet** programme. By participating in the programme, a guest who is staying in the hotel for more than one night can choose to reuse their towels, thereby saving water that would have otherwise been used to wash them. For its part, AccorHotels is committed to **donating** half of the money saved in this way to finance reforestation projects in wooded and **cultivated** areas.

The Group does its best to promote the use of the **dual flush function** on its toilets. Something as simple as flushing the toilet is a perfect example of an everyday action that has considerable consequences. With its more than 480,000 rooms, water consumption in AccorHotels' bathrooms in 2014 was the equivalent of at least 500 Olympic swimming pools in volume.

3 HOTEL RESTAURANTS

FOOD AND BEVERAGE IMPACT PROFILE

ACCORHOTELS MENU

This menu presents the main environmental impacts of each food category offered by the Group's restaurants as well as the quantities bought of each category over a year.

GROCERY STAPLES: Salt, pepper, sugar, flour, oil, vinegar, aperitif products, rice, pasta, soup, and biscuits in the AccorHotels grocery staples category account for **15% of total water consumption** by the Food and Beverage department.
Quantity purchased: ..... 18,000 tonnes

MEATS AND CHARCUTERIE: Although meat served by the restaurants represents only 5% of the total weight purchased for Food and Beverage, this product alone accounts for **half of the Group's marine eutrophication and a third of its carbon footprint**. This can primarily be explained by the impact of liquid manure (a mixture of excretions and water used as a fertilizer) and the significant greenhouse gas emissions from livestock digestion.
Quantity purchased: ..... 12,000 tonnes

FISH: Fish accounts for only 1% of food purchased by the Group but causes **one-third of total freshwater eutrophication**. This is due in particular to aquaculture, characterized by high levels of feed usage, which leads to significant discharge of organic matter (faecal matter and unconsumed feed) and inorganic substances (mainly nitrates and phosphates).
Quantity purchased: ..... 4,000 tonnes

FRUITS AND VEGETABLES: Fruits and vegetables account for around **10% of total water and non-renewable energy consumption** by the Group's Food and Beverage department.
Quantity purchased: ..... 27,000 tonnes

DAIRY: Dairy products account for **half of the total impact on ecosystem quality and one-third of the total carbon footprint** of the AccorHotels Food and Beverage department. The scale of this impact can especially be attributed to the fact that milk production depends on livestock production, a process that has a considerable environmental impact, but also due to the large quantity purchased.
Quantity purchased: ..... 42 000 tonnes

BAKED GOODS AND DESSERTS: These foods account for **18% of total non-renewable energy consumption** by the AccorHotels Food and Beverage department.
Quantity purchased: ..... 24,000 tonnes

BEVERAGES AND COFFEE: This category accounts for **half of the total weight of the Group's food purchases**. These products account for half of water consumption and a quarter of total Food and Beverage energy consumption.
Quantity purchased: ..... 130,000 tonnes

MAIN ENVIRONMENTAL CHALLENGES AND EFFECTS OF AGRICULTURE

BIODIVERSITY

CARBON DIOXIDE

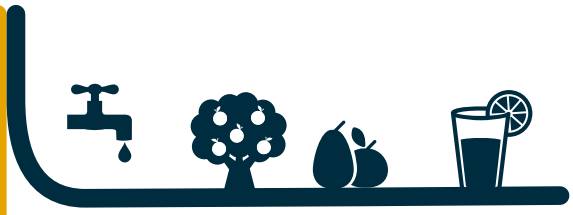
WATER

Fishing and agriculture

Regarding fishing, 30% of fish stocks are overexploited and at risk of collapse. As for agricultural impact, pesticides released into rivers and streams can reduce insect and other invertebrate freshwater populations, essential for balancing biodiversity, by up to 42%.

Animal feed

Each year, over one million hectares of forest are destroyed to raise animals (becoming pastures or food production sites for fattening the animals).



Irrigation

Irrigation accelerates desertification in certain regions. In an arid region, it may take over 100 litres of water to produce a single litre of fruit juice.

Livestock digestion

Of greenhouse gases emitted by the agricultural sector, 39% come from livestock digestion in animal husbandry facilities. This means over 80% of the carbon footprint of dairy products is linked to livestock production.

Pesticide, fertilizer, and manure use

Spreading fertilizers liberates greenhouse gases such as nitrous oxide (N_2O), whose global warming potential is 98 times higher than that of CO_2.

FOOD AND BEVERAGE: HOW TO GO FURTHER?

REDUCING FOOD WASTE

In hotel kitchens, there are many different actions that can be undertaken to avoid or limit waste:

- Promote **just-in-time production** practices to limit the amount of stored food products
- **Optimise and adjust food storage temperatures twice daily** to prevent unnecessary food spoilage
- Cook dishes using **prep sheets** that are distributed to kitchen staff to standardise amounts and cooking methods
- Work on **keeping buffet temperatures stable**
- **Repurpose** what you can, showing off your creativity! For example, an AccorHotels restaurant chef in Auckland uses orange peels to make marmalade for breakfast. Another chef in New Zealand makes feta cheese from any milk that is not consumed in the morning
- **Help guests to make more reasonable choices** at the buffet, and make doggy bags available for them **to take away their leftovers**.
- **Redistribute** food as much as possible. In Thailand, ten hotels in Bangkok launched Operation Food for Thought to give children living in the slums around Bangkok the leftovers from their buffets twice a week.

Some food waste is inevitable, but the development of recycling streams within hotels allows this food waste to be recovered through composting or anaerobic digestion.

MORE ECO-RESPONSIBLE FOOD

Promoting sustainable food means acting in different areas to support more eco-friendly production methods by favouring produce that is fair trade, organic, local, in season, and by using crops that are the least "greedy" for water or whose production emits less CO_2. Hotels can all undertake different actions (each one at its own level) that take into account the local context and the produce and supply chains that are available.

The Group is also acting in favour of biodiversity by fighting against the extinction of endangered species. That is why bluefin tuna, swordfish, and shark are all banned from hotel restaurant menus.

IMPACT BY INGREDIENT

Food habits have a direct impact on the environment. Different kinds of food have different impacts on the environment depending on how they are produced and how long they take to grow or raise. Meat is one of the most environmentally unfriendly kinds of food.

Beef, which leads this category, requires 616 litres of blue water (surface or subterranean fresh water) to produce 1kg of meat. That's almost five times more water than is needed to produce 1kg of apples. Feeding cattle also involves the water consumption that was needed to produce fodder or grain. This double occupation of the land and the great length of time needed to raise livestock explain part of meat's outsized impact on biodiversity: 82 PDF.m^2.yr compared, to only one to produce 1kg of apples. Moreover, raising cattle involves releasing an unprecedented quantity of methane, which is 25 times more potent as a greenhouse gas than CO_2 (according to the IPCC).

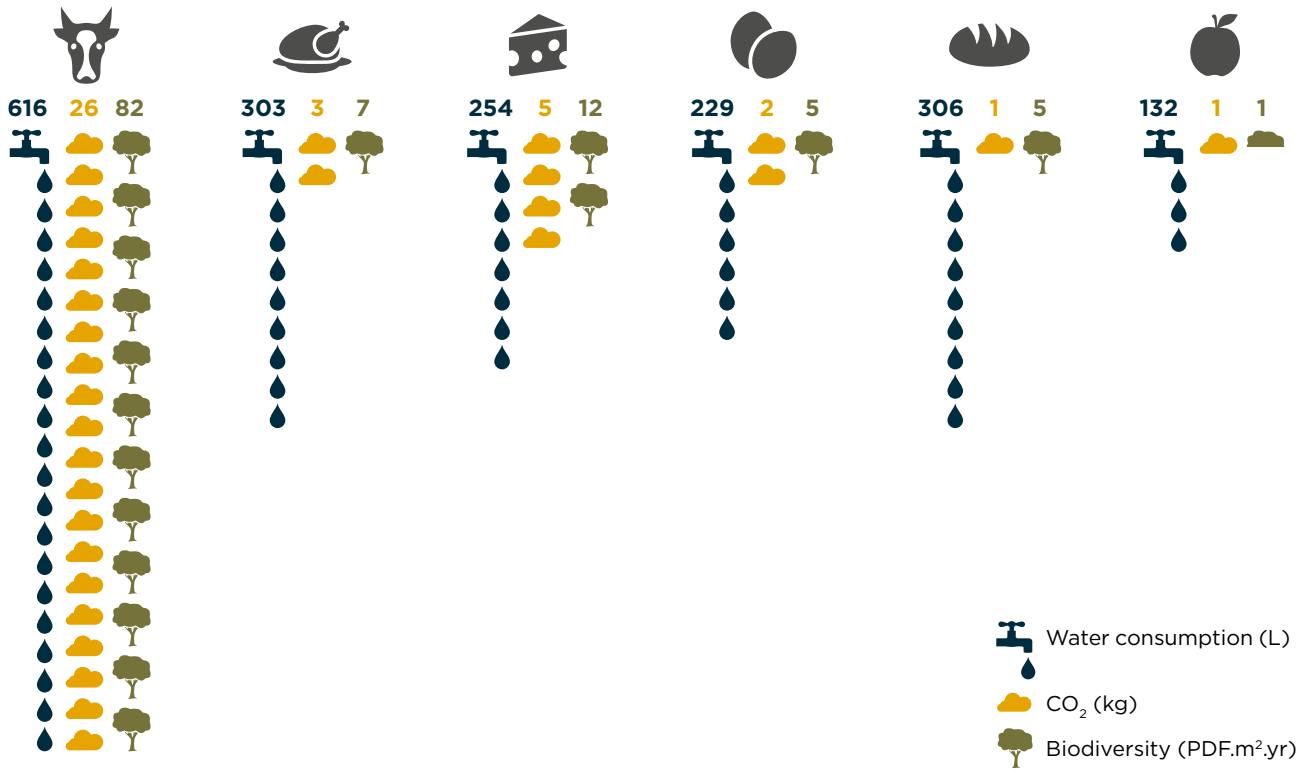
PATHS TOWARDS MORE RESPONSIBLE FOOD

Organic or sustainable agriculture
This kind of agriculture is a production method that limits its environmental impact and respects the natural cycles of plants and animals. It therefore precludes, among other things, the use of genetically modified organisms (GMOs) and the use of synthetic chemical products such as pesticides on plants or medicine on livestock.

Fair trade
This creates greater fairness within world trade and contributes to sustainable development by creating better sales conditions. A fair trade product is a guarantee to small producers that their rights are being respected and that they will be paid enough to cover socially and environmentally sustainable production practices.

Local food
Local in this sense means local geographically (produced in the same region where it is consumed), in the sense of having direct contact with the producer, and in terms of supply chains and processed raw materials. Based on the idea of short supply chains, local products that are sourced and processed locally reduce the number of middle-men between the producer and consumer. This kind of food also limits the use of transportation.

IMPACT OF PRODUCING 1KG OF DIFFERENT FOODS



CONCLUSION

To continue progressing towards more sustainable development, more understanding is necessary. To reach this understanding, we need more measurement data.

Hotel energy consumption, water consumption and pollution, and impacts derived from restaurant activities—these three themes are AccorHotels' main areas for action if it is to have a positive impact on its environmental footprint.

The study carried out in 2011 already established these subjects as priorities, and they were naturally part of the Planet 21 sustainable development programme for 2011–2015. Since then, the Group has had some resounding successes. But we can't stop there!

As we near the launch of the new plan for 2016–2020, it seemed necessary to undertake a new exhaustive environmental assessment. We needed to measure the Group's advances, to make progress in how precisely we assess our footprint, to provide food for thought, and to seek out new opportunities for action in the future.

CONFIRMATION...AND A FEW SURPRISES

The 2015 results have provided their fair share of lessons and discoveries. While assessment methodology has progressed and become more robust, with a wider scope, it is too different from the 2011 methodology to allow the results to be compared directly. We must accept this fact. Life-cycle assessment methods are becoming more and more reliable. The 2011 study was fairly experimental. The 2015 study has laid the groundwork for comparisons in the future.

In terms of substance, the main confirmation is that buildings have a profound impact on a project's carbon footprint and water consumption. AccorHotels has been focusing its actions on this subject for more than 10 years. The Group must continue to move ahead with its goals and never cease improving.

In 2011, the results of the study demonstrated the importance of upstream agriculture. The 2015 study confirms this observation, and even strengthens it. As for the avant-garde assessment of the Group's biodiversity footprint, the results cannot be argued with. Food is a major issue for AccorHotels, and its commitment to this subject will only deepen over the coming years.

Among the new features of the 2015 study, water scarcity analysis has led to many new lessons. First off, research has highlighted AccorHotels' exposure to current and future problems accessing water: a quarter of the hotel network is exposed to a high risk of water scarcity, a figure which should drive the Group to act! Another lesson from these results is that it is necessary to tailor actions to suit local contexts. Water stress is the best illustration of this. Carbon stress, which is related to a country's energy mix, is also a good example.

Finally, one last good surprise: the assessment of Plant for the Planet's successful outcomes. The figures can be refined in the future, but they show that this programme's actions may, over time, have a positive impact on the environment.

PATHS FORWARD TO GO EVEN FARTHER

Faced with these issues, new paths forward have been identified to make our current actions even more stringent and effective over the next five years. AccorHotels is currently pursuing these paths forward along with expert and committed players.

Among them are the French Alternative Energies and Atomic Energy Commission (CEA), with whom the Group launched the Energy Observer project. The goal is to test the incorporation of a complete and innovative hydrogen energy chain on an experimental catamaran.

Another initiative that has been undertaken alongside other companies, NGOs, and experts is the creation of the IPI (International Platform for Insetting). The companies committed to this initiative are working with their suppliers in order to reduce their environmental impact. As a driving force behind the launch of this initiative, the Group hopes to improve the environmental impacts of its agricultural production, to develop eco-responsible supply chains, and to acquire high quality raw materials for its restaurants.

Finally, through its support for the Circul'R project, AccorHotels is participating in emerging solutions that allow resources to be used in the context of a circular economy and to thereby reduce waste.

While they may cover different themes, these projects have a strong sense of innovation in common.

Innovation is an important goal that AccorHotels hopes to include in the next chapter of the Planet 21 programme.

NOTES

Planet 21 Research

WHAT IS PLANET 21 RESEARCH ?

A PLATFORM ACCESSIBLE TO ALL, PLANET 21 RESEARCH IS A SHARED KNOWLEDGE BASE ON SUSTAINABILITY IN THE HOTEL INDUSTRY. IT IS BOTH FREE OF CHARGE AND OPEN TO ANYONE.

AccorHotels regularly adds to the platform with the results of new polls, research or case studies on best practice to help the entire hotel industry incorporate sustainability more effectively.

Furthermore, AccorHotels makes its methodologies available, to enable its research to be replicated or refreshed by other members of the hotel industry. Only one condition is attached to use of the methodologies, namely the findings obtained must be distributed free of charge, as AccorHotels itself does.

YOUR
CONTACT

PLANET21@ACCOR.COM

PEFC 10-31-1075 / **Certifié PEFC** / Ce produit est issu de forêts gérées durablement et de sources contrôlées. / pefc-france.org

Photos credits: © Abaca Corporate/Boris Zuliani, © Bernard Vanden Eynde, © Abaca Corporate/Barbara Zonzin, © Abaca Corporate/Caleb Ming, © Abaca Corporate/Boris Zuliani, © Fotobubbles Tech Pvt Ltd, © Abaca Corporate/Barbara Zonzin, © Philip Clark, © Emmanuel Ferrand, © Hugo Potharst, © Michael Su, © Abaca Corporate/France Dubois, © Abaca Corporate/Stefan Kraus, © Eric Cuvillier.