

Walking into the Light (literally!)



It all started back in 2010 with a simple question – why do we talk about energy savings so much, while we keep lamps lit all night? The idea of technology, after all, is to make our lives more comfortable. Chintan Shah created street lights that not only contribute to urban sustainability, but make us feel safe, comfortable and welcomed. As we approach them, Twilight lamps would light up gracefully as if they have been waiting for us.

The fear of darkness has followed the human race throughout history. Obscurity at night may be fascinating to poetic souls, but the majority of people strive for personal safety and tend to minimize their exposure to darkness at all costs. As a result, modern cities resemble incredibly bright clusters of light, which look beautiful from plane windows, but account for 40% of every municipality's energy bill.¹ Urban safety is dependent on outdoor lighting, but a lion's share of night lights is in fact a waste of electricity, as during the late night hours, there are sometimes no people who need the light around them.

How do we stop wasting electricity without compromising safety? Is it possible for urban citizens to have the right amount of light and only when necessary? In 2010, Chintan Shah, an engineer from Delft University of Technology (TU Delft), began researching statistics on energy consumption of lighting in Europe. He was astonished to find that outdoor lighting costs the European Union €27 million every night.² Furthermore, inefficient street lights contribute to the production of unnecessary CO₂ – a 500W street lamp, if lit for 7 hours a night, can single-handedly produce up to two tons of CO₂ a year.³ First driven by sheer curiosity, this engineer decided to use his knowledge of sensor technology to design a solution that would address the existing problem of inefficient lighting solutions.

It was evident that lights could not be switched off completely, but neither could

they be continuously lit. The idea behind Twilight is seemingly simple – lights can be dimmed instead of switched off and made to light up when human presence is detected. Motion-activated outdoor lamps were not a new idea, but the majority of them lit up in a sudden flash and would go out immediately. Chintan wanted to surround humans with a safe circle of light, which would accompany them as they walked: "it is a beautiful solution - you move and the light moves with you," he shares. However, the development proved to be a painstaking process, requiring excellent understanding of the very nature of sensor and wireless technology. The task was further complicated by the fact that outdoor sensors envisaged by Chintan needed not only to detect humans and vehicles, but also filter out movements caused by animals or wind.



In 2010, Chintan reduced his regular work week to three days in order to start experimenting on what became his passion and "idée fixe." As an alumni and a research candidate of TU Delft, Chintan received a tremendous amount of support, and was able to submit his project to the Delft Energy Challenge competition. Looking back, Chintan is certain that without TU Delft's support, Twilight would have never come into existence. As a winner of the contest, he received funding for developing a prototype and launching a pilot on campus.

The process of bringing such a product to the market certainly wasn't easy and the engineer remarks on the challenges of starting up in the energy sector overall: "high-tech developments require extensive investment – millions might be needed before you break-even." On top of that, uncertain outcome and a lot of work is what awaits those who venture. Having someone to encourage you during the initial phase is important and to Chintan, this person was his wife. Today, already CEO, he still stresses the value of having a partner and a team: "It's a 60-80 hours per week job, more so during the first years of entrepreneurship. Support is incredibly important!" However, he never doubted that the world desperately needed his solution. The first pilot tested in 2011 was a huge success, having attracted media attention, buyers and investors. In 2012, the city of Neunen became the launching customer, first of many to implement the intelligent street lighting solution that has been in development for three years. The launch coincided with investments, and that was when Twilight started its commercial operation.

Today Chintan Shah gladly states that the demand for Twilight lighting systems exceeds the capacity to meet it, which would be addressed through increased production in 2014. In 2013, the company installed 600 wireless sensors (called 'CitySense'), but this amount has increased up to 5000-6000 in 2014. "There is a huge demand worldwide, from America to South Korea, because street lights are everywhere, and Twilight's solution is a comprehensive answer to a range of existing lighting problems," the engineer explains. The company's current customers are primarily cities and industries while upcoming plans are to



Train stations in the Netherlands (Beilen, Meppel and Sneekveen); Park & Ride (Groningen); Industrial terrain (Assen)



setup a global distribution network and co-operate with large companies like Philips, Osram or General Electric. Twilight's CitySense is already widely implemented in Ireland and Germany and is on the way to USA, Canada and Australia. By adopting the Twilight technology, governments across the globe can significantly cut their electricity expenses and preserve urban safety. According to Chintan, the estimated ROI for this solution should be seen between 3 to 6 years – this is how much time is necessary to make up for the initial investment in annual saving costs. ●

TIPS FOR TALENT

You should always have a plan B, which you can fall back on when things go wrong. Never underestimate the value of previous work experience – it will help you, since not everything in making business is about technology.

¹ www.ee-streetlight.com, project financed by EU examination.
² www.ee-streetlight.com and www.lightajournal.com
³ www.ee-streetlight.com, European efficient street lighting