



**EISBJERGHUS INTERNATIONALE
EFTERSKOLE**

Project title:

Water usage at Eisbjerghus

Name of school:

Eisbjerghus Internationale Efterskole

Country:

Denmark

Team name:

Eisbjerghus Internationale Efterskole

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Rammerne for opgaven, se i link: https://waterislife2018.jp/wp/wp-content/uploads/2017/08/Information_Pack2.pdf

Marginer op/ned/højre/venstre, 1,5 cm. To kolonner á 8,5 cm med afstand på 1 cm



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Water usage at Eisbjerghus

1. Abstract

At Eisbjerghus we are about 100 students, who use many litres of drinking water everyday. We have therefore chosen to focus on our own usage of water, in general, in the students' - and common rooms, for sanitation and cleaning, as well as in the kitchen.

By that, we will include the entire school to get an idea of the consumption and thereby to get the best possible insight on how we, as a community, can reduce our annual water usage. We will manage the formulation of the problem by including the school's "Energy Team", where the four of us, as representatives, will be put in the position as the speakers.

We will be looking into these challenges by seeking solutions within both behaviour among the students and the staff at the school, as well as with technical solutions based upon the statistics that will contribute to our future research.

We will, among many things, be looking into how we can exploit the yearly amount of rain we are provided with in Denmark, and how we by that, can use our facilities at the school to save a greater amount of clean water annually, as well as how we can make use of recycling water for the case of sanitation, among others.

The term 'efterskole' is a unique and really Danish term that has a very atypical structure compared to more common schools. The idea of an efterskole-year is that you move into your chosen school and by that live at the school together with other youths typically between the ages of 14-18. Many 'efterskoler', usually offer a variety of 'study-lines' focusing on different topics, whereas Eisbjerghus International Efterskole has its focus on being international by traveling and educating in the field of different cultures and developing intercultural skills

2. Keywords

- Recycle
- Behaviour
- Reduction of water usage
- Local
- Efterskole



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3 The purpose of the research

The purpose of the research is to enlighten the students of our school regarding our own water usage and how we can reduce it on a daily basis. We would like to elucidate the awareness of the urgency regarding water issues. This, because of the research showing how severely it can influence the environment and thereby lead us in the wrong direction, ending up with limited access to clean water in the future. The water cycle might ensure that water is an option, but can definitely not guarantee the quality of the water, which we tend to take for granted. This we would like to shed light on.

Therefore we would like to look through exploit the water cycle in the best possible way which can ensure a healthier water consumption. In order to fully understand Denmark's circumstances regarding water sources.

The groundwater in Denmark is the source to all water usage which means that it goes through a natural cleaning filter process as it goes through the stratum of earth. This is possible as we in Denmark is assigned a great amount of precipitation annually.

4. Method of the research

We have been involving the rest of the school in our project by using surveys, to arrange a project day, with water as our heading, and pass on our knowledge about the schools water usage to the other students at the school. As of the technical part we have focused on how to recycle water at Eisbjerghus both in the rooms, the kitchen and by researching the precipitation in our local environment. We are going to arrange a competition, where the students have to make a 2-3 minutes video concerning our water usage at the school, and how we can reuse the water. They also have to make a poster with some special criterias e.g they have to have visual expressions and specific colors on the poster. The poster also has to contain a slogan regarding water conservation.

We have divided the students into groups of 8-12 people consisting of what, we at the school refer to as 'Contact groups'. The contact groups are the people living together or next to each other. We chose to do this, as we figured that would be the best possible way to achieve the greatest outcomes as there generally is a better mutual understanding of one another's needs, when sharing living conditions. We made sure that there would be a prize for the winner, so everyone would be more motivated and thereby do their best. We have contacted the organisation "Clean Cluster". Their main focus is to make the planet reliable on sustainable resources, and they are in big favor of recycling. Our intention was for them to come to our school on the project day and be the judge of the competition. Unfortunately they declined, but we are in the full process of finding a new and suitable judge.

We are in the process of planning an entire day, where everyone, students, staff as well as the kitchen staff will be focusing on their water consumption. Thereby not indicating that they are not allowed to take a shower, but making them aware of how much time they spend in there. At the school we have many different rooms where we spend a great amount of our day. The different rooms are on different geographic locations, and thereby also different lengths away from the original water source. We examined the water in the bathrooms in different rooms at the school, to find out if the speed on the showerhead and the taps are different from room to room. We discovered that in terms of how much



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water was discharged from both the tap and the shower head all together, there was a surprising difference when looking at the different rooms. This showed us that in 1 minute of use, of the two water sources, there could in some cases be a difference as huge as 1-2 liters, depending on which room we tried.

Storing of water:

We have thought of different methods to assemble precipitation. An underground storage tank would be the optimal way of collecting water, due to our steep ledges, right next to our school. This means we can build pipes that would lead rain water from the roof, to the underground tanks. The pipes would be build with a filter that sorts the leaves from the water. The reasoning is that we would like to restore our rain instead of it all just running out in the sewage. In Denmark our rain water is fairly clean, and so is our groundwater. We were thinking of using rainwater in our toilets, instead of drinking water. As previously told we are about a hundred students at our school. As we live at the school, cleaning plays a servere part for sanitation, hygiene as well as to prevent illnesses. By this means all areas, including the rooms, are cleaned every day, some areas, more than once. Therefore great amounts of water are used for cleaning as well. The difficulty of this situation is to find a way where both water usage as well as hygiene are given priority. The same dilemma is put up when looking at the water usage in the kitchen.

The kitchen provides foods, which includes both meals and snacks, for all students as well as staff members 7 times a day. Besides that the kitchen cleans and rinses plates, glasses etc. several times a day, using water as well. This is where we imagine the possibility of recycling could come in handy 125 along with using it for toilet flushes. We're going to have an interview with our kitchen chef and our caretaker at the school, where we will question them regarding their water usage and thereby see how they can decrease it regarding their annual usage, with them still being able to do their work.

5. Results of the experiment/ research

We have conducted a survey to get an idea of how the students' relation with water usage actually is, and to show habits that might be changeable. We had 70 students answering, and the first question went as following;

It is important to mention that In Denmark, older toilets usually use 9 Liters of water if not more, while newer toilets have two buttons. One for a big flush, which is usually 6 Liters of water, and a small one which uses 3 Liters.

Which leads to the next question.

Question:	Answer:
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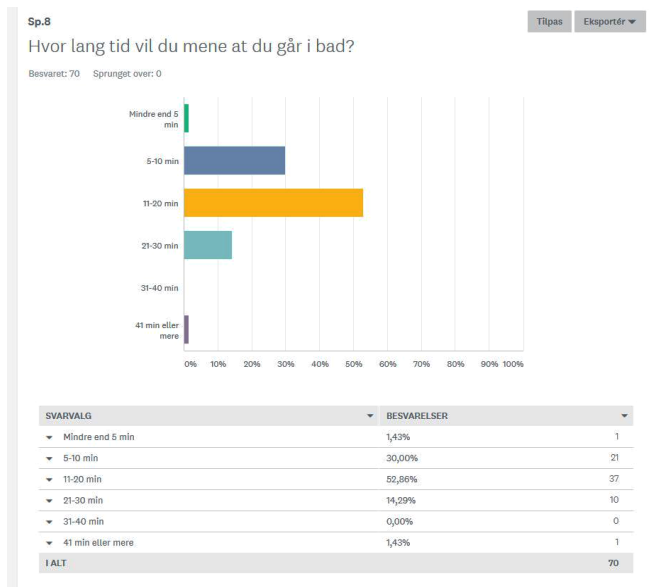
How often do you take a shower?	1-2 times a week 8,57%. 3-5 times a week 72,86%. 6 or more 18,57%. 61,43% said yes, while only 38,57% said no. With these answers, we can now take into consideration which things would be better to keep our focus on, where we can improve, and where it is unnecessary. An example could be the next question.
Do you let the water run while brushing your teeth?	4,29% said yes, 95,71% said no.
How many times a day, do you flush the toilet?	1-2 times a day:18,57%. 3-5 times a day: 70%. six or more:11,43%.
Do you notice which button you press, when using the toilet	75,71% said yes, and 24,29% said no. (It is, as previous told, important to mention that In Denmark, older toilets usually use 9 Liters of water if not more, while newer toilets have two buttons. One for a big flush, which is usually 6 Liters of water, and a small one which uses 3 Liters.)
Do you let the water run, while washing yourself?	72,86%. 6 or more 18,57%. 61,43% said yes, while only 38,57% said no. With these answers, we can now take into consideration which things would be better to keep our focus on, where we can improve, and where it is unnecessary. An example could be the next question.
Do you think about how much you shower	77,14 yes, 22,86% no.
For how long would you estimate you shower	Less than 5 minutes 1,43%. 5-10 minutes 30%. 11-20 minutes 52,86%. 21-30 minutes



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	14,29%. 31-40 minutes 0%. 41 minutes or more 1,43%. Less than 5 minutes 1,43%. 5-10 minutes 30%. 11-20 minutes 52,86%. 21-30 minutes 14,29%. 31-40 minutes 0%. 41 minutes or more 1,43%.
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Figure 1: Shows the amount of time used showering.





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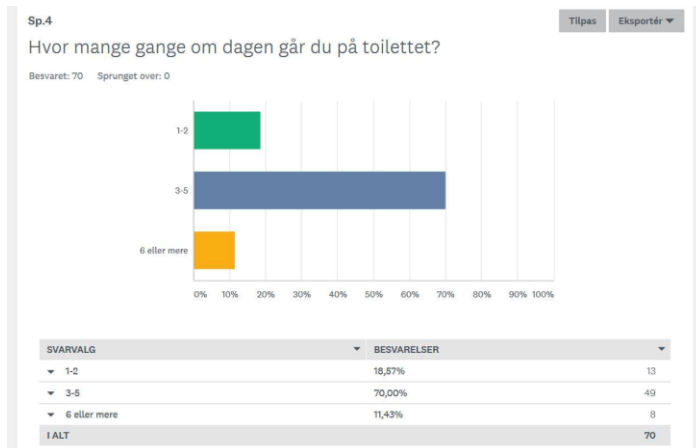


Figure 2: Shows how many times a day flushing the toilet.

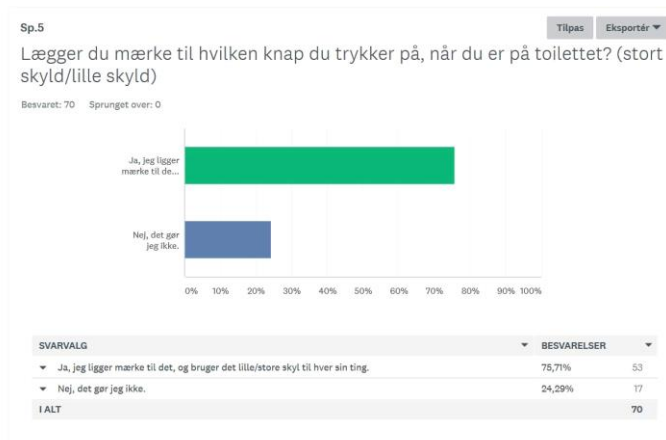


Figure 3: Shows the awareness of which button to press when flushing the toilet.



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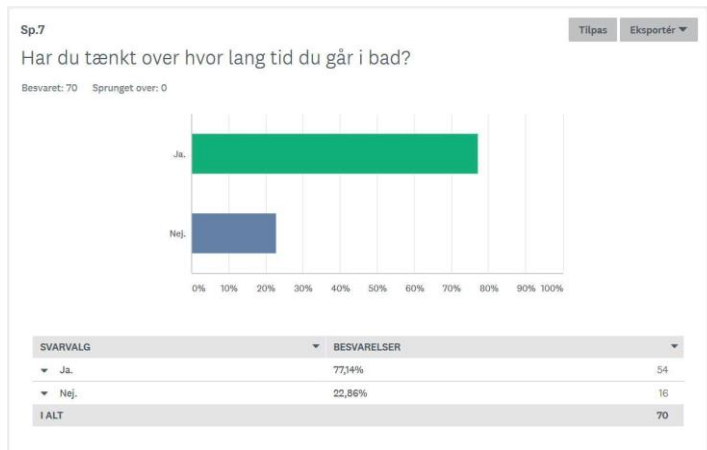


Figure 4: shows the awareness of how long you shower.

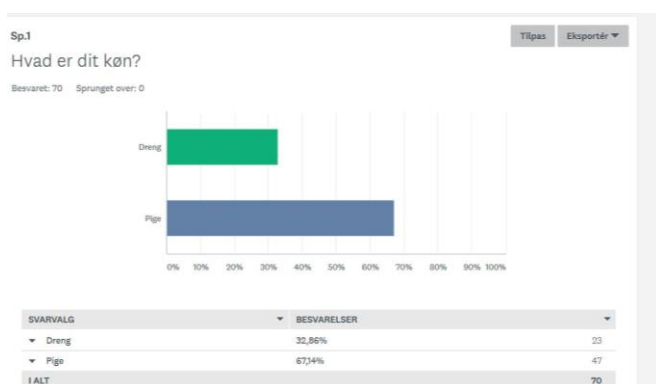


Figure 5: Shows the gender.



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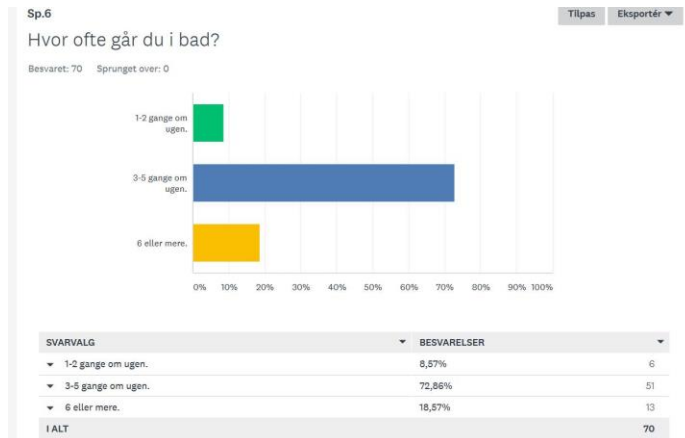


Figure 9: shows how often you shower.

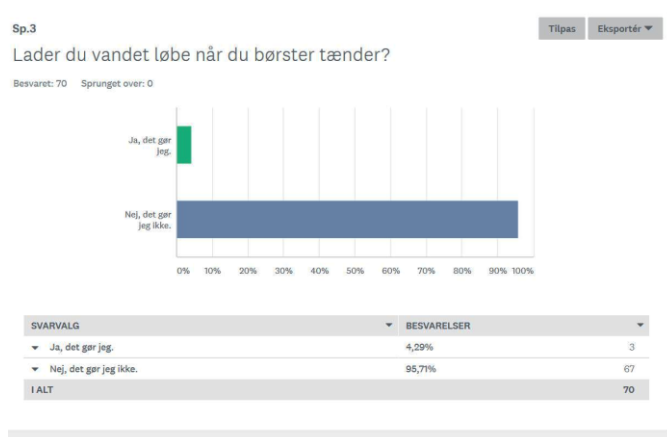


Figure 10. Shows the awareness of letting the water run, while brushing teeth



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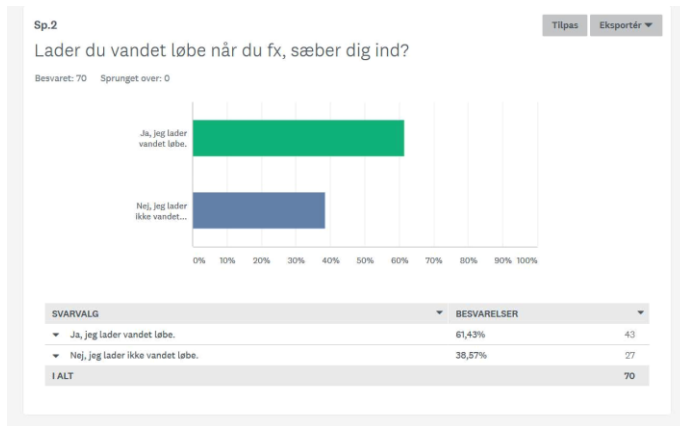


Figure 11: Shows the awareness of letting the water run, while washing yourself.

From this survey and the numbers it has lead us to, we can thereby look into where our main focus should be placed, according to the students of our local environment. Our main problem is located around the focus of the estimated long showers people tend to take, as we tested the water runs from different rooms and discovered that in one minute of showering 6-8 litres water were used. Besides that it is servere to acknowledge the fact that many are not aware of the daily changes they can make towards this, as it seems for an example that 24,29% of all students do not hesitate when pressing buttons after visiting the restroom.

To get the best idea of how much water, we can collect from the roof of the school, we calculated how big the area of the roof is. This, for recycling. We have found the numbers mentioned below from Google maps.

$$\underline{1\text{ cm}=6,45\text{ m}}$$

Place	Measure
Grey Hall	$3,1*3,1 = 9,61\text{ cm}$
Annex to grey hall	$0,8*2= 1,6\text{ cm}$
Classrooms	$2,8*1,6= 4,48\text{ cm}$
Assembly hall	$3,4*1,8= 6,12\text{ cm}$
Student rooms	$5*2,3+2,5*2,1= 16,75\text{ cm}$



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Main building	$2,6 * 1,6 = 4,16\text{cm}$
Dining hall	$0,9 * 1,2 * 2 + 2,5 * 0,6 + 3,3 * 0,8 + 1 * 0,2 = 6,5\text{cm}$
Bicycle shed	$1,8 * 0,9 * 4 = 6,48\text{ cm}$
<i>Results:</i>	$6,45 * 55,7 * 6,45 = \mathbf{2317,25\text{m}}$

The Danish Meteorological Institute was the website we used, to get a general idea of how much rain we have had last year. It suggests that 125mm precipitation has fallen in that period. The school has existed since 1997

We have collected data of our water consumption since our first day at school, 10-08-2017, till recently, 10-01-2018. The price per. m³ is 65 danish kroner, which is 8,73 €, and 1.137,94¥.

At the end of our research, we wish to have made a noticeable difference in our schools water consumption. The ideal scenario would be that the students habits, regarding water, would changed for the better. We are aware of that our own commitment will affect the rest of Eisbjerghus International Efterskole, and we aspire to end the project satisfied with not only our own effort, but also all the participants.

6. Conclusion

To conclude, our main project consists of our focus on the behaviour and change of mindset according to water as well as the focus on the water usage at our school itself. We will ensure a good process by including the rest of the school and thereby also enlighten the different water habits there might be. Besides that we will take action by innovation according to recycling and thereby do research according to precipitation where we will include our local waterworks as well as companies that engage themselves to the case of water and the issues followed . All in all we hope that the results of our overall project will increase the engagement, the ambitions as well as create possibilities that will account for a change of behavior.

7. Acknowledgements

We would like to thank the students at Eisbjerghus International Efterskole who participated in our research. A big thanks to the management of the school and our amazing two teachers for the help and support we needed throughout this process. Our two teachers have taken a lot of their spare time to help us understand, cooperate and keep our minds at the right place. For that we are deeply thankful.

8. References The reference section should not be numbered (Please use the style Reference heading).



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<https://www.dmi.dk/vejr/arkiver/vejrarkiv/>

<https://www.google.dk/maps/place/Eisbjerghus+Efterskole+-+European+International+School/@55.458079,9.8713249,17z/data=!3m1!4b1!4m5!3m4!1s0x464c955cebba8609:0x13ccc3e183c50666!8m2!3d55.458079!4d9.873519?hl=en>

<http://vejr.tv2.dk/2018-01-08-danmark-fik-historisk-meget-regn-i-2017-se-hvor-meget-din-kommune-fik>

