

Opening Slide: This excerpt lasted 15 seconds. Do you know how many liters of water it differs between the dripping faucet and the running shower?

Slide 1: More than 2 liters! Enough drinking water to sustain yourself for one day. More than 2 liters! That's wasted in your shower and mine within 15 seconds.

Slide 2: Now imagine. Extreme drought. It's arid and dry everywhere you look. The Sun squeezes the last drops of water out of the ground. You feel the tingling sensation in your mouth that screams for water. What would you do for a glass of refreshing water?

Now imagine; not you. No, your children, your parents, your loved ones begging you, dying of thirst. Do you have some water for me? What would you do for a glass of refreshing water? Would you drink your own urine?

Slide 3: This does not happen here in the Netherlands. When we want clean drinking water, we simply turn the faucet on. We even do a lot of things at the same time without thinking about it. We wash our hands, dry them, and meanwhile, the faucet keeps running. Only when our hands are dry do we turn it off. Sounds familiar? It does, to me at least.

Water is of extreme importance and we use water for everything. More than 100 liters of water per person per day. And this is not just any water. No, this is clean drinking water. It has become so obvious and normal for us that clean drinking water is available out of every shower, toilet, and faucet that it is hard to imagine what it is like to be thirsty. Just imagine living a week without clean drinking water, who would voluntarily choose to do that?

Slide 4: But water is not so readily available to everyone. Water is scarce. Just look at the total distribution of water on the globe. 97.2% of it is salt water and only 2.8% is fresh. From that fresh water, 2.1% is locked in ice caps and glaciers. The vast majority is not suitable for human consumption!

Slide 5: So this small amount of water that is suitable to drink is all we have. "We" meaning literally all of us. And the world population is increasing and this increase is accelerating rapidly. In 1990, when I was not even born, there were 5.3 billion of us on this planet, 25 years later in 2015 we number 7.3 billion and the most recent forecast by the United Nations indicates that in 2030 8.5 billion people will live on this planet.

Imagine distributing the same amount of water to more and more people. Who will be allowed to drink? Or perhaps a more important question; Who will be forced to remain thirsty? Are we going towards a future where money determines whether you are allowed to drink or not? And who here would accept that? Who?

Slide 6: And that available potable water is spread across the world disproportionately. If you look at the Middle East you will see a large red region where the water stress is very high. Water stress is a measure in which the society can sustain itself with drinking water.

This region has more problems aside from a growing population. Climate change will significantly affect this region and it is also politically unstable, which has recently led to many refugees coming to Europe. And even these countries in Europe where the refugees get first aid are starting to turn red.

But the same applies to water stress during the trip. How would you give your family anything to drink on your trip from the Middle East to Europe? Liters of water on your back? Beg along the way? This is a problem.

Slide 7: And it is not just a small problem. A lack of potable water can be deadly. According to UNICEF, 748 million people don't have access to clean drinking water. I cannot comprehend this. 748 million. That really is 748 million too many.

Slide 8: I am Danny Wagemans, 22 years old, born in Erp, less than 5 kilometers from here and study nanotechnology at Radboud University in Nijmegen. After my bachelor's in both chemistry and physics, I decided to study for half a year in Munich for my masters' degree. I applied for an ERASMUS scholarship and was assigned a spot in this beautiful OLYMPIAPARK. Everything ran like clockwork and I braced myself for a beautiful autumn semester.

Slide 9: I got to know a lot of new people and I enjoyed myself to the fullest. And if you think about autumn in Munich, then it's time for the Oktoberfest. But autumn 2015 was also the time for something quite different. It was the peak of the refugee crisis in Germany.

Slide 10: 40,000 new refugees had already arrived in Munich that week. And every train that arrived at the central station brought 500 new refugees. On Saturday, 12,500 thousand new refugees arrived in Munich within 24 hours. The refugees from earlier that week did not have proper shelter. But there was a lack of clothes, food, and water as well. It was a mess.

Slide 11: Witnessing such a need touched something in me. I was moved by seeing this. Every day I went there to a beautiful and grand university in the heart of the city. I got very good grades and then went back with a stunning S-Bahn to a marvelous neighborhood in Munich. But on my interchange on the central station, I saw what I needed to see. I saw the despair in the faces of the refugees. I still remember. I still remember it very clearly. I saw the doubt in a man's eyes and thought to myself. Yes, that could have been me. But was I so lucky while they had nothing? Is this it? Do I have to look the other way and focus on the upcoming exam, making sure I get a good grade for that. Or was there anything else I could do? Having the privilege of living the life that I am living right now, I felt guilty. I had to do something.

Slide 12: So I started to think. And I began talking about these feelings that I just described. Am I alone? Or would someone else feel this too? I came into contact with an organization called socialERASMUS. They connect students to voluntary work. And I came to work at the Erstaufname in the Bayerkaserne. The erstaufnahme is a place where refugees receive first aid. Things like shelter, clothes, food and water. It was inspiring to be there and to help where it all happens, but I couldn't contribute optimally there.

So at the same time, I began to think ahead. I didn't study nanotechnology without reason and wondered what I could contribute to the life of a refugee with that knowledge. Okay, so the thinking process began. What does a refugee need during his trip from the Middle East to Europe? Okay, food, electricity, water. And what do they have? Well, that's different in each case, but one thing that every human being has in common is the need to do a number one and a number two. But how do they do that during such a trip? Inspired by the circular economy, I wondered if there was any value left in this human waste. Urine is 95% water. Is it not crazy that you're thirsty while urinating? And is there, perhaps, more value in urine that we can still use?

Slide 13: And guess what. It is possible! It's possible due to the recent discovery of the filtering capacities of graphene. Graphene is a very new material that has very small pores. So like I said urine is 95% water and water is about this big. The rest is 2.5% salts, which are already slightly larger, and 2.5% larger organic molecules. The

waste products. With the filters now on the market we can already block those larger organic molecules, but the salts and water just pass through. By using graphene as a filter, these salts can also be blocked and only clean drinking water can pass. But there is even more value in urine. Those larger organic molecules that I mentioned still have residual energy that can be used by bacteria to produce electricity. Exactly enough to charge your phone! With this idea, I won a \$ 50,000 scholarship last summer to study in Silicon Valley.

This is a beautiful future, but unfortunately, it is still far from reality. Scientists around the world refine the science and when the technology is more mature, this bottle will be produced. Until then, work, dedication, and passion will be expected. This isn't problematic, however, because I realized something more important during this process. I learned a new lesson about myself.

Slide 14: As a kid, I wanted to be rich. Filthy rich. Riding my bike across the Veghersedijk towards the Zwijsen College in Veghel, I dreamed of driving around in a beautiful car, living a big house and becoming a millionaire.

And, I still want to be a millionaire. But I want to be millionaire according to a new definition. I do not want to be a millionaire because I have 1 million euros in my bank account. No, I want to become a millionaire because I helped 1 million people. In this way, wouldn't everybody want to be a millionaire?

So, this makes you thirsty.

Thank you.