



PHILIPS

Living Experiments

Light up the dark

Tegnérparken, Uppsala, Sweden.
Global brand team



At Philips we believe we can
always make **life better.**

Through a series of living laboratory experiments we will provide innovation solutions and ideas to particular challenges in order to improve people's lives around the globe. Our lighting experiment in Uppsala, Sweden is the first of many experiments that bring us closer to achieving our vision of improving the lives of three billion people a year by 2025.

In order to truly make a difference in people's lives, all companies especially innovative ones, must adapt to the needs of a particular community or place. One size does not fit all. This fact is especially true for lighting.

At Philips, this insight has inspired us to launch an experiment in Sweden, the first of many 'living lab' explorations to understand how meaningful connected lighting solutions can have a positive impact on society. Collaborating with a group of families, stakeholders and local government, we set out to understand how changes in lighting can improve confidence, health and well-being.

The Philips 'Light up the dark' initiative has helped to transform an entire community in Uppsala, demonstrating that we at Philips have the technology, desire and ability to provide powerful solutions that can be tailored for users.

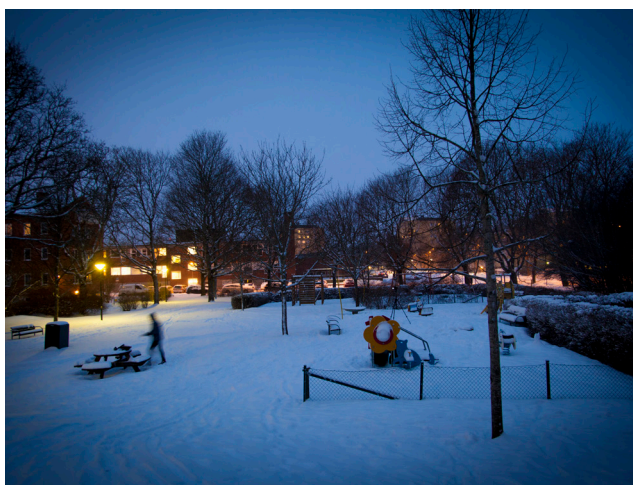
As a company, we know that innovation begins not by knowing answers but by asking the right questions and collaborating with those communities, stakeholders and individuals most affected. To contribute to society significantly, we need to listen to people, understand their needs and work with them towards concrete solutions.

Together with the lighting design consulting firm Bjerking and the municipality of Uppsala, we worked with the community to understand how technology could tackle a troubling societal problem. In iterative cycles, we formed a team of partners to analyze, innovate and implement an experiment with lasting impact.

Quickly, the group identified outdoor play spaces as the experiment's focus. Playgrounds are vital for a child's cognitive, emotional, physical and social development (reference i). Playing outside goes beyond exercise – it's a chance to make friends, use imaginations and develop social skills. But what if for many months of the year it's simply too dark to play outside during the day after school?

What the team has created in the town of Uppsala reaches to the very heart of the Philips philosophy – to use innovation in a meaningful and agile way to improve society, protect our natural resources, and transform people's lifestyles. And do so not just in the short term but for generations to come.

And it all stems from light. Or, more precisely, the lack of light.



Tegnérparken before



Tegnérparken after



How a living lab **can empower.**

Uppsala is a beautiful city on the eastern coast of Sweden, a 40-minute train journey from Stockholm. However, it is so far north that, during winter months – from October to March – there is often less than six hours of sunlight each day. Schoolchildren and commuters leave and return home in darkness, experiencing a deprivation of light that affects moods, motivation to work and physical health.

Building on the “living lab” approach to prototype ideas on the ground, our project team in collaboration with families and local officials – focused on innovation designed to improve the well-being of the entire community. We installed a state-of-the-art LED street lighting system – coupled with Philips CityTouch – in one of the city’s most popular green spaces, Tegnérparken, also

known as Giraffe Park. Surrounded by residential apartments, this small playground area is situated within a mid-size park.

Normally school ends around 3pm and children head straight home because it’s already too dark to play with friends outside.

Now, however, with the Philips CityTouch connected lighting solution, municipal engineers remotely manage precise levels of lighting at the park according to time of day and activity levels, which in turn allows the local children to play there even when it’s dark. In an era of constrained budgets, the ability to dim lights, reduce operating costs, use less energy and reduce pollution makes Philips CityTouch – both scalable and a valuable asset.

A design **vision**

The lighting design by Bjerking is very much satisfying Philips own lighting design spokesman Svante Pettersson. The system can also be personalized by changing color and vibrancy, a perfect example, says Philips lighting design spokesman Svante Pettersson, of how artificial light can completely transform environments and moods.

“As designers, it is important for us to try and understand what kind of lighting is good for you, how it can make you feel, how the mind reacts, how different kinds of light can make you feel different emotions. That was our starting point with the Uppsala experiment – to improve people’s moods and behaviors through light.”

In the Giraffe Park, the lighting designers were able to bring light where it really matters – directly on the jungle gym, the slide and the swings, for instance. Working with these objects, we created the feeling of a large space and park, yet at the same time made it more attractive and intimate as if it were a relaxing outdoor room. It was vital that we use light in innovative ways – instead of just a standard tone and brightness, we varied things, played with shadows. For lighting design, it isn't simply about light and dark, it is much more than that.

‘If we can adapt technology to suit people’s needs then we can create different types of atmospheres and colors to create different moods. We already do so in our own homes, changing light moods from room to room, so we wanted to take that concept and make it work in larger open spaces.’

‘There is still a lack of knowledge in this field because the effects of light on people’s behaviors is so subjective. So, through experiments like this, we as a company are able to learn from the

feedback our customers give us. We are asking questions and seeking answers. And we’ve never been able to work so intimately with a group of families, which makes this experiment particularly exciting.

‘So by learning, we can then adapt such a lighting system to other environments, where lack of light or poor light might be an issue, something which is particularly common in urban areas. Designers have a responsibility to address important societal issues like depression and crime, and it may be that light can provide some of those solutions.’

According to a forthcoming Philips report on light and its influence in urban spaces – Light for Public Space (ii) – **socio-political changes and technological advances are driving a new understanding of light’s social and urban role.** The report says: ‘This refreshing approach to public lighting moves beyond the constraints of roadway and functional lighting to focus on activating public spaces. Urban lighting projects have shifted away from longstanding assumptions about public lighting towards a new image that embodies a completely transformed understanding of light’s role and distribution in space, of its users, their behavior and their preferences.’

The report continues: ‘Allowing citizens to modify public spaces to their own needs is a very effective means of connecting people to their cities and can increase the liveliness and vibrancy of public spaces.’ And indeed the wellbeing of citizens, too.



Impacting **Well-being**

Light deprivation is a more prevalent issue than many might imagine, especially in a society where children are growing up in enclosed spaces surrounded by electronic devices.

Children find it particularly hard to wake up in the morning and their sleep patterns are frequently disrupted by the pervasive glow of phones, tablets and televisions that are the default options for so many, whether in light-restricted areas such as Uppsala or other urban environments (iii).

One of the stakeholders was an Uppsala mother Mary, a science teacher in a local English school. Married to Ben, a palaeontologist, they have two young children Jonas and Stasia. She says:

“The Giraffe Park is hard to use when it’s dark.

Lighting is imperative when the children go outdoors. As parents you really sense the children suffer lethargy in winter, they get very withdrawn when they stay indoors.”

When the darkness sets in and they race home from school, you feel in them a very real sense of isolation. When you have nine months of winter it can really affect the whole family, so it’s vital that you get out there and create an environment where there are lots of activities. We know that the children will benefit.”

Being deprived of light disrupts many of our natural circadian rhythms including melatonin, a hormone associated with night time. Under normal circumstances, the pineal gland – a pea-sized organ in the brain – begins to release melatonin, which affects moods, just before bed-time. But the lack of strong light-dark contrasts between day and night negatively impacts a regular melatonin cycle. (iv).

Just like in adults, the circadian rhythms of children are affected by light. These physiological, psychological and behavioral processes typically follow approximately a 24-hour cycle. And it is light that is the most important circadian cue that keeps us synchronized with the world around us. (v).

Lack of strong light-dark cycles during the winter months, especially in parts of Sweden, disrupt this natural balance and also negatively impact sleep. (vi).

A proper night's sleep lowers the risk of obesity and depression in children. It also has wider implications for learning, memory, brain development, and other health issues, such as Seasonal Affective Disorder (SAD) or 'winter depression', which worsens moods and behavior (vii).

The knock-on effect, particularly from worsening moods, is that children may crave comfort foods with excess unhealthy calories. This can exacerbate feelings of fatigue and lack of self-worth, and may even lead to social withdrawal (viii).

These concerns apply to us all, but have especially negative effects on children. Child psychologist Louise Hallin is adamant that behavioral problems are linked to lack of light and play. She says:

“We are only now beginning to understand how such factors can impact children’s lives, especially if they are kept in the house after it gets dark.”

The more light we have in cities, the less criminality, abuse and violence there will be. Parents are worried about their children going out in the dark and so those children lose their independence and it affects their entire behavior.

‘Parents I have come across still don’t understand the basic connection between light and the brain, what effect it can have. But of course it’s not just the brain. When children don’t move around very much, it also causes obesity. Plus, schools have cut down on the amount of sports and outside play they allow. It’s a very dangerous situation. Which is why experiments like this one in Uppsala, and the research and development that Philips has put into it, is so vital to everyone’s futures.’

Tracking Results



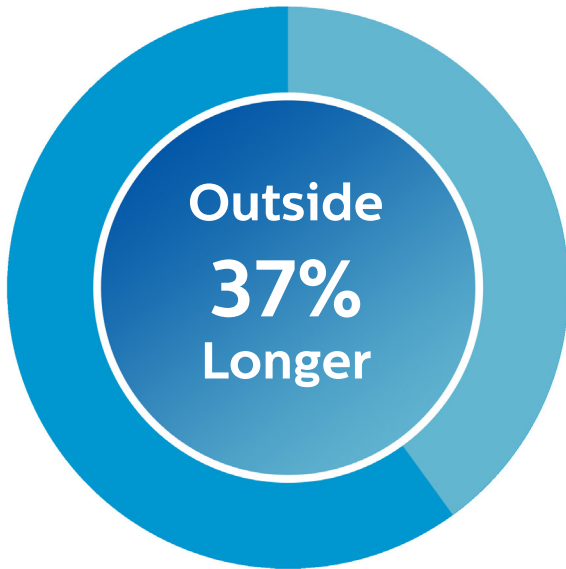
Enhancing the well-being of future generations is what meaningful innovation represents to Philips – as it has done for more than 120 years. Technology to provide solutions that directly benefit people’s lives can be evaluated with qualitative and quantitative techniques to deepen our understanding of people’s core needs.

For a two-week period in Uppsala, a number of metrics were recorded to understand the impact on a group of children in a local Kindergarten class– in particular play, well-being and sleep.

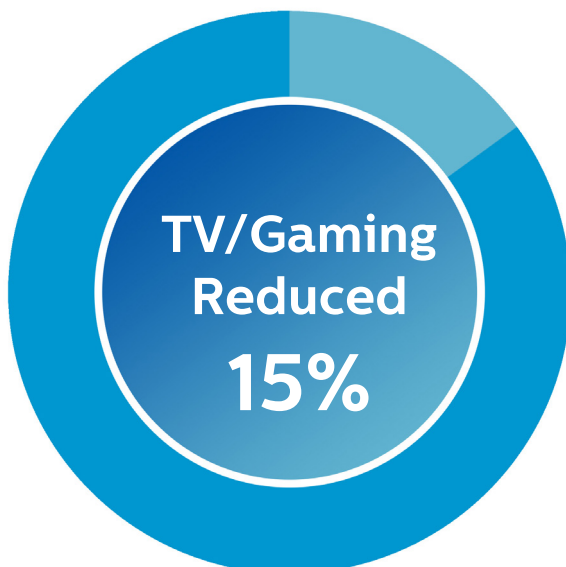
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The most significant observations, that are possibly indicative of a trend, include:

- Before the installation of the lighting, the children surveyed spent an average of **72 minutes a day playing outside**. This rose to 99 minutes in the week following the installation – **a 37 per cent increase** in the time spent outdoors.

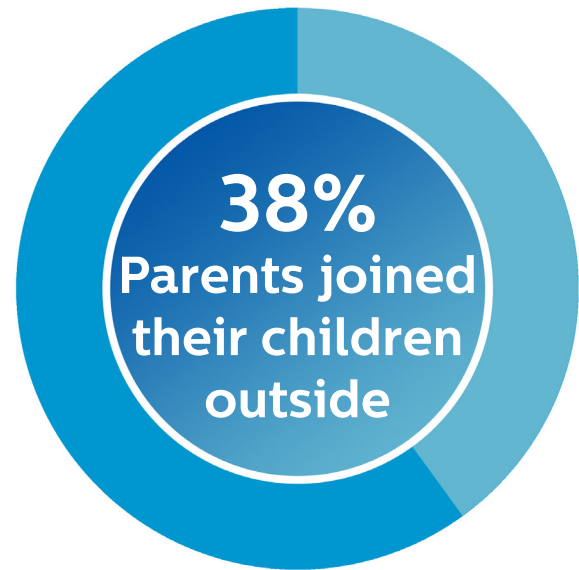


- During the same period, time spent playing inside with electronic games or watching television dropped from an average of 72 minutes a day to 61 minutes a day. **A 15 per cent reduction**, presenting a one-hour reduction of screen time a week.



- 43 per cent of parents reported a positive impact on their children's sleeping patterns.

- During the week following the installation, **38 per cent of parents played outdoors** each day with their children.



There were no recorded figures from before the installation.

- **57 per cent of parents reported seeing a noticeable improvement in their child's mood** after playing outside regularly, adding that the children seemed 'more content'.

- **28 per cent of parents reported their children as having a better appetite after outdoor play.**

- And when it comes to overall well-being, **100 per cent of parents and teachers surveyed felt that outdoor play had a positive impact on the children's overall well-being.**

Louise Hallin, child psychologist, interpreted the results and she said: **‘For me, these early figures are sensational. We mustn’t extrapolate too much from them and of course these are indications rather than facts but it seems to me that the figures show that the principal aims of the experiment have been fulfilled.**

‘Children are spending less time on their computers and in front of their TVs, which is wonderful news, although of course we cannot say for certain that the new light installation caused that behavioral change. However, anything that can lift them from that cycle of coming home and switching on must be praised. And playing outside for almost half an hour longer than normal, and using screens for an hour less, are highly significant figures.

‘Also, something else emerged that I hadn’t anticipated – almost 40 per cent of parents said that they played outside with their children because of the new light. This is fantastic. Playtime with adults. We don’t see enough of that and for children to bond even more deeply with their parents in such a way is so important.

‘Such behavior becomes a habit. The outside play extends indoors and the fun of being in a family is rekindled. The newly-lit playground becomes a platform for happy childhoods inside the home.

‘It’s incredibly encouraging, too, that children who use the playground in Uppsala are now sleeping better because of the lights. It’s not proof of anything but it indicates that if you have plenty of light during the day,

your body and brain benefit from more consolidated sleeping patterns which can only benefit health. More movement and less sitting around makes for a contented child – and thus a contented parent.

‘Most children want to see some light when they go to bed, not total darkness. Equally, when they finish school they don’t want to rush home and go from one inside room to another because it’s so dark. They want to live.

‘We also know that if we light up parks, there will be less crime. Light has that transformative effect, on children’s behavior too. And it will create a domino effect – children will see their friends play and they will follow. Parents will be inspired by their peers to make a greater effort.

‘Such outcomes are why I believe so strongly in this experiment. **Light is a powerful resource and we underestimate it to our detriment.** In the Western world we can be incredibly lazy. It’s terrifying how we live our lives – sitting down, no exercise, eating the wrong foods, disregarding our children’s basic needs – and it is going to get worse in the future. So we need to find ways to get them outside, to enjoy their playtime more.’



Conclusions

We hope that Uppsala will become a beacon of Philips bold vision to improve the lives of three billion people a year by 2025. And an example, too, of how an innovation can create enormous change for a small community.

It's an experiment that can be emulated in communities throughout the world and very much defines what the Philips Living Lab is all about. It's a constantly evolving concept unleashing innovation to make people's lives better and tackle society's most daunting challenges.

From conquering global poverty to protecting our natural resources, from providing modern healthcare to the world's most remote areas, to caring

for an increased aging population. It allows us to connect even more directly with individuals and attain a greater understanding of their desires, so our innovations can be even more effective.

And for us to ensure that people live better lives, we need to listen to their needs, understand their desires and work with them to provide truly meaningful innovations. This Philips Living Lab experiment fulfils those criteria precisely. And we hope other, similar experiments will show how we can have a transformative effect on communities, improving people's lives by providing innovative solutions to particular challenges.

We collaborate – with government, community leaders, businesses and key stakeholders – to understand how our innovations can be both empowering for citizens and positively impact their environments.

Philips CityTouch is a result of such collaborative thinking. It is part of our Philips IntelligentCity initiative that

offers cities an end-to-end solution for a connected public lighting system. As more of us gravitate towards urban areas – by 2050 two thirds of the planet’s population will live in cities – this kind of public lighting will become even more integral to our safety and overall well-being.

Philips CityTouch is a cloud-based lighting management and maintenance system for outdoor lighting that enables dynamic, intelligent and flexible control on a city-wide scale. It provides lighting precisely when and where it is needed and allows users to manage the entire system from a single intuitive online interface. Plus, it provides easy, streamlined maintenance and oversight with real-time status reports for every individual light point that is connected.

In addition, because the LED luminaires are more reliable and environmentally-friendly, local governments can, in principle, reduce their energy consumption by as much as 80 per cent and save 50 per cent on maintenance costs.

As Philips CityTouch is an intuitive system, it can be adapted to fit the needs of the entire community. So it’s not simply parents who are reassured that their children are playing in a safely-lit environment – it can help pedestrians, drivers, commuters and cyclists feel more confident too.

That philosophy, embodied by Uppsala, of enabling light to intimately fit with a community’s needs, is echoed by Philips lighting advisor Svante Pettersson: ‘Working closely with lighting designers is integral to a project right from the start – and can have a truly transformative effect

on so many people, whatever their job, background or age.

‘This applies to existing structures such as those in Uppsala and new construction projects. Collaborating from an early stage in the innovation process can create powerful structures within communities.

‘What we’ve learned from Uppsala is that by placing our relationship with light at the center of things, we can help society. It shows why we need to make lighting systems more human and creative; it’s as much about the experiential connection, the emotions evoked by light as it’s about the technology.’

It is this collaborative way of working, this understanding of what constitutes meaningful innovation, this bold ambition to improve society through light that Philips believes is the future of innovation.

And with the way light has breathed new life into Uppsala, we’ve shown that the future is here.

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