Intelligent geyser to give SA a handle on resource consumption

By Cari Van Wyk

28 Jun 2016

The Water Research Commission (WRC) hosted a Youth and Water Entrepreneurship dialogue on 22 June, which saw youth entrepreneurs pitching their water innovations to experts and leaders Dragon Den style. I spoke to Dr Thinus Booysen, a senior lecturer at the Electrical and Electronic Engineering Department at Stellenbosch University, who is part of the team that brought South Africa the intelligent geyser system.

Tell us about the intelligent geyser and the technology behind it.

Thinus Booysen: The intelligent geyser is based on the notion that, in the new Internet of Things domain, we are able to control things that have not really been intelligent and not accessible to the average user. So we've created a system that gives you a handle on your geyser – to control it, to get readings from it, and to perform some analysis which gives a more intelligent control of your geyser.

How did all this start? What inspired you to develop this technology?

Booysen: We wanted to do something that's useful. Engineers exist for the sole purpose of making things easier, I think that's our purpose in life. The two problems we identified were energy and water restrictions and limitations, so we wanted to save energy and water. Being a lecturer, one of my key drivers is to help people understand what they are doing and to give a bit of perspective on the natural environment.

All of those things came together neatly in a geyser control where you have something that consumes 32% of household energy and quite a lot of water as well. In South Africa we have 5.4 million geysers and combined they use in excess of 500 billion liters of water annually. If we had a grip on this, we can help people understand how their consumption patterns lead to their expenses and we can do quite a bit with that.

▦ *Why did you pitch? What did you want to achieve?*

Booysen: First of all, we would like to create a bit of awareness of what we're doing. I think people often think that technology is not meant for Africa and that the general population here aren't comfortable with technologies and see it as a foe rather than as a friend. For example, just the term smart metering gives folks a bit of anguish and angst because they get their electricity or water supply cut off by it. So this is really just an opportunity for us to spread the message that this could be something good. As an example, our technology allows you to break down your daily consumption. You can very easily see that, for example, your bath was R5, which is actually quite useful.

We recently returned from Mpumalanga where we did our first ten installations in the province and it was wonderful to see how excited especially poor people were about the fact that they can control their geyser remotely from work. They don't have to come home, turn the geyser on and only after an hour have hot water. They can turn it on an hour before they go home and have hot water immediately when they get home. And we can help people save energy – some of the experiments actually showed that you can save up to 30%.It's just a matter of intelligently controlling the device.

We're hoping to make an actual difference, to have people benefit from it. If we can get somebody to buy in and say they are willing to sponsor a thousand of these in a township somewhere, then we've really achieved more than we could hope for. We're busy with a project to install 300 now in Mpumalanga in Mkhondo and Chief Albert Luthuli, and before that we had installations in the Stellenbosch area.

▦ *How user friendly is the technology? Is there a bit of training involved when you first install it?*

Booysen: It takes about 10 minutes' worth of training. The layout of the readings allows you to clearly see what the current temperature and flow rate is, it's very intuitive. It also gives you a nice list of your consumption for the day. You can see that it didn't burst. You can see when it is and isn't supplied by power as it is on scheduled control through our system, and when the element is off. Its things like this that makes it easy to understand. In a very neat way, it tells you what happened at what time and how much it cost you. It's fairly user-friendly and easy for people to learn how to control it – on, off or scheduled.

⊞ *Do people need an internet connection to monitor the geyser?*

Booysen: We are dependent on an internet connection and a device with which to access the website or app, like a smartphone, tablet or computer, and an email address. It has proven to be a bit of a challenge in Chief Albert Luthuli, but in bigger towns like Mkhondo, most people had access to the internet.

⊞ *How will your project/technology impact on water and other resources, the way these resources are used, etc? What difference can it make?*

Booysen: We've run an experiment here in Cape Town and, just to give you one very optimistic view of it, one participant reduced their consumption of hot water per day from 500 liters to 320-350 liters. That's about a 40% reduction already in terms of water consumption. In terms of energy consumption, we were able to achieve about 30% reduction in energy without any effect on the consumer. They didn't even notice any changes.

We've also seen some users just don't care and it's typically the very affluent who don't care about the expenses – they would just keep on using as they do. On the other hand, we've also experienced behavioural changes which saw a reduction of up to between 40-45%.

⊞ *Essentially, with technology that has this kind of potential for water and energy saving, it should become a standard in every household. Now more than ever with water resource challenges facing our country. Do you have any plans to collaborate or partner with government or municipalities?*

Booysen: The technology that we've made just attaches to your existing geyser, so it's quite small and simple. We have been talking to the WRC and they have given the funding for the installations in Mpumalanga.

We're also partnering with MTN. They own most of the IP that we've generated because they are funding our research lab here at the University.

We've also been speaking to the Department of Environmental Affairs, who is doing a huge role out of RDP houses about including this solution as part of their smart metering solution.

ABOUT CARI VAN WYK

Cari Coetzee is a contributor to Bizcommunity Tourism, Agriculture and Lifestyle.
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