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# **Demystifying the Impact of Energy and Water Consumption During and After Remote Work**

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## **Abstract**

Consumption patterns have shifted significantly since the pandemic. Key literature sustains that residential electricity consumption increased by 16% during working hours, with an additional 3% rise in areas with more remote workers. This study examines the impact of the Covid-19 pandemic on water and electricity consumption patterns among administrative workers. For this research individual interviews were conducted with a sample of 30 respondents aged 23 to 62, to gather in-depth insights. Additionally, we included a case study of a family-run business in Peru. While the pandemic initially led to significant resource savings during remote work, our findings suggest that there are no notable long-term changes in consumption patterns once workers returned to the office. Instead of the pandemic itself, the research indicates that the work environment and employees' identification with it are the primary factors influencing resource expenditure in offices. Furthermore, smaller companies exhibited more pronounced resource-saving behaviors compared to larger, internationally recognized firms. These insights challenge the prevailing assumptions about pandemic-related changes in consumption habits and underscore the importance of workplace dynamics in resource management.

*Key words: sustainability, work environment, water consumption, light consumption, Covid -19*

## **Introduction and background**

According to the platform of the well-known American micro-labor company "Upwork" "Remote work is a workforce strategy that enables people to perform their work from a location outside of a company's office. This may be from their home, a satellite office, co-working space, or coffeehouse". (Do, 2022). The term remote work became popular a few years ago, but it was already a work modality implemented by some companies. It allowed employees to organize their schedules according to their personal productivity, better balancing their work and personal responsibilities. This was especially useful for people who urgently needed to take care of a personal matter, but also could not neglect their work. For example, a mother who had an important position at work that could not be covered by another person and her son got sick and had no one to take care of him. In this case, remote work allowed the woman to work from home while watching her son. This was not the only case where this way of working was used. Some companies were interested in hiring people from different parts of the world. Working remotely allowed these people not to have to relocate, but to be hired without leaving their country or city.

Although remote work was a great advantage, it was not common until the arrival of the Covid-19 pandemic, when everyone was forced to stay at home to avoid contagion.

Due to mandatory remote work, all types of companies, both global and family-owned, had to adapt quickly and invest in technologies that allowed remote collaboration, such as video conferencing tools (Zoom, Microsoft Teams) for meetings and tools such as Google Drive or Microsoft OneDrive for document sharing. An article by James Thomas (2020) explores how the COVID-19 pandemic has transform work culture for the better. " Modern collaborative technologies—videoconferencing, screen-sharing, digital shared file storage, simultaneous multi-authoring of documents, digital whiteboards, smartphone chat groups—are freely available and sophisticated. Organizations have dropped the dogma that it's just better to do it face-to-face." (Thomas, 2020).

For years, many companies were skeptical about the effectiveness of remote work, as they believed that employees would be less productive outside the office. However, the first year of the pandemic proved otherwise and this fear of remote work was broken. A study by the consulting firm PwC in 2020 found that 83% of employers and employees considered remote work to be a great advantage, reporting an increase in productivity. In addition, for many workers, remote work offered a better relationship between their personal and professional life. By not having to go to work on a daily basis and being able to stay at home, they could focus that extra time on spending time with family or on activities outside of work. This led to greater satisfaction and well-being in their personal lives.

However, by working from home, there were not only changes in the productivity of people and the way they worked, but also our daily behaviors, especially about the consumption of essential resources such as electricity and water.

Before the global health crisis, energy and water consumption was distributed among various places that people visited throughout the day, with the workplace being one of the main consumers, since many adults spent most of their day there. However, with the arrival of confinement and mobility restrictions, a radical change occurred: all that energy and water that used to be consumed in various spaces was concentrated in one place: homes. Because of this, the population's patterns regarding energy and water use changed.

A study conducted by Steve Cicala (2020) reveals that consumption patterns have changed significantly: before the pandemic, electricity use increased in the morning and fell during the day, but during the pandemic, residential consumption is 16% higher during working hours. Metropolitan areas with a higher proportion of home workers experienced an additional 3% increase in consumption. However, it must be taken into consideration that, despite the fact that electricity use at home has increased for obvious reasons, it was not harmful, taking into account that all the electricity that was spent was at home, and not elsewhere; adding up what a person spent daily before the pandemic, it was much higher than what they spent during the pandemic at home. "In the case of Peru, the

mandatory lockdown began on March 16 and produced a reduction in electricity demand of 34%. In the case of Colombia, which imposed the lockdown on March 24, the reduction in electricity demand is 17%. Additionally, in both countries there is a marked increase in the share of residential electricity demand. "(Inter-American Development Bank, 2020).

A study conducted in 2020 analyzed how the COVID-19 pandemic has transformed electricity demand in general in Latin America and the Caribbean. "This analysis identifies that the maximum drop in demand in the countries analyzed was 15% with weekly impacts between 34% and 8% over the base year (2019). At the most critical moments of the pandemic, during the month of April, countries such as Peru stopped consuming 1 out of every 3 kWh they used to consume." (Inter-American Development Bank, 2021). These results are shocking, as the study shows that electricity consumption dropped by 1/3 once people stayed at home.

Hand in hand is the energy consumption that was saved due to transportation. During the pandemic, people stayed at home most of the time, and when they had to move from one place to another, they regularly traveled short distances, such as to the grocery store, all by walking; but specially, by stopping going to work, people stopped using the car on a daily basis. That created huge energy savings around the world.

There was not only a reduction in the consumption of electricity, but water consumption also changed during confinement and the pandemic.

"Regarding water consumption of CII and SC properties, the estimated effects were significantly negative, showing evidence of a large decrease in water use during SAH relative to the pre-SAH period. " (Nemati & Tran, 2022). The study found that although water consumption at home increased by 11% to 13%, consumption in public places was reduced to almost zero.

However, over time, due to the improvement of the situation, people began to gradually return to the workplace. Although people returned to the offices, it seems that most employees did not take with them some of the habits acquired as a result of the pandemic or these began to fade little by little, specifically in this case, the awareness about the use of water and electricity in everyday life in the offices.

In this context, it is essential to explore how workers' energy and water consumption patterns manifest themselves, the reasons for the behaviors to be analyzed, and whether the Covid-19 pandemic long-term impacts those behaviors. Investigating this phenomenon will contribute to a better understanding of the hidden mentality regarding the change in habits, but also, based on the results, guidelines can be recommended to develop more responsible practices in the work environment.

## **Methodology**

To identify the implications of workers' energy and water consumption patterns, this research used a perception analysis via surveys and interviews and a case study analysis on whether sustainable practices in the post-pandemic work environment exist by covering consumption indicators

**Research question:** How significant was the shift to remote work during the COVID-19 pandemic in impacting individual water and electricity consumption patterns?

### **Perception Analysis**

**Survey:** First, a survey was conducted via WhatsApp with 30 people between 23-62 years old. The idea was to determine on a small scale what the general trends were for people of different ages and different countries. The questions related to their preferences regarding working from home and in an office, and their energy/water saving behavior during the pandemic and afterwards at their respective workplace. The survey focused on people that worked in big companies that are well known worldwide, and that worked in the admirative environment, where the use of light and water is basically managed by the workers within the office.

**Interview:** As with the surveys, two types of interviews were conducted. The first was conducted after the survey, with the 7 people with the most different responses from the rest of the participants, as well as 3 with the average responses. Some of the interviews were made via Zoom, while others only via WhatsApp by call. With these interviews the reason for each type of response of the survey could be understood and evaluated in a deeper level. In addition, to prepare for the case study, an interview was conducted with a business owner to obtain his opinion and the consumption information of the business during and post pandemic. He was asked about some details of the work environment, like the number of workers, or the area of the workplace, and most important, the water and electricity payment receivables of the same month of the years 2020 and 2024, in order to make a comparison of both years in the case study.

### **Study Analysis**

The study was carried out based on a family of 3 people in Lima and their energy and water consumption during and after the pandemic. Consumption patterns were analyzed both at home and at the father's workplace, in order to determine on a small scale how much consumption decreased/increased within a family unit. Based on this small sample with exact data on expenses both at home and at work, one can have an approximation of the water and electricity consumption patterns in the population during and after the pandemic, and most important, the consumption patterns of a small business.

## **Data Results**

### **Survey and interviews**

A survey was conducted via WhatsApp to 30 people between the ages of 23-62 years old who work in different administrative work environments around the world, however, it was important that the people making the survey worked in big companies; that helped to notice if there were a difference between a big and a small company regarding their consumption patterns.

After reading the article by James Thomas and the study by PwC, which both affirm the positive impact of remote work in 2020, the objective of the first question of the survey is to analyze whether people really continue, after 4 years of both studies, considering remote work as an advantage, or on the contrary, as a disadvantage in both their work and personal life.

To do this, respondents were sent 3 aspects via WhatsApp: Productivity, Employee Happiness and Work-Life Balance. (These three parameters were obtained based on the two previously mentioned studies). After presenting the aspects, people were asked in which work modality (on-site or remote) they felt that these points were best met and they had to mark their responses through a WhatsApp Survey. An important aspect to mention is that none of the respondents knew exactly the reason why they were asked the questions; the only thing they were told was that their answers were going to be used for academic research purposes. In this way, respondents would not be influenced to change their answers, knowing that the study had a sustainable focus.

Below is a table with the results of the answers of the 30 respondents (Chart 1)

### ***Graphic 1: preferences between face-to-face and virtual work***

*(Answers of 30 people from different administrative workplaces)*

<b>Aspect</b>	<b>Responses</b>	<b>Analysis Remote Work (RW)</b>	<b>Analysis In-Person Work (IPW)</b>
Productivity	RW: 47% IPW: 53%	Moderate	Moderate
Employee Happiness	RW: 7% IPW: 93%	Low	High
Work-Life Balance	RW: 13% IPW: 87%	Low	High

The results show that as time went on and restrictions began to ease, there was a growing desire among many people to return to in-person work for a variety of reasons, not only in response to the need to regain the social interaction and spontaneous collaboration that the office environment offered, but also to re-establish a clearer separation between personal and workspace, as can be seen in the chart. Remote working was undoubtedly a “lifesaver” for the operation of companies during Covid, however, as time went on, a large percentage of people no longer felt entirely comfortable working from home forever.

Once people's feelings about remote and office work were known, the same 30 people were asked about their behavior in both scenarios, during the pandemic (at home) and after the pandemic (at their workplaces), regarding their personal electricity and water usage.

**Graphic 2: Habits at home during pandemic**

<b>Aspect</b>	<b>Yes</b>	<b>No</b>
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Do you turn off the light after leaving a room?	<b>97%</b>	<b>3%</b>
Do you unplug your computer after you finish using it?	<b>67%</b>	<b>33%</b>
Do you turn on the lights in your workspace even during the day?	<b>0%</b>	<b>100%</b>
Do you worry about not letting the sink water run after using it?	<b>97%</b>	<b>3%</b>

*(Answers of 30 people from different workplaces)*

**Graphic 3: Habits at workplace after pandemic**

*(Answers of 30 people from different workplaces)*

<b>Aspect</b>	<b>Yes</b>	<b>No</b>
Do you turn off the light after leaving a room?	<b>53%</b>	<b>47%</b>
Do you unplug your computer after you finish using it?	<b>3%</b>	<b>97%</b>
Do you turn on the lights in your workspace even during the day?	<b>37%</b>	<b>63%</b>
Do you worry about not letting the sink water run after using it?	<b>7%</b>	<b>93%</b>

The respondents' trends showed very interesting responses: most of them did not care at all how much energy/water was used at their workplace, unlike when they were at home during the pandemic (Chart 2) and (Chart 3).



Despite the benefits of remote work, such as flexibility and the habit of reducing resources, such as the conscious use of light, electricity or water, when returning to in-person work, these habits have gradually been left behind, being forgotten for the majority.

The reason for this phenomenon is unclear, however, 10 of the respondents who had the most contrasting answers in the previous surveys were asked if they believed there was a relationship between the careless use of resources and the discontent of workers towards the owners of the companies. 7 of the 10 respondents had similar answers.

One interviewee (28 years old, female) commented: "I really don't think there is a direct relationship. The truth is that when I am in the office, I have to admit that I don't really care if the light is off, or if the water is left running a little longer after using the tap. It's not that I want to wastewater or electricity on purpose so that the company pays for it, it's just that I've gotten used to the fact that nobody here in the company cares about that, so I don't pay attention to it either."

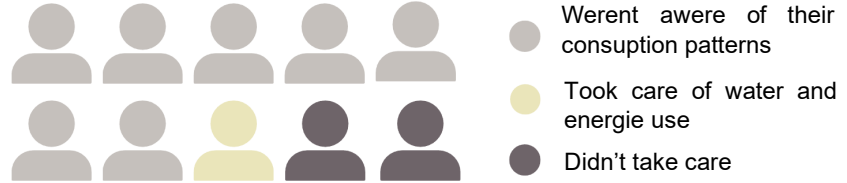
On the other hand, although she commented the same as the statement said previously, one interviewee (25 years old) mentioned that "there must be some connection." She explains that if you are not happy with your workplace, you simply will not notice these little types of behavior, for example if you left the light on, or if the water run for a few seconds. She considers that when you are unmotivated in a workplace, these thoughts of "It's not mine, I don't take care of it" are magnified even more.

After analyzing the results and speaking with people, it can be said that the habits mentioned in the survey were acquired by people mainly because they were the ones who paid the electricity and water bills, and when working in an office, all these expenses are assumed by the companies. However, this is not due, according to the analysis, to a consequence of discontent with the company or superiors who pay for the services, it is merely due to a culture of not taking sufficient care of what does not belong to us or "I don't do it because they didn't tell me to."

One of the respondents (24 years old, man) mentioned that while working at home, he was aware of the expense that this waste implied for his parents, so he tried to use as little electricity or water as possible, however, when he was in the office these habits disappeared. At that moment, he was asked the question: "And why didn't you continue doing the same thing in the office?" To which he responded "I don't know, since my family didn't pay for it, I assume that's why I didn't fully notice. Besides, everyone uses electricity and water without limitations and the company has never said they had a problem with it, so subconsciously I stopped caring."

**Graphic 4: Responds of interviewees**

(Answers of 10 people)



**Case study**

A case study was conducted to determine the patterns of water and electricity consumption during and after the pandemic talking as an example a family of 3 and the workplace of the father: a faucets company in Peru. This specific example was chosen because it is a business with few employees in the administrative area (14), and the owner of the company has a family of 3 people. Having few people involved makes it an easy case to analyze as a first step, instead of conducting a study in an internationally known company where analyzing it would be much more complex.

To do this, water and electricity payment records were obtained for the months of October 2020 and 2024, both at home and at the workplace. The idea is after obtaining the records, analyze the information and be able to recognize the difference in energy and water expenditure during and after the pandemic, both at home and in the office. In this way we can determine if there is a relationship with the usage patterns between expenditure in the workplace in relation to expenditure at home, and if the decrease in one factor has to do with the increase in the other and vice versa.

	Electricity	
	Home	Workplace
2020	199.00 kW	145.00 Kw
2024	139.00 kW	916.78 kW
Difference	-60 kw	771 kW

	Water	
	Home	Workplace
2020	372 m3	56.50 m3
2024	120 m3	262.20 m3
Difference	-252 m3	205.7 m3

Once the data was obtained, an analysis was made by calculating the expenditure per person for both water and electricity in the 4 situations (in the office during/after the pandemic, and at home before/after the pandemic). In this way, we were able to determine in which situation an individual on average spent the most energy and water.

**Electricity:**

### At home

$$2020: 199,00 \div 3 = 66.33 \text{ kW}$$

$$2024: 139,00 \div 3 = 46.33 \text{ kW}$$

### At work

$$2020: 145,00 \div 14 = 10.35 \text{ kW}$$

$$2024: 916,78 \div 14 = 65.48 \text{ kW}$$

### Water:

#### At home

$$2020: 372 \div 3 = 124000 \text{ l}$$

$$2024: 120 \div 3 = 40000 \text{ l}$$

#### At work

$$2020: 56,5 \div 14 = 4040 \text{ l}$$

$$2024: 262,20 \div 14 = 18730 \text{ l}$$

Descripción	Potencia (W)
Congeladora-Freezer	1500
Acondicionador de aire (24°C)	1500
Ducha eléctrica	5500
Cocina a placa eléctrica (2 hornallas)	3500
Estufa	1200
Horno eléctrico	2700
Cocina eléctrica a inducción (2 hornallas)	2000
Heladera	300
Termocalefón	1500
Lavarropas	1000
Plancha	1000
Computadora	200
Microondas	1500
Televisor	150
Ventilador de techo	80
Foco común	100
Fluorescente	40
Foco bajo consumo	25
Focos LED	9
Licudora	300
Cargador de celular	10

In order to determine whether energy use was adequately used by workers in the workplace analyzed, the amount of kW that each device should generate approximately during the day was added, taking into account that workers start working from 6am to 7pm, the time when the last person closes the workplace. (13 h)

Next, the devices used in the company and the power they generate are marked. With this data, the amount of kW of each device could be calculated with the help of the formula:

$$\text{kWs} = (\text{W} \times \text{hours}) / 1000$$

By using this formula, not all devices were considered to be used 14 hours a day, but some, such as the television, chargers or lights, are used for less time and are not used all the time, as is the case with

computers for example.

After making an estimate, it was estimated that the daily power generated should be 18,4 kW. Then it was multiplied by 31 days of the month and the result was 570 kW per month approximately. However, the amount of energy used in the month of October was 916,78 kW. This means that an estimated 400 kW have been overused. However, it cannot be said that there has been a large waste of light, since electricity generated by other devices not included in the table must also be taken into consideration, such as printers, photocopiers or the coffee machine, devices used regularly, in addition to fixed electricity. This was demonstrated due to the energy expenditure during October 2020. During that

time, no one was working there in the office, however, an expenditure of 10.35 kW was still incurred.

While analyzing the data, a clear reduction in water at home was noted in 2024 compared to 2020 (more than 60% less). This finding was disconcerting; that is why each family member was asked why the reasons of it could be, and if there were some changes in habits that could have caused this considerable decrease in the average water consumed per person. Some reasons were mentioned:

1. First of all, it was mentioned that during the pandemic, the family used to turn on a pool of water every day so they could hear the water falling while they ate lunch. Lately, they no longer do that.
2. The family bathed the dog once, even twice a week in a tub at home. Now they bathe him at the vet.
3. An important factor is the fact that in 2020, all family members played sports and bathed regularly twice a week. Lately, most of the time after exercising they shower at the club where they do sports, that is why some days they do not shower at home.
4. Finally, two of the three inhabitants are out of the house most of the day, so not much drinking water is consumed at home, as it used to be during the pandemic. That fact is important to mention because bottled water was not bought, but rather a filter from the kitchen sink.

Overall, after performing a data analysis, it was observed that in the case study, the pandemic expenses at home are generally proportional to the expenses in 2024. This means that, in this specific case, the change to remote work during the COVID-19 pandemic does impact the water and electricity consumption patterns of people within the company. This contradicts the above-mentioned results and the results obtained in the surveys and interviews. However, this may also be due to the fact that the case study is about a family business, and since there are few employees, they are not so distant from the owners, thus creating a link in a certain way, and a little more consent regarding the expenditure of resources.

## **Discussion**

The study mainly highlights a contradiction in the results obtained, which may be due to two types of circumstances. The first behavior, obtained through surveys and interviews, demonstrates a significantly diverse behavior in workers' habits during and after the pandemic. There was a decrease in the environmentally conscious habits that workers acquired at home during the pandemic, such as turning off lights and unplugging devices, as employees returned to office environments. On the other hand, another behavioral pattern could be noticed when comparing the results of the case study in a family business

in Peru. There was no major difference between the patterns obtained at home and in the office with respect to resource expenditure.

The decrease in sustainable practices upon returning to the offices of respondents and interviewees suggests that environmental awareness may be a lower priority in massive corporate environments, where one works for a large company compared to a family-owned one. Taking into consideration and analyzing the participants' responses, this difference is generally due to a lack of interest in taking care of everything that does not belong to us directly, as well as a lack of information about what uncontrolled consumption of energy and water generates in the environment in the long term.

However, after carrying out the case study, another factor can begin to be noticed: not only do people take less care of what is not theirs, but when being in a small work environment, where most everyone knows each other, a person unconsciously reduces that careless behavior, and begins to worry more about what could be said to be another's problem. In this case, that problem would be the water and electricity expenditure generated within the company.

When analyzing the responses obtained, the difference in the responses was not due to the impact generated by remote work from home during Covid-19, but rather their work environment, and how related or how alienated they felt to the company. This could be observed in the comparison between the results obtained on water and energy consumption patterns in large global companies compared to family businesses.

These findings show the importance of the work environment, instead of the impact that the pandemic had on consumption patterns. Although one generally takes much more care of resources when working at home compared to in the office, the relationship one has with the owners of the company, and the size of the company, also depends on the behavior of the workers, and therefore also on their patterns of water and electricity consumption. The pandemic may have in some cases created awareness about how we take care of resources, however, this was not an important factor, especially at present.

Despite finding interesting facts, the study has certain limitations. Firstly, there is not much research done on the subject, so it was difficult to find reliable sources that provide information on any data related to the research or that can contribute as a case study; for this reason, a case study had to be carried out from scratch. Another limitation is that the sample only contains participants who work in an administrative environment at work. Due to this limitation, in order to obtain more varied results and generate more varied research, the surveys and interviews were conducted with people from different jobs in different companies and in different countries. Another aspect to take into consideration is that many of the interviewees could not give a concise or accurate answer as to the reason for their response in the interviews. Many responded in a doubtful manner, so

their answers in many cases were not entirely valuable for the research. Future studies should consider larger sample sizes to validate the findings of this small-scale study, and to obtain the opinions of many more people. In addition, it would be beneficial to have expert opinions to avoid vague responses from respondents.

Considering the above research, we can get an idea that in general, the biggest problem when wasting energy and water in a workplace is the lack of awareness of the workers. It is known that in order to raise awareness among the majority of the population, it requires many years of training, and it is not something that can be achieved overnight, especially in third world countries where the word sustainability is almost non-existent. For this reason, we then investigated some energy and water saving options that work independently, without having to depend on the behavior of the workers.

A very effective way to reduce energy in a workplace, without depending on the workers behavior is using smart lighting, that means motion sensors to control the lights in areas where lighting is not always required, such as bathrooms, meeting rooms or some less busy hallways. In this way, one no longer must waste energy that is not used and companies in such workplaces do not have to worry about their workers forgetting to turn off the lights when leaving the space. Energy is only used when required. Along with this, programmable thermostats can also be installed to adjust the temperature based on occupancy; this allows the amount of air conditioning or heating to be proportional to the number of people in the space and not waste extra. There are situations where the air is turned on and enough air comes out to satisfy 10 people, when there is only 1 person in the room. Another option, with a lower budget than sensors, is to change to LED lighting, at least in strategic places where greater use of light is required. This type of lighting consumes much less energy than conventional light bulbs, and has a longer lifespan compared to traditional lighting.

Regarding water conservation, a measure that many places around the world are already implementing is the use of Sensor Faucets, especially in the bathrooms. These sensor faucets use motion recognition technology to activate the flow of water automatically when it detects the presence of hands. By activating only, when necessary, these faucets help minimize water waste to a minimum, and prevent water from running for longer than necessary. Another well-known measure is the dual Flush Toilets. They allow the user to choose the amount of water needed based on the type of waste, resulting in significant water savings compared to traditional toilets that use only one amount of water per flush. However, an important factor is to perform a water system check every so often to detect if there is a problem or if everything is working correctly.

## Conclusion

Remote work during the COVID-19 pandemic was expected to impact individual water and electricity consumption patterns, however, during the research, the study took a 180-degree turn. Despite everything pointing to the fact that the pandemic had created a great impact on the population with respect to the expense of water and electricity when working and that the current standards of workers would be related to remote work during Covid-19; however, this assumption was far from being correct.

The fact of working at home and assuming all the expenses of water and electricity, one could become aware, however that is not a key factor for the current behavior of workers, who are now in a workplace. The truth is that for most people that time working at home was a “stage in their lives”, and now they continue to assume the same behavior they had before the pandemic. A takeaway from this research is that, although the pandemic did not impact consumption patterns in the workplace, in a certain way it did change patterns at home, indirectly.

Despite concluding that the pandemic had no impact on workers’ water and light consumption patterns at their workplace, it is important to note that there are certain patterns that could be noticed during (working from home) and after the pandemic (working in the office) in the participants, especially in people working in large, mostly global companies. The theoretical findings of the study reveal a significant change in consumption patterns due to the shift to remote work. During the pandemic, people became more conscious of their energy and water usage at home, leading to increased awareness of resource consumption.

This study concludes that when people are directly responsible for utility costs such as water and electricity, they exhibit more sustainable behaviors. However, when workers returned to their offices, many of these habits decreased, indicating a disconnect between personal responsibility at home and perceived responsibility in shared workspaces. The results of this study also indicate the importance and urgent need to implement policies that promote sustainable practices in most work environments, in this specific case, in white-collar environments, where people spend most of the day at a desk with their computer working. Companies and/or organizations must realize that while remote work has fostered greater awareness of water and energy consumption, this awareness apparently stayed at home. Upon arriving at the conventional office environment, most workers forgot these customs and chose to continue with the same behaviors. Therefore, it is important for policy makers in companies to integrate sustainability practices into work cultures. This could include initiatives such as energy-saving campaigns, but above all, measures that are external to employee behaviors, in order to ensure the proper use of resources.

Future research could delve deeper into the findings obtained in the study. Various cases could be analyzed, similar to the case study, but in different countries and different companies, for example, a local, national or international company. This would offer a

broader understanding of behavioral changes in different situations. Another important aspect is that the present study can serve as a basis for other researchers to ask more technical questions to specialists in the field. In this way, information would not only be obtained from workers, but from professionals who could complete the research.

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