Water Management Manual

Let's go!

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Content

About this Manual 4

1. Introduction: Why Water? 5

2. Thomas Cook's Water Footprint Project 7

3. Where does tourism consume water? 8

4. How can I monitor and benchmark water use in my hotel? 10

4.1 Monitoring 10

4.2 Benchmarking 14

5. How can I save costs by saving water resources? 16

5.1 Direct water resources 17

a) In guest rooms 17

b) In gardens 20

c) In the pool area 22

5.2 Indirect water resources 23

a) Food 23

b) Energy 26

6. The importance of staff training and customer communication 28

Templates 31

Interesting reads and online tools 31

About this Manual

Water scarcity already is an issue in many tourism destinations today and will become more so in the future. Furthermore, the customer demand for hotels that take sustainability seriously, is steadily increasing. The manual is therefore designed as an invitation to hotel owners, managers and staff to take seriously the challenges that declining water resources bring and to take action to preserve this precious resource, thus meeting customer expectations.

This Manual aims to provide a practical guide to water management in hotels. It serves to assess water consumption in your hotel as well as gives recommendations on reducing resource use and associated costs.

In the course of reading this manual you will learn:
- why water is a scarce resource (chapter 1)
- how water is consumed in tourism (chapter 3)
- how you can monitor and benchmark water consumption in your hotel (chapter 4)
- how you can save costs by reducing the existing resource use (chapter 5)

It's not just direct water consumption, i.e. for showers or pools which plays a role with regards to the challenge that tourism implies for global water resources, but also the large indirect consumption factors of food and energy used in hotels (find out why in chapter 3). Therefore this manual also gives recommendations on how to reduce indirect water consumption by minimising energy usage and lowering the offered amounts of food with high water footprints. Both of these measures can help you to save substantial amounts of costs, as you will see in chapter 5.

As this book was designed as a practical guidance to better water management we have included the following:
- A page navigation, that will quickly lead you to the chapter you are most interested in
- Boxes with markers in different colours, which give you a quick overview of the most important facts and cost saving possibilities
- Links to useful spreadsheets for direct application in your hotel as well as templates for good customer communication

"Good to know" Boxes: In these boxes you will find important details and the most useful tips for water management in your hotel.

"Water Footprint" Boxes: These boxes will provide information on our Water Footprint project.

"Business Case" Boxes: In these boxes you will find the best cost saving opportunities through optimised water management.

"Fit for Travelife" Boxes: These boxes will show you opportunities to tick off criteria on your Travelife certification checklist.

1. Introduction: Why Water?

Without water, tourism cannot exist. Few economic sectors are as dependent on water as tourism is, where water supports virtually everything from scenic landscapes to lake, stream and ocean environments; from water parks to pools and spas; from energy production to food. **No destination and no hotel is imaginable without the blue element, in a direct or indirect form.**

Yet, our water use patterns are unsustainable. **While over 70 % of the earth's surface is covered with water, only an estimated 2.5 % of the global water volume is fresh water.** Of this, less than 1 % is available for human use, including water held in lakes, rivers, groundwater, atmosphere and biomass. A large share of this water is already used for human activities, and an estimated 1.4 to 2.1 billion people (20–29 % of the global population) already live in water stressed areas, i. e. in northern Africa, the Mediterranean and southern Asia.

UN Water suggests that global water demand will increase by 55 % by 2050, as a result of consumer demand and increasing standards of living. **As a result, as much as 40 % of the global population may live in areas of severe water stress regions by 2050 as aquifers are over exploited and groundwater supplies decline.** Notably, much of the increase in people living in areas with severe water stress is anticipated to be concentrated in regions where some of the strongest growth in domestic and international tourism is projected.

Water security is also expected to be affected by climate change, which is likely to have notable impacts on regional rainfall patterns, worsening water security challenges caused by increased water demand. **Water stress is likely to be the most significant climate change challenge to face the tourism industry throughout the Mediterranean region by mid-century.** Without costly investments in desalination, water stress may for example pose a barrier to further tourism development on the North African coast. Moreover, desalination should be avoided wherever possible, as it is costly both financially and in terms of its environmental impact. The International Panel on Climate Change (IPCC) have developed a variety of scenarios depending on the predicted global average temperature change. **The most probable climate change scenarios show a significant decline in rainfall as well as rising temperatures in southern Europe and the Mediterranean over the next 50 years.** This will result in increasing demand for fresh water due to irrigation, additional evaporation from swimming pools and increased demands for showers and laundry.

Good to know

Water shortage in paradise – Cyprus, 2008
Cyprus and its tourism industry experienced critical water shortages in 2008 when a severe drought struck the island. Tourism businesses as well as local inhabitants were affected. Water was rationed from the beginning of the tourism season in April and needed to be imported from Greece at a high cost. After this initial shock, many hotels started implementing water saving mechanisms in a project with the Travel Foundation and the Cyprus tourism organisation and achieved a 9 % reduction of water consumption in the hotel industry – equalling a total cost saving of almost 240,000 €.

To ignore the water situation in tourism implies operational, regulatory, financial and reputational risks for tourism businesses and especially hotels.
If there is a physical shortage of water, water availability may impact operations, to the extent where operations become impossible. Regulatory risks arise out of legislated water use restrictions, for instance regarding the amount of water that can be taken for golf courses, or that may be abstracted from reservoirs or streams.

Financial risks refer to increasing costs, as decreasing available water volumes in tourism destinations will also impact on prices charged for withdrawing water. While today in many destinations costs are solely applied to water provided by the municipality, **water pumped using own wells is likely to be priced in the future through taxation.** Meanwhile, municipal tariffs are increasing steadily and there is a high probability that they will keep on doing so in the future.

Reputational risks can result from pollution of water bodies, or notions that water is wasted by tourism in water scarce areas. However this can be an opportunity as tourists expect their holiday companies to operate in sustainable ways, as important travel surveys in the UK and Germany have shown. **Therefore reputational benefits can be gained by responsible water consumption in tourism, leading to better sales.**

Good to know

Why desalination cannot be the solution
Where water is already scarce, desalination is often regarded as the best alternative, although the technology is potentially unsustainable due to growing energy demand, emissions generation and high costs. Using renewable energy sources for desalination may even be more costly, particularly when small-scale solutions are favoured. Even though such technologies may have a role to play, using water more efficiently through technology will always be a priority.

2. Thomas Cook's Water Footprint Project

As water scarcity is a problem for some tourism destinations already and will be even more so in the future, Thomas Cook established a project to reduce the pressure that tourism is putting on already scarce water resources and to identify areas of improvement for our hotels to save both water and cost.

As most water in tourism is consumed in the accommodation, the aim of the project is to understand and reduce water consumption in Thomas Cooks' most important hotels. To reach this goal, 12 Thomas Cook Hotels & Resorts (SENTIDO, smartline, Sunwing, Sunprime) in Rhodes were examined to develop water footprints showing how and where water is used across the business and to derive recommendations for optimised water management.

To supply accurate consumption data and enable monitoring, two hotels of the pilot group were equipped with meters at the most important usage points. Furthermore, all 12 hotels have been examined regarding water consumption by the well-known expert on tourism and water Dr. Stefan Gössling. The data was collected by inspecting the technical infrastructure, measuring flow rates and discussing the results with hotel managers as well as technical and housekeeping staff. In addition customer surveys and choice experiments were conducted to find successful ways of raising customer awareness for water saving on holiday.

The data obtained was used to develop a benchmarking/monitoring system as well as to identify possible improvement areas to reduce water consumption, thus cutting costs. These recommendations served as a basis for a general water management framework which has been developed to form this Water Management Manual.

In the second project phase, starting from 2015, the 12 hotels in Rhodes will be offered an implementation programme based on this Water Management Manual. In addition the water footprint will be used for customer communication purposes to deliver a sustainable marketing strategy for participating hotels.

We expect that as a result of the project Thomas Cook Hotels & Resorts will be able to significantly reduce water consumption, thus decreasing the pressure on the scarce resource water and avoiding consumption conflicts with local communities.

Good to know

Ecotrophea
We are very proud that the Thomas Cook "Water Footprint" project was awarded the Ecotrophea in the International DRV Awards for Environmental Protection and Social Responsibility in Tourism. Highlighting innovations in sustainable tourism since 1987, the DRV (German Travel Association) awards one initiative or project each year. This initiative won because water scarcity is an issue in many holiday destinations, so the strengthening of responsible conduct with regards to this precious resource, is one of the most important future tasks for the tourism industry.

3. Where does tourism consume water?

The large volumes of water that are consumed in tourism can easily be imagined when looking at the sweeping swimming pools, massive amounts of freshly washed towels and linen as well as the extensive, well-kept garden areas of many hotels. However, even more substantial quantities of water are used by so-called indirect consumption, especially caused by the food that is offered on the hotels buffets and the energy that is used to keep the whole operation going. This chapter therefore explores the different kinds of water consumption in tourism and shows you some surprising starting points for successful water management.

Considerable differences exist in water use in countries, with for example the average per person water withdrawal of 22 litres per day in Chad and 4,315 litres per day in the USA. However, these figures only show the direct water consumption, that results from water used for drinking or hygienic purposes, while it does not take into consideration the massive amounts of water that are embodied in goods, and in particular agricultural products, that are consumed in the respective country. **Comprehensive water consumption is thus captured in the water footprint concept or in the direct and indirect use of water.**

Direct water consumption in hotels

In tourism, most water is consumed in accommodation: it is here that tourists consume water directly during their stay, sign up to different activities, and where they eat a share or all of their food. Figure 1 shows global values for two 'direct' and six 'indirect' water use categories. Direct water use ranges between 84–2,425 litres per tourist per day in accommodation. This direct use is mainly comprised of water use in guest rooms, public areas of the hotel, gardens, pools as well as for laundry and kitchen purposes. Activities are adding 10–875 litres per guest night (see figure 1). The higher value for activities refers to golf, which appears to be the most water-intense activity in tourism. **On global average, direct water consumption values are in the order of 350 litres/day for accommodation, and 20 litres/day for activities.**

Indirect water consumption in hotels

It is much more difficult to specify indirect water volumes used in a hotel, i. e. with regard to food, fossil fuels, energy use at the hotel or the construction of tourism-related infrastructure.

With regards to energy, power generation involving fossil fuels is most water-intensive with 15 % of global freshwater use being related to fossil energy production. Fossil fuels are mostly needed for transport to and in the destination.

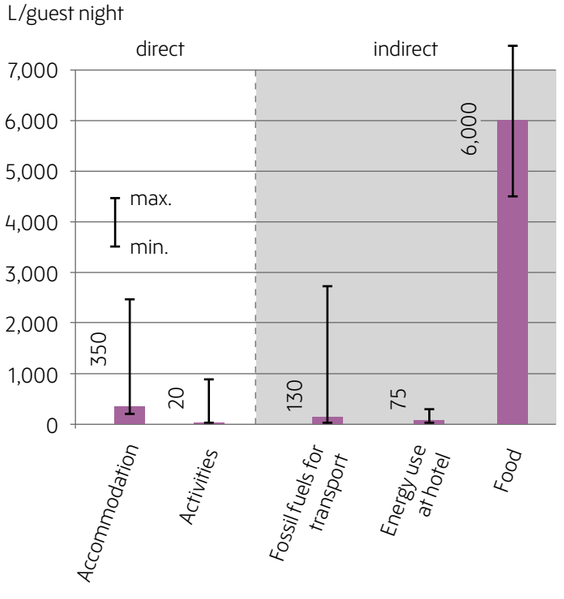
Energy consumption at the hotel is a further important factor in indirect water consumption by tourism. Depending on the source of the energy consumed, i. e. electricity generated from fossil fuels or renewables, water use for energy in accommodation will vary. Values in the literature suggest direct energy use of up to 430 kWh per guest night. At 10 litres water per litre of fuel, this translates into an energy-related water use average of 75 litres of water per guest night in accommodation (Figure 1).

Food consumption in tourism, i. e. on the dinner buffet, requires the largest amounts of water. The production of one kg of foodstuffs may require anything between 214 litres (for a kg of tomatoes) to 15,500 litres (for a kg of beef) of water. The water-intensity of foods is primarily related to the amount of water taken up in the production process. For example, the large amount of water necessary to produce a beef steak results from the fact that cattle are plant-eating animals and "accumulate" large amounts of water during their lifespan.Vegetable and fruit plants also take up certain volumes of water during their growth, but not as much as is needed to produce meat.

To calculate water consumption embedded in food use in tourism, it is necessary to calculate the amounts of different foodstuffs consumed per tourist per day, and their specific water content. It was found that meat consumption, at 2,650 litres of water per tourist per day, is the most water-intense aspect of food use. In contrast, carbohydrates (e. g. bread, rice) as well as fruit and vegetables are less water intense.

On global average, it can be assumed that direct and indirect water use amount to an estimated average of 6,575 litres of water per tourist per day. Results also show that food is by far the most important water use factor, accounting for an estimated 85 % of total water consumption. **Food, as well as energy management are thus significant aspects of an integrated, holistic water management strategy.**

Figure 1: Direct and indirect water use, accommodation



Good to know

Water Footprint = Total volume of freshwater used directly or indirectly to run the business

Direct Water Footprint = Total volume of freshwater used immediately by consumer/hotel, i. e. for pools, irrigation, guest showers

Indirect Water Footprint = Total volume of freshwater used indirectly/virtually for the production of goods and services consumed by consumer, i. e. food on the buffet, energy used throughout the hotel

Water Footprint for hotels = Volume of freshwater used per guest night (directly or indirectly)

Good to know

1 kg of tomatoes has embodied 214 litres of water during its production process

1 kg of beef has embodied 15,500 litres of water during its production process

4. How can I monitor and benchmark water use in my hotel?

You cannot improve what you did not measure and you can only know how good you are if you've seen the best practice! Therefore monitoring and benchmarking are the two keystones of a successful water management programme. This chapter shows you how to best use these important instruments.

4.1 Monitoring

Monitoring is a key element of any approach to reduce resource use. Monitoring water volumes used throughout the hotel allows you to;

- Ensure that continuous, year-on-year savings (water volumes and cost) can be made.
- Identify the sub-sectors where most water is used, and where savings may be comparably easy to achieve.
- Ensure that resource saving objectives (where existent) are met.
- Confirm that water-saving effects of for instance staff training are maintained over time.
- Identify leaks, which are often a cause of considerable water losses.

To effectively engage in water management, you need to measure on-site water consumption related to gardens, pools, kitchen, and the remainder of the hotel, including laundry (if not outsourced). To understand the relative distribution of water use among these sub-sectors helps to plan water management measures related to these areas.

Once you have measured your water consumption for a specific amount of time, sub-sector consumption analyses can be carried out to identify where most water is used and where savings may be achieved. Figures 2 to 4 show examples for such analyses. Here, the distribution of water use by sub-sector is explored in Greek 4- and 5-star hotels. Which sectors use most water is always dependent on the respective hotel facilities. While in Figure 2 it becomes visible that gardens, pools and guest rooms are the largest usage factors, Figure 3 shows a hotel with a comparably smaller garden in need of irrigation.

Figure 2: Water use by sub-sector, 5 star hotel, Greece

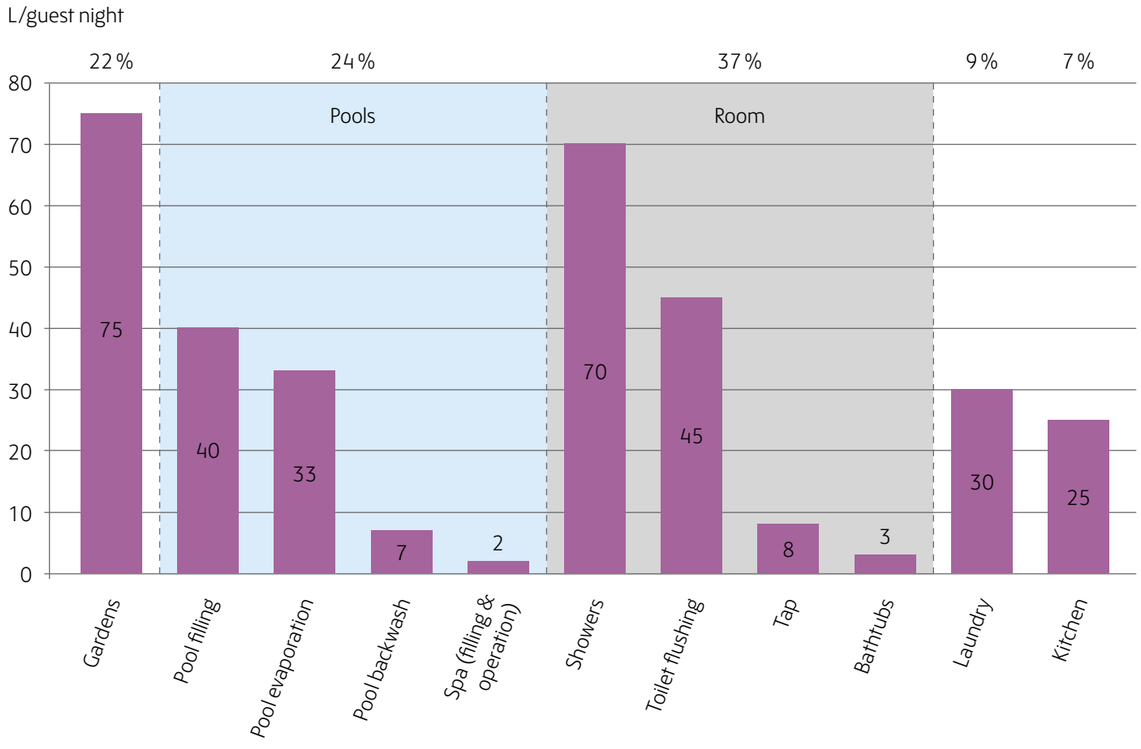


Figure 4 gives more detailed insight in the breakdown of guest room water use. **Toilet flushing here was the most important factor in in-room water use (53 %), followed by showers (23 %) and sinks/bathtubs.** The high usage volumes of the toilet were mainly due to the fact that no dual-flush system had been installed. An important insight was also that half of the faucet water consumption was hot water, probably as a result of the default mix in the faucet, although hot water is hardly needed in tropical and subtropical climates to wash hands. Both of these insights highlight that monitoring can detect unnecessary water volumes or temperatures which can require unnecessary, often costly energy to provide.

Figure 3: Water use by sub-sector, 4 star hotel, Greece

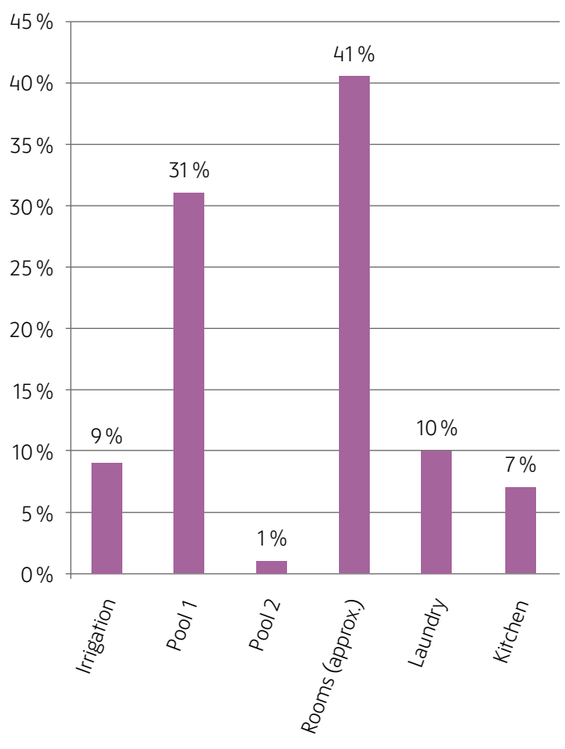
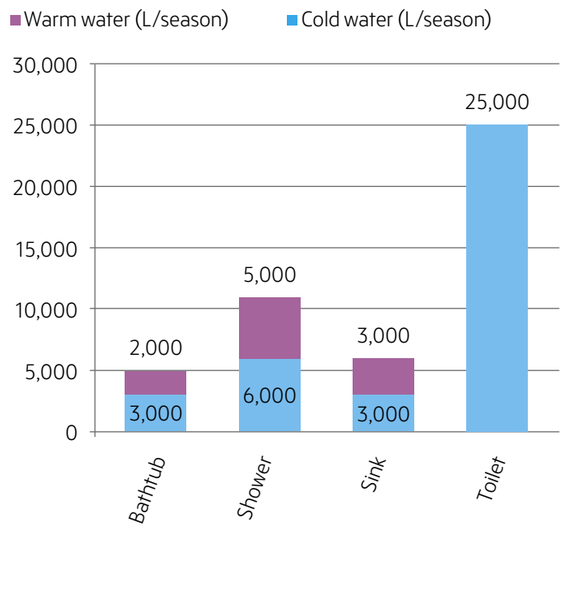


Figure 4: Water use in rooms, 5 star hotel, Greece (no dual-flush toilets installed)



Fit for Travelife

Monitoring your water consumption as described will take you one step closer to achieving a Travelife award. Travelife is an internationally recognised, independentsustainability certification scheme. It helps its 1,300 hotel members around the world improve their environmental, social and economic impacts cost-effectively. Hotels that meet the Travelife standard are formally recognised with a Travelife award to promote their achievements.

Gold Travelife Sustainability in tourism

Please see www.travelife.org for more information!

To enable monitoring, the following five steps are necessary:

1) If not already existent, install **water meter for main supply line(s)** to hotel.
Keep in mind that water often is coming from different sources, i. e. municipal supply, boreholes, grey water recycling or rainwater harvesting – these sources need to be distinguished from each other to obtain a complete and correct picture for monitoring. To achieve this, install water meters for each of the water supply lines leading to any part of your hotel.

2) **Install water meters in main consumption areas,** determining the best meter locations specifically for your hotel by using the pipework drawings.
Sometimes, two meters are needed per section, as hot and cold water separation allows for more detailed measuring. These main consumption areas of your hotel should be covered:

- Garden irrigation
- Pools
- Pool showers
- Room Section
- Kitchen
- Laundry
- If existing: Spa
- If existing: staff showers, sinks, toilets

3) **Read all meters manually** in regular intervals (i. e. once per day/per week) and record water volumes in a central place, using the spreadsheet provided following this link: www.thomascook.info/Dateien/Water_Meter_Data_Collection.xlsx
Alternatively a wireless measuring system can be used, which directly sends measurements to a central data unit. This has higher investment costs, but requires less staff time in the ongoing monitoring process.

4) **Take flow rate measurements in each room.**
This is because flow rates of taps, showerheads and bathtub faucets can vary immensely from one guest room to another. This will be very useful to avoid using unnecessary volumes of water and will save costs without any additional investment.

5) **Analyse the water volumes** consumed in your hotel. Follow the links to the spreadsheets in the Appendix as well as compare your results to industry benchmarks on page 15. This way you can detect sectors of unnecessary high consumption, look for the reasons behind this and avoid wasting water and costs.

So far the monitoring chapter has only covered direct water consumption in the hotel. Monitoring direct water usage is straightforward, while indirect water consumption can be more difficult. The largest indirect usage factor of water – the food served in the hotel – is also most complex as water embodied in foods is complicated to measure. Here, a number of general measures can help reducing this indirect water use (see chapter 5).

When it comes to the second-largest factor regarding indirect water use – energy consumption – monitoring can be established more easily, as all measures that conserve energy help to save indirect water, and are often even more cost-effective than water savings. Therefore it is sufficient if energy consumption is monitored, which also has high benefits for general energy management in the hotel.

Good to know

Detecting leaks
Sub-sector water meters can be very useful to detect leaks. On the one hand, metering over longer periods of time will allow you to calculate average usages per week/month in the different sectors – if these figures increase without a visible reason, a leak might exist and will need investigation.

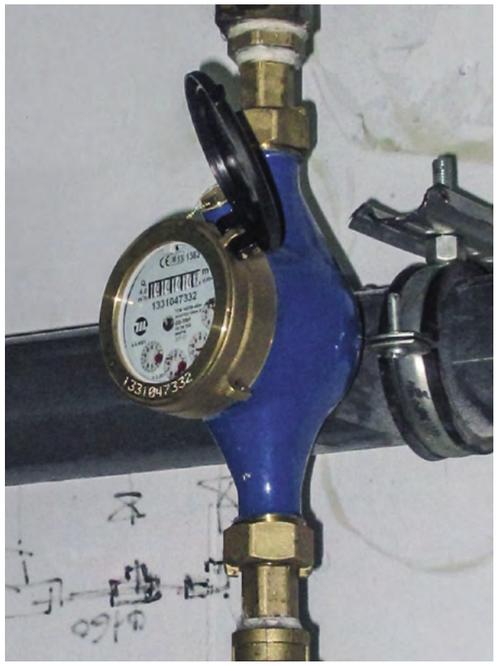
To detect leaks straightaway without having measured for a long time, a meter for a certain sub-sector should be read late at night and early in the morning (out of business hours) – if substantial water volumes have been recorded, a leak is a likely explanation. Other good ways to detect leaks are to take regular walk arounds of the hotel (especially back-of-house) and train staff that they need to report any unusual water outlets they might observe. Leaking toilets are especially wasteful and costly, therefore these should be paid special attention to and fixed immediately.

Good to know

Meter installation
A standard cold water meter will cost between 20–100 €, depending on the size, while hot water meters are slightly more expensive. A manual metering system for an entire hotel, covering the most important areas, costs around 1,000 €, while the automatic wireless alternative is likely to be more costly at 6,000 €. However, a wireless system has many advantages, i. e. staff time saved in the reading procedure as well as error free data reading and direct transmission to a central electronic device.

When preparing for water meter installation, bear in mind the following points:

- Check pipework plans for ideal meter placement.
- Take different water sources and the main water usage sectors in consideration.
- The size of the meter should correspond to the pipework it needs to be attached to, especially because water pressure should not be compromised by the meter.
- If you measure small volumes, i. e. in rooms, sub-dials of the meters will need to be read in order to make use of the data.



Good to know

Measuring flow rates
Flow rates of appliances like faucets and showerheads can be measured in two ways:

- Use a flow meter as shown in the picture (cost: approx. 20 €).
- Use a bucket and a stopwatch:
  1) Turn on tap at full flow (if hot and cold water is available, turn on both) .
  2) Put container (ideal: 5 litres) under the tap and start the stopwatch.
  3) Stop the watch when the container is filled up to the capacity mark and note the time.
  4) Divide the volume of water collected (i. e. 5 litres) by the time this took in seconds (i. e. 30 seconds).
  5) Multiply this number by 60. The result will be your flow rate for the tested appliance (in this example: approx. 10 litres/minute).

Flow meter

4.2 Benchmarking

Benchmarking can help to better understand your own performance in relation to others. To know where you use more water can be helpful in identifying strategies to reduce your own water use. **Notably, it is generally acknowledged that hotels can reduce water consumption by at least 10–50 %, without compromising guest comfort or experience.** Savings are dependent on the standard already in place, as well as water consumption levels, and what your businesses accepted return on investment is.

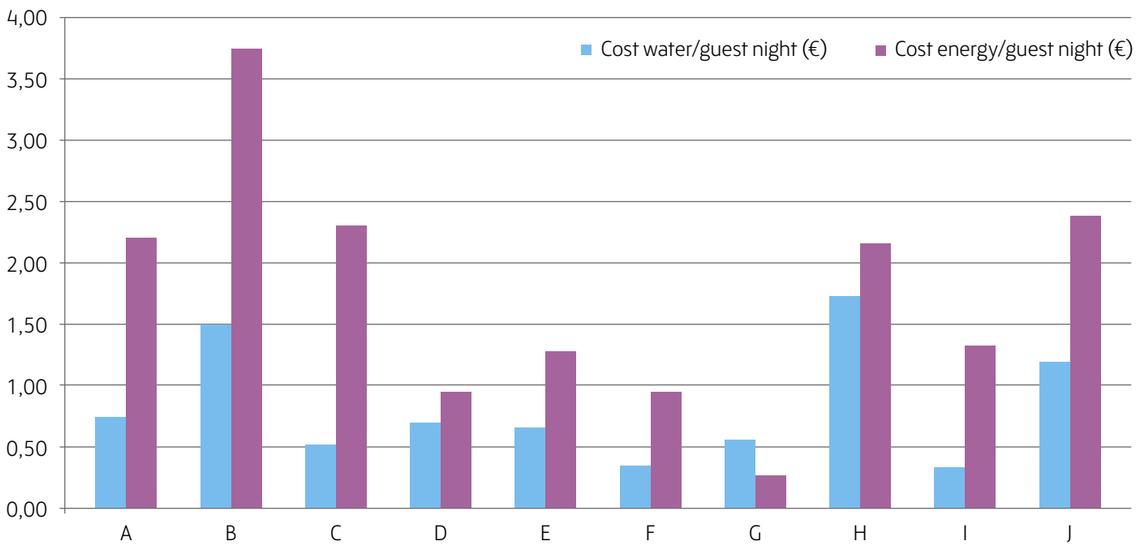
In this benchmarking chapter, energy consumption is examined next to water usage as energy is very relevant for the indirect water footprint of a hotel (see chapter 3). Water and energy consumption in Figure 5 show how a sample of 10 hotels investigated in Greece differ in terms of water and energy use. While some hotels use as little as 149 litres/guest night, the highest consumption seen climbed up to almost 800 litres/guest night. Regarding energy, the differences are similarly substantial, with a scale from 4.5 kWh/guest night to as much as 42 kWh/guest night. As costs are a very important driver for resource use reduction, the benchmarking also shows the differences in average costs per guest night for both water and energy. In this sample of hotels this ranges between 0.75 € and more than 5.00 € per guest night. Some of the differences can be explained by the size and number of pools a hotel has as well as by taking cases of outsourced laundry into consideration. **However, there are still considerable variances in water and energy costs between hotels with comparable onsite facilities.**

In summary, a benchmarking approach is an ideal instrument to define strategies for water reduction, based on indicators such as water or energy use per guest night, or water/energy cost per guest night (Figure 5).

To find out more about your performance in comparison to existing benchmarks, take the following steps:

- Calculate the water consumption per guest night in your hotel using the formula on page 15.
- Compare the KPI you calculated with the water consumption benchmarks on page 15 (pay attention to the different ranges defined per region and hotel category).
- If you find your calculated KPI in the “High-excessive” region, you should definetely reduce your water consumption volumes, but even when the result is in the “Medium” range, you are missing out on substantial cost savings if you don’t take action.

Figure 5: Water and energy costs, per guest night*



* Sample of 10 hotels in Greece, calculated at 0.12 € per kWh and 2.20 € per m³ of water

Good to know

Calculation of comparable KPI for water/energy consumption

$$\frac{\text{Total water/energy consumption per year/month/week}}{\text{Total guest nights per year/month/week}} = \text{Water/energy consumption per guest night}$$

Good to know

Water consumption benchmarks in hotels

When you have calculated your water consumption per guest night as described above, you can compare your hotel to industry benchmarks:

Litres of water/ guest night	Luxury Hotel			Midrange Hotel			Small/Budget Hotel		
	Low	Medium	High-excessive	Low	Medium	High-excessive	Low	Medium	High-excessive
Mediterranean Climate	<450	450–650	>650	<300	300–500	>500	<150	150–250	>250
Tropical Climate	<600	600–900	>900	<500	500–700	>700	<300	300–400	>400

Water Footprint

Take part in the free Thomas Cook “Let’s go green” benchmarking system

You have already read about the consulting project we started with a pilot group of Thomas Cook Hotels & Resorts in 2014 in Rhodes, to assess current water and energy consumption levels and provide recommendations where possible. To make this effective and useful for all our hotel partners, we would now like to widen the approach.

Please join the Thomas Cook “Let’s go green” benchmarking system by providing your water and energy data using this spreadsheet www.thomascook.info/Dateien/Lets_go_green_Benchmarking.xlsx

Taking part in this system will allow us to benchmark your hotel with other hotels of the same category. The results will be shared with you and in case your hotel shows considerably higher figures, we will provide you with recommendations for water, energy and cost savings. Often reduction measures are quite easily achievable and have short payback periods. **Using these recommended measures, hotels can reduce their resource consumption and associated costs by up to 50 %.**

Participation in the “Let’s go green” benchmarking system is free of charge – join today and receive great recommendations for resource and cost saving! Send an email to sustainability@thomascook.com to participate.

5. How can I save costs by saving water resources?

Low-flow shower head

Saving the precious resource water as such is a very good reason to improve water management in your hotel. **However, saving water and energy resources can also have a very positive effect on your operating costs.** Therefore, this chapter shows recommendations to reduce direct water use across your hotel's sub-sectors as well as reductions in indirect water use along with potential cost savings.

In the following, the resource and cost saving measures listed are dependent on the current standard already implemented in the hotel. All business case calculations are based on a cost of 2.20 € per m³ water (as found in Greece, similar cost figures are found in many other Mediterranean destinations) and 50,000 guest nights. When calculating water saving business cases for your hotel, please adjust these numbers according to your destination and hotel.

Table 1: Best practice and typical water savings per room, Rhodes

Component	Best Practice	Existing Usage	20 % saving	
			L/year	€/year/room
Showers	6–9 L/min	8–15 L/min	1,200 L	5 €
Toilet	6/3 dual flush	6–12 L	15,000 L	33 €
Basin	4–6 L/min	5–12 L/min	600 L	2 €
Cleaning	1 flush	2–3 flush	1,200 L	5 €

Business Case

The business case for switching to low-flow installations:
Considerable savings can be made by installing appliances that reduce flow output, often with payback times of less than a year:

Technical measure	Initial cost per unit	Payback period
Install low-flow shower heads	10–30 €	Approx. 4 years
Install flow restrictors	0,25–1 €	<1 year
Install shower flow controllers	5 €	Approx. 1 year
Install faucet aeretors	3–5 €	<1 year
Adjust toilets to best practice standard	0 (adjust existing) –170 € (buy new)	0–5 years

5.1 Direct water resources

a) In guest rooms
Rooms are where customers are likely to directly use substantial amounts of water, i. e. by taking baths, showering, washing their hands or flushing the toilet. Another important factor are towels, bed linen and pool towels, which may be replaced daily, or every second or third day, depending on policies.

With regards to showers, toilet flushing and faucet water use, it is generally important you make sure that:

- **Low-flow installations are installed**, not only in guest rooms, but also in staff changing rooms and in public bathrooms. Table 1 shows best practice volumes for all water outlets in comparison to existing usage in examined hotels on Rhodes, while the Business Case box above lists prices of installations with the respective payback time. Next to the water savings, energy savings can also be reached by reducing the flow intensity, as less water needs to be heated, i. e. for taking a shower. Best Practice volumes can be achieved by making the following (mostly low-cost) adjustments:
  - **Install low-flow showerheads** (specifically designed showerheads to generate a satisfying shower flow while using only 8 to 10 litres/min.)
  - **Install flow restrictors in showers** (small perforated discs, made of copper, stainless-steel or hard plastic, that are placed upstream of the showerhead to restrict its output to less than 10 litres/min)
  - **Install shower flow controllers** (these are water conservation devices that are inserted at the connection between the water supply line and the showerhead, that generally perform better than flow restrictors)
  - **Install aerators in faucets** that generate the desired maximum flow output and replace aerators that produce excessively high flow. (You can see if an aerator is installed if the jet of water has air bubbles in it [see picture])

Fit for Travelife

Installing low-flow installations as described will take you one step closer to achieving a Travelife award. Travelife is an internationally recognised, independent sustainability certification scheme. It helps its 1,300 hotel members around the world improve their environmental, social and economic impacts cost-effectively. Hotels that meet the Travelife standard are formally recognised with a Travelife award to promote their achievements.

Gold Travelife Sustainability in tourism

Please see www.travelife.org for more information!

Faucet with aerator installed (air bubbles in water jet)

Good to know

Choosing the right dual flush mechanism:
When purchasing toilets with dual flush mechanisms, the following aspects should be taken into consideration:

- The dual-flush mechanism should be clearly visible and easy to understand for guests and staff.
- The toilets should allow for easy maintenance and spare parts should be available locally.
- Standardize the type of toilets in the hotel to enable routine maintenance procedures and ensure toilets are free of leakages.

- Of course these measures also apply to **public and back of house areas** in the hotel. Here, the maximum flow outputs should be:
  - 2–4 litres/min in public and staff bathrooms
  - 8–10 litres/min in all work areas, i. e. in kitchen, bar, laundry
- **Toilet flow rates** are reduced to 6/3 litres: As you have seen in chapter 4, toilets can account for up to 50 % of guest room water use. It is therefore very important that all toilets are equipped with dual-flush systems (partial flush of 3 litres for liquid waste and full flush of 6 litres for solid waste).
- **Toilets are regularly checked by maintenance** to quickly detect leakages.
- **Warm water flow (faucets) is reduced** to decrease energy use. Often faucets mix cold and hot water by default, which increases hot water use even though this is unnecessary in hot climates.
- **General water pressure** is adjusted (ideal pressure: 3.5 bar, communal water: 5.5 bar).
- **Cleaning procedures are adjusted**, so that only one toilet flush per room cleaning is used.

Towel/Bed linen exchange

Up to 40 % of the weight of laundry processed in hotels consists of guestroom and pool towels that have only been used for a single day and are basically clean. Washing these towels consumes a significant amount of effort, water, energy and chemicals, and produces a large volume of wastewater that is contaminated with bleach, detergents and other chemicals. These unnecessary high amounts can be reduced by introducing or improving towel and linen reuse schemes.

However, as you know, towels, bed linen or pool towels are also often seen as challenging management issues, because there is a perception that guests insist on frequent changes. To address this, a study was carried out in Rhodes, Greece across several five and four star hotels. Results indicate that there are significant differences between seasons and with regard to towels in the room, towels used at pools and bed linen.

Bed linen is the item that appears to be in least need of change, with only 7 % of summer guests demanding a daily change (Figure 6). Another 29 % are willing to keep their linen for at least two days, and 30 % for three days. This indicates that a bed linen changes every three days will be acceptable to most guests, particularly when accompanied by a policy that allows for more frequent changes on demand.

The situation is more complicated with regard to towels. About a quarter of respondents indicated that they would expect new towels every day, and half of all respondents every second day.

Business Case

The business case of thorough toilet maintenance

- Initial situation: moderate toilet leak in one toilet: wastes approx. 0.5 L/min and 20 m³/month.

- Detect and repair leak → save 20 m³/month or 140 m³ per 7-months season
  → **save 308 €/year, which could buy almost two new best practice toilets.**

Good to know

To Dos to install a functioning towel/linen reuse program:

a) Set up clear and attractively designed information in guest rooms regarding bed linen and towel change (follow this link: www.thomascook.info/Dateien/Customer_messages_towel_and_linen_reuse_scheme.pdf) as well as a "laundry basket" that guests can easily distinguish from a rubbish bin.

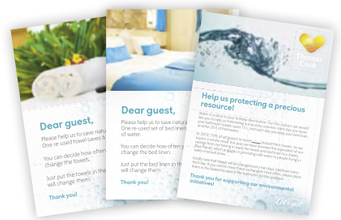
b) Exchange bed linen every three days, and offer additional exchanges on the basis of a card to be set up on the bed: 'Please exchange bed linen'.

c) Replace in-room towels only when these are thrown in a specific basket placed in the bathroom to avoid misunderstandings.

d) Offer one pool towel in the beginning, and exchange these on demand, but potentially at restricted times (e. g. daily between 10–12.00). Another possibility is to charge a small sum for each pool towel change.

e) Thoroughly and regularly train staff on the implementation of the towel/linen reuse program (also see chapter 6).

f) Perform monitoring of laundry volumes by tracking exchanged towels per room (by following this link: www.thomascook.info/Dateien/Towel_and_linen_exchange_Tracking_sheet.xlsx).



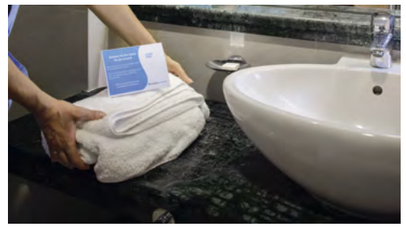
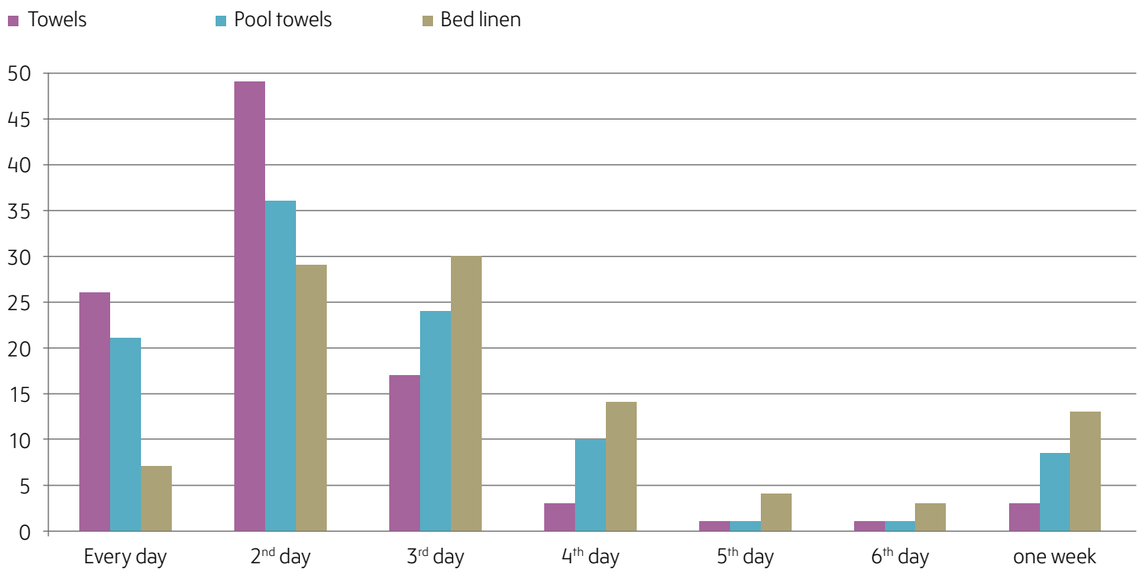


Figure 6: Towel and bed linen exchange: guest perceptions (%)



Pool towel perceptions are similar, though there is a significantly larger share of guests indicating that they are willing to use their pool towels three or even four days. **While setting up a towel/linen reuse program is a first step towards saving water resources, training staff on this program is the much more important second step.** Various hotels in Rhodes that already operate reuse programs reported that guests reacted with irritation when towels were exchanged even though guests wished to keep them. Hotels are thus advised to set up a towel and linen reuse program and communicate clearly about it towards staff and customers. **Hotels may also control the quality of the towels used.** Very thick and large towels result in considerably larger amounts of laundry, while medium thickness may be sufficient in terms of guest quality perceptions.

Notable differences in the amount of laundry can be observed between otherwise identical hotels (in terms of star rating, but also guest rating). This indicates considerable scope for reducing laundry volumes, without jeopardizing guest quality. With each piece of laundry corresponding to an estimated cleaning cost of 0.50 €, **reducing laundry volumes can save tens of thousands of Euros per year,** not including purchasing and labour costs (cleaning staff, laundry staff).

b) In gardens

Gardens are beautiful extensions of the hotel facilities, but they also are a major water-consuming factor in many destinations. They often require up to several hundred litres per tourist per day to irrigate, while this demand is influenced by their size and design, as well as the chosen plant species. **In an average resort hotel, irrigation will be responsible for 30–50 % of overall direct water use** (in a city hotel, this may be lower at 5–25 %).

Business Case

The business case for a towel/linen reuse system:

- Initial situation: 3.5 laundry items/guest night, 0.50 € per piece of laundry.
- Reduce laundry pieces from 3.5 per guest night to 2.5 by introducing towel/linen exchange program → save 1 piece of laundry and 0.50 € /guest night.
- **Total savings at 50,000 guest nights: 0.5 × 50,000 = 25,000 €/year.**
- Costs (guest communication,laundry baskets): negligible compared to savings made.

Therefore, from a management perspective, this is one of the most important hotel areas where water resources and costs can be saved. Improvement measures include:

- **Improve the interaction of soils, hydrology and plants:** In many destinations, soils are porous, draining irrigation water rapidly and hence making continuous irrigation a necessity. For such soils, increasing the humus content of topsoils may help water storage capacities. Humus can be generated from compost, i. e. cut grass and other biomass, or returning food waste into organic compounds.
- **Choose the right plants:** Landscaping can considerably reduce water consumption. For instance, 30–50 % of water can be saved through measures such as choosing drought-resistant plants and grasses (there exist many grass varieties that are less water-demanding, i. e. Kentucky bluegrass, turfgrass, fescue, perennial ryegrass, bentgrass, buffalo grass) or mulching garden beds to reduce evaporation. The use of indigenous plants for landscaping may in many areas reduce the need for irrigation altogether. In some locations the use of roof gardens may be a valuable way to enhance water recharge, help maintain biodiversity and provide a means of insulation.
- **Improve irrigation mechanism:** Use drip irrigation with electronic controllers and moisture sensors for flower beds. Always operate sprinkler systems for lawns between 22:00 and 6:00 in order to ensure the plants can make the most of the water before the sun evaporates it. Installing a smart controller system is a worthwhile way to save resource and cost (see example calculation below).
- **Use grey water (recycled water from showers/bathtubs/sinks/laundry) for irrigation:** Such systems are best installed in the building phase of a hotel or during a substantial renovation, however converting to such a system can be a very attractive cost-saving mechanism with payback times of about 2–3 years, especially when municipal water is used for irrigation purposes. This also has the positive side-effect that – often costly – wastewater disposal is reduced. You need to make sure that the grey water recycling system complies with legal requirements of your destination and does not pose a danger to staff or guests.
- **Use harvested rainwater or clean condensed water for irrigation:** Rainwater can be collected from the roofs of buildings, while there are substantial amounts of condensed water from air conditioning systems. Both can be reused for irrigation purposes by installing a piping system to direct flows.

Business Case

The business case for a smart control system:

- Initial situation: 75 litres per guest night used for irrigation.
- Installing a smart-control system for sprinklers: reduction of irrigation by a third → 25 litres savings per day.
- **Total savings at 50,000 guest nights: 1,250 m³ per season = 3,000 €.**
- One-off cost of smart control system: 2,000 €.
- Payback time: less than one year.

c) In the pool area
Creatively shaped pools are the highlight of many resort hotels. They are also the second most important direct water-consuming factor, accounting for 50–100 litres of fresh water use per tourist and day. About half of this volume is needed during the initial filling of the pools, and half to top up evaporated water and to carry out backwashes. While deep pools increase the overall amount of water needed, pool size (surface area) is important in terms of evaporation. This might be increased even further by installations that keep water in motion, like fountains or waterfalls.

Once the pools are built, measures to reduce water use for pools are thus limited. However, the following possibilities exist:

- **Cover smaller pools at night to reduce evaporation** (although this may not be an option for irregularly shaped pools that also constitute part of the night-time attraction of a hotel)
- **Only turn on installations like waterfalls or fountains for a certain duration of time,** i. e. once per hour for ten minutes or install timer switches that can be operated by the customers themselves
- **Regularly inspect pool area for leaks,** repair all leaks immediately
- **Reduce water for backwashing,** i. e. by:
  – Perform backwashes when necessary due to contamination levels (indicated by gauge pressure), not as a routine procedure in certain intervals (i. e. once or twice per day).
  – Determine the length of a backwash by the achieved desired clarity of water, not according to a fixed timespan.
  – Stick to timespans for the required steps in the backwashing process as indicated by the manufacturer.
  – Using crushed glass for filters.

Make sure that health & safety aspects are always adhered to.

- **Replace freshwater with seawater:** Various options exist for this:
  a) For instance, you could fill the pool with seawater at the beginning of the season, and subsequently 'top up' evaporated water with freshwater. In this way, no freshwater is used for the initial filling.
  b) Where two pools exist, one may contain freshwater and the other seawater, to cater for different guest tastes while also reducing freshwater demand.
  c) Freshwater pools could also be replaced with seawater pools altogether.

In options b) or c) the seawater may possibly have to be circulated constantly, in order to avoid an accumulation of salt and algae growth.

Business Case

The business case for replacing fresh water with seawater:
- Initial situation: 2,000 m³ pool.
- Replace half of the fresh water with salt water → saves 1,000 m³ of the initial filling → **cost saving of 2,200 € annually.**
- Replace an entire freshwater pool with a saltwater pool → saves 2,240 m³ (initial filling and evaporation) → **cost saving of approx. 5,000 € annually.**

5.2 Indirect water resources

a) Food
Food is one of the most important ingredients of every holiday – sometimes we even travel to certain destinations or hotels, because of the special food that is served there. The thought that our food consumption on holiday might also have an influence on global water resources does not come to mind instantly. **However – surprising as it might be – food is the most important overall water-consuming sub-sector in a hotel.** Read more about the reasons for this in chapter 3.

Food and beverage management is complex with regard to the amount of water and energy contained in food. It would be advisable to avoid certain foodstuffs altogether (vegetables grown in heated greenhouses; foods involving air transport; beef), and to increase the share of vegetarian dishes. Current practices may involve food consumption of about 2–3 kg of foodstuffs per guest per day, which means indirect water use of an estimated 3,500–4,500 litres per day. **As a large share of this is due to the consumption of meats, and customer interest for vegetarian dishes is increasing, it would seem possible to reduce indirect water consumption by 20–30 %.** This would mean a 750–1,500 litre reduction of indirect water volumes used by each guest per day.

As there are huge differences with regard to per-kg food purchase costs, there also is a high cost-saving potential in a decreased offering of water-intensive products. **Dairy products, certain fish and seafood as well as meats are comparably expensive, while fruit and vegetables as well as carbohydrates are cheap.** For example, carbohydrates, including rice, bread, pastry or potatoes will usually entail purchase costs of less than 1.50 € per kg. Fresh vegetables and fruits will be available for less than 1 € per kg. In comparison, dairy products will often be considerably more costly, with in particular cheese usually costing more than 5 € per kg. Meats and cold cuts will regularly cost more than 4 € per kg.

This opens up opportunities to create menus offering a greater variety of, for instance, non-meat alternatives. **Depending on your hotel and the guest types found, menus can be adjusted to better reflect tastes, while also being less water consuming and especially more attractive for management from an economic viewpoint.** The fact that most hotels can reduce the share of meat has been verified in a sample of hotels in Rhodes. Here, it was found that in one hotel, meat consumption was 385 grams per tourist per day, in addition to 140 grams of seafood and fish, and almost 300 grams of dairy products, while another hotel of comparable standard only used 281 grams of meat and 94 grams of fish/seafood. This would indicate that it should be possible to reduce high protein food amounts, while still offering a great experience to guests.

Business Case

The business case for water saving/less meat-intensive food management:

- Initial situation: hotel with a large amount of meat served throughout the day.
- Replace 100 grams of meat with vegetarian dishes per tourist per day (in line with emerging guest expectations for more vegetarian and healthy alternatives).
- Savings on foodstuffs of 0.1–0.3 € per guest night.
- **Total savings at 50,000 guest nights: approx. 10,000 € annually in purchasing costs.**

Good to know

Sustainable Food Management:

It is difficult to assess the impact of certain foods, which may have different environmental implications depending on whether they are produced in or out of season, and in regions that may be more or less water scarce etc. It therefore makes sense to rely on a limited set of food rules for water management, relating to purchases, the preparation of food, and the presentation of food choices:

Purchases:
Implement a purchasing policy using the principles below

Buy as little as possible
- Buy as little as possible vegetables grown in heated greenhouses (highly energy intense).
- Buy as little as possible foods involving air transport (highly energy intense).
- Buy as little as possible specific species, such as giant, king and tiger prawns, lobster (environmentally harmful as contributing to mangrove destruction).
- Buy as little as possible imported beef (highly energy intense).
- Buy as little as possible aluminium foil (highly energy intense).

Buy less (all highly water or energy intense)
- Buy less beef.
- Buy less deep-sea fish (e. g. cod).
- Buy less farmed carnivorous fish (e. g. salmon).
- Buy less rice.
- Buy less seasonal foods out of their season.

Buy more (comparably little water/energy use involved)
- Buy more locally produced foods, if transported over short distances.
- Buy more potatoes.
- Buy more grains (including pasta).
- Buy more pork.
- Buy more chicken.
- Buy more foodstuffs with longer shelf lives.

Preparation:
- Purchase energy from renewable sources (low emission, low water).
- Use more energy-efficient cooking routines (to save water and energy).
- Put dishes on the menu that use less meat and more vegetables (saves water and energy).
- Plan purchases to avoid waste (saves water and energy as well as resources).
- Separate food waste from general waste for composting (soil generation).

Presentation:
- Always present as many as possible attractive vegetarian alternatives (less water intense).
- Reduce portion sizes at buffets, with more regular replenishment (reduce waste).
- Reduce plate size at buffets (reduce waste).
- Arrange buffets so that less water-intensive foods are at the centre.
- Train staff to recommend less water-intensive dishes (à la carte).
- Avoid single-use packaging (to reduce waste, energy intense packaging).

By the way

Best Practice: Reusable glass bottles for table water

All food transports create greenhouse gas emissions. Bottled water in particular has received attention as a carbon-intense product, as manufacturing of plastic or glass bottles, water treatment, bottling and labelling, chilling for sale and use, collection and recycling, and in particular transport of the heavy end-product all entail considerable emissions. Many destinations, particularly in the tropics, are not ready to handle the huge numbers of empty plastic bottles disposed of by tourists.

Furthermore, **bottled water has a much higher water footprint than you would suspect.** In total, bottled water requires energy inputs between 5.6–10.2 Mega joules per litre. This means that in terms of water use for energy production, each litre of bottled water requires 1.2–2.5 litres of fresh water in the production process in energy alone.

Yet plastic bottles contain just plain water, and can thus be easily replaced with refillable glass bottle systems, which are now readily available. Even though it is unclear what payback times are, hotels report that there is a positive rate of return on investment. Moreover, guests perceive glass bottles as a far better quality standard than water in plastic bottles, and glass bottles can be used to display logos, working as a marketing tool.

b) Energy
Saving energy means saving water – for each kWh about one litre of indirect fresh water (see chapter 3 for more details). Moreover, saving energy also means substantial cost reductions – you should therefore engage in regular review of your hotel's energy consuming equipment. In many cases these may be old, consuming far larger quantities of energy than state-of-the-art technology. Regular replacement of all white appliances and other technology items is essential to save water and energy.

Hotel infrastructure
- Check insulation of all pipes.
- Check state of technology and that there is a regular maintenance schedule of A/C, chillers, boilers, heat pumps, circulation pumps, filter technology, washing machines, dryers, fridges & freezers, stoves and ovens, TV-sets, mini-bars, etc.

Public areas
- Use LED technology, which can save 30 % on low-energy lighting systems.
- Use air dryers in public toilets to avoid paper/linen towels.
- Install waterless urinals.
- Shut down part of night-time illumination when guests sleep.
- Install motion sensor detectors for lighting in corridors.

Rooms
- Check if mini-bars or other electric items can be avoided.

In hotels where incandescent light bulbs are still in use, changes to LED will be hugely profitable. However, even where low energy bulbs are already in use, changing to LED will cut down another 30 % on energy consumption. Table 2 shows how the three options compare to each other, and which savings are possible in a given scenario. Here you can find more tips on how to save energy in your hotel: **www.thetravelfoundation.org.uk/green_business_tools/greener_accommodations**

Business Case

The business case for switching to LED lights:

- Initial situation: hotel's lighting features are operated with incandescent light bulbs.
- Replace light bulbs with LEDs: save 25.20 € per year per bulb at 2,000 kWh/year.
- Cost for one LED: 24.95 €.
- **Payback time: 1 year.**

Table 2: Comparison of cost for lighting

	Incandescent light bulb	Compact fluorescents (Low energy)	Light emitting diodes (LED)
Watt (800 Lumen)	60	15	10,5
Lifetime	1,000 h	12,000 h	50,000 h
Cost	1.50 €	6.40 €	24.95 €
Price per hour*	0.0015 €	0.00375 €	0.00238 €
Replacement/yr*	3.67 €	0.31 €	0.07 €
At 2,000 kWh/yr	30 €	7.50 €	4.76 €
Cost over 10 yr	**367 €**	**91 €**	**73 €**
Incandescent to LED – Savings per bulb over 10 years: 294 €			

* at 25 Cent/kWh; at 22 €/hour (work), and 10 minutes per light bulb, including purchase, replacement, disposal, and four hours of running time/day per lightbulb, and a season of 250 days/year.

Solar thermal
Saving 1,000 kWh of electricity, or producing 1,000 kWh of electricity on site will reduce indirect water consumption by 1,000 litres. Therefore, investments in energy efficiency should be complemented with investments in renewable energy technology. Not only will this substantially reduce indirect water consumption of your hotel but will enable savings on energy costs. An increasing number of studies have concluded that renewable energy systems for small- to medium-sized accommodation establishments are delivering a more acceptable return on investment and payback period. Solar thermal installations, that provide warm water in a renewable way, are known to have relatively short payback times and thus high economic viability. Moreover, also photovoltaic cell (PV) installations for small-scale tourist operations can be economically viable with a 10 years payback time, and considerably lower payback times if government subsidies are provided. Wind energy conversion systems even have shorter payback times (3–4 years), and are thus economically preferable to PV systems, however may cause planning issues.

Business Case

The business case for a solar thermal installation for water heating:

- Initial situation: Annual hot water cost in hotel: 41,100 €.
- Cost for 300 solar panels covering 600 m² and sufficiently sized hot water tanks: 59,000 €.
- Hot water cost reduced to 11,000 €.
- Savings of approx. 30,000 €/year.
- **Payback time: less than 2.5 years.**
- **Approximate savings of 234,000 € over a ten year period.**

6. The importance of staff training and customer communication

Over the last chapters you have learned how to manage your water resources in a responsible way. However, the best action plan to reduce water consumption cannot be implemented when your staff and customers do not actively engage in it. Therefore the last chapter underlines the importance of staff training to develop and maintain a successful water management strategy as well as the benefits that you can gain by communicating your successes to your customers.

Business Case

The business case for staff training regarding resource savings

- Successful staff training campaign by a large international hotel chain between 2006–2008.
- Environmental workshops organized for a total of 16,000 employees to develop their knowledge of environmental issues.
- **As a result the chain reduced energy use by 15 % and water use by 8 % in Europe → avoiding costs of 11 million €.**

Staff training

Staff are integral to sustainable management because they are in contact with your customers, which gives them an opportunity to talk to guests about these issues, as well as monitor facilities and detect leakages or other problems with water fixtures. Cleaning staff can also considerably increase water consumption, for instance when flushing toilets more than once per room cleaning. In order to empower staff in their role to make environmental and cost saving improvements, it is important for them to understand the underlying reasons for water management, and to provide them with knowledge about the hotel's activities in this regard. **Communicating with staff about resource use reduction also improves your image as an employer** – it has been found that staff are more motivated to stay with your hotel if it engages in pro-environmental initiatives.

Hotel staff may be trained specifically in:

- Guest communication, to positively frame environmental initiatives.
- Engage in towel/bed linen saving programmes.
- Report leaking toilets, faucets, or ideas as to how water use could be further reduced.
- Engage in water saving behaviour, for instance for cleaning staff to flush toilets only once for room cleaning.

Ideas for staff training and engagement activities:

- Regular training workshops that explain policies, implementation procedures and reasons behind these.
- Reminders placed visibly in places of consumption, i. e. save water sticker on cleaning trolley, posters in back of house areas (i. e. cleaning cabinets on hotel floors).
- Establish "green team" with different responsibilities allocated to members of staff i. e. team expert for water savings, energy savings or waste reduction.

Customer communication

Be proud to be part of the leading hotels in the world to reduce water and energy consumption. Communicate your achievements to both staff and guests, and see them as a sign of quality. Guests are increasingly aware of environmental issues – survey results from Germany and the UK reveal that many customers would like to book sustainable holiday products, but need more or better information about these products to do so. To meet this customer demand and avoid the risk of losing customers to other hotels who meet this need, you should communicate with your guests about your environmental initiatives wherever possible.

Water Footprint

Staff training workshops as part of the Thomas Cook "Water Footprint" project

In the second phase of our Water Footprint project the hotels in Rhodes will be offered consultancy support to implement this water manual. This will be delivered through water management training workshops which will be conducted by a professional training company and a designated member of hotel staff.

These workshops will cover the content of the water management manual with a special focus on staff training and awareness raising among customers, i. e. technical hotel staff will be trained on monitoring water figures while housekeeping staff will be trained on less water consuming cleaning procedures. The workshops will also provide assistance to inform customers about the water saving measures the hotel is taking and how customers can support this.

Committed hotels and their staff will then implement the proposed improvements, realized savings (resource and monetary) will be monitored and communicated among Thomas Cook Hotels & Resorts.

If you'd like to receive a free copy of the training template, contact us under sustainability@thomascook.com

Of course good customer communication is also helpful to directly reduce resource use:

- Inform customers where they can save water and energy, i. e. not letting the water run while brushing teeth or shaving or closing all windows and doors when using the air conditioning.
- Give customers information regarding your sustainable initiatives at the point of consumption, i. e. inform about your energy-saving appliances with a sticker on the TV (see picture).
- Successfully communicate with customers about your towel and linen reuse program using attractive and clear messaging in room.

Annex:

Templates

- Monitoring and analysing consumption
  - Water Meter Data Collection Sheet
    (http://www.thomascook.info/Dateien/Water_Meter_Data_Collection.xlsx)
  - Towel and Lines exchange tracking sheet
    (http://www.thomascook.info/Dateien/Lets_go_green_Benchmarking.xlsx)
  - "Let's go green" – The Thomas Cook benchmarking system
    (http://www.thomascook.info/Dateien/Towel_and_linen_exchange_Tracking_sheet.xlsx)
- Customer Communication
  Useful examples for towel and linen exchange cards
  (http://www.thomascook.info/Dateien/Customer_messages_towel_and_linen_reuse_scheme.pdf)

Interesting reads and online tools

http://www.thomascook.info/unternehmen/nachhaltigkeit/
http://www.travelife.org
http://www.thetravelfoundation.org.uk/
http://www.unwater.org/
http://www.worldwaterweek.org/
http://wtd.unwto.org/en/content/wtd-2013-about
http://www.wri.org/our-work/project/aqueduct/aqueduct-atlas
http://waterriskfilter.panda.org/