SMART STORIES

amsmartterdam city

in case of loss, please return to:

smart stories

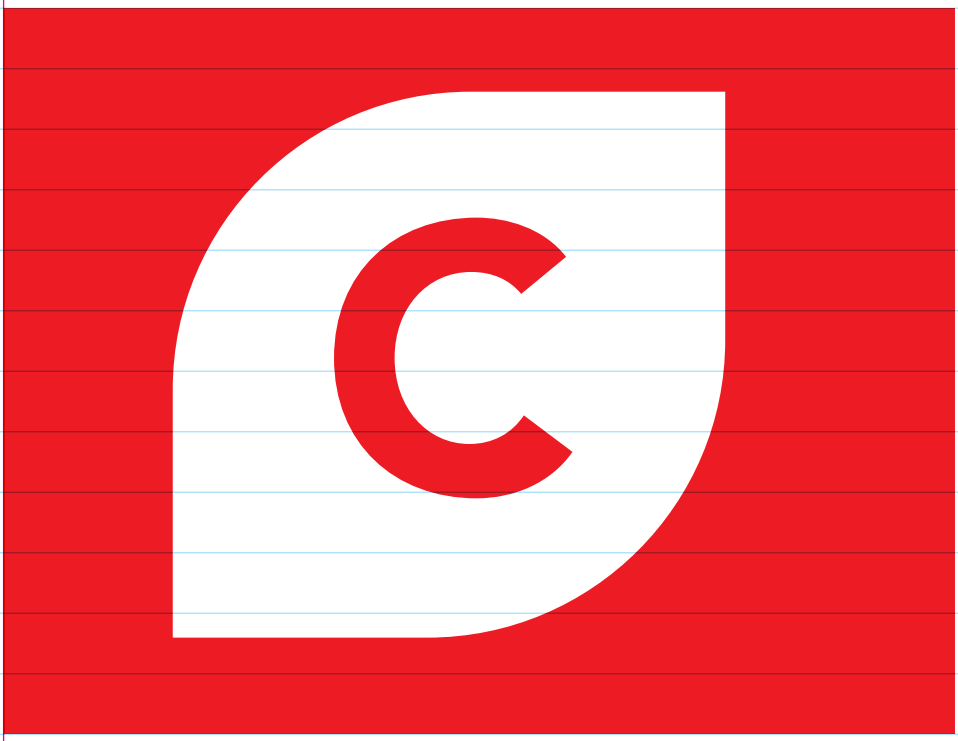
CHECK OUT OUR LATEST MOVIE AND KEEP UP TO DATE ON THE AMSTERDAM SMART CITY YOU TUBE CHANNEL!

I amsterdam®

Liander
onderdeel van alliander

AIM Amsterdam Innovation Motor

AMSTERDAM SMART CITY IS PARTLY FINANCED BY THE EUROPEAN FUND FOR REGIONAL DEVELOPMENT OF THE EUROPEAN COMMISSION



Content

SMART STORIES

i **Introduction** **04**
By the Amsterdam Smart City Steering Committee

1 **Amsterdam Smart City is…** **06**

- **Partner overview** **12**

2 **The story continues…** **14**

3 **Smart projects** **18**

#01 Geuzenveld 20
#02 West Orange 28
#03 eManagement Haarlem 34
#04 Onze Energie 42
#05 Smart Challenge 48
#06 ITO Tower 54
#07 Monumental Buildings 60
#08 Decentral Generation: Fuel Cell Technology 66
#09 Zuidas Solar Challenge 72
#10 Online Monitoring Municipal Buildings 76
#11 Ship to Grid 82
#12 Moet je Watt 88
#13 Klimaatstraat 94
#14 Smart Schools Contest 102
#15 ZonSpot 108
#16 Swimming Pools 114

- **Amsterdam Smart City value cases** **120**

4 **Overall lessons learnt** **136**

- **Value cases overall results**
- **Amsterdam Smart City in the News**

5 **Knowledge sharing** **148**

- **Knowledge sessions**
- **Conferences**

6 **There is more smartness in this city** **154**

To me Amsterdam as a Smart City is… quotes **160**

Colofon **162**

Joke van Antwerpen

Introduction

SMART STORIES

As director of the Amsterdam Innovation Motor I am very happy that these Smart Stories are about tangible innovative solutions. Amsterdam Smart City (ASC) proves that ICT can contribute to the challenges related to energy transition and sustainability. And according to magazines like BusinessWeek, The Economist and newspapers such as the Nikkei Times, Amsterdam has become a frontrunner in this field. Innovation can be realized by stimulating cooperation between knowledge institutions, commerce, industry and government. Exactly these organizations have accepted this challenge and cooperate in testing different initiatives in several projects in our region. Testing means gaining experience and learning about new technologies in real life situations. Based on these learnings, the Smart Stories, we can now start the next fase: scaling up fast!

Joke van Antwerpen
director Amsterdam Innovation Motor

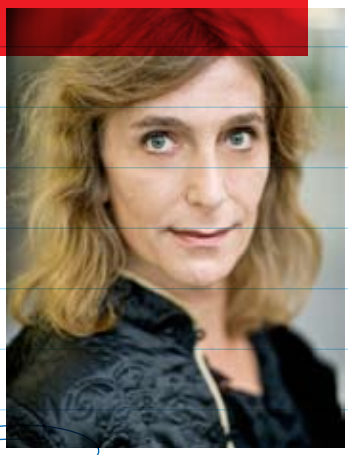
Ronald Prins

To realize our climate ambitions we need public private partnerships. Amsterdam Smart City is a good example of how this can work in our city. We need active cooperation with all stakeholders involved to realize the energy transition. Together we developed and shared know how, we realized innovations and implemented them in several parts of the city. Our city as a living lab.
ASC showed us also how important it is to present the Amsterdam story to an international audience. This certainly attracts new partners and strengthens the cooperation with and within the city. The challenge is to use the lessons learnt and to focus now on large scale implementation of successful solutions.

Ronald Prins
director Environmental and Building Department City of Amsterdam

Liander sees a major role for itself, given our independent role as a Dutch regional grid manager, in helping to achieve our stakeholders' sustainability objectives and to effect the transition to a more sustainable energy supply within our area. What is special about Amsterdam Smart City is that it allows scope for initiatives from businesses and consumers that meet their own individual needs for sustainable energy. In the energy world, services and products are structured by the provider, while ASC starts at the other side. This results in new alliances. And in sustainability solutions that could never otherwise have been devised. ASC is of great value to Liander in showing how sustainability solutions can best be aligned with the world as citizens and businesses experience it. Without initiatives such as ASC this would take much longer to achieve. Learning with our customers and partners is invaluable for us.

Pallas Achterberg
director of Strategy Liander



Pallas Achterberg

1

Amsterdam Smart City is...

Amsterdam Smart City is a unique partnership between the people of Amsterdam, businesses, knowledge institutions and local authorities that was set up with the aim of showing how it is possible to save energy now and in the future. To that end, we collaborate to develop smart projects that will change the world. But before changing the world, we will first test our plans in Amsterdam.

Photo: Edwin van Eis

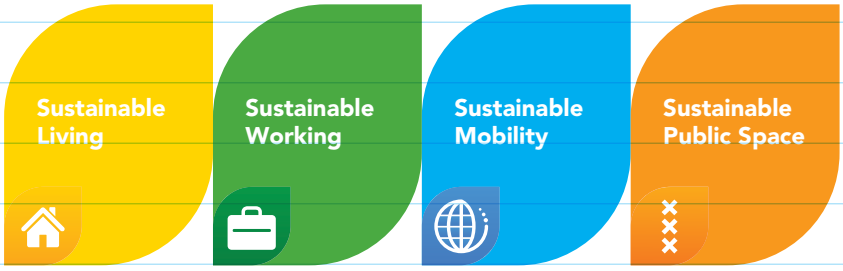
The project was initiated in June 2009 by the Amsterdam Innovation Motor and grid manager Liander in close collaboration with the Amsterdam Municipality. TNO, an independent research institute, joined forces with Amsterdam Smart City to make sure that the research results would be recorded, underpinned and shared based on a rigid scientific foundation.

ASC is all about the total sum of innovative technology, behavioural change and sustainable economic investments. By bringing partners together and setting up small local projects, it creates opportunities for these initiatives to be tested.

More than 70% of all CO_2 gases are emitted in and by the major cities: 80% of the population live and work in cities and 80% of all energy is consumed in cities[1]. This makes cities the most suitable platforms for launching the movement towards building a more sustainable future. Which is exactly what ASC is aiming for. Over a period of two years, the programme set up a substantial number of projects in the fields of Working, Living, Mobility and Public Space.

Source: EU Covenant of Mayors

Innovative partnerships | Behavioural change | Economical viable



Intelligent grid management

FOUR FOCUS AREAS

Amsterdam Smart City does not only involve the testing of new technologies, but also the creation of new partnerships and the application of different types of approaches aimed at involving the city's inhabitants. The idea is that the most effective initiatives will be implemented on a large scale at the end of the test period. The lessons learnt and the acquired experience can be incorporated into all subsequent projects. By doing so, ASC hopes to be able to act as an accelerator of climate and energy programmes. The ultimate purpose of the project is to reduce CO_2 emissions. ASC thereby wishes to contribute to the objectives of the City of Amsterdam.

About AIM

The Amsterdam Innovation Motor (AIM) is established to stimulate innovation in the Amsterdam Metropolitan Area. AIM promotes cooperation between academic institutions, companies and government through clustering. This will encourage new innovative business and the development of new products and services. To do so, we focus on the four sectors that are the most promising in terms of strengthening the economic position of the region, namely Creative industries, ICT, Life sciences and Financial services.

www.aimsterdam.nl

About Liander

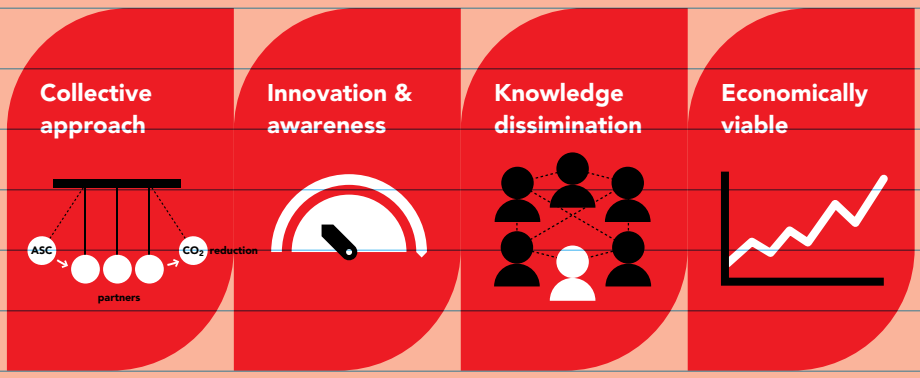
Liander is a Dutch regional grid manager, transporting electricity to 2.9 million customers and gas to 2.1 million customers in the provinces of Gelderland, Noord-Holland and large areas of Flevoland, Friesland and Zuid-Holland. Liander is responsible for the maintenance, expansion and innovation of its grids. Liander also allows its customers to purchase energy from their supplier of choice. Liander is part of Alliander.

www.liander.nl

Ambitious Climate Program

The City of Amsterdam, acting in line with the EU's 20-20-20 climate targets, has set itself a number of even more ambitious goals: to make all municipal organisations climate-impact neutral before 2015 and to reduce CO2 emissions by 40% compared to 1990 by the year 2025. To achieve those goals, the City of Amsterdam has developed an extensive and ambitious Climate Program.

www.amsterdam.nl/klimaat



Amsterdam Smart City could be viewed as an 'accelerator' of climate/energy programmes. By bringing parties together and by initiating projects in which smart technologies and different approaches are tested, it is possible to develop best practices for future large-scale implementation of similar initiatives.

The following are the pillars on which Amsterdam Smart City operates:

1. Cooperation at every possible level is essential to achieve viable results. It could be a public private partnership, but it must incorporate the close involvement of the (end) user.
2. Driven by smart technology and the need to bring about behavioural change.
3. Knowledge exchange: All the acquired knowledge and experience will be shared via ASC.
4. Only economically viable initiatives will ultimately be rolled out on a large scale.

Partner platform

In less than two years, Amsterdam Smart City has evolved into an alliance of partners that continues to grow. Besides the partners that are involved in specific subprojects, the ASC platform also consists of a network of companies, local authorities and organisations that, in the future, could play an active role in any given subproject or component in terms of sharing knowledge and experience about smart cities. The platform currently consists of approximately 70 partners. The partners are collaborating in a continuous process to initiate subprojects in all focus areas, including the grid manager of Amsterdam, energy suppliers, government authorities, housing corporations, technology start-ups, knowledge institutions, financial institutions, network organisations, etc.
Partners join ASC for four main reasons:

- Partners can put their wish to attain sustainable business into practice
- Partners can learn more by supplying their products / services in this form of partnership
- Lessons learnt and best practices will enable the partners to develop tested products that will eventually be effective for large-scale implementation
- Participants can exchange knowledge and experience with all the other partners

Smart figures

71
partners

6
partner meetings

36
smart technologies

4
knowledge sessions

16
subprojects

998
newsletter subscriptions

254
contacts in the network

442
LinkedIn group members

JOIN THE DISCUSSION!

132
interested companies

2422
Website visits per month

60

presentations to interested parties

52

conferences where ASC shared her knowledge

41

guided tours for interested parties

93%

of the partners wish to remain involved in the follow-up of ASC

1

interactive website

WWW.AMSTERDAMSMARTCITY.COM

Founding Partners

Liander onderdeel van alliander

AIM Amsterdam Innovation Motor

City of Amsterdam

Gemeente Amsterdam

I amsterdam.

Amsterdam elektrisch

Gemeente Amsterdam
Bureau Monumenten & Archeologie

Gemeente Amsterdam
Stadsdeel Nieuw-West

Gemeente Amsterdam
Stadsdeel Centrum

Gemeente Amsterdam
Dienst Zuidas

Gemeente Amsterdam
Programmabureau Klimaat en Energie

Port of Amsterdam

Gemeente Amsterdam
Programmabureau Luchtkwaliteit

Techno starters

Plugwise

LEDLEASE

chess engineering the future

Home Automation Europe
technology made simple

READ ON online metering management

Utiliq new ways of energy

geo Green Energy Options

ONZO

thenewmotion

TRE FOIL

heatsavr™
'the green swimming pool solution'

wattcher
BESPAAR THUIS ENERGIE DOOR INZICHT

ZONSPOT

Consultancy

FAVELA FABRIC
CO CREATION CONSULTANCY

MSL

wij zijn koel.nl

C30

ROYAL HASKONING

energiemissie
energiemissie.nl

Tauw

cool endeavour

Universities & Knowledge institutions

milieu centraal

NYENRODE BUSINESS UNIVERSITEIT

UNIVERSITEIT VAN AMSTERDAM

Strategic Partners

accenture
High performance. Delivered.

TNO

Utilities & Infrastructure

Joulz

JCDecaux

Tempus
Eneco installatiebedrijven

Ziut

GasTerra

NUON

Onze Amsterdam Noord Energie

Eneco

Living, Offices & Buildings

deKey
ontwikkelt en verbindt

Far West

DGBC Lab

Ymere
wonen, leven, groeien

NEMO Science Communication Center

debalie

Netwerk platforms

Green Business Club

de groene bocht

nudge

AIM TO SUSTAIN

FAIR CLIMATE FUND

International Technology

CISCO

vodafone

IBM

COFELY GDF SUEZ

PHILIPS

Imtech

CERAMIC FUEL CELLS LIMITED

Various

Kolibri
Leisure Management

SPORTFONDSEN
AMSTERDAM OOST
altijd een belevenis!

van Gansewinkel

Rabobank

ONDERNEMERSVERENIGING
UTRECHTSESTRAAT

L.A.J. Duncker BV
KOEL - VRIES TRANSPORT
Food Center Amsterdam www.duncker.nl

020stadsdistributie.nl
schoon scherp snel

TNT

GOED BEZIG

2

The story continues...

The current Amsterdam Smart City pilots created new partnerships and showcased various possibilities of how smart innovation can contribute to reduce energy consumption, increase the quality of life and make the city more resilient. You can read all about the different projects in chapter 3.

Now, the time has come to scale things up and focus on total impact. This means that Amsterdam Smart City will continue to work on Smart Stories: Stories, and not fairy tales. In the years ahead, ASC will continue to develop new stories, but it will also continue to spread the word about the things that are already taking place. And we will share the lessons learnt about how smart solutions can help save energy and enable people to make smart choices.

Photo: Edwin van Eis

Creating impact

Over the past two years, Amsterdam Smart City has shown that new and surprising collaborations are needed to make the difference: IT companies working together with housing agencies and telecom operators working with grid operators. But also SMEs collaborating with big companies, and companies that normally only do business with other businesses are now entering the consumer domain. The time has come to create impact and to leverage on everything we have already done.

The greater Amsterdam metropolitan area is uniquely positioned to do so. The rollout of Fibre to the Home and Smart Energy meters, electric vehicles and large investments in sustainability for buildings, over the next few years, combined with the knowledge and entrepreneurship in the area, will enable us to create impact and ensure that every investment will result in significant contributions to enhanced quality of life. We, in collaboration with our partners, are determined to make Amsterdam a leading Smart City and to guide other cities to use their resources more efficiently too. Although Amsterdam Smart City will continue to focus on Energy, Mobility and Data, it would also be possible to establish links to sustainable living in the broader sense of the word; for example, Ambient Assisted Living and the impact of society on government and governance.

Amsterdam Smart City will align its investments with and seek opportunities to leverage on work that is already being done; in other words: Smart Execution.

The owners of Amsterdam Smart City are its inhabitants

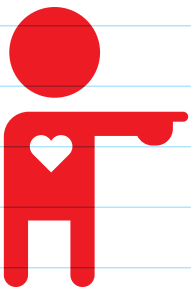
Smart Cities are all about multi-stakeholder development; however, at its core, it is in fact all about the people that live in the Smart City. The only way Amsterdam Smart City can succeed in that mission is by enabling its inhabitants to act smartly, by providing them with the appropriate information and by creating the necessary opportunities.

In principle, this entails that everybody could participate in the creation and maintenance of Amsterdam as a Smart City. We intend to make that possible by creating a powerful coalition of companies and knowledge institutions that will collaborate to make the city as smart as possible by rolling out new infrastructure that will, in turn, facilitate the creation of new products and services. ASC will continue to facilitate that process by creating new coalitions and by bringing parties together. That way, we will all be able to create new Smart Stories that we will all be able to share with the rest of the world…

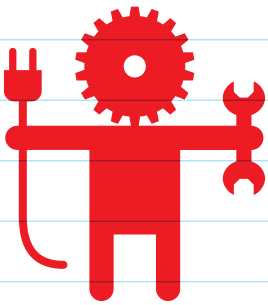
READ MORE INTERESTING QUOTES ON AMSTERDAM AS A SMART CITY ON PAGE 160 - 161

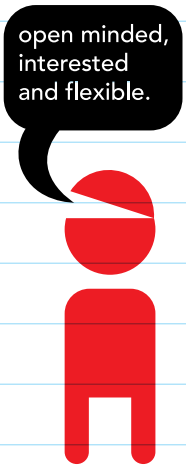
To me amsterdam as a smart city is.....

an essential way of improving the city quality of life.

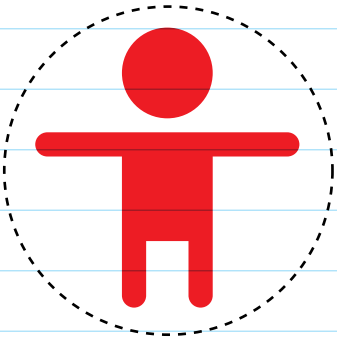


daring to explore the latest technologies/possibilities and stimulate people & companies to implement these.

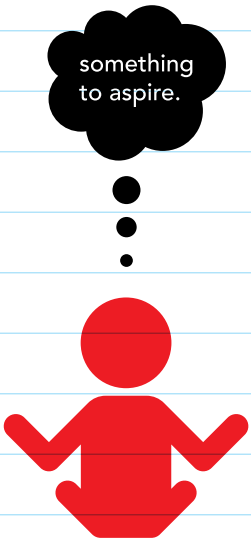




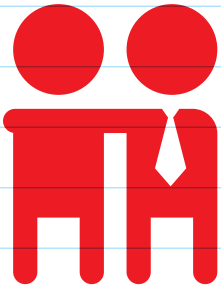
Cities are complex systems of systems. As our planet becomes instrumented, interconnected and intelligent, we have the opportunity to connect these systems and make our cities smarter. Together we will achieve this for a better society.



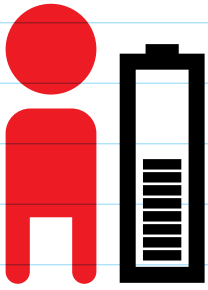
a city with space for people, ideas and experiments - and where technology supports such a smart city, rather than dictating space, people, ideas and experiments.



an invitation for meeting the right people and getting energy to go on.

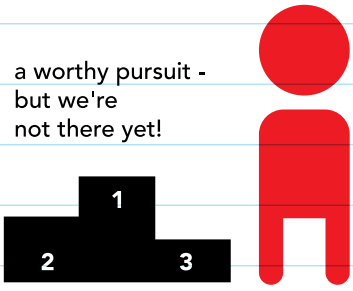


dynamic, clean, and benchmarked as one of the leading cities in how government works in collaborative networks with its citizens to be fast and smart in responding to their needs.



We need smart technologies to use the benefits of sustainable energy supply. Thereby, smart technologies can help to make society conscious about the amount of energy that is used.

a worthy pursuit - but we're not there yet!



In other words...
The story continues...

3

Smart projects

An extensive number of projects in the areas of Working, Living, Mobility and Public Space were set up over a period of two years. The first three categories are each responsible for approximately one third of the CO_2 emissions in the city. The subarea, 'Sustainable Public Space', is ultimately a combination of various different elements from the other subareas.

Sustainable Living

All the households in Amsterdam together are responsible for approximately 33% of the overall volume of CO_2 emissions in the city. The key focus of sustainable living is to create awareness amongst residents and to reduce energy consumption in the households.

- Geuzenveld
- West Orange
- eManagement Haarlem
- Onze Energie
- Smart Challenge

p. 20→53

Sustainable Working

Amsterdam features everything from one-person businesses in old canal-side houses to some multinationals in modern office blocks and everything in between. Most of the city's companies can still make significant progress with regard to sustainability and energy consumption. Users must become aware of their energy consumption patterns in the working environment and they must be stimulated to reduce energy consumption. The projects focus on energy saving, sustainable housing and business processes.

- ITO Tower
- Monumental Buildings
- Decentral Generation: Fuel Cell Technology
- Online Monitoring Municipal Buildings
- Zuidas Solar

p. 54→81

Photo: Edwin van Eis

Sustainable Mobility

Given the number and diversity of transport in Amsterdam, a great deal of progress still needs to be made in the area of CO_2 reduction. The purpose of this subarea is to research sustainable means of transport and the infrastructure required to implement it. This could be the implementation of new transport concepts for waste collection or something like the installation of charging points for electrical vehicles.

- Ship to Grid
- Moet je Watt

p. 82→93

Sustainable Public Space

The success factor for a sustainable public space is the awareness of the energy consumption in the applicable public space, as well as the reduction of energy consumption. The projects focus on sustainability in schools, hospitals, libraries, streets, and so on.

- Klimaatstraat
- Smart School Contest
- ZonSpot
- Swimming pools

p. 94→119

#01 Neighbourly Living in Geuzenveld

Over five hundred Smart Meters installed in the New West district (Geuzenveld) and 60 connected in-home energy-feedback displays give customers insight into their energy consumption.
A user participation programme enables neighbours to interact with one another by discussing sustainability topics.

Exceptional about the *Buurzaam Wonen* (Neighbourly Living) project in Geuzenveld is the intensive activation and interaction between the local residents. Different sessions are being organised to activate residents and to discuss issues related to energy saving. The residents are also stimulated to discuss the individual and collective aspects of energy saving. Moreover, residents can exchange their thoughts and ideas via a blog. Activation in this neighbourhood area is a challenge because of the high rate of social housing and the social structure of the neighbourhood. Over 500 smart meters have been rolled out in the Geuzenveld area. Sixty residents are also issued with a display that is connected to the smart meter. The purpose of the display is to give the residents insight

into their energy consumption. Grid operator Liander is the leading partner in the project in Geuzenveld and is also responsible for the overall technical realization, infrastructural work and organisation of the project, which includes the installation of the smart meters and energy displays. In addition, all eight partners play an important and indispensible role in the realization of the project.

Kids with energy cartoons Bonny & Blitz

Objectives

The purpose of the *Buurzaam Wonen – Geuzenveld* project is to stimulate awareness among Amsterdam's citizens and their energy consumption patterns, to make them aware of how to improve their behaviour and thereby to actually save energy. The residents are engaged in the project on an individual and collective basis. Another important objective is to gain experience on the implementation of the smart meters and energy feedback displays.

Liander's smart meter

Research

The research in this project is conducted by the University of Amsterdam. The research takes into account the different factors that influence behavioural change. So far, the research has shown that residents who have an energy feedback display tend to demonstrate more environmental friendly behavior and are more aware of the amount of energy they use than residents who do not have an energy feedback display. Another goal of the research is to determine the actual concrete savings percentages, the differences between the percentages attained with the use of the different types of displays, and how a neighbourhood, such as Geuzenveld, can effectively be engaged in themes such as energy saving. The final results will be expected in the summer of 2011.

Onzo display

GEO display

www.buurzaamwonen.wordpress.com

Lessons learnt

Experience was accumulated during the course of the project, and is still being accumulated in the collaborative processes between the partners. The most important lesson learnt in terms of the engagement of the residents in the neighbourhood is that the use of local influentials to create awareness for the project and to generate support is necessary to succeed. Furthermore, it resulted that that house owners showed more interest and were more likely to join the programme compared people who live in rented houses. In addition, in order to activate people, it is also important to talk to all the members of the family – young and old – and to make the project objectives comprehensible to everyone. Innovative technology must be simple for the participant to use and understand. The residents must not be burdened with technological explanations. What does it mean to them and what can they do with it? Short, simple, and concrete explanations are required. An important lesson learnt regarding cooperation is the influence of external factors, such as the impact of internal decision making processes of the different partners may have on project planning.

EcoSession in Geuzenveld neighbourhood

Partners

Liander onderdeel van alliander

Gemeente Amsterdam Stadsdeel Nieuw-West

ONZO

deKey ontwikkelt en verbindt

Far West

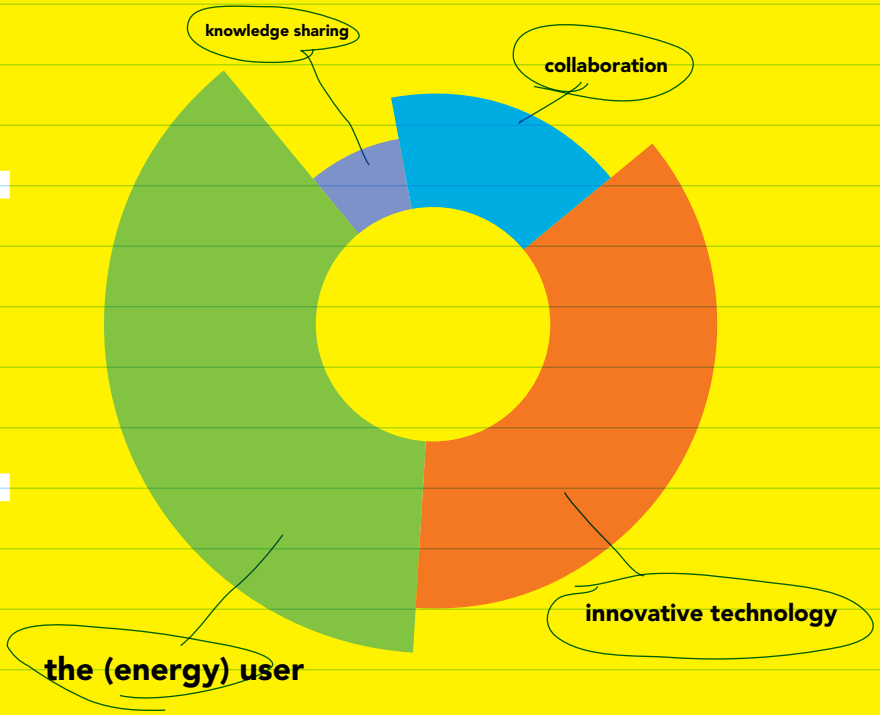
FAVELA FABRIC CO CREATION CONSULTANCY

geo Green Energy Options

Universiteit van Amsterdam

Focus on innovative technology and the user

The Geuzenveld project tests types of innovative technologies, including a smart meter and different types of energy feedback displays. Although this method of testing new technologies in an existing neighbourhood is no novelty as such, the fact that it was combined with an intensive resident participation programme means that a great deal of experience was accumulated in the use of the technological system and the motivations for and thresholds to saving energy. The collaboration and harmonization between the different partners was a necessary condition for a succesfull implementation of the technologies and the engagement of the residents of the neighbourhood.



541
smart meters

2
neighbourhood events attended

2
different types of energy displays

10
visits by the Bliksems to Geuzenveld

60
displays used by households

2
eco tours to Amsterdam's waste and energy company

541
households

120
children with Bonnie & Blitz Bliksem

6
residents meetings

1
residents blog

1

Facebook page

8

partners

50

energy saving boxes handed out to residents

2

students of the University of Amsterdam conducting research

3

smart technologies

SMART QUOTES

"My 16-year-old son always takes extremely long showers. I always tell him not only to turn the hot tap down, but to get out of the shower. But he never listens..."

"I put long life bulbs in everywhere, and I do my laundry at night with a full washing machine. It cuts my electricity bill by quite a bit."

"Check the price tag on a TV. It shows what the TV will cost you in Euros."

“I have a lamp fitting with 6x100W, because I like a lot of light. But I don’t know what to do.”

“My computer stays on all day long. How can I save energy with it?”

“Anything that generates heat uses energy.”

“Why can’t Bonnie & Blitz feature on Nickelodeon; if they did, then other kids would also learn something from them!”

Residents of the New West district on energy saving during an Ecosession

#02 West Orange

500 households in Amsterdam are testing innovative energy feedback displays which are connected to a smart meter.

Nuon, IBM and Cisco initiated the West Orange project in which 500 Amsterdam households test an innovative energy management system. Home Automation Europe is supplier of the display, Far West and Ymere are housing cooperations and partner in the project: their tenants will participate in the test. Grid operator Liander is responsible for the implementation of the smart meters. From an earlier small scale pilot it is expected that the energy management system will yield energy and CO_2 savings of about 14 percent.

The displays and smart meters were implemented in the period between October 2010 and March 2011. The measuring programme will run for almost a year to incorporate the seasonal effects. The first results will be expected in July 2011.

Energy display

The energy display is a user-friendly display with the size of a small picture frame. The display is wireless connected to a digital gas and electricity meter of Liander and is therefore able to show real-time information of the total energy consumption. By entering personal energy saving targets in the display, the user is continuously stimulated and stays keen on their gas and electricity usage. This makes it easier for households to monitor and realize their energy saving objectives.

Objectives

The objective of the West Orange project is to validate the energy saving results from earlier pilots. This project also has the goal to design and optimize all the operational processes that will be needed in order to prepare a smooth large scale roll out. Last but not least this project will help the consortium in optimizing the attractiveness of the display, find out the customer preferences of this new device and define the economic value of this product.

Energy feedback display

Research

Nuon and Liander, working in collaboration with the University of Amsterdam, are conducting the research in the West Orange project. This research will mainly be based on data of energy usage and personal interviews with the participants. The most important research data will be the energy savings percentages obtained via the different types of energy feedback and the insights gained into the possible change of behaviour.

Lessons learnt

Most of the lessons learnt in this project are, at this stage, still related to the actual process itself. An important question wich keeps occurring is: what is the best way of establishing an effective collaboration between nine partners that all have their own objectives?
A lot of insight was also gained in the technology and customer communication; all of which was tested by means of several different approaches. Despite the 400,000 households in Amsterdam, the criteria made the number of households significantly smaller. For instance, no defaulters were allowed, the houses had to be built after the 1990's and most important of all, Nuon had to be de energy supplier at the given address. Although the display is offered free of charge, only 10% of the approached population showed interest in the test. This confirms the hypothesis that energy isn't top of mind for a lot of people.
One of the crucial decisions, waiting for the new P1-compliant smart meter, did delay the project a bit but created a very stable solution that was needed for a project with 500 units installed.

Next steps

A great deal of knowledge was acquired at every level during the rollout of the displays, including technology, customer communication, subsidy procedures and collaboration. Those points will all be incorporated in the future implementation of this type of smart technology. The partners in the West Orange project also discovered that preconditions are essential: firstly, the standardization of the meter box (powered, smart meter, Internet access) and secondly the installation process must be simplified in order for the customer to install it themselves.

West Orange project in the RTL news

Partners

NUON

cisco

IBM

Ymere
wonen, leven, groeien

Far West

Universiteit van Amsterdam

Liander
onderdeel van alliander

Home Automation Europe
technology made simple

West Orange

AIM Amsterdamse Innovatie Motor

This project is financed with support of the European Fund for Regional Development of the European Commission'

SMART QUOTES

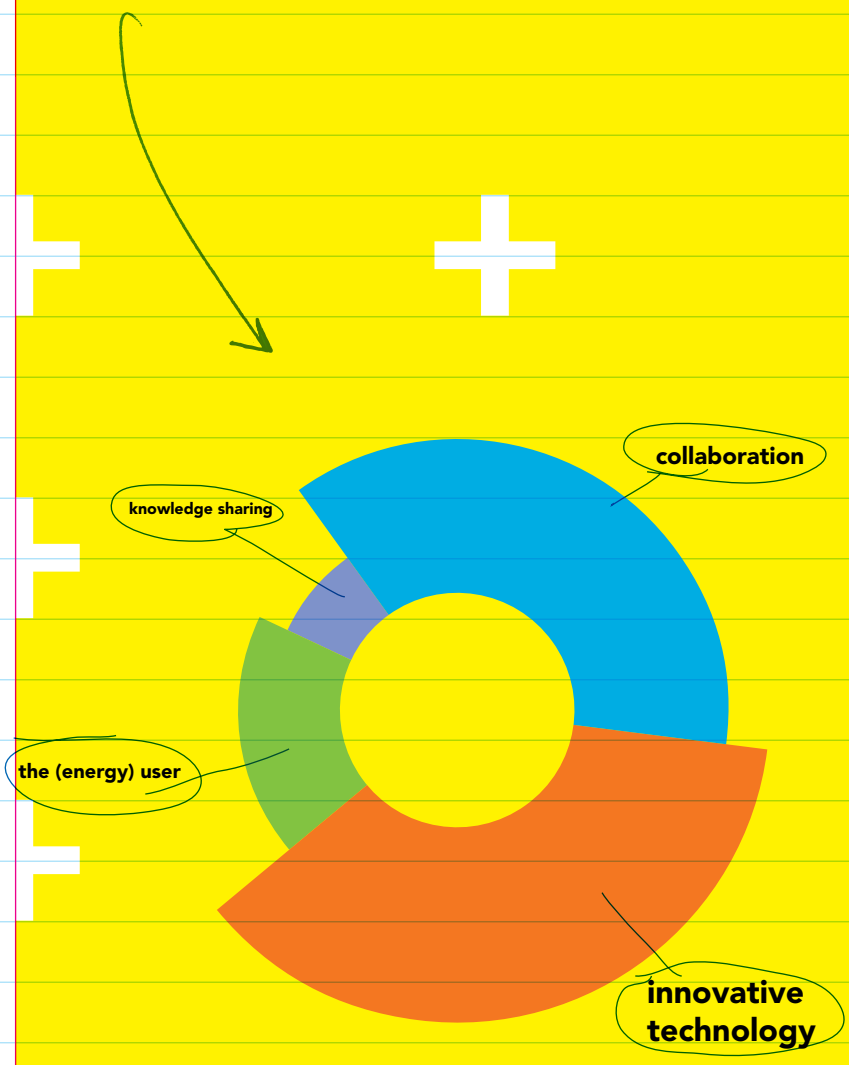
“It is clear that not all groups are equally aware of the concept of energy saving. Homeowners are much more likely willing to participate than, for example, tenants.”

“There is a big difference between technology in the lab and technology in practice; which makes it essential to subject the systems to extensive testing. Fortunately, we managed to succeed time and again, thanks to the efforts and willingness of all the partners.”

Gory Lambregts, Projectmanager West Orange, New Business Developer Nuon

Collaborating to innovate

The West Orange project is a collaboration between nine different partners. The purpose of the partnership is to set up and develop the demonstration project and to fit 500 Amsterdam homes with the innovative Smart Home Systems. The work will culminate in a series of reports on customer satisfaction, financial viability, actual energy savings and CO_2 reduction. Although the project and the objectives were formulated jointly, it is always challenging to set up an effective collaboration with so many partners involved.



9
partners

500
smart meters

3
smart technologies

500
displays

500
households

617
installation visits

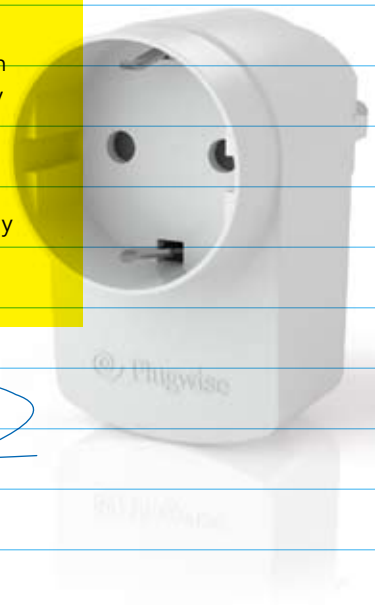
10,529
letters sent

#03 eManagement Haarlem

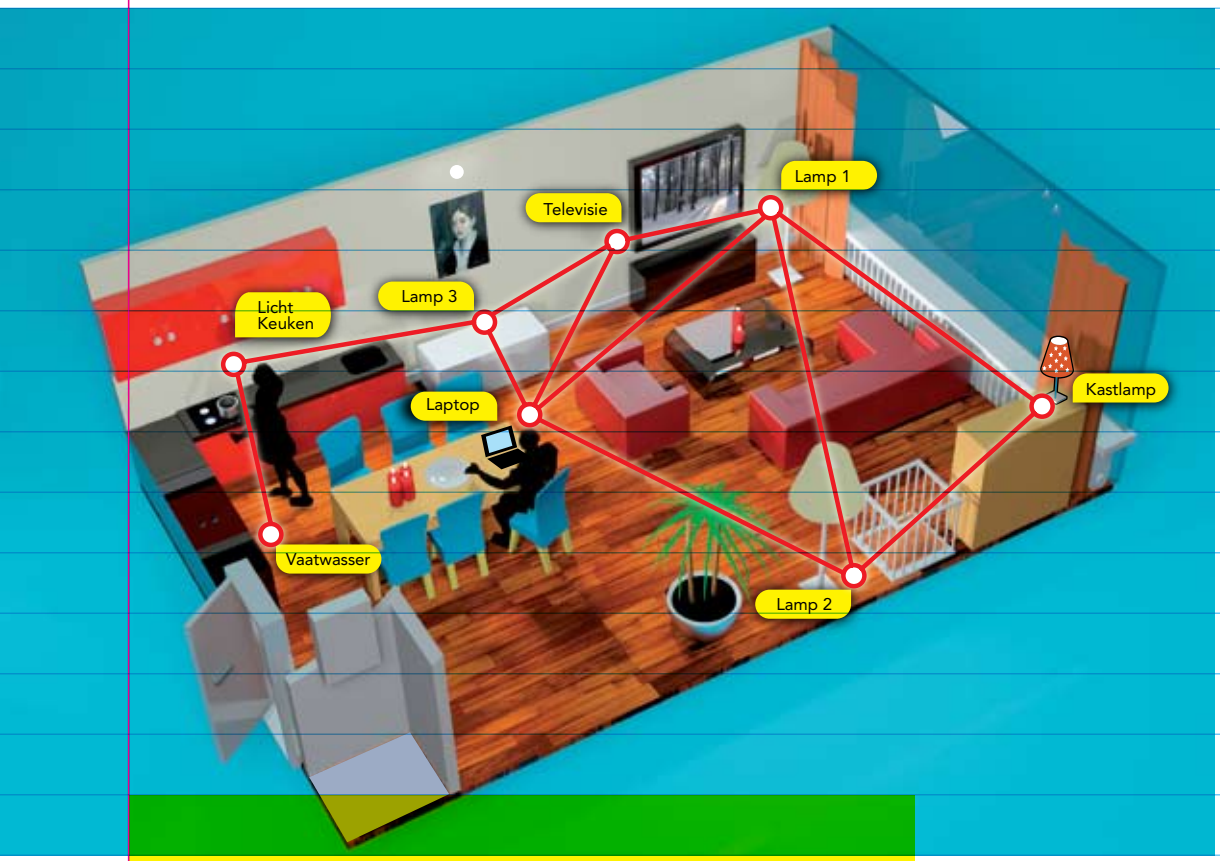
250 Households in Haarlem were offered to test an energy management system over a four-month period to obtain insight into the energy consumption patterns of a number of domestic appliances.

How can the consumer actively contribute to energy savings and make energy consumption more sustainable? Energy management systems could help the consumer to do just that. In order to answer this question, Liander conducted a test with a smart plug energy management system, Plugwise, to gain better insight into this issue. The targeted audience were households in the city of Haarlem.

Plugwise is an energy management system that works based on the principle of a smart adapter socket that measures electricity consumption and transmits the data wirelessly to a computer. The accompanying software gives the user direct insight into the exact amount of energy consumed and the related costs. The user can use a number of switching options to automatically switch individual appliances, or whole rooms, on or off.



Smart Plug



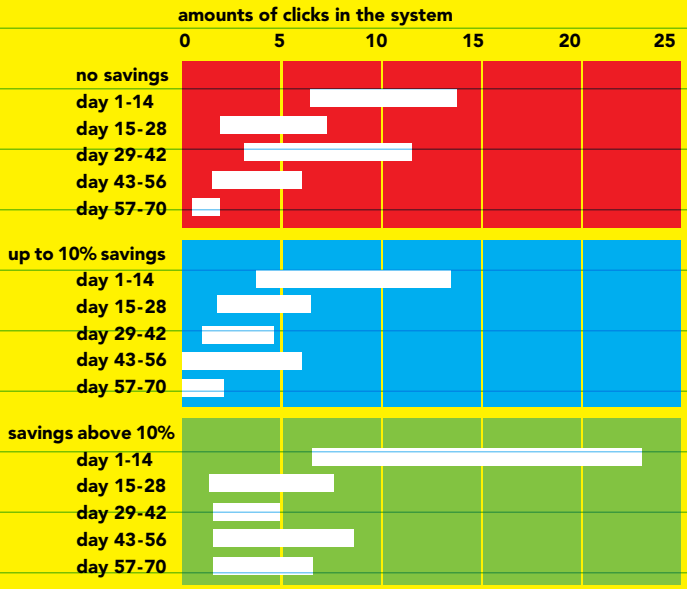
Options for smart plugs at home

By doing so, the user is able to optimize electricity consumption. The 250 households in Haarlem were selected to participate based on high electricity consumption and low gas consumption. Those consumers are identified as 'families with young adolescents' and 'active Internet users', and were all provided with an energy management system over a period of four months. The participants were provided with a set of nine plugs. It resulted that of the 250 selected households 141 households participated during 4 months.

Objectives

The purpose of the project was to determine the most effective propositions for energy management systems. Specifically in this case, answer the question whether the use of the energy management system Plugwise has an effect on consumer behaviour The research consists of two components: a quantitative and qualitative component.

The first component aims to answer the question: *What is the effect of the use of the Plugwise system on domestic energy consumption?*
In order to analyse this, the first two weeks a baseline measurement was performed to create a benchmark. During the whole project the energy consumption of the connected devices was recorded. The qualitative research was performed by subjecting the participants to a number of questionnaires on personal and household characteristics, consumer experiences, desired and expected positioning of the energy management system Plugwise.



Next steps

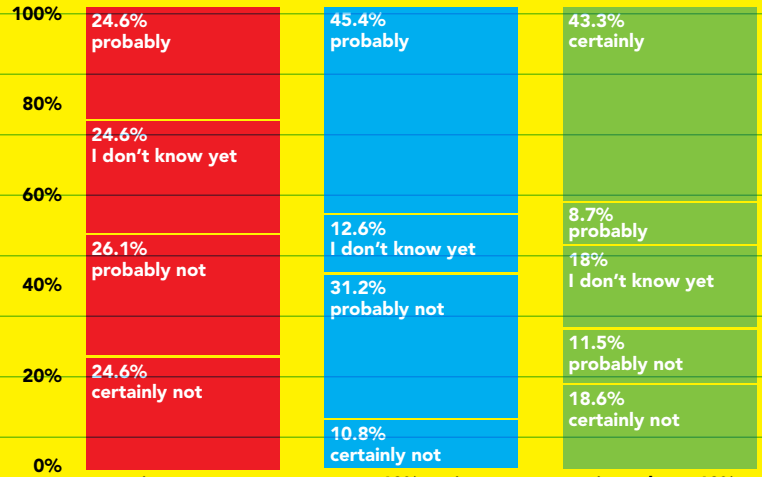
The pilot provides a lot of knowledge on energy management systems and in this case specifically Plugwise. With the gained knowledge and insights resulting from the project this system is currently being further developed. Optimization of the system for the consumer market can generate higher potential for energysavings in the future.

Partners

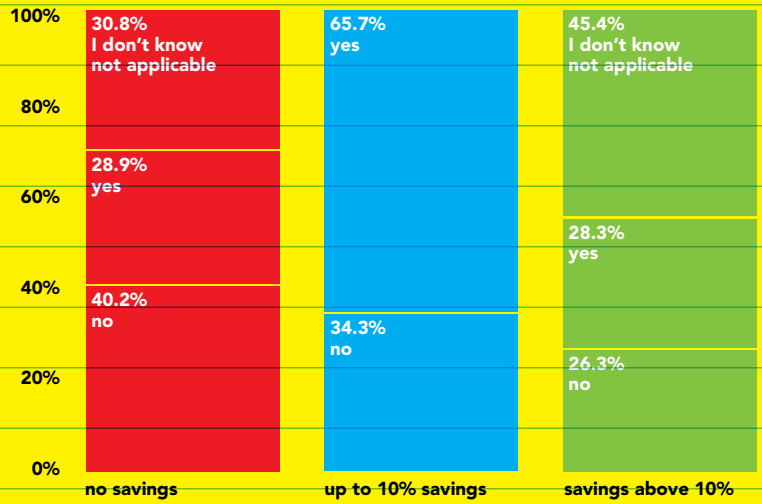
Liander onderdeel van alliander

Plugwise

With the knowledge of the energy managementnow, would you have purchased and used this system if you didn't participated the test?



Have you changed your savings behavior in response to the insights that the energy management has offered you?



141 households

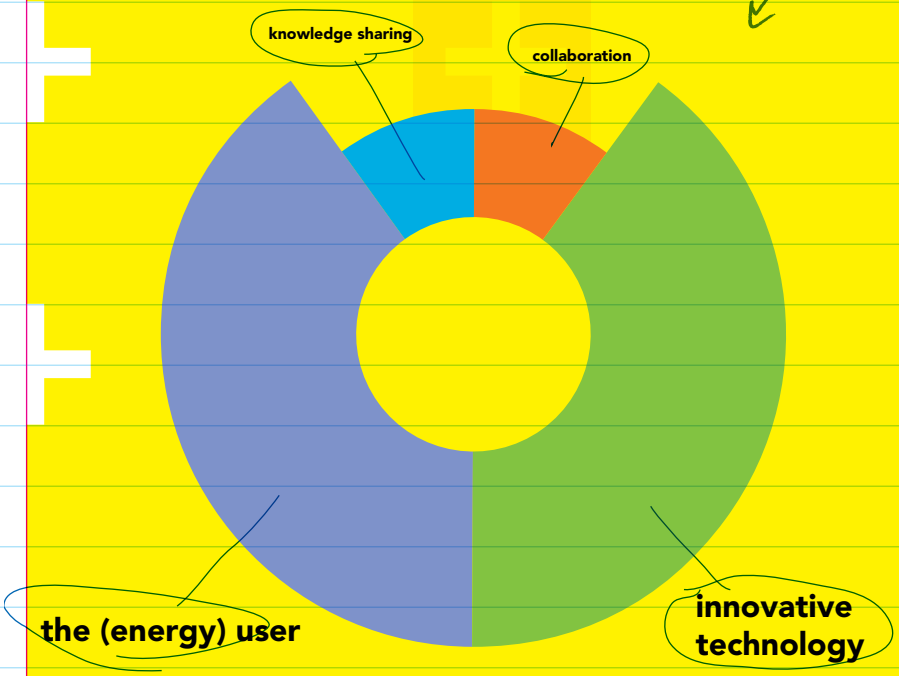
1269 smart plugs

2 partners

4 questionnaires

1 smart technology

4 months



Lessons learnt: Households and smart technologies

The emphasis in the eManagement pilot was on testing a smart technology in a consumer situation. The lessons learnt during the pilot relate to both the process and the technology, as well as to consumer use of a new technology. In addition, a qualitative survey was conducted to determine what users' reasons and motivations are for saving energy or for failing to do so.

To start with the latter, it resulted that the participants in the project were people highly interested in innovations and the majority can be categorised as the consumer types innovators and early adopters. Main reason to participate was that an easy method to monitor energy consumption was offered and people would like to save on energy costs.

The system offered the possibility of switching or linking devices which was done by a quarter of the participants, half did not use this application and the remaining quarter did not know if they used the application. Of the participants that did use the switch option, 45% thought it was a user friendly application, whereas the other part did not agree on the user friendliness.

The participants' clicking behaviour revealed that, on average, they check into their portals every 2.3 days. If the system is not experienced as user-friendly, the users terminate participation prematurely. It is therefore preferable to also test the technology in a consumer situation.

An analysis of the recruitment figures reveals a conversion percentage of between 5 and 12%. It is therefore recommended to adopt a completely transparent approach when inviting people to participate in the pilot, about the steps involved, the amount of time that the participants will need to invest, and what they can expect. If the researchers expect a low participation population, it is also advisable to offer suitable incentives.

The four-month test period revealed that this kind of energy management system could yield energy consumption savings of between 0 and 30%. Two-third of the consumers yielded an energy saving between 0% and 10%. 19% Yielded an energy saving between 10% and 20%. A low score in energy savings could be explained by the fact that people did not actively use the system. The group that yielded the highest scores made active use of the system and the switching option, which made it possible to obtain insight into the energy use of the different appliances on the plugs.

SMART QUOTES

"I am participating because I enjoy innovations and even though I am an energy consumer, I want to be a conscious consumer."

"We thought we would only receive an energy meter, but the available programs made it possible to manage for instance the lighting at home from another location."

"I did not think it was possible to get that detailed information on the energy consumption per device."

"I see plenty of opportunities to save money."

“I expected a more integrated system.”

“I did not know that devices on stand-by modus use that much energy.”

“Interesting to see that my son uses more energy in his bedroom than any other room in our home.”

“I thought we already dealt with energy in an efficient way, but it can be better. We are more consciously dealing with energy now, for instance when we purchase new equipment (energy labels).”

Quotes by participants in the eManagement pilot

#04 Onze Energie

MOVIE

***Onze Energie* (Our Energy) is an initiative to collectively finance seven windmills. Collective financing is intended to break the barrier of high investment costs for consumers wishing to generate their own energy.**

The two main options for reducing CO_2 emissions are: the reduction of energy consumption and the production of energy from renewable sources. Sustainable energy can be produced centrally in large wind or solar parks, or locally on or around houses and buildings. Both systems are needed in the future to be able to generate sufficient sustainable energy to meet the demand. One of the big barriers to both the consumer and business, with respect to generating their own energy, is the high investment cost and uncertain profits. This is particularly true in the case of households, where the period required to earn back the initial investment – given the present subsidy schemes for e.g. solar panels - is longer than the average number of years the owners occupy any given house. As a result, insufficient consumers are investing in domestic energy production to represent a significant share of the overall production of sustainable energy. The *Onze Energie* initiative addresses that problem.

Onze Energie is a concept in the collective financing of sustainable energy production designed to enable groups of energy consumers to invest small amounts to be able to participate in the overall cost of setting up and operating windmills. The rest of the cost is financed by big commercial operators. That way, the people of Amsterdam can stimulate growth in the production of sustainable energy while, at the same time, enjoying a fixed price for green energy.

Onze Energie was started by two enthusiastic initiators who strongly believe in a more sustainable future. During the preparation of the project, *Onze Energie* partnered with different organisations, including: Stichting DOEN, Stadsdeel Amsterdam Noord, Climate Agency of the city of Amsterdam, Greenchoice, HIER, Stichting Mijn CO_2 Spoor, AIM to Sustain and Amsterdam Smart City.

Objectives

The ambition of *Onze Energie* is to recruit 8,000 households in Amsterdam Noord to become members of the cooperation in order to build 7 windmills in this area. This is equivalent to 20% of the households in Amsterdam Noord. The project drew the attention of Amsterdam Smart City, especially this type of collective financing with the potential engagement of many consumers. What are the actual reasons for Amsterdam residents to become a member? And why don't people simply change to the existing green and discount providers? In other words, what is the (perceived) benefit of 'own' energy generation versus commercial green energy generation?

Onze Energie campaign

www.onzeenergie.nl

Research

In September 2010, during the recruitment phase, a market survey was performed in Amsterdam Noord. The purpose of the survey was to determine what the motivation of the target group, Amsterdam residents, is for changing to an initiative such as *Onze Energie*. Although the marketing budget of *Onze Energie* was limited, the project was highly recognized and respondents had a positive association with the initiative.

In addition to this survey, a student of Leiden University is conducting a research study to determine residents' motives for participating in collective initiatives and the role of early adopters in such a process. The survey targeted consumers that are members of other initiatives (Windvogel, Zonvogel and Texel energy).

Lessons learnt

It takes time to explain the need for sustainable energy properly. Windmills apparently have a negative perception, people think it is expensive and unprofitable.
Next to this consumers seek security. *Onze Energie* did, deliberately, not liase with a major energy company. Through an association with a brand like MTV or HEMA *Onze Energie* would probably have had a more reliable image. *Onze Energie* was and still is a plan. With actual windmills already installed the recruitment of members would have been a lot easier.

Next steps

At this moment *Onze Energie* has 180 enthusiastic members.
The cooperation is now at the point that these members are starting 'the snowball'-effect and recruiting new members. The *Onze Energie* organisation is supporting the members with marketing materials.
With 1.200 members the first windmill will be build. This will certainly speed up the adoption process and increase the number of members.
The initiative can be scaled up throughout the Netherlands, where a suitable terrain, a supportive government and some initiators that are truly connected to their neighbourhood seem to be the most important prerequisites.

Partners

Onze Amsterdam Noord Energie

STICHTING DOEN

NATIONALE POSTCODE LOTERIJ

Member number
100 joins *Onze Energie*

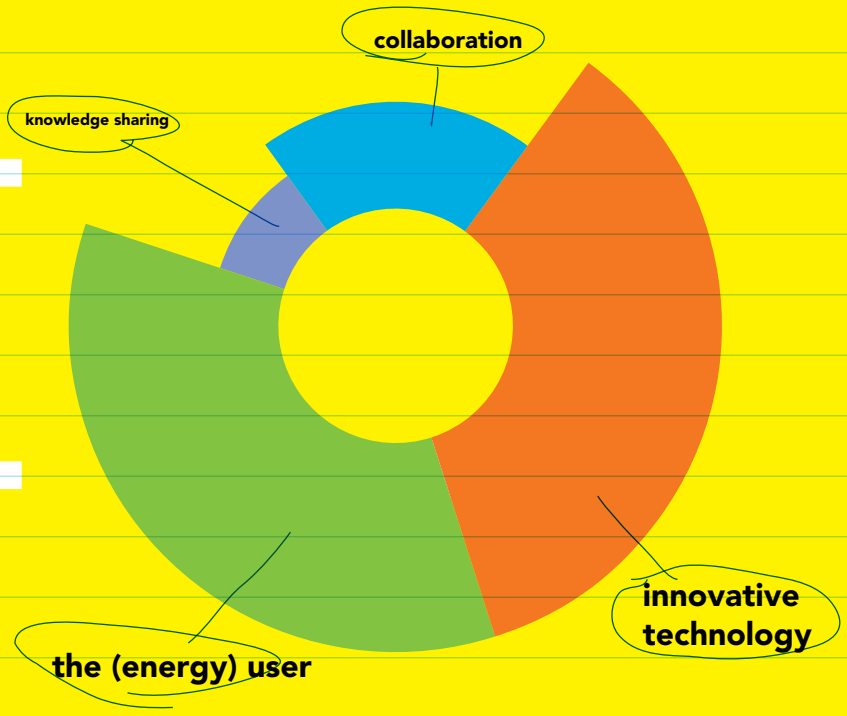
SMART QUOTES

"I support *Onze Energie*, not only because it is a very good initiative but also because I'm fed up with the big energy suppliers!"

Member of *Onze Energie*

Innovative approach to reach Amsterdam's residents

Onze Energie is using a highly innovative approach in the form of its investment concept: Amsterdam residents who wish to generate their own energy can now easily do so by taking one small step and an investment of 50 euros. All the members of the partnership are also co-owners of the company and have a democratic vote in the strategy, which increases the level of acceptance and involvement. The collective approach and financing concept make this project unique.



7

windmills

8000

members needed

50

membership fee in euros

10

partners

180

people switched over to *Onze Energie* so far

#05 Smart Challenge

The Smart Challenge is set up for the employees of 11 different companies in Amsterdam. The competition involves giving 30 employees of each organisation a two-month opportunity to use the Wattcher. The tool gives the user insight in his energy consumption patterns and thereby enables him to start saving energy. The winner of the contest will be the company whose employees save the largest amount of energy!

Sustainability and energy saving are themes that play an increasingly integral role in businesses. Employees are now able to not only use energy smartly and more efficiently in the office, but also at home. A year ago, technical service company Imtech launched an energy saving programme named ICARUS® for its staff in light of its CSR policy. ICARUS explicitly targets the reduction of domestic energy use by its staff and awareness of domestic energy consumption. This is achieved by measuring electricity use, displaying it in a simple way and making information on efficient energy use available through information exchange among staff, and by

website of Smart Challenge

communicating the results of the energy saving actions internally and externally. An evaluation of the programme, as used by 300 Imtech employees, revealed that ICARUS has yielded average domestic energy savings of 14%!

Imtech was delighted to learn of Amsterdam Smart City's plan to expand this concept to a number of companies and municipal organisations: 11 companies, three competition rounds and 10 employees per company would result a competition between 11 companies and 330 employees!

The Smart Challenge thereby has major energy saving potential. In addition, it will also generate greater awareness among the participating companies' employees, which will in turn be consolidated through the mutual exchange of experiences and tips. The purpose of the new project is to study behavioural change and to find out to what extent employees will adapt their behaviour at home and at work when participating in a competition. That way, the participating companies will all contribute to energy savings and the reduction of CO_2 emissions.

Imtech sponsors the competition by providing for the Wattchers, the smart devices that enable the participants to monitor their energy use and is responsible for the project management.

www.smartchallenge.nl

Objectives

The purpose of the energy saving competition is to give 330 employees of 11 companies insight in their energy use and thereby to help them save energy over a period of six months. The fact that the employees are able to share their experiences and tips via a weblog will make them more aware of their energy use and will also increase mutual interaction between the employees. In addition, surveys of the behavioural changes of the participants will also provide insight into how effective this kind of competition is in terms of engaging employees in energy saving initiatives. The project will be executed in a carbon neutral way: the estimated CO_2 emissions needed for the organisation of the project and the winning household will be compensated.

Research and next steps

The Smart Challenge, which is based on Imtech's energy saving programme, is designed to create large-scale energy savings and awareness among the employees of participating organisations. The Imtech project yielded average savings of around 14%. A large implementation of the concept could multiply the aforementioned savings. The fact that the competition involves both qualitative and quantitative research means that it will be possible, by the end of the project in December 2011, to show concrete results in the fields of energy savings and behavioural change of employees. Another aim of the programme is therefore to check whether this type of awareness and energy saving behaviour will be successful in other companies as well.

Energy feedback system Wattcher

Partners

Imtech

FAIR CLIMATE FUND

wattcher
BESPAAR THUIS ENERGIE DOOR INZICHT!

Participants

ABN·AMRO

accenture
High performance. Delivered.

ATHLON CAR LEASE

Gemeente Amsterdam
Dienst Ruimtelijke Ordening

Gemeente Amsterdam
Dienst Milieu en Bouwtoezicht

Eneco

Heineken

liander
onderdeel van alliander

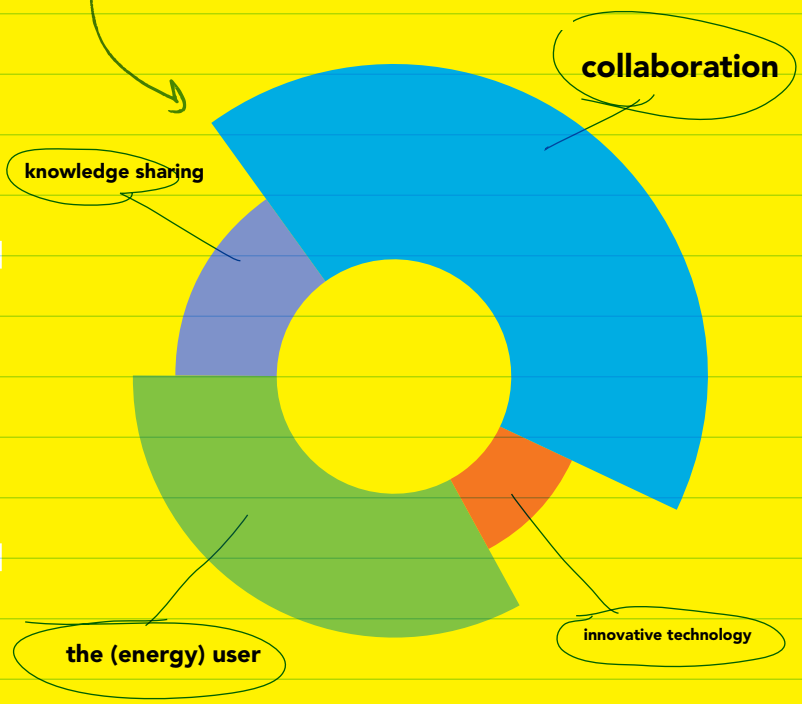
TNO

upc

vodafone

Collaboration and insight in energy use

The knowledge acquired in the Imtech energy saving programme will be shared with the participating companies in the competition. The challenge offers employees insight into their energy consumption patterns and increases awareness.
This is partly achieved by means of weekly tips and assignments issued to the employees. Participating employees can also share their experiences and tips via a blog and participate in a survey on behavioural change. In other words, the central focus is on the end user. The Wattcher gives the employees insight into their energy consumption patterns and also enables them to view their consumption data online on a dedicated portal. By doing so, the project stimulates the participating companies' employees to participate in 'energy saving' initiatives in their domestic situations and to apply the newly gained awareness of efficient energy use in the work situation. For that reason, the programme is viewed as a direct extension of Amsterdam Smart City's two focus areas: working and living.



3
partners

330
employees

1
smart technology

14%
energy savings per employee

11
companies

6
months to save energy

42,800
aware collegues at the participating companies

#06 ITO Tower

Collecting, analyzing and visualizing energy consumption will help to make the modern and prestigious ITO Tower to be even more energy efficient.

Large office buildings are big energy consumers. Improved system coordination and automatic adjustment of energy consumption systems could save a great deal of energy, even in modern office buildings, such as the ITO Tower.
Accenture's Dutch head office is located on four floors of the ITO Tower at the Amsterdam Zuidas. Considering the fact that sustainability is one of Accenture's core values, Accenture has developed a comprehensive sustainability strategy that concerns business operations, services provided to clients and the way Accenture interacts with her suppliers.

Accenture implemented a number of activities over a period of 18 months, including extensive consultations with the building manager and owners about the implementation of a variety of suitable sustainable measures. In cooperation with innovative technology provider *Plugwise* 360 smart plugs including switching schemes were installed. In addition, with the support of sustainability-consultancy organization *Wij Zijn Koel* other sustainable initiatives were implemented: among others LED lighting on the 17th floor and the *JoinThePipe* initiative.

ITO Tower Zuidas

Objectives

The principal purpose of the ITO Tower project was to obtain insight in the company's energy consumption patterns and find ways to reduce energy consumption by installing innovative solutions. Gaining experience with these solutions was a positive spin off of the project.

Results

Although the energy saving research in the ITO Tower was done with the use of smart plugs, the outcome was by no means simple and clear. After the first baseline measurement in April 2010 the energy usage seemed to rise instead of decrease. For this reason it was necessary to perform a new baseline measurement. This in combination with switching of lighting and appliances outside office hours reduced the electricity consumption by 18%. This means an annual reduction of 20 MWh. Due to the flexible and relative long office hours at the Accenture office, this percentage can probably be a lot higher for other offices.

The replacement of 300 halogen lamps on the 17th floor by LED-lights had an even a bigger impact: savings of 47 MWh per annum. This is the equivalent of the energy usage of 15 households.

Lessons learnt and next steps

The ITO Tower project yielded many important lessons in rendering (part of) a modern office block more sustainable and energy efficient. Obviously everything starts with the company's wish to make its operations more sustainable. However, the actual implementation of the applicable measures generally appears more simple than it really is. One of the most important lessons learnt in this project is, for example, that many tenants are not in the least bit motivated to save energy, because the energy costs are incorporated in the service costs. If they do save energy, the financial benefits of the savings go to the owner instead of the tenant. It is therefore recommended to adjust the system to motivate both the owner and the tenants to use energy in a more efficient way.

The precondition for the successful implementation of an energy management system is an engaged and properly trained facility manager. A bit surprising was the fact that the building manager was rather reluctant to the initiatives at the beginning. Therefore it is also very important to engage the building manager at an early stage. Once again, it is extremely important to establish cooperation between the parties concerned, each of which has its own objectives when implementing smart technologies. Automatically switching of lighting and energy intensive appliances outside office hours and large scale implementation of energy efficient lighting solutions can easily be scaled up, as long as the financial benefits are balanced between tenant and building owner.

Join the Pipe initiative at ITO Tower

Partners

accenture
High performance. Delivered.

Plugwise

wij zijn koel.nl

Smart plug and Plugwise webinterface at ITO Tower

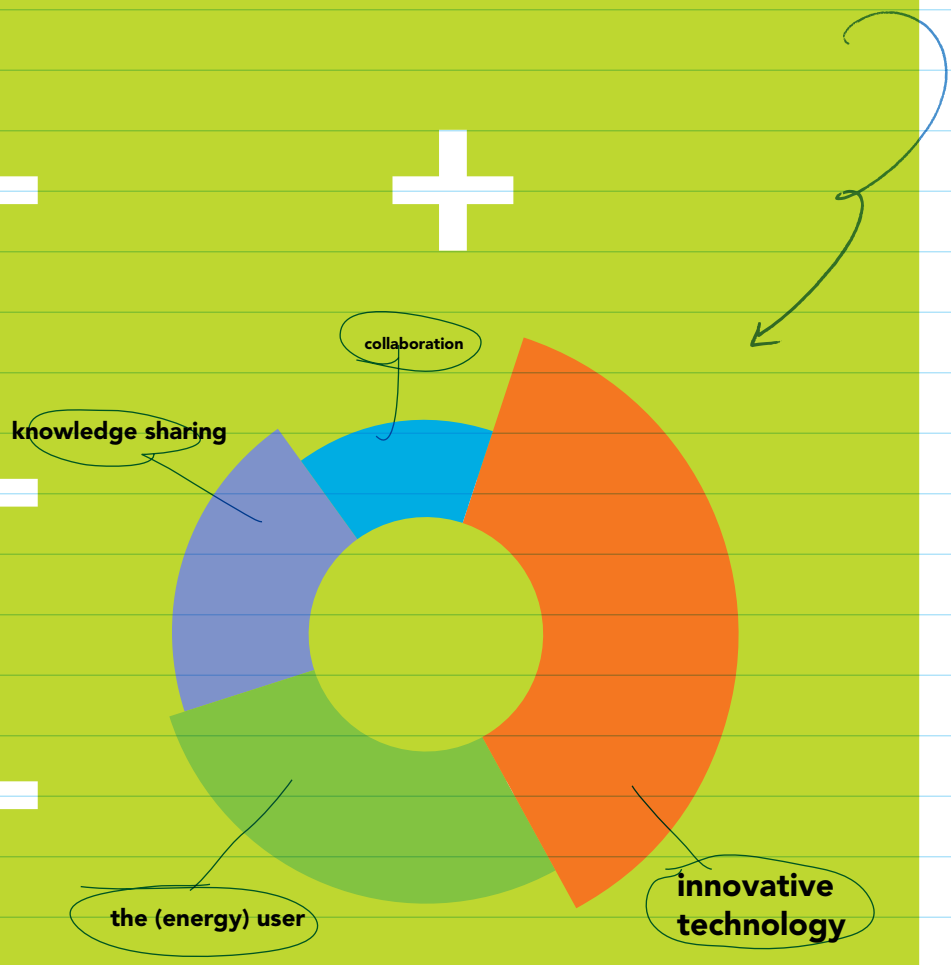
SMART QUOTES

"Since the start of the ITO tower project, we welcomed at least 4 TV-crews from Asia! Next to this the Amsterdam Smart City initiative has accelerated our own sustainability ambitions: 15% of the 100 LEAFs (new electric vehicles) that recently came to Amsterdam, will be driven by Accenture personnel!"

Martijn de Groot, Manager Facilities Benelux Accenture on the ITO tower project

Accelleration in innovation

The implementation of the smart plugs solution turned out, due to technical and operational issues, to be a lengthy process. Nevertheless the system and LED-lights are implemented and currently perform conform expectations. A positive side effect of the project was the acceleration of other innovative initiatives: Accenture became frontrunner in Electric Mobility: 16 employees will drive plug in Electrical Vehicles from March 2011. Also at the Accenture office an innovative printing solution has been implemented, saving 16% on office prints. Besides this the energy saving battle (Smart Challenge) was a direct spin off of the ITO Tower project to involve employees.



3
partners

300
LED lights

6
smart technologies

72%
energy saving by LED

360
smart plugs

18%
energy reduction by switching off devices automatically

2500
employees

1
knowledge session

1
join the pipe unit

15
electric cars

#07 Monumental Buildings

REPORT WORKSHOP SUSTAINABLE MONUMENTS

Supporting monumental buildings in Amsterdam in the process of becoming more sustainable makes it possible to learn more and analyze the opportunities of this large target group in Amsterdam.

The canal district, the historical buildings, as well as some industrial sites and post-war neighbourhoods, all tell part of Amsterdam's rich history. A large proportion of the buildings, especially those in the city centre are government or municipal monuments. If many monuments, about 8,000, in the Amsterdam city centre become more sustainable a significant contribution towards the city's objectives is made. With this in mind, Amsterdam Smart City approached a few monumental buildings in the city, whose owners had expressed a desire to make the buildings sustainable. It was decided to approach several monuments in order to accumulate a broader body of knowledge. The monuments also differ substantially in terms of the objectives, character and ownership construction to maximize the experience.

At the end of 2009, Amsterdam Smart City initiated partnerships with the *Ambtswoning* and *De Balie* and the *De Groene Bocht* also joined the partnership at the beginning of 2010. The buildings were mainly chosen based on their public attraction value and their exemplary nature for the city. The exemplary function and the public access to the monuments - which offer opportunities for stimulating sustainable awareness – make this target group indispensible.
Given the complexity of the playing field, the first step will be to gain experience with these three monuments by bringing them in contact

Monumental building, De Balie

with potential sustainable solutions. The most important conditions for success in this project are: active participation on the part of the project partners, the development of a smart vision and the collective perseverance needed to overcome the inevitable bottlenecks.

Objectives

The initial focus of Amsterdam Smart City, with respect to monumental buildings, is mainly on the following areas:

- How can technical innovations that save energy be used to render monumental buildings more sustainable? And what does this involve in terms of technical and financial feasibility?
- Many of the (public) monuments are characterized by a high level of public attention. How does that interaction work with respect to creating awareness? Stimulating other owners and distributing good and bad practices are additional essential objectives.

However, during the project the initial goals were adjusted due to the diversity and complexity of the target group. In other words, in the case of Amsterdam's monuments, the main result became the learning of the (collaboration) process involved in the set up of each subproject and each different initiative. For example, the complexity and uniqueness of the buildings generally entail longer project running times which is needed to analyse awareness effects on the public. So, Amsterdam Smart City mainly adopted the role of moderator by continuously bringing in potential partners and by stimulating knowledge exchange.

Lessons learnt

The monumental buildings project ends after the results have been disseminated to all participants of the workshop and all other people that are interested. The report *"The Balance between Monuments and Sustainability"* is also proposed to the alderman of the Centre district, Jeanine van Pinxteren, and actively communicated to various Amsterdam stakeholders. If you are interested in making monuments sustainable it is highly recommended that you take a look at the report posted on the Amsterdam Smart City website first. A quick view on the results tells us:

- Monuments have many different characters, so a customized approach is needed.
- The meaning of sustainability on monuments is interpreted differently by stakeholders.
- Regionally and even nationally sustainable measurements on monuments are often undertaken individually; to make steps, more collaboration and knowledge sharing is inevitable.

Next steps

The project fulfilled a number of objectives by stimulating the use of sustainable applications and through the dissemination of the knowledge acquired in the process. The next steps must be taken by the city and all its stakeholders, all of whom have hopefully become inspired by the workshop, report and all the gained experience. It became evident from the three pilots that it is not possible to generalize in this domain. Every monument is different from another. Not only in terms of construction, but also because of all the different parties involved and the fact that each organisation has a different set of objectives.

It also emerged that the objective of reaching the visitors of the monuments and influencing their behaviour is a step too far. The pilots reveal that it is essential to first research many possibilities before it becomes meaningful to implement and test various types of smart technology. Obviously the smart technology is one of the results that would first have to be implemented before it becomes possible to communicate it to the visitors. Stimulating sustainable awareness among the visitors could certainly become one of the targets afterwards. Prior to the start of the projects, the participating organisations in the three pilots had different substainable ambitions. For similar future projects these different intentions should be taken into account, because only the feasible will be applied.

Partners

Gemeente Amsterdam
Bureau Monumenten & Archeologie

NYENRODE
BUSINESS UNIVERSITEIT

LEDLEASE

COFELY
GDF SUEZ

DGBC Lab

debalie

de groene locht

Collective office building 'De Groene Bocht', *Photo by Isabella Visser*

SMART QUOTES

'Think ambitious, do the feasible.'

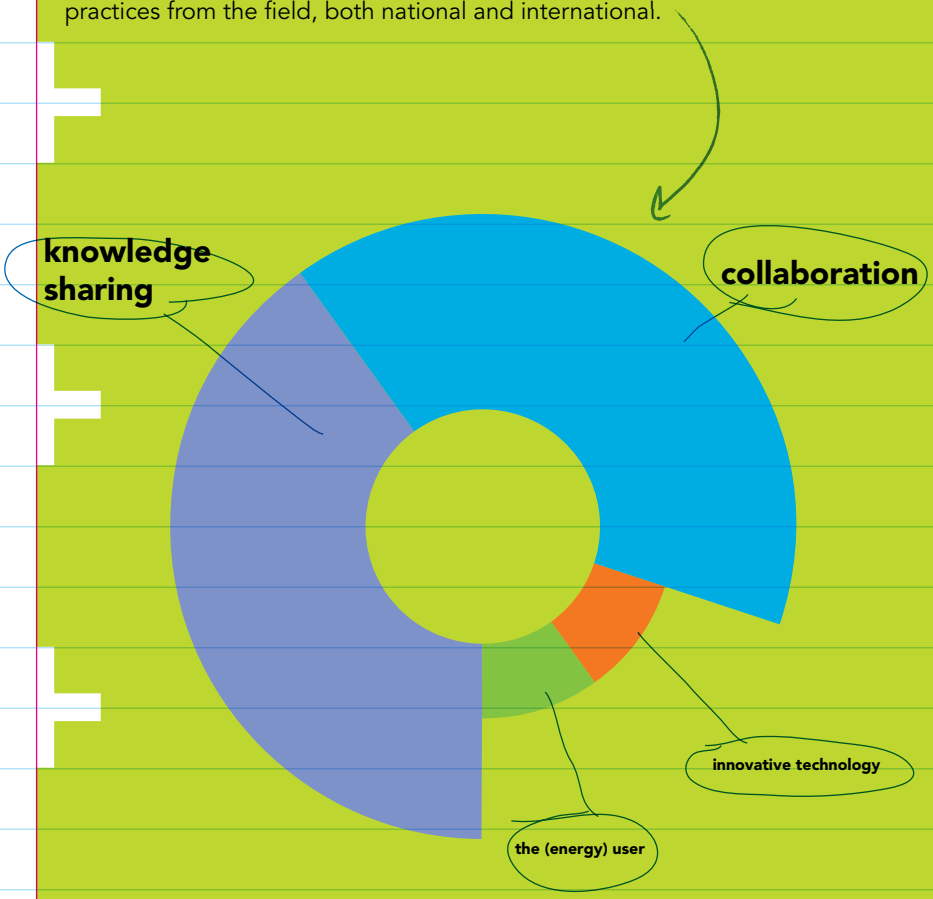
Dianne Zuidema, Director De Balie

'Despite many attempts no collaboration was feasible with De Balie at that time. On the other hand a quick match with Nemo set up by ASC is promising.'

Werner Out, Project Manager Cofely

Knowledge sharing and collaborating

The sustainable monuments project aims to learn as much as possible from the three pilots and share all results with third parties. In November 2010 Amsterdam Smart City initiated a workshop for which all project partners, the municipality councillors and several other Amsterdam stakeholders that share the same interest were invited. The workshop was jointly organised by the *Bureau voor Monumenten en Archeologie* (BMA), the Center for Sustainability (CfS) at Nyenrode Business University and Amsterdam Smart City. The three ASC pilots served as input for the workshop. This resulted in the research report *The Balance between Monuments and Sustainability* made by Nyenrode Business University. The report and the discovered lessons are used to inspire others and to share the acquired knowledge with interested partners and other cities. Besides the ASC projects, the research also contains a lot of other good practices from the field, both national and international.



8
partners

43
guided tours

6
smart technologies

11
events

3
different builings

108
led lights implemented
at De Balie

1
knowledge session (25p)

8
sustainable initiaves implemented
at De Groene Bocht

3
research reports

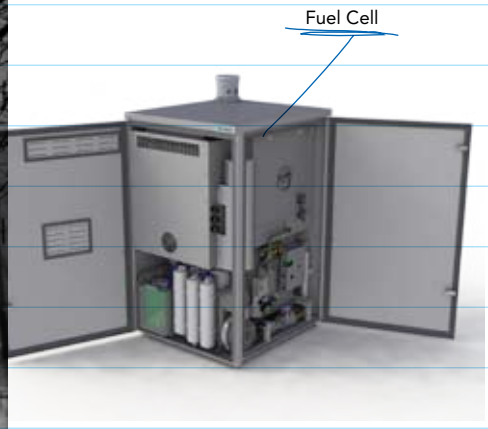
#08 Decentral Generation: Fuel Cell Technology

FIND OUT MORE!

Introducing a 21st century technology in a 17th century monumental building will reduce CO_2 emissions by 50%. Using this innovative local energy-generation technology will enable the building to provide in its own electricity.

After almost 20 years of research and development in Australia, fuel cell producer Ceramic Fuel Cells Limited (CFCL) has succeeded in creating a fuel cell with a higher electrical yield than the most modern gas-fired power stations existing today. The fact that the residual heat is also utilized for other purposes means that the system is able to realize a 50% reduction in CO_2 emissions[1]. The fuel cell is currently being tested by several clients in nine countries around the world.

1 Compared to average CO_2 emissions/kWh in The Netherlands



Collective office building 'De Groene Bocht', *Photo by Isabella Visser*

Fuel cell technology is quite a broad field that requires experience from many different disciplines: from chemistry to material sciences and all the way through to engineering and thermodynamics. Because fuel cells are very efficient and do not burn the fuel through a combustion process, the fuel cells do not produce large quantities of greenhouse gases, such as Carbon Dioxide (CO_2), Methane (CH_4) and Nitrogen Oxide (NO_x). The only emissions from fuel cells are water in the form of steam and low levels of carbon dioxide.
Local companies Coolendeavour, Eneco, GasTerra and Liander believe this to be a promising technology and have jointly decided to conduct a proof of concept in the Amsterdam inner city with a 2kW fuel cell supplied by CFCL. In other words, not in a laboratory, but in a 'living lab' environment. The proof of concept will fully supply the "De Groene Bocht" building with self-generated electricity.
The system is designed to generate power on the user location, which means that it also saves approximately 5% of the normal transport loss. The use of residual heat results in a total energy efficiency of 85%.

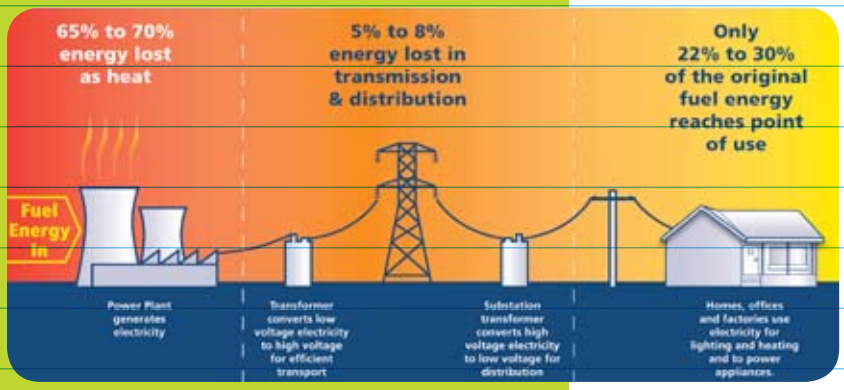
www.degroenebocht.nl

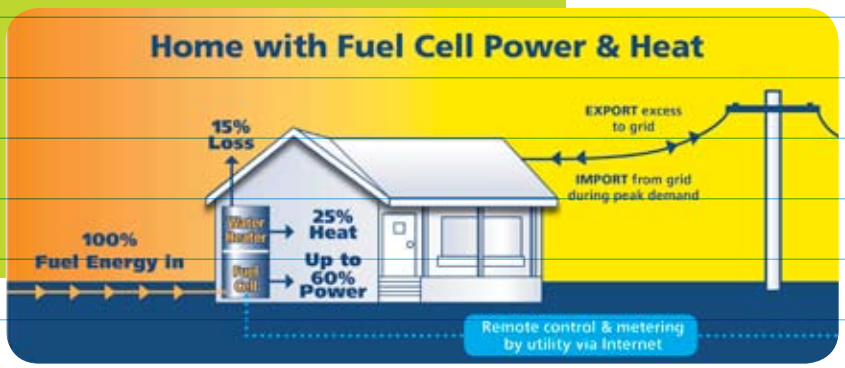
Decentral Generation: Fuel Cell Technology

Objectives

The purpose of the implementation of the fuel cell technology in the centre of Amsterdam is to learn more about the technology, its implementation, and its performance: this is a true proof of concept. A secondary purpose of the proof of concept is the investigation of the regulatory framework and recommendations for optimizing those regulations that make fuel cell technology economically viable. During the two year trial period, the performance of the fuel cell will be monitored and experience will be gained in implementing this technology.

Fuel Energy at Home





Partners

cool endeavour

Eneco

Tempus
Eneco installatiebedrijven

GasTerra

Liander
onderdeel van alliander

Ceramic Fuel Cells Limited

SMART QUOTES

"This consortium really is the Dutch Dream Team. The partners in the consortium supplement one another perfectly and share an excellent vision in the field of sustainable local energy generation."

Frank Obernitz, director Business Development CFCL, on the consortium of partners in this project

"Now we can show the weekly stream of visitors around the world real state-of-the-art technology nex to the LED lighting and smart displays!"

Mattijs Guichelaar, projectmanager Cool Endeavour, on smart technologies in collective office building De Groene Bocht

"Natural gas will play an important role in the transition towards a sustainable energy supply. GasTerra initiates projects that supports and accelerates this transition. Decentralised electricity generation with fuel cells running on natural gas is a good example of these developments."

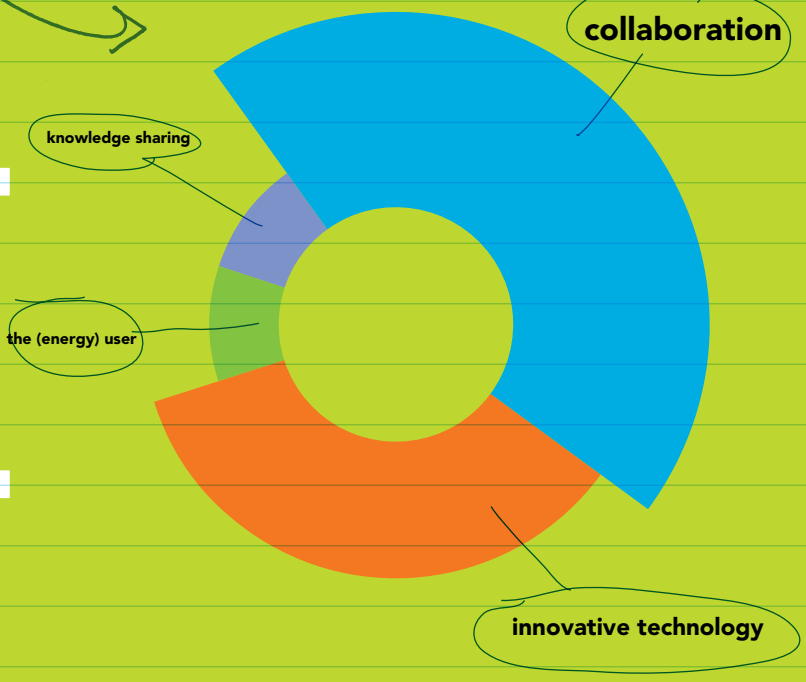
Hans Overdiep, Manager Energy Transition GasTerra B.V.

"Liander works proactively to support the development of promising sustainable solutions. Decentralized generation can truly revolutionize the energy market, and Liander is working to prepare our network and operations in time for this challenge."

Martijn Bongaerts, Manager Innovations Liander

Lessons learnt and next steps

It took more than six months to set up a suitable consortium consisting of different partners with a shared interest that transcended their individual interests. It transpired however that the six-month period was needed for the group to be able to concretize the idea, the partnership, the role division, and potential follow-up steps.
One of the activities that will take place, besides monitoring the system, is to find solutions to introduce the technology to the market on a larger scale. To prepare a large scale market introduction the specific knowledge on service and support will be transferred during the project.



6

partners

60%

electrical efficiency

200

Distance in km between Groene Bocht and CFCL factory in Heinsberg

27

the Fuel Cell at the Groene Bocht is the 27th to be produced

20

years of development

50%

CO_2 reduction

13,000

kWh per annum

MOVIE ZUIDAS SOLAR LAUNCH

#09 Zuidas Solar Challenge

NextEnergy has issued a challenge to install 3,000 solar panels on the roofs at the Zuidas business district within one year. With this project NextEnergy wishes to demonstrate that large-scale solar power generation is indeed viable. The companies, employees and residents of Zuidas will all be engaged to help ensure the success of the Zuidas Solar Challenge.

In the years ahead, the Zuidas in Amsterdam will develop 270 hectares of land to create the city centre *par excellence* for international business and knowledge development. Four hundred trendsetting, internationally operating companies have already established a base at the Zuidas. One of the biggest universities in the Netherlands, and a trendsetting university medical centre are prominent features in this precinct. The Zuidas has placed a sharp focus on two aspects, namely, cooperation between companies and involvement in the developments and, secondly, sustainability.

NextEnergy has adopted the theme of sustainability for the launch of the Zuidas Solar Challenge. The action plan, to install 3,000 solar panels on the roofs at the Zuidas, was drawn up by a small group of professionals. There are 30,000 people working at the Zuidas, whereby the idea arose to set up one solar panel for every 10 people. The aim is to make the Zuidas less dependent on limited energy sources. Another motivation for the plan is to demonstrate

Workshop Zuidas Solar Challenge

that a group of companies can jointly take significant steps rendering the Netherlands less dependent on non-sustainable energy resources, without any government support.

Objectives

The ambition of the Zuidas Solar Challenge is to install 3,000 solar panels in and around the Zuidas within one year. This is equivalent to a capacity of 0.5 MW. An innovative objective that can be achieved by actively engaging all the companies and their staff, as well as all the residents of the Zuidas. The challenge will also serve as a test project, which means that it is important to learn from it and to analyse which approaches work and which do not.

Research

The impact the Zuidas Solar project will have on the climate goals of the city of Amsterdam will be taking into account. In many ways, the most interesting aspect of this project is the challenging approach. The main purpose of the research is therefore to determine the level of participation by the companies in the area and the reasons why they do or do not intend to participate. One of the other goals of the project is to determine the critical success (or failure) factors of a project such as this. The aim is to define to what extent and under which circumstances this kind of challenge is feasible.

www.zuidassolar.nl

Partners

Gemeente Amsterdam
Dienst Zuidas

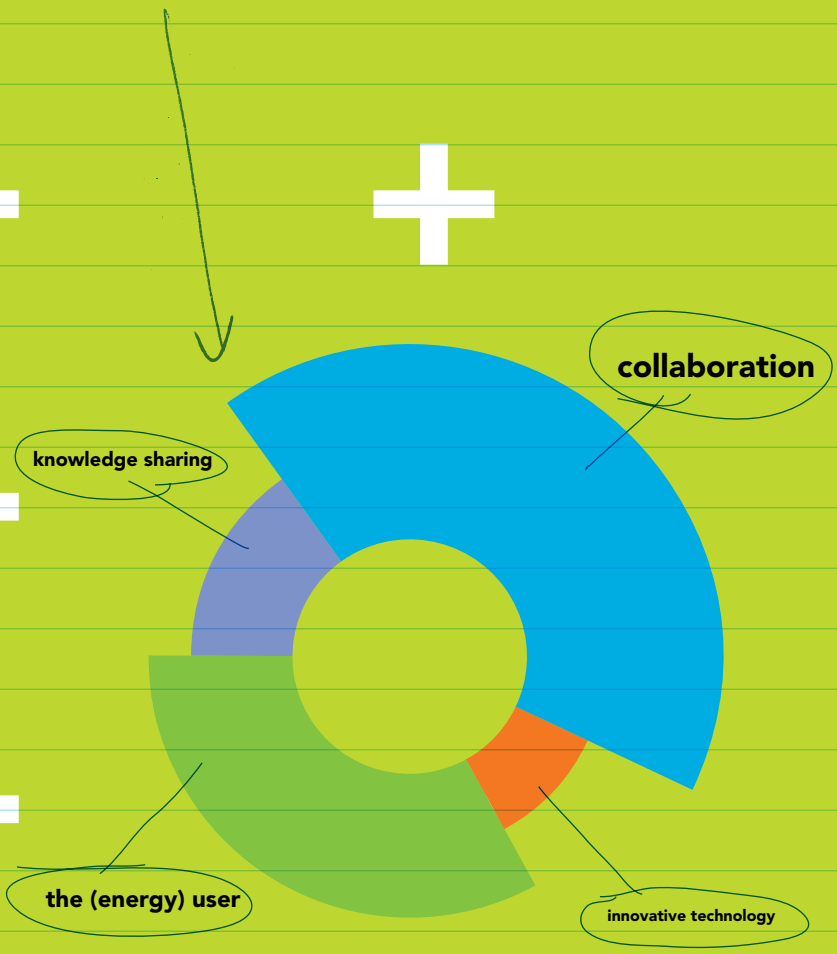
TRE FOIL

Green Business Club

GOED BEZIG
www.goedbezig.eu

Collaboration and Zuidas Solar

NextEnergy is using the challenge to set a necessary social trend. Instead of talking about long-term projects, it wants to use this challenge to demonstrate that it is possible to act now. This kind of 'just do it' mentality is important if we want to achieve our climate goals. The challenge will also contribute towards the acceleration of related developments in the field of sustainable energy and will furthermore demonstrate that innovative partnerships can make things happen: which is another reason why this project is so ideally suited for Amsterdam Smart City. Not only will this initiative test a number of smart technologies, it will also put the spotlight on the participating partners.



5+
partners (number is growing)

10
employees per solar panel

1
smart technology

1
year for the challenge

0.5
MW capacity

14
interested companies

30,000
employees on the Zuidas

3,000
solar panels

#10 Online Monitoring Municipal Buildings

SHORT MOVIE 5 PROJECTS

Measuring energy use via an online portal increases awareness and shows the effects of energy saving measures in municipal buildings.

The Amsterdam Municipality wishes to be a carbon neutral organisation by 2015. To that end, Amsterdam Municipality is developing a number of activities and promising energy saving initiatives. But what does it all actually yield and what is the baseline? The online energy monitor could provide an answer to those questions.

The first step in the process of making the municipality carbon neutral is to gain insight and to monitor energy use in the municipal buildings in order to establish a baseline measurement that all subsequent savings could be measured against. In addition, insight in the energy consumption levels may also result in energy savings and therefore a reduction in CO_2 emissions. The buildings will be connected to an energy monitor that will enable the building managers to view energy use online. The municipality will also

The Stopera,
Photo: Picture gallery City of Amsterdam

monitor other locations in the municipal areas, such as tunnels and sports accommodations.
The City of Amsterdam has set itself an ambitious target by 2015. Meeting that deadline entails rendering an extensive number of municipal buildings energy efficient. To be able to facilitate that process and to monitor future improvements, Amsterdam has initiated this project that will connect all the municipal buildings to a monitoring system in the period of 2010 to 2011.
A pilot in the first phase will connect ten different buildings to the monitoring system. The purpose of the pilot is to gain experience with this type of energy monitoring system. The pilot is a collaboration between the municipal services (*Dienst Milieu en Bouwtoezicht* (DMB) and *Dienst Facilitair Management* (DFM)), the grid operator Liander and the supplier of the online monitoring system: *Energiemissie*. At the end of the pilot period the system and the connecting proces will be evaluated and decisions will be made on how the rest of the municipal buildings will be connected.

Online Monitoring Municipal Buildings

Objectives

The purpose of this pilot is to accomplish energy and cost savings with the aim of establishing sustainability, financial awareness and accountable motivation of the implemented measures and thereby to ultimately contribute to Amsterdam Municipality's objective to be Carbon neutral by 2015. The main goal of the energy monitoring system is to give building managers primarily, and building users secondarily, a grip on their energy consumption patterns. Monitoring makes it possible to explain deviations in the energy consumption characteristics of the buildings; which provides the insight needed to make accountable investments to enhance the energy saving performance of the buildings.

Research

The principal goal is to gain insight into energy consumption patterns and to identify viable quick wins based on that insight. The primary focus of the pilot is to acquire knowledge and experience in the field of energy management. DFM will use the acquired insights to actively work with the building managers to optimize energy consumption. Obviously, the energy consumption levels will be recorded from the very beginning of the operational period to demonstrate the effects of the implemented measures. Although it is hard to quantify the savings in advance, previous research conducted by TNO indicated that it might be possible to achieve average savings of approximately 10% on energy use in most of the buildings if all the building systems are properly set. This will be realized just by monitoring the energy usage, so no investment will be needed tot realize this 10%. With the information from the monitor it will be decided what adjustments of the buildings are necessary and therefore are worthwhile to invest in.

Several Municipal Buildings. *Photos: Picture gallery City of Amsterdam*

Partners

Gemeente Amsterdam

Liander onderdeel van alliander

energiemissie energiemissie.nl

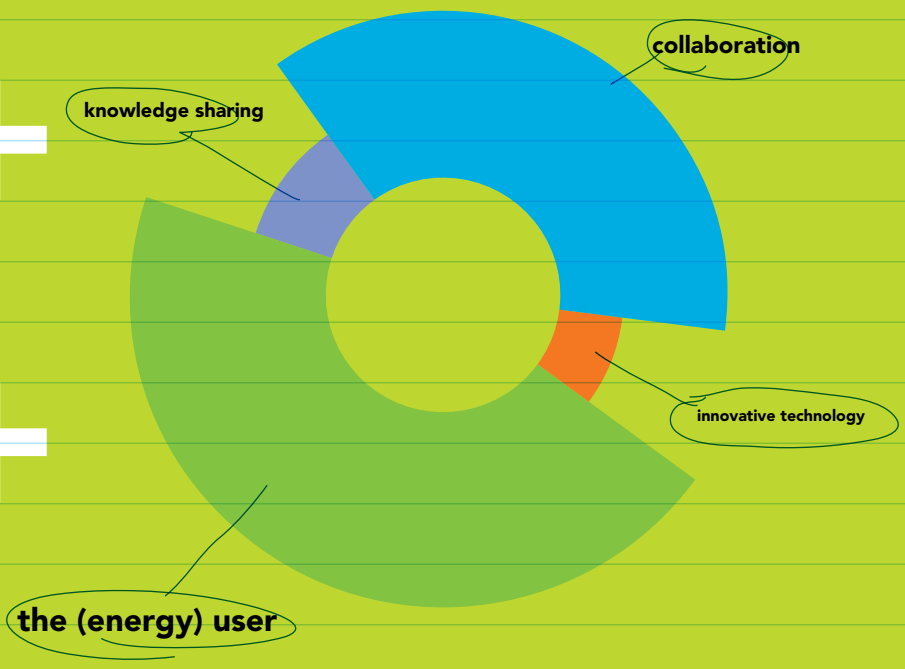
SMART QUOTES

"Now that the monitor is available I check it several times a week. Especially the part with our statistics is useful. The portal is very user-friendly and hereby I mean that you don't need a lot of knowledge to use it. You can actually start right away. With the help of these statistics I have a lot of insight in our energy usage. For instance; our heating is quite busy at nighttime! We can really make some adjustments with the switching schemes of our ventilation system. We can yield some savings!"

Johan van Meenen, Advisor Facility Management *Stadsbank van Lening*, shortly after the implementation of the system

The user of the system

The principal purpose of this pilot is to gain experience in the collaboration between the municipality and Liander. Liander is responsible for providing measurement data and for installing the meters in the applicable locations. A second objective of the pilot is to gain experience in the use of the monitoring application, which was custom designed for the municipality in partnership wit Energiemissie. The users and the facility managers of the municipal buildings will be trained to work with the monitoring system and to implement the applicable energy saving measures. The building managers will be trained to execute the energy saving measures and will be supported in the process. To that end, a number of knowledge sessions will be held in 2011. All the acquired knowledge and experience will be recorded on the intranet site of the City of Amsterdam, called the *Energie Portal*, to facilitate subsequent knowledge exchange.



3

partners

1

monitoring system

1

smart technology

10

facility managers (currently) involved

10

municipal buildings in the first pilot

#11 Ship to grid

One hundred and ninetyfive ship to grid electricity points are being installed in the Amsterdam harbour. The ship to grid system will reduce CO_2 emissions, noise pollution and air pollution.

The ambition of the Port of Amsterdam is to be one of the most sustainable harbours in Europe by 2020. The ship to grid electricity project is one of the 40 projects that will contribute to that objective. The port is a mooring place for inland navigation vessels and river cruise ships that is located close to the city centre. Currently when moored in the port, the electricity used by the vessels is generated by diesel generators that produce noise and exhaust gases, and therefore also CO_2 emissions.
In the course of 2010 and 2011, the Port of Amsterdam will install 73 ship to grid electricity points for the barges vessels and river cruisers. All vessels and ships will thereby be bound to make use of the sustainable ship to grid electricity. Ship to grid electricity is clean and sustainable and causes less noise pollution, less CO_2 emissions and therefore promotes cleaner air. Ship to grid electricity is supplied via power connections with the use of a telephone payment system. Skippers simply call in their personal codes by telephone to activate the power connection. The connection is deactivated when the skipper signs out or unplugs from the power point, and the due amount is automatically debited from the ship owner's account. The fact that the power is supplied by a green supplier means that it contributes to the reduction of CO_2 emissions.
The TNO calculations predict enormous reduction of greenhouse gases by the full implementation of the Ship to Grid project: NO_X by 95%, SO_X by 90% and particle pollution even by 99%. These reductions have a positive effect in the direct surroundings of the harbor. The Amsterdam harbour is investing € 2.5 million in this project.

Description and objectives

The project was commissioned by the Port of Amsterdam. Royal Haskoning developed the plan, the design and did the main engineering based on the technology of other ship to grid projects. Utiliq developed the ICT infrastructure, so the skippers can activate a power point by telephone or internet. Joulz engineered, constructed and placed the installation and Liander delivered and placed the hardware for the grid connection.

The ultimate goal of the ship to grid project is the banning of diesel generators in the harbours of Amsterdam. A secondary purpose of the project is to learn which technologies, partnerships and approaches are the most successful when it comes to rendering large-scale energy supply to ships in harbours sustainable.

Kick off Ship to Grid in Amsterdam harbour

www.portofamsterdam.nl

Research

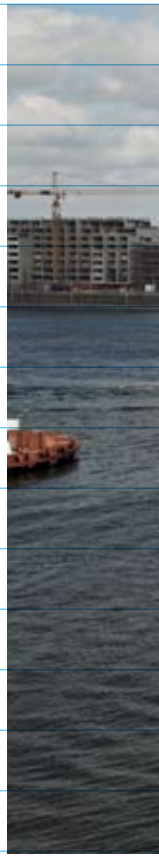
In preparation of the project TNO conducted the necessary research to estimate the potential reductions. The research results included the data for the total net CO_2 savings (through the use of green energy instead of local power generation with diesel generators) and the elimination of (local) emission of fine dust particles. The TNO calculations predict enormous reduction of greenhouse gases by the full implementation of the Ship to Grid project: NO_x by 95%, SO_x by 90% and particle pollution even by 99%. These reductions have a positive effect in the direct surroundings of the harbor.

Lessons learnt

In the ship to grid project there where many stakeholders involved form the municipality but also from several service providers. Cooperation between these different parties is essential. Unfortunately the level of commitment from all these organisations differ. Therefore it is recommended to organize a project like this in a top down manner

Next steps

After the preparation phase the project is currently implementing the ship to grid points. 80 points are currently available and during the rest of 2011 another 115 connection points will be delivered. This expansion of the project is a bit smaller than expected because of different safety regulations in the harbour, making the ship to grid technology not applicable in some locations.



Partners

Port of Amsterdam

Joulz

liander
onderdeel van alliander

Utiliq new ways of energy

ROYAL HASKONING

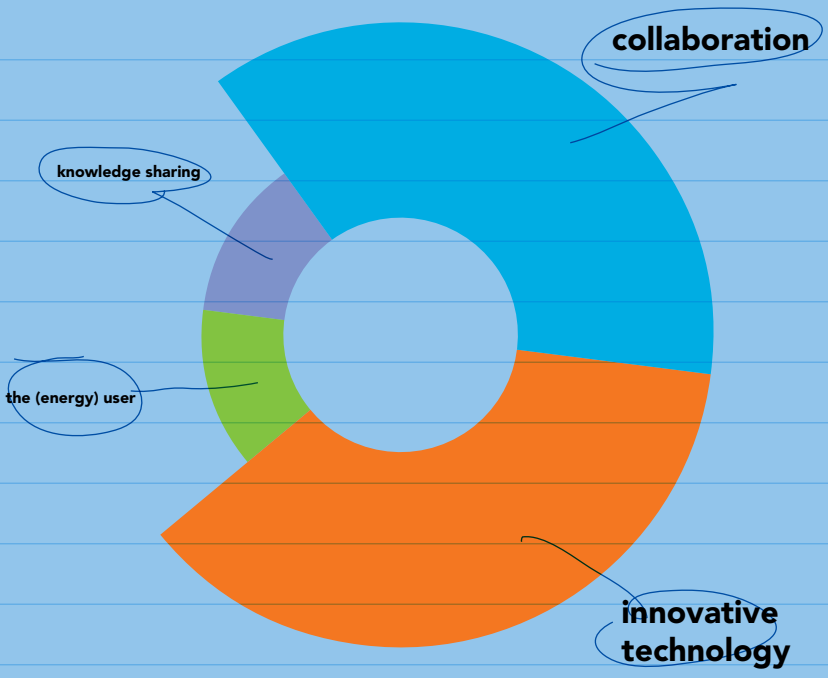
This project is financed with support of the European Fund for Regional Development of the European Commission'

River cruisers Amsterdam harbour
Photo by Edwin van Eis

Ship to Grid charging point on Amsterdam dock

Collaboration in the implementation of smart technologies

This project is a close partnership between Utiliq, Royal Haskoning, Joulz, Liander and the Port of Amsterdam. Utiliq is responsible for the ICT infrastructure and Royal Haskoning for the power technology, the design, the main engineering and supervision. Joulz is responsible for the detail engineering, construction and management of the ship to grid boxes and Liander, the grid operator of Amsterdam, for the connection to the power grid. To obtain standardisation for the ship to grid solution, the port of Amsterdam has worked closely with the National Port Council (for instance: Port of Rotterdam, Port of Drechtsteden) and the World Port Climate Initiative.



5
partners

3
types of vessels

1
smart technology

18
organizations involved

195
ship to grid charging points

80
currently connected points

730
days between idea and realisation

400
ampere and voltage
(maximum capacity)

#12 Moet je Watt

SHORT MOVIE 5 PROJECTS

The New Motion develops electrical charging points for home and office use: their partnership with grid manager Liander will make it easy to charge electrical car batteries.

Liander and The New Motion are currently testing a smart electrical charging box that can be used to efficiently charge electrical cars at home and at the office. The *Moet je Watt* (What do you want) box will first be tested in Amsterdam in combination with a smart meter. The system makes it possible to charge a car's battery and use other electrical appliances simultaneously without overloading the grid connection. In addition, it also enables companies to charge several cars successively. The standard plug that all electrical cars will use in the future will be connected to the *Moet je Watt* box.

Moet je Watt box

Innovative technology

The *Moet Je Watt* box is being designed with user-friendliness in mind and is based on the 'carefree charging' concept. The plug box is full of smart technologies: Besides the fact that it supplies electrical power, it also identifies the user by means of an RFID scanner, and it only switches on if it recognizes the user. In addition, the system also sends feedback to the user via coloured LED lights and measures the amount of electricity used by each user. By communicating with the smart meter, it regulates the amount of power supplied, based on the capacity of the grid connection and the electricity use of all other appliances connected to the distribution board. The latter property is important to prevent grid overload. The system also sends all the data to a website where the user is able to monitor the amount of kWh used at any given *Moet Je Watt* point. Finally, the box can be placed on a pole or on a wall.

Research

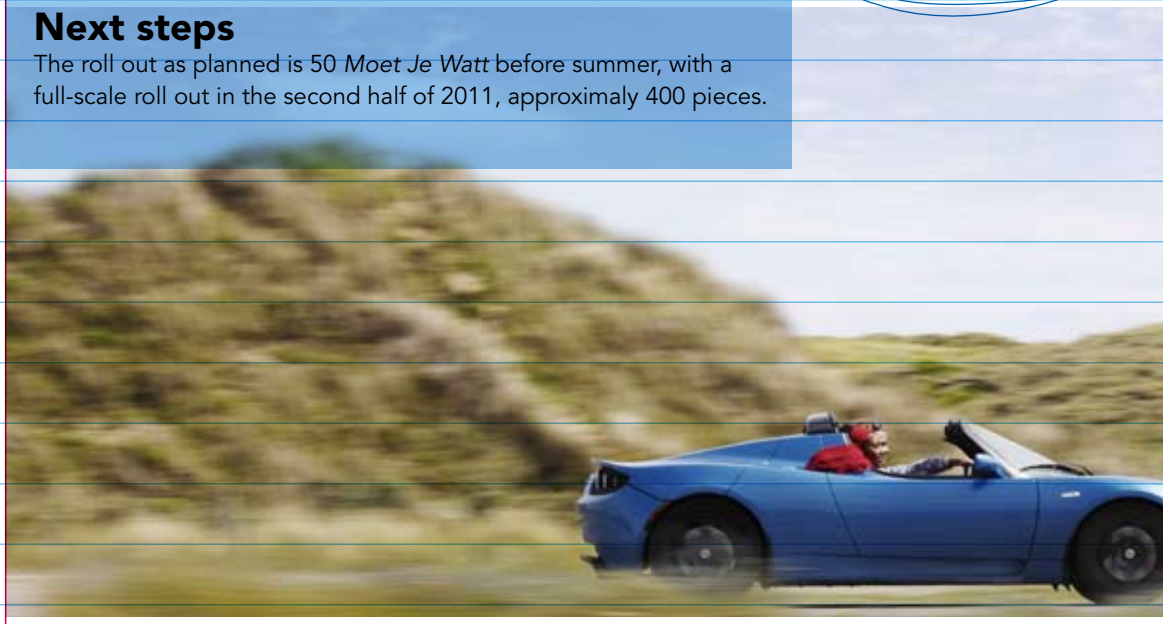
This project is currently still in its start-up phase. In the case of a survey being done in the test phase, the main survey questions will deal with the following themes: Ease of use and the impact of home charging on the electricity grid.

Lessons learnt

Even though the project has just started, the cooperation between Liander and The New Motion is already fruitful. The exchange of information about what kind of output the smart meter produces and what kind of input smart chargers, such as the *Moet Je Watt*, would need has already helped both parties to further improve their products. Lesson learnt: once you start connecting people with the aim to connect devices, you'll immediately start to see how devices can be further improved.

Next steps

The roll out as planned is 50 *Moet Je Watt* before summer, with a full-scale roll out in the second half of 2011, approximaly 400 pieces.



Tesla electric vehicle

Partners

thenewmotion

Liander onderdeel van alliander

CHESS engineering the future

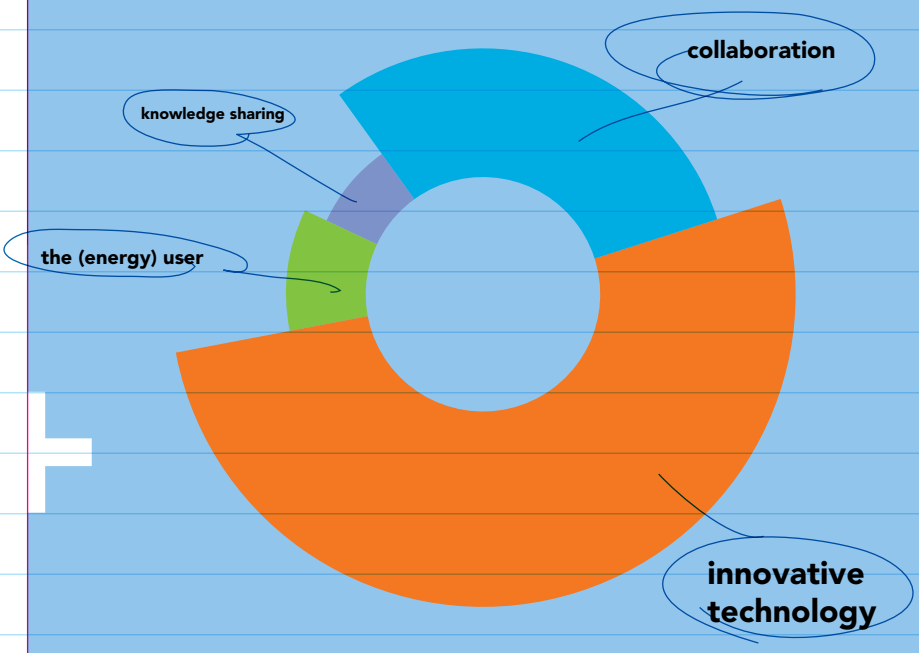
SMART QUOTES

"We came in contact with Liander through Amsterdam Smart City and we started to make big strides together in the development of the intelligent charging box even before the project really started. Liander's knowledge and experience in small and large volume meters helped a great deal in terms of making the best choices in the design of our smart charging box. And of course it will be great to set up a substantial number of charging points at Liander itself!"

Wouter de Ridder, Project Leader of *Moet je Watt*, The New Motion, about the successful cooperation with Liander

Jointly taking smart technology to the market

The New Motion and Liander collaborated closely in the development and implementation of this innovative technology. Both parties see mutual benefits in the partnership, which is obviously also good for the end product. The benefits for the customer are clear: a one-stop-shop solution. The *Moet Je Watt* and the smart meter will be fully integrated to prevent the need for a heavy-duty connection. The fact that the system can be installed in a simple, one-off procedure means that it is also very customer friendly. The New Motion values the partnership with Liander, as the latter partner is considered a reliable provider and the partnership is therefore a valuable component of the product proposition.
The partnership enables Liander, on the other hand, to position the smart meter positively and with added value. In addition, the partnership also positions Liander as a pioneer in the field of electric mobility, which is good for its image as an innovator.



3
partners

50
charging points (this summer!)

2
smart technologies

1
large volume user location

400
charging points in 2011

#13 Klimaatstraat

INTERESTING CLIMATE STREET MOVIE

The *Klimaatstraat* (Climate street) is a holistic concept for shopping streets with a focus on a number of different aspects: public space, logistics and entrepreneurial spaces.

Utrechtsestraat is a typical narrow and busy Amsterdam (shopping) street in the city centre.The entrepreneurs in the street wanted to participate in a more sustainable form of enterprise. To that end, the entrepreneurs joined forces to start the *Klimaatstraat* project a holistic concept designed to make the inner city (shopping) streets more sustainable. The project encompasses physical and logistical initiatives in the public space, as well as sustainable initiatives in the businesses themselves. The street is located in the centre of Amsterdam and accommodates approximately 120 independent small and medium-sized entrepreneurs that are united in an active business association and are represented by the shopping street manager.

Objectives

The objectives of the *Klimaatstraat* project include the reduction of CO_2 emissions and the reduction of energy consumption in Utrechtsestraat. This will be achieved through a combination of sustainability initiatives (sustainable waste logistics, energy displays, LED lighting, smart meters and energy management systems) and the related changes in user behaviour. With the following goals:

- To create a platform for sustainable products and innovations in an inner city environment;
- To record user insights (reduction potential and behaviour);
- To record insights in the related processes, including the operational rollout and collaboration between the public and private partners;
- To activate and facilitate sustainable entrepreneurship amongst SME's

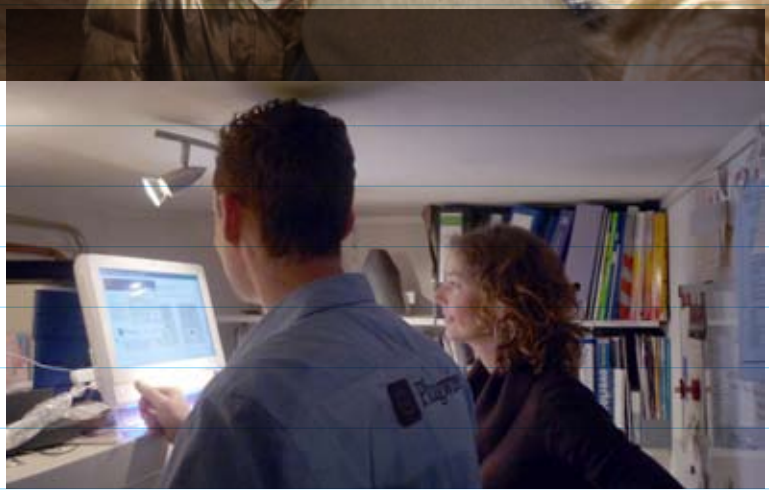
The Utrechtsestraat, *Klimaatstraat*

To prepare for large-scale implementation, a smaller group of entrepreneurs, the so-called pioneers, will gain experience through a pilot run. The *Klimaatstraat* project will thereby serve as a test bed for various types of technology. The project is a partnership between the entrepreneurs, municipal organisations, business groups and a number of innovative start-ups. The entrepreneurs form the cornerstone of the partnership as this is the group that will need to adopt the available technologies. The entrepreneurs in the street are motivated to join in the programme to increase the attractiveness of the shopping street and generate more business.

The project is executed as such to ensure that the lessons learnt and experience acquired will be available for use in other streets and areas, both inside and outside Amsterdam.

www.utrechtsestraat.web-log.nl

Information meeting with entrepreneurs



Plugwise installation at Marije Buffing Edelsmid

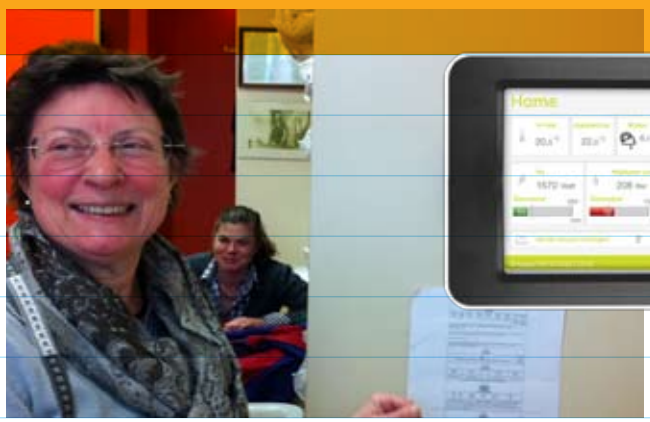
Research

The research was done by *Club van 30* in collaboration with engineering firm Tauw. The first outcome of the collaboration is a baseline measurement of the current CO_2 emissions in the Utrechtsestraat. TNO reviewed the data and harmonized the value case. The baseline measurement still needs to be followed up with a second measurement. The main outcome of the research will be the savings percentages obtained through the implementation of the different sustainability measures: energy display, energy scan, smart plugs, reduction through logistical optimization, reduction of energy use by dimming public lighting, etc.

Lessons learnt

Although the *Klimaatstraat* project will continue to run for a while, the partners have already gained a lot of experience and learnt many valuable lessons. Face to face communication with the entrepreneurs is essential in all the projects in which the user of the technology has a major influence on the energy saving potential. The communication must be transparent and the processes must be explained to the entrepreneur in a clear manner. It is important for the entrepreneur to be able to understand clearly what the benefits are for the business. In a project with an extended scope and many partners it is a necessity to always communicate collectively and via a known sender. Whenever organisations communicate unilaterally and fail to contextualize the message into the framework of the bigger picture the effect or response is almost invariably less significant. In the case of the Utrechtsestraat, the entrepreneurs in the street are represented by the shopping street manager and an active entrepreneurs society. This has proved to work very effectively because the shopping street manager is the main point of contact and hereby can communicate with one voice to the entrepreneurs about all the developments in the street.

Shopping street and project manager proudly present award winning Quby display



Entrepreneur Maja Brandon in her Fashionstudio with Quby display

Next steps

Because of Amsterdam Smart City's network, the *Klimaatstraat* project has gained international status as an example of a Smart initiative in Amsterdam. ASC is frequently asked to share knowledge about the *Klimaatstraat*. The lessons learnt in the project are disseminated and exchanged amongst the audiences that wish to apply the concept in their own cities. Although every street in every city differs from every other one, it is clear that it is possible to reduce CO_2 emissions in every shopping street, irrespective of whether it is occupied by big or small businesses. The focus areas are: awareness, sustainable logistics and the implementation of smart technologies. The Blueprint yielded by the project will help other shopping streets to adopt these points.

Partners

Ondernemersvereniging Utrechtsestraat
C30
Liander onderdeel van alliander
vodafone
Home Automation Europe technology made simple
Plugwise
JCDecaux
PHILIPS
TNT
L.A.J. Duncker BV koel • vries transport
Gemeente Amsterdam Stadsdeel Centrum
Gemeente Amsterdam Programmabureau Luchtkwaliteit
Gemeente Amsterdam Programmabureau Klimaat en Energie
Tauw
van Gansewinkel
Eneco
Ziut

SMART QUOTES

"You really end up being much more aware of your energy use. It makes me think twice before switching on an appliance. In the past, I used to switch on the air-conditioning for the evening already in the afternoon. I don't do that anymore!"

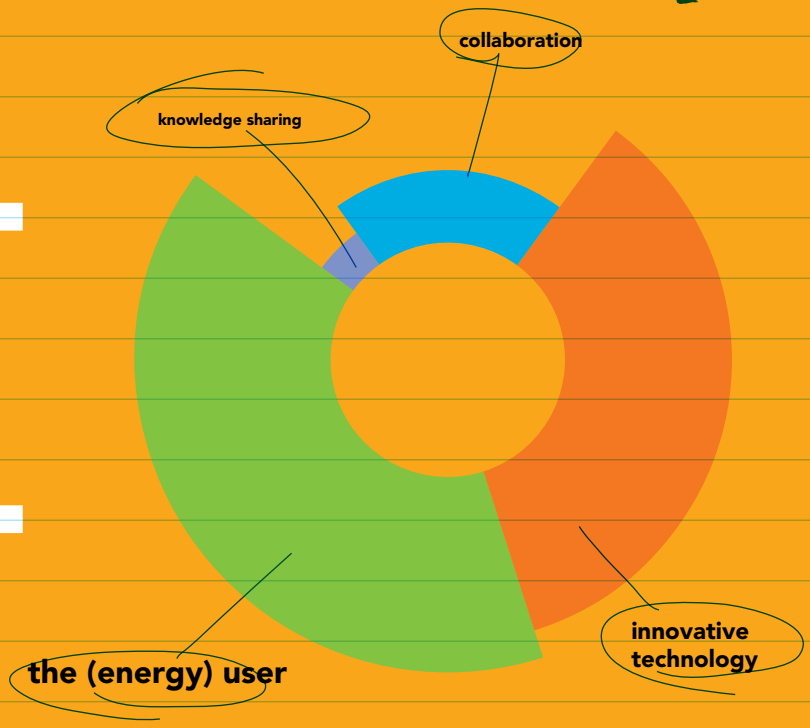
Jan Louman, Café de Biecht, on his Plugwise set and Quby display

"Van Soest Chocolatier is now completely switched to LED lighting. A number of 60 LED lights have been installed, resulting in 80% less CO_2 emissions!"

Entrepreneur Franny Blauwendraat-Van Soest of Van Soest Chocolatier on her newly installed LED lighting

Entrepreneurs and innovative technologies

It is a challenge to involve users – in this case the entrepreneurs – in the implementation of innovative technologies and to get them to actively utilize the technologies and the proposed measures. The entrepreneur in fact still has his or her own business to run. A learning from the is to to first create support and cooperation in a smaller group and consequently make use of the spill over effect from the smaller group to reach the bigger target population. As such, the small group will serve as ambassadors of the innovations. Moreover it is essential, to listen carefully to the needs and wishes of the entrepreneurs and provide intensive personal guidance and to explain and clarify the personal benefits of the technology to the entrepreneur.



120
entrepreneurs

47
energy display

40
front runners

45
entrepreneurs use sustainable waste collection

17
partners

9%
energy saving by dimming public lighting

40
smart meters

19
entrepreneurs test smart plugs

39
energy scans (cooling, heating, lighting)

171
smart plugs

#14 Smart Schools Contest

Six primary schools in Amsterdam joined a contest to determine who can save the biggest amount of energy. During the contest they are provided with a specially developed teaching programme and an online energy portal. At the same time, the children also learn about energy and energy saving in a playful way.

Liander developed an online portal that communicates with the gas and electricity meters in schools. The children in the participating schools can use the portal to find out how much energy they use and how much energy they saved during the course of the competition. They can also use the portal to check their position in relation to the other schools, so that they will be able to do a final sprint in their effort to win the competition. The schools can also exchange tips via a portal on the Hyves social media website.
The portal is supplemented with a dedicated toolkit consisting of teaching materials and assignments on energy and energy saving. Special lessons and assignments have also been developed for pupils of different age groups. The purpose of the assignments is to reduce energy consumption, the results will be directly accessible on the portal.

Webinterface Smart Schools portal

The Smart Schools Contest started on 1 March 2011, will last ten weeks and was launched with an event that was attended by the pupils of all the participating schools. 'Bonny & Blitz' not only played the main roles in the introduction video about energy saving, but also made a live appearance at the kick-off event. The school that saves the highest percentage of energy will win the competition and a big party with a mini funfair on the school grounds at the winning school. Another feature of the competition is that a jury will judge the participating schools on points such as the originality and creativity of their energy saving tips and actions.

Objectives

The Smart Schools Battle contributes to a number of different objectives: Firstly, it increases awareness of energy consumption among primary school children, and it also reduces the actual energy consumption in the participating schools. Secondly, Liander is using the project to test a more elaborate energy management system. Not only is it testing the technology used to provide insight into energy consumption, but the technology in the pilot is also combined with an interactive teaching programme with educative and competitive

www.slimmescholenstrijd.nl

elements. In addition, Liander believes it is important to test the smart schools proposition at this scale before scaling up to more schools. Finally, the project also contributes to Liander's name, role and image as a grid manager.

Research

The research will be conducted based on the data obtained via the energy portal. The most important research results will be the percentage of gas and electricity that was saved, as well as the 'oil spill' effect: What did the children and the teachers think of it? Did the competition element work? And does this kind of competition also inspire the parents to change their behaviour?

Lessons learnt

A lot of schools expressed their interest to participate in the competition. The recruitment timing is however critical: To ensure that the teaching programme associated with the competition can be effectively incorporated into the syllabus, it is important for the participating schools to be recruited in the year prior to the school year in which the competition will take place and not in the course of the current school year.
In some cases, Liander needs to technically customize some of the meters to ensure communication with the portal. This means that time needs to be scheduled to do so.

Next steps

As a grid manager in a large part of the Netherlands, Liander has approximately 3,000 primary schools in its service area. If the pilot is successful, Liander will consider expanding the 'Bliksems' campaign with this Smart Schools Contest concept. In addition, primary schools are also an interesting and valuable target group, as thousands of children can be accessed and taught about energy efficiency through this type of programme. Also the children pass their experiences on to their family and friends. The idea of providing energy recommendations applicable to the school buildings, along with the competition elements, is also currently under consideration.

Partners

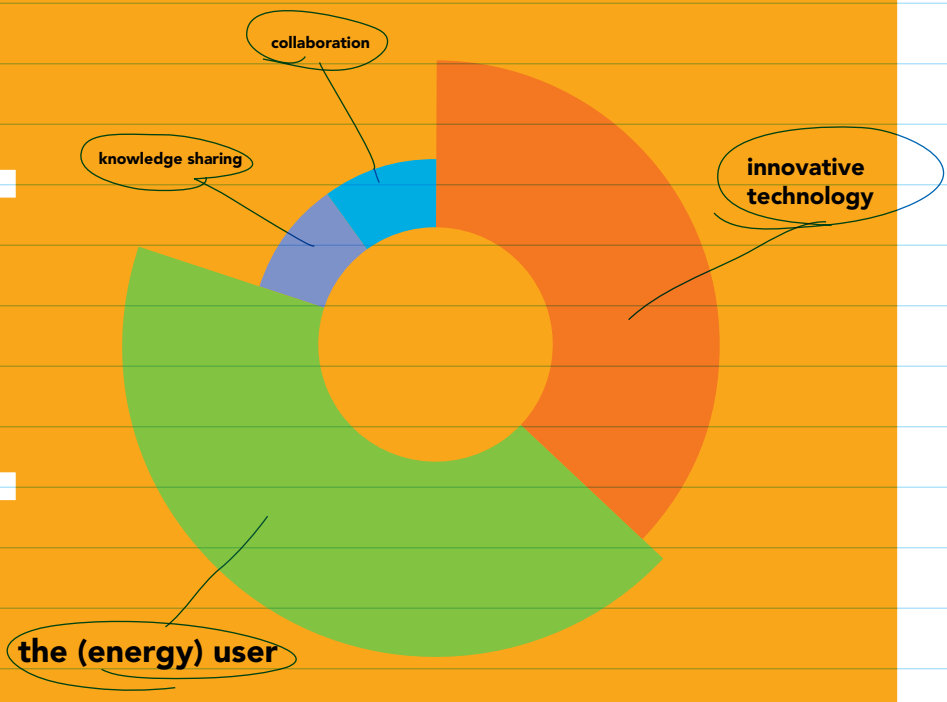
Liander onderdeel van alliander

MSL

READ ON online metering management

Helping school pupils to save energy

Although the use of energy feedback systems is already innovative in itself, this project goes one step further by adding a community element: a group of participants can mutually compare their energy saving performance in a central online location and leave messages behind. The children can contribute to energy savings in a playful way and will take this behaviour, which they will have acquired at an early age, home with them. In addition, they will also remain alert to the issue in the future.



5
test school

1
energy portal for insight into consumption / savings

6
locations

1
teaching programme with three lessons per group

90
teachers

3
partners

10
weeks

90
classes/groups compete in this contest

2,000
pupils compete in this contest

#15 ZonSpot

SHORT MOVIE 5 PROJECTS

It will soon be possible to work in the open air on a town square in your own neighbourhood in Amsterdam. The *ZonSpot* system makes this possible by providing solar power at inspiring locations in the city. It also demonstrates the easy access to solar power towards the Amsterdam's citizens. In addition, it is also very healthy and inspiring to work in the outdoors!

A *ZonSpot* (SunSpot) is an outdoor workplace enabled by solar power and a Wifi Internet connection. The *ZonSpot* is installed at an inspiring location in one of the city's public spaces and thereby contributes to the promotion of a new kind of working. The concept makes sustainability more visible and accessible.

Nowadays the potential of solar cells to produce the electricity of the future is recognized. The *ZonSpot* takes you a step closer to sustainability awareness by showing the direct functionality of solar power. To increase the financial feasibility it is possible to use advertising and/or link it to large-scale sustainable initiatives, companies and other organisations. Amsterdam Smart City hopes to contribute by providing the ASC network and label to stimulate the first steps towards placing *ZonSpots* units in an urban environment. Several introductory scenarios are possible: in a public environment, public and privately financed and/or in a private space (with private funding).

ZonSpot artists impression

Objectives

Amsterdam Smart City's main focus in this project is to promote cooperation between different external organizations. ASC will thereby, for example, endeavour to put ZonSpot in contact with other relevant partners in Amsterdam, such as municipal stakeholders, companies, intermediaries, sponsors and probably also, at a later stage, research organisations. ASC will coordinate the use of *ZonSpot* communication via the available channels to promote the concept and thereby add value to the project.

www.zonspot.nl

Research

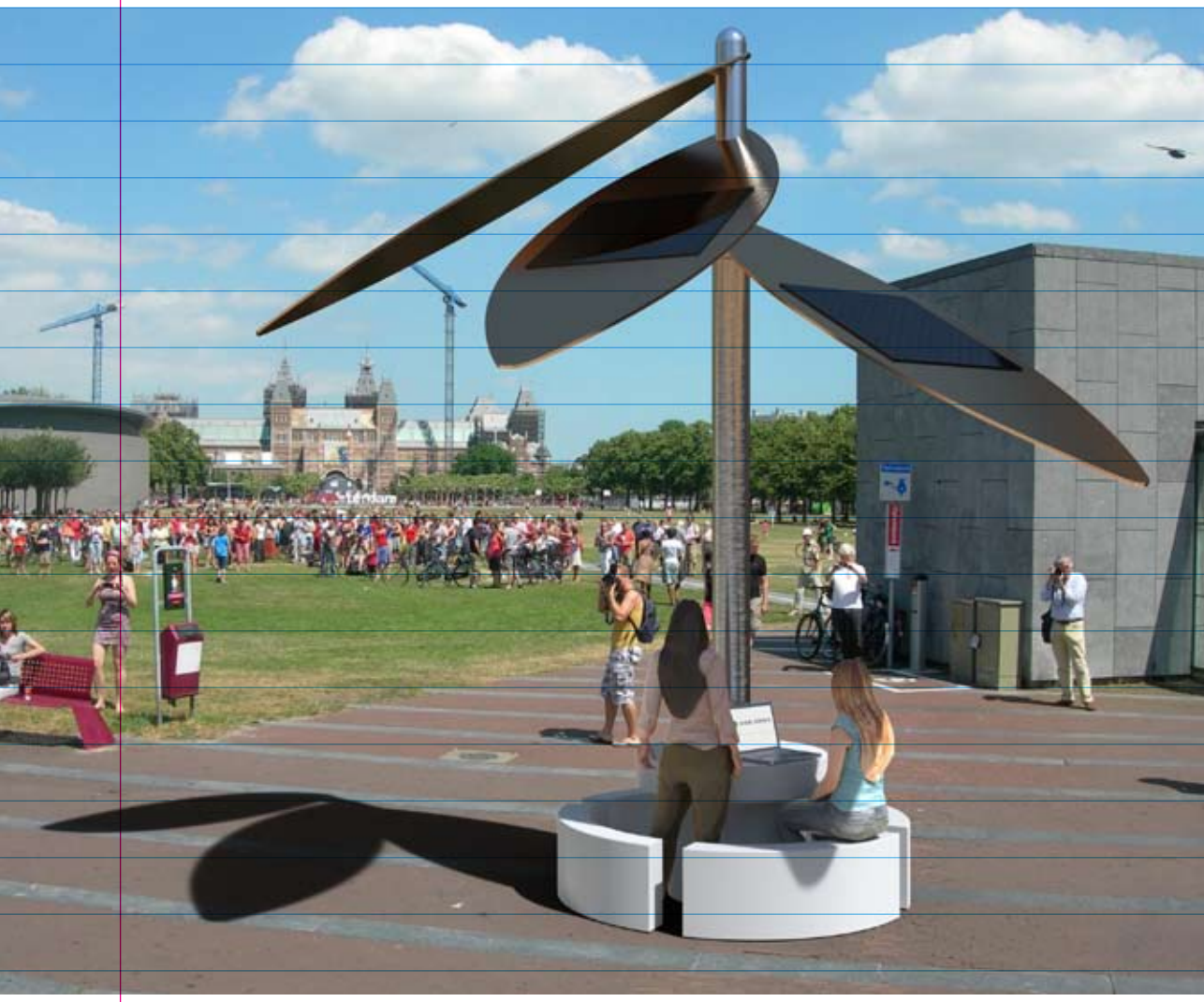
The purpose of the *ZonSpot* is to promote sustainably generated energy and the concept of 'new working' in environments where people tend to gather. The fact that this initiative does not really target energy savings as such, means that a CO_2 value case is not really relevant. The main purpose of the project is to stimulate change in the attitudes of the general public. The research related to *ZonSpot* will therefore have a communicative and/or human character. Amsterdam Smart City sees opportunities for research in the following themes:

- Technical operation of and complications in the *ZonSpot* itself: Although the technology is considered reliable and was extensively tested in advance, it would still be interesting to find out how it will be affected by external (behavioural) factors, such as weather influences and the use of the *ZonSpot*.
- Interaction with the user: What do users think of the *ZonSpot* en do users enjoy working outside?
- Interaction with the environment: What do local residents and employees think of it?
- Public awareness of the use of solar power.

SMART QUOTES

"Amsterdam Smart City has placed the ZonSpot in the spotlights of a number of potential partners."

Charles van Heck, ZonSpot



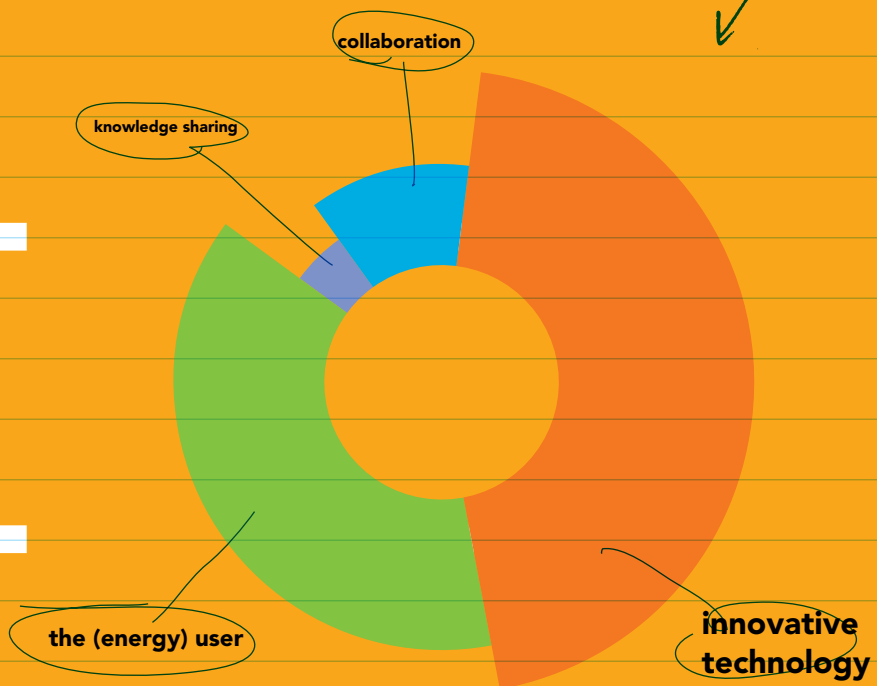
ZonSpot artists impression

Partners

ZONSPOT

Innovative technology to make sustainability more visible

The *ZonSpot* is a sustainable, innovative workplace for outdoor spaces with a striking appearance. The combination of WiFi, solar panels, energy storage and a publicly accessible location makes the *ZonSpot* attractive with respect to current themes in the urban environment. The unique feature of the *ZonSpot* is the fact that it makes the use of solar power visible, which promotes awareness and interest among the public. The *ZonSpot* lowers the threshold to the adoption of sustainable energy and even makes it convenient. It thereby also stimulates the 'new working' concept.



5

potential partners

20

organisations interested

4

smart technologies

6

potential locations

#16 Swimming Pools

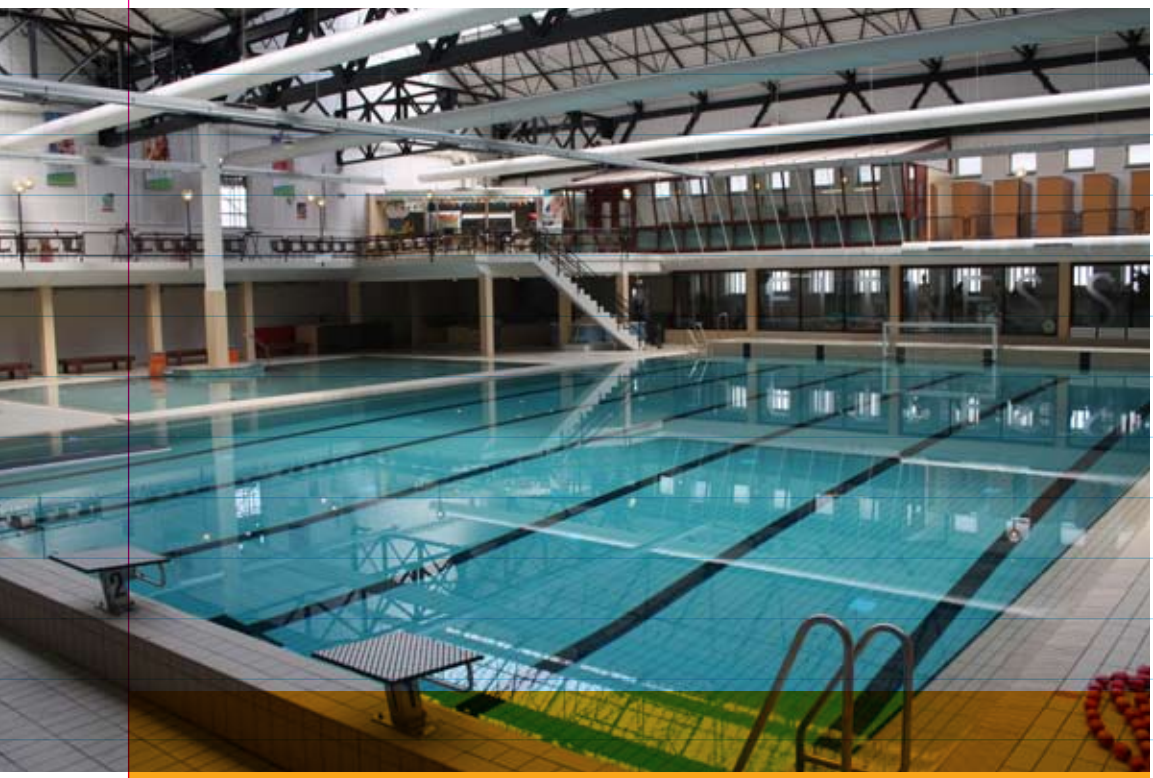
SHORT MOVIE 5 PROJECTS

By linking up swimming pools in the region with sustainable initiatives, those public spaces learn how to use energy in a smarter way.

Swimming pools are public buildings that consume a lot of energy. At the moment, most swimming pool owners and managers do not have a very clear view of the available options when it comes to sustainability and the potential benefits. By linking up swimming pools in the region with sustainable initiatives, those public spaces learn how to use energy in a smarter way. Amsterdam Smart City introduces swimming pools to different sustainable initiatives and technologies, including the fluid swimming pool cover produced by Heatsavr, LED lighting, and special glazing systems; all of which are products designed to save energy in simple ways.

Amsterdam Smart City only recently started to collaborate in the process of making swimming pools sustainable. It was initially thought that the energy-saving contribution of a few swimming pools in any given city would be relatively small; however, experience has shown that this is not true and that there are clear opportunities in this field. An energy bill of € 15,000 to 20,000 per month is not unusual for a public swimming pool.
The energy saving potential is therefore substantial in the case of swimming pools, because energy savings of up to 40% are quite conceivable.

Amsterdam Smart City seized the opportunity to become involved in the promotion of sustainability at swimming pools after a meeting with Heatsavr. This is a fluid swimming pool cover that is designed to reduce the total energy spent on swimming pool heating, air conditioning and dehumidifying by 15 up to 45%. Some 70 to 90 % of the energy



loss from a swimming pool is caused by the evaporation of the swimming pool water, countering that water loss with the use of Heatsavr results in a major reduction of the evaporation. The idea is that swimming pools start using the product after a joint promotional introduction by Amsterdam Smart City and Heatsavr. The investment in Heatsavr can, after all, be earned back after one or two months. This is the first big step towards creating awareness and trustworthy relationships with the swimming pool owners and managers. The next step would be to offer them other sustainable initiatives to expose these potential opportunities.

Objectives

There are many different types of public spaces that can benefit from energy savings and sustainability initiatives. Amsterdam Smart City wishes to use the Swimming Pools project to learn more about all the available sustainable possibilities that can be applied in this specific type of public space. The objective is to stimulate and introduce potential sustainable applications to swimming pools during pilot projects. Related to this objective is a proper analysis of the actual effects of the sustainable initiatives and concepts in terms of reductions in energy consumption and CO_2 emissions. The next step, one that must make a real difference in terms of the reduction of energy use at regional level, is to share the lessons learnt with other swimming pools. ASC, in partnership with Heatsavr, wishes to scale up the project by inspiring other swimming pools with the accumulated good practices. Direct savings also elicit new opportunities for informing the swimming pool visitors on sustainability via the predefined communication opportunities. Substantial reductions in energy use could contribute to the awareness of sustainability of visitors of these public spaces.

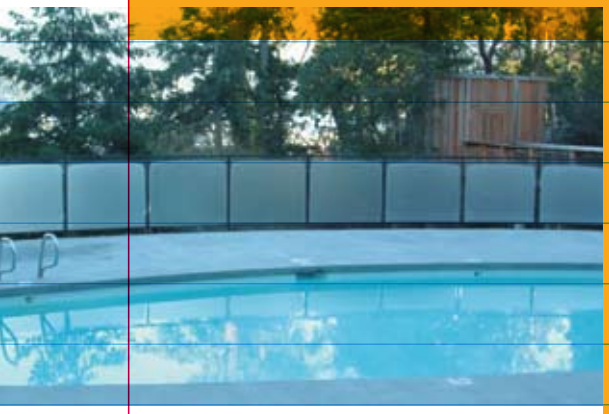
Research

Heatsavr has been used internationally for more than 20 years, but needs the endorsement of a successful pilot to be applied in the Netherlands. This kind of pilot takes six weeks to complete and is quite expensive. Amsterdam Smart City and Heatsavr collaborate in the first pilot research in the Netherlands. Some of the essential prior steps include finding a suitable test location, the right (municipal) partners, and the necessary funding. The many international studies that were done with Heatsvar in countries such as the United States, Australia, England and Japan serve as guidelines for the local pilot project in Amsterdam.

Lessons learnt

After a few months of introducing Heatsavr to different swimming pools we can say that there is many interest in Heatsavr. However, almost no pool is prepared to participate until the system has been approved by the controlling organisations. Secondly, because of all the different interests of the participating organisations and the dependence of other involved institutes, there has been some delay in setting up the pilot.

Before and...



...after using Heatsavr

Next steps

The Swimming Pools project is a learning curve with a clear focus on scaling up. The first step towards implementing the Heatsavr system in the Netherlands is to get the approval of the competent authorities based on the outcome of a pilot study. Besides this Amsterdam Smart City wishes to test other sustainable applications in a few pilot swimming pools. All outcomes of the pilots will be used to inspire and inform other swimming pools.

Amsterdam Smart City hopes to contribute directly to energy saving objectives in different regions. The province of Noord-Holland has approximately 120 swimming pools and there are roughly 1,600 in the entire Netherlands. ASC, in collaboration with Heatsavr, is hoping to be able to speed up implementation at a rapid rate.

SMART QUOTES

"ASC was the channel I used to motivate swimming pools in becoming innovative in sustainability."

"ASC brought together various parties in the sustainable swimming pools project and was also the main source of motivation for the participants to work on sustainable innovation."

Nicholas Ninaber van Eyben, HeatSavr, about the cooperation in the Swimming Pools project

Partners

heatsavr™ 'the green swimming pool solution'

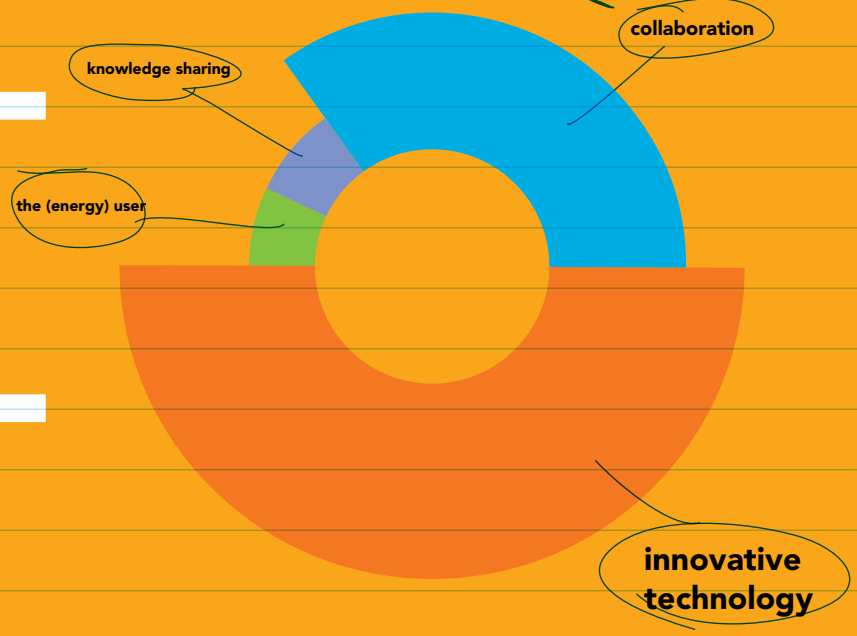
LEDLEASE

SPORTFONDSEN AMSTERDAM OOST altijd een belevenis!

Kolibri Leisure Management

Collaborating with innovative sustainable solutions

The aim of the Sustainable Swimming Pools project is to learn as much as possible from the two pilot projects and all the subsequent steps. Each activity in the process concerns a collective, so stimulating collaboration is therefore a target in itself. Parallel to the organisation and implementation of the aforementioned pilot, Heatsavr also did some preparatory work by contacting other swimming pools to gauge their interest. A substantial number of those swimming pools are prepared to start using Heatsavr if the pilot turns out to be a success. A number of other potential sustainable measures were also contacted even before the end of the sustainable initiatives with the aim of enrolling them simultaneously with Heatsavr. LEDlease, Greeninglass, Cofely and IBM are a few other parties with an interest in swimming pools that wish to collaborate conceptually!



4
partners

16
swimming pools interested

3
smart technologies

2
knowledge sessions

2
test swimming pools

3
interested new partners

Explanation of the figures

The Amsterdam Smart City value cases

How were the value cases prepared?

A 'value case' is a expanded business case. One of the main purposes of the projects in Amsterdam Smart City is to limit CO_2 emissions and to determine the best ways of doing so. To do so, it was therefore necessary to calculate, in advance, what the anticipated reduction of CO_2 emissions would be. Obviously, this is a complex calculation exercise that requires data from many different sources to be combined: it is obviously not possible to connect a CO_2 meter to every project. The value cases are based upon, to the greatest extent possible, available data from reliable public sources, such as the CBS (population data), Agentschap NL, Department Research and Statistics (O+S) of the Amsterdam Municipality, data from the grid operator (Liander) on energy usage consumption average, and data from research institutions, such as CE Delft, TNO and Tauw.

The next step was to use the 'hard project figures'. How many households would be involved? What would it cost to implement the measures? How many solar panels would be installed? How many trucks would become electrical vehicles? How many boats are moored at the Amsterdam Harbour every year?

Assumptions

The hardest part of the value case is the assumptions; in other words, our expectations of how effectively the implemented systems will work. Wherever possible, we measured the figures as accurately as possible during the trials. How much less energy would people use once an energy display has been installed in their homes? How much energy would you reduce using a Plugwise plug on your coffee machine? Some projects are still running, in which case the assumptions derive from experiences acquired in previous, more or less comparable projects.

Some assumptions can however not be measured. If 10% of the residents of Geuzenveld want an energy display, how many people would want one in other areas like Sloterdijk, Bos en Lommer and the City Centre district? And how much cheaper would a project become if you were not selling ten or twenty items, but a mass product? Or if you were to implement the same project in another neighbourhood but in a slightly different way, would the population adjust their behaviour differently? These are the kinds of assumptions you are bound to make when repeating a project in a different location; in other words, if you wish to scale up the results.

Scaling up

In order to get a sense of the project's viability, we extrapolated the Amsterdam Smart City pilot projects in two different ways: the first was a 'naïve', extrapolation: we pretended to live in an ideal world. The second was a 'realistic' extrapolation: when we scale up, the projects would probably not be supervised quite as intensively, once the novelty has worn off, the circumstances would change as a result of which the results would simply be less impressive.

Standard figures

All of the value cases relied on a number of standard figures. Although those figures might appear to have been assigned the status of 'facts', it is important to keep in mind that, to a certain extent, they are also mere assumptions, for example: the CO_2 emissions, per kWh of electricity, are highly dependent on the energy mix that is used. That, in turn, depends on the energy supplier. The same applies to the cost of the energy. To be able, nevertheless, to create a set of comparable figures, it was decided to work with a single standard conversion factor. The only time due differentiation was made was when that method yielded significant differences, for example: Amsterdam Municipality bought energy in the past from Amsterdamse Energie Bedrijf (AEB), which uses a much 'greener' energy mix that results in significantly lower CO_2 emissions per kWhs – less than half the volume generated by 'normal' electricity 230 grams per kWh instead of 560 grams.

The summary of each project includes a number of indicators from each project:

- Energy saving, per unit, in the pilot: Depending on the pilot, a unit could be a household, a company, a school or something else.
- Total reduction of CO_2 emissions: This expresses the CO_2 emissions, in tons, that were prevented by the pilot.
- 'Realistic' scaling up: This figure indicates the amount of CO_2, in tons, that will be prevented if the pilot were to be done in the whole of Amsterdam. We based this on a number of less-than-optimistic assumptions.
- 'Maximum' scaling up: Same as 'realistic' scaling up, but this time with somewhat more naïve assumptions, such as that everyone would participate in any given measure.

The different values are shown in combination with a number of brief explanatory notes on each Value Case. The most important assumptions are summarized at the end.

What is one ton of CO_2?

We want to save energy, because much of the energy we generate derives from sources that will eventually be depleted: oil, coal and gas. These conventional ways of energy production also generates CO_2 as a by-product. While the gas is not dangerous in itself, it is a greenhouse gas, which is linked to climate change. In the last few decades, we have generated much more CO_2 than nature is capable of absorbing. But how much is one ton of CO_2 really?

The average Dutch household emits 9 tons of CO_2 a year: mainly by heating, lighting and transport. This does not include the CO_2 generated by goods production (food, clothing, appliances, etc.). Fifty trees growing in the tropics in one year can absorb one ton of CO_2. So you would need 450 trees to compensate the CO_2 of an avergae Dutch household. If you were to pump nine tons of CO_2 into a balloon, the balloon would have a diameter of 21 metres!

CHECK OUT THE OVERALL VALUE CASE RESULTS ON PAGE 142 - 143

Value cases / Sustainable Living

Geuzenveld

#01

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per household	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Geuzenveld	**3.9**	**153**	**17,271**	**172,712**

West Orange

#02

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per household	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
West Orange	**7.8**	**249**	**72,274**	**210,462**

eManagement Haarlem

#03

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per household	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
eManagement Haarlem	**3-12**	**17**	**2,895**	**28,954**

Onze Energie

#04

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per household	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Onze Energie	**–**	**1,364**	**11,254**	**479,813**

Smart Challenge

#05

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per household	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Smart Challenge	**14**	**99**	**823**	**12,348**

#01

Remarks on the calculations
Two different types of display were used in the project (Onzo and Geo). It would be interesting to find out whether there are any differences in the savings between the two types of displays.
The participation percentage is 10%. It was not easy to find support for the displays in this neighbourhood. The participation percentage was much higher in other neighbourhoods (West Orange project). This explains why the bottom percentage was assumed to be 10% and it is assumed that 10% will also be feasible in the case of scaling up.

The calculation of the savings by means of the displays is otherwise straightforward.

Important assumptions
- The savings percentage was set at 7.8% for the time being for the same reason as in the case of the West Orange project.
- No data are fed back on gas usage in the current design phase of the system, which means that the gas savings in the pilot are assumed to be 0%. Therefore the potential savings are devided by two and result in 3.9%

#02

Remarks on the calculation
The calculations in this pilot were straightforward: it is acceptable to use savings percentages for the displays (behavioural change through feedback) and energy control (support in automatic shut-down of the appliances) that can result directly in reductions in energy consumption.

Important assumptions
- The gas and electricity savings due to the use of the displays are assumed to be 7.8%. The latter percentage is equivalent to the savings yielded in previous, comparable tests.
- The savings from Energy Control were additional (i.e. over and above the savings yielded by the feedback on the display). The assumption is that this will mainly have an effect on gas consumption (10%) and to a lesser degree on electricity consumption (5%). The pilot has yet to yield data.
- In the case of scaling up: What percentage of all households will make use of the display and Energy Control functionality?

#03

Remarks on the calculation
The calculation of the value case was quite simple because the test yielded a very clear result. The use of the Plugwise system resulted in an average saving on electricity consumption of 3.5%. The savings vary between 3 and 12%.

The savings vary significantly depending on the kind of appliance in question, for example, the savings on home theatre sets were 17.2% and 7.3% on a freezer.
The questions about scaling up mainly concern the participation percentage: What is the maximum number of households that would participate in the case of scaling up? In the realistic scenario this was assumed to be 10%, because 10% of the test group stated that they would buy the system. The maximum scenario is obviously 100%. It was however remarked that the Haarlem test group was not representative of the whole of the Netherlands (or of Amsterdam).

Important assumptions
- What percentage of the Amsterdam population would adopt the Plugwise system if the project were to be scaled up? The current assumption is 10%.

#04

Remarks on the calculations
The project started out with a target of recruiting 1,200 households. It transpired that it was hard to fulfil that ambition during the course of the actual project. About 10% of the target has been reached at this stage.
Our market survey asked the residents of Amsterdam Noord why they would or would not participate.
The value case is based on the 1,200 households. The fact that energy supplied by Onze Energie is cheaper than other sources (the cost is not tied to the price of oil) means there is a benefit for the members. The OE energy prices are based on an investment calculation derived from an eight-year Net Cash Value of investment, costs and assets. Realistic scaling up is based on the Onze Energie business plan, which assumes a penetration level of 25% of the Amsterdam Noord population and is strictly limited to Amsterdam Noord. The maximum scaling up is the scenario in which every household in Amsterdam derived its energy from windmills.

Important assumptions
- It is still realistic to fulfil the target of 8,000 households after starting the project with 1,200 households. 42% already use green electricity.

#05

Remarks on the calculations
Experience with a previous Smart Challenge gave the result that an energy reduction of 14% for Smart Challenge contestants is a good estimate. This is easily calculated into net reductions of CO_2 when the number of participating companies and the number of participating employees is known.

Important assumptions
The Smart Challenge is designed for larger companies, so a maximum of 1500 companies (maximum scaling up for Amsterdam) is assumed.

FIND OUT MORE ABOUT THE SUSTAINABLE LIVING PROJECTS ON PAGE p. 20→53

Value cases / Sustainable Working

ITO Tower

#06

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per office building	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
ITO Tower	**30**	**31**	**12,120**	**134,503**

Monumental buildings

#07

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per office building	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Monumental buildings	**28.1**	**9**	**2,262**	**11,310**

FIND OUT MORE ABOUT THE SUSTAINABLE WORKING PROJECTS ON PAGE P. 54→81

#06

Remarks on the calculations

The savings derived from the use of the Plugwise system amount to approximately 19%. The total energy use per annum was (extrapolated) 102,429 kWh. This is more than the calculated consumption based on the indicators (surface area of 900 m2 multiplied by 82 kWh/m2/year = 73,800 kWh/year). It is important to take into consideration the fact that the measurements were taken in winter. In other words, the calculation of the total potential was ultimately based on the (lower) annual consumption figures derived from the indicators.
One quarter of all the appliances were fitted with a Plugwise system. In other words, the total savings, in the case of the ITO tower, was therefore one quarter of the 19% per appliance.

A participation degree of 10%, respectively 100%, was chosen in the upscaled project. The total number of offices and the related floor surface area are known figures derived from the O+S service.

The upscaling was only based on the replacement of halogen lighting with LED lighting. According to SenterNovem (2008) it amounts to 7% of the total of all the office buildings. According to the same report, the interior lighting uses 260 MJ/m2 electricity a year; i.e. 72 kWh/m2 a year.

The scaled up scenario did not take into account the adjustments to the exterior lighting by means of solar and wind power, because it is not at all clear what the potential of that measure would be in other office buildings.

Important assumptions

- Floor surface area of 17th floor (900 m2, 'measured' with Google Earth)
- Only the halogen light bulbs were replaced. The replacement of fluorescent lighting (with LED lighting) yields significantly less in actual savings.

#07

Remarks on the calculations

The purpose of this project was to determine what kind of energy-saving measures could be implemented in three separate buildings:

- De Balie: Use of LED lighting in different places in the building. A total of 100 LED bulbs were used, which resulted in a reduction of 7% (23,216 kWh saved out of a total of 335,000 kWh).
- De Ambtswoning: Breakdown of all the energy-saving measures that could be implemented within the restrictions of the monumental character of the building. The measures have not been implemented yet.
- De Groene Bocht: Breakdown of all the energy-saving measures that could be implemented in a monumental building that is being used as an office. The measures were implemented in a very progressive way, because the Groene Bocht has a very special type of population: all of the organisations working there have something or another to do with sustainability objectives.

The (technical) problem, the drivers, the options, and the savings (whether realized or not) vary significantly between the different buildings. It is assumed that the same principles will apply to other monument buildings in Amsterdam; which means even greater variations.

To be able to indicate the potential outcome of an upscaling scenario, we considered the 'LED lighting' measure that had been implemented in De Groene Bocht. A similar measure was implemented in De Balie.

Important assumptions

- Amsterdam has a total of approximately 9,000 monuments (government and municipal monuments) (source: DMB Gem. Amsterdam). That number includes all the buildings that are significantly bigger than the average canal building, and monuments that are not used as offices and that can therefore not be compared accurately with De Groene Bocht. On the other hand, not all canal buildings are official monuments; one indication to that effect is the statistic that the Inner City precinct (Stadsdeel Centrum) has a total of 26,119 houses that were built before 1906. It is estimated that there are approximately 10,000 buildings in Amsterdam that can be compared to those in De Groene Bocht.
- A participation level of 20% is assumed for a 'realistic' upscaling scenario based on the good experience with LED lighting in De Balie and De Groene Bocht.
- The annual consumption and the number of light points per building are assumed to be the same as in De Groene Bocht. It is furthermore assumed that the energy is used for business purposes; which means 220 workdays a year and 10 lighting hours a day. The average percentage for halogen lights used in office buildings is 7% and the percentage for incandescent bulbs is 5% (as against 55% for fluorescent lighting); it is therefore assumed that 12% of the lighting can be replaced with LEDs.

Decentral generation: Fuel cell technology

#08

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per office building	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Decentral generation: Fuel cell technology	**-**	**4**	**24,570**	**98,280**

Zuidas Solar Challenge

#09

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per office building	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Zuidas Solar Challenge	**-**	**168**	**560**	**28,164**

Online Monitoring Municipal Buildings

#10

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per municipal building	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Online Monitoring Municipal Buildings	**10**	**16**	**326**	**489**

#08

Remarks on the calculations
From experience at the Groene Bocht, a fuel cell can reduce about 50% of the total CO_2 emissions (when compared to 'grey' energy). Fuel cell energy can be deployed optimally for those locations that have an annual average electricity consumption between 10 MWh and 20MWh. In Amsterdam, this is the case for about 9000 locations. For greater Amsterdam, this number is estimated three times as big.
On average, the consumption for each such location is 13 MWh. The CO_2 reduction can be calculated from this figure.

Important assumptions
- For scaling up a participation degree of 25% is taken.

#09

Remarks on the calculations
The project is based on the assumption that 3,000 "standard" (1.5 m^2, 200 Watt peak) solar panels will be installed on the roofs of the offices at the Zuidas. Given the variable light angles during the course of the day, the influence of the seasons and overcast skies, it is not possible to translate the peak capacity into a total annual yield on a one-to-one basis. ECN uses an average of 0.50 kWh per Watt (peak) per annum.
Regarding up scaling: There are 7,500 companies in Amsterdam. Based on the assumption that the average roof has a surface area of 100 m^2, it is possible to calculate that 500,000 solar panels could be installed in the whole of Amsterdam. (The average office in the Netherlands is 590 m^2 based on the figures of Agentschap NL. Corrections for multi-storey buildings and flat roofs yield an estimate of 100 m^2.)

Important assumptions
- The number of PV cells that will actually be installed and the number of participating companies (the project has only just begun). Currently, this is based on 3,000 PV cells and 20 companies.
- How many companies would participate in the two scaling up scenarios? There are 7,500 offices in Amsterdam.
- In case of scaling up: How many solar panels would be 'realistic' and how many would represent the 'maximum'? How much m^2 in office roof surface area does Amsterdam have? Based on an average of 100 m^2 per office, one arrives at a maximum of 750,000 m^2 of roof surface area; in other words, half a million solar panels.

#10

Remarks on the calculations
Previous research conducted by TNO revealed that most of the Dutch building management systems are set incorrectly. If the settings were correct, the savings would amount to approximately 10%. The Municipality expects the saving to be between 5% and 10%.

Important assumptions
- The average surface area of one municipal office is assumed to be 600 m^2; the size of the average office in m^2 can be derived from Agentschap NL figures (total energy use in NL offices; index of energy use per m^2).
- Maximum up scaling: for how many office buildings is the system suitable?

FIND OUT MORE ABOUT THE SUSTAINABLE WORKING PROJECTS ON PAGE p. 54→81

Ship to grid

#11

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per ship	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Ship to grid	**–**	**9,314**	**9,773**	**9,773**

Moet je Watt

#12

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per charging point	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Moet je Watt	**–**	**–**	**–**	**–**

#11	**Remarks on the calculations** The fact that the Amsterdam Harbour immediately made use of the new ship to grid electricity regulation means that the participation percentage and behavioural influence play hardly any role. In addition, the ship to grid connections were also immediately installed in all the available locations, as a result of which the pilot and the scaling up scenarios are (almost) identical. TNO determined the effect on local emissions in a separate study based on the emission data from ships' engines and air distribution models. The use of green power of Electrabel results in a CO_2 reduction of 100%. It has also resulted in reduced fine dust particle emission and other emissions, because central power generation is much more efficient: • NO_X: 95% • PM_{10}: 98% • SO_2: 94%
#12	No value case was made for this project. The purpose of the project is to create basic conditions for the broader adoption of Electrical Transport, but is not designed to yield any energy savings or reductions in CO_2 emissions as such. If it were possible to determine by what percentage Electrical Transport would increase, per installed Moet je Watt, it would be possible to calculate the reduction in CO_2 emissions. That relationship was however not studied in the framework of this demonstration project. Generally speaking, it would be very good, seen from the perspective of the reduction of CO_2 emissions, to introduce more Electrical Vehicles in a city such as Amsterdam. It would reduce local emissions to zero and depending on the type of power that is used to charge the vehicle batteries, it would also be possible to cut the central emissions; both CO_2 and fine dust particles. The energy consumption varies from one type of electric vehicle to the next and the net reduction in emissions obviously depends on the way in which the electrical power is generated. Research conducted by TNO for Amsterdam Municipality (2009) showed that the "well to wheel" efficiency of electrical vehicles is improved by approximately 35%.

FIND OUT MORE ABOUT THE SUSTAINABLE MOBILITY PROJECTS ON PAGE P. 82 → 93

Klimaatstraat

#13

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per business or shopping street	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Klimaatstraat entrepeneurs	**9**	**660**	**34,978**	**216,596**
Klimaatstraat public space	**36.5**	**1**	**1,213**	**2,188**

Smart schools contest

#14

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per school	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Smart schools	**10**	**24**	**143**	**717**

#13

Remarks on the calculations
The Club van 30 commissioned engineering firm Tauw to do an extensive baseline measurement for the Klimaatstraat. The baseline measurement mapped out all the aspects of energy use in Utrechtsestraat.
The value case only took those aspects into account that were actually subject to interventions, for example: the baseline measurement also included the energy use of the private residents, but because of the fact that the project only targets entrepreneurs, the figures for the residents were not included in the value case. The structure of the value case was aligned with the baseline measurement. This means, for example, that prevented CO_2 emissions from (freight) transport are only calculated in as far as they occur in Utrechtsestraat itself (600 metres).
The following measures were included in the value case:
Interior space in businesses:
- Energy displays. The installation of energy feedback displays to support behavioural change. Given the fact that the displays were introduced in parallel with the Plugwise system and Energy Scan, it is expected that the saving will be less. The basic assumption is 4% for both gas and electricity; which is half of the reported energy saving achieved when the displays were installed in private homes.
- Plugwise. A breakdown by Plugwise of the equipment that can be shut down based on switching schemes at all the possible times. The savings that can be achieved that way are relatively moderate, namely 2%, based on a prior estimation.
- Energy Scan. A scan conducted by the "energieloket" of the municipality to determine the measures that could be implemented to save energy. The "energieloket" report states that, if all the recommendations could be implemented (which is happening now), the total energy saving for electricity would be 26% and 9% for gas.

Logistical processes
- Electrical Vehicles (EV) for waste disposal: The use of electrical waste disposal trucks eliminates the CO_2 emissions that normal trucks emit. That is however based on the assumption that the electricity that is used is 100% green. Please note: The cuts in emissions were only calculated for the street as such. To be able to calculate the figures in an upscaled scenario, one would have to know the number of kilometres of shopping streets in the whole of Amsterdam and, in principle, also how many kilometres the trucks travel outside the shopping streets.
- Big Bellies: The use of Big Bellies translates into fewer trips needed to remove the waste, which yields savings in the kilometres travelled. If the waste disposal trucks had already been electrically powered, it would not result in an extra reduction in emissions. The potential contribution of the Big Bellies in terms of CO_2 reduction is therefore not included.

Public spaces:
- Street lighting: The energy consumption figures for streetlights are known, and Alliander determined, in previous measurements, that dimming yields a saving of 9%. It is therefore easy to derive the savings for the whole of Utrechtsestraat from the aforementioned numbers. The total number of streetlights in Amsterdam is known (approximately 116,000), which means that it is possible to calculate an upscaled scenario based on the assumption that, on average, all the streetlights use the same amount of energy as those in Utrechtsestraat. The upscaled scenario is based on the assumption that 50% of the streetlights elsewhere can be dimmed. Obviously the maximum potential is 100%.
- ABRIs: The energy consumption figures for the ABRIs and the MUPIs are known. The calculations for the solar cells were based on those figures; in other words, all the energy consumed by the ABRIs and MUPIs is generated green, which means that it is possible to make a direct conversion to determine the reduction in CO_2 emissions.

The total net savings percentage is hard to determine, because some entrepreneurs used displays, in some cases with the Plugwise system, while others had also or only done an Energy Scan. This means that some of the entrepreneurs used more than one of the available options. For that reason, we calculated the savings percentages for each participating entrepreneur for each of the separate components. The average of those figures was ultimately used as the savings percentage.

Important assumptions
- The electricity and gas savings due to the use of the displays have not been determined yet. It is assumed to be 4%.
- The savings due to the use of the Plugwise system is approximately 2% in relation to the overall consumption. This is much lower than expected.
- How many of the Energy Scan measures were ultimately actually implemented?
- The total number of ABRIs and MUPIs in Amsterdam (for the calculation of the upscaled scenario) was estimated at 1,000 ABRIs and 250 MUPIs.

#14

Remarks on the calculations
The scaling up calculations were based on the assumption of a participation percentage of 20%, respectively 100%. Because the competition would be copied in the case of scaling up, it is expected that the energy-saving percentages would remain more or less constant in the case of scaling up.

Important assumptions
- Gas and electricity savings based purely on behavioural change. This is assumed to be 10% in both energy categories, but the competition still needs to take place.
- The size of the average school is assumed to be 760 m^2: there is an average of 217 pupils per primary school in the Netherlands (Wikipedia) and the standard is 3.5 m^2 per pupil (government, Dutch Ministry of Education, Culture and Science (OCW)).

ZonSpot

#15

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per –	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
ZonSpot	**–**	**–**	**–**	**–**

Swimming pools

#16

	pilot		scaling up	
	energy savings	**total reduction emissions**	**realistic**	**potential**
	% per swimming pool	*tons CO_2 a year*	*tons CO_2 a year*	*tons CO_2 a year*
Swimming pools	**35**	**162**	**647**	**647**

#15

No value case was made for this project. The main purpose of this project is to show the possibilities of solar energy. The actual savings are more or less insignificant.

#16

Remarks on the calculations

Scaling up: The 'realistic' scaling up and the maximum scaling up scenarios are assumed to be identical; on the one hand, this is because the measure will save a lot of energy and yield return on investment in a very short period of time while, on the other hand, the municipality can impose this measure on the public swimming pools (8 in Amsterdam).

Important assumptions

- The total energy use of an average swimming pool is a known number. The unknown factor is however how much of the energy is be used to heat up the swimming pool water. The calculation was based on a factor of 50%.

FIND OUT MORE ABOUT THE SUSTAINABLE PUBLIC SPACE PROJECTS ON PAGE P. 94 → 119

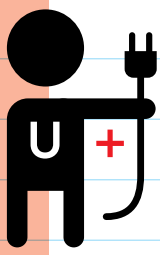
4

Overall lessons learnt

Amsterdam Smart City has learnt a lot during the two year period. The project tests lead to many positive and negative results, which are both equally valuable.

Amsterdam Smart City shares the achieved knowledge with as many people as possible, as it is important to incorporate that knowledge into the large-scale implementation process of smart solutions - regardless of the city in which it is done. The projects gained a great deal of experience in the (internal) processes, the implementation of technologies, the involvement of the users and most of all, on the collaboration. The purpose of this chapter is to zoom in on a few of the lessons learnt.

Photo: Picture gallery City of Amsterdam



The user

The biggest challenge all the partners in the different projects faced was to engage the people of Amsterdam; in other words to involve the residents, the entrepreneurs, the employees in the office buildings and also the visitors of the city. There are many ways to render houses, office buildings and public spaces in a sustainable manner. Although significant cuts in CO_2 emissions can be made by implementing technology, the bottom line is that a very high percentage of the total energy use is still controlled by the (end) user and his or her behavior. Not only in terms of making them aware of the different initiatives that are being rolled out, but also in terms of engaging them to become actively involved in energy saving.

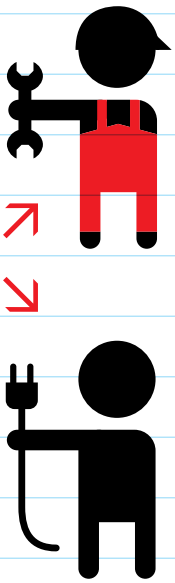
Testing smart solutions with the user

While this might seem obvious, it is essential to be aware of the fact that, when it comes to the implementation of technologies, the (end) user may never be left out of the implementation equation. Projects reveal that the technology should not be presented to the end user before the project team has gained a substantial amount of experience in testing the technology. At the same time, it is also extremely important not to burden the participant with technological complications, such as having to install the display system themselves. The ready-to-use solution is definitely preferable. Notwithstanding, the fact remains that sooner or later the smart technologies must be tested in real life situations, like in homes and shops.

Overall lessons learnt

Two types of users

Some projects have revealed that actively engaging users could, in itself, be an ambitious objective. While it was previously thought that it would be fine to engage occupants of a building regarding the implementation of a few sustainable technologies, it transpired that the processes involved in the first step – the actual implementation of the initiatives – were invariably more complex than expected. The conclusion drawn from that lesson was that it is advisable to first complete the implementation process and gain results before communicating to the users and to engage them in the awareness-creation process and then to actually start saving energy.



In several projects this was the case, for instance in the Monumental Buildings and the Smart Swimming Pools project. While this does not necessarily mean that those projects were unsuccessful (on the contrary, a great deal was learnt about the implementation of different types of technology), an even more important lesson that emerged from those projects was that it is essential to engage and focus on the right target group throughout the entire process. In summary, it would be fair to say that the visitor of these buildings is actually the secondary target group in the projects. The first and direct target group consists of, for example, the owners of the swimming pools and the parties responsible for making the monumental buildings sustainable.

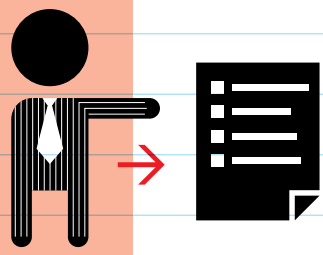
Process-based and technical lessons

A great deal was and is still being learnt in all the subprojects. Quite a lot has already been said about engaging the user. However, we also gained a lot of experience in implementing all the tested initiatives and the technologies as such. Was a specific energy display system really as user-friendly in the field as it was thought after testing it in the lab? Obviously, internal processes in organisations are tested and must in some cases be reorganised when new products are introduced to the market.

Experience has shown, logically enough, that this happens more easily in smaller organisations The collaboration that is required for the implementation of the new technologies also adds to the novelty and complexity of the processes. Because of this reason, and because of the fact that Amsterdam Smart City wanted to start at least 12 projects in a short period, ASC decided to work with many small companies to test the innovative technologies they have to offer. Testing recently developed technologies and concepts has made it possible to acquire a great deal of knowledge about those technologies and the appropriate approaches in a very short period of time.

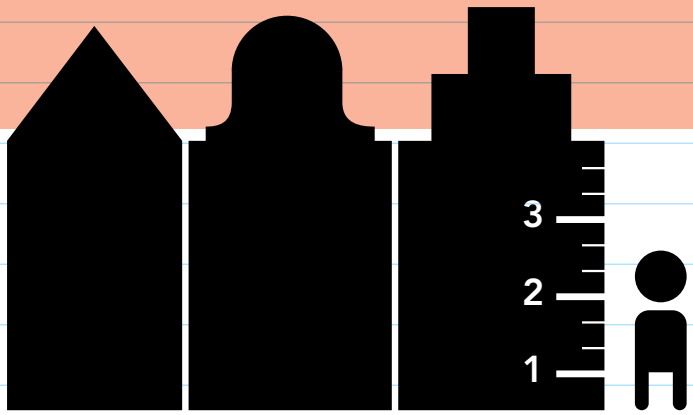
Regulations

One of the lessons of several projects is the fact that currently only highly motivated persons and businesses are really trying to lower their carbon footprint. Due to the structure of the energy tax, it is more difficult for high consuming businesses (>50.000kWh) to create a positive business case on energy saving, than for households. Strict regulations from (local) governments can however boost the area of every reduction. Mandatory energy-labels for houses and offices and binding energy reduction plans are examples that can accelerate this.



Amsterdam as testing area

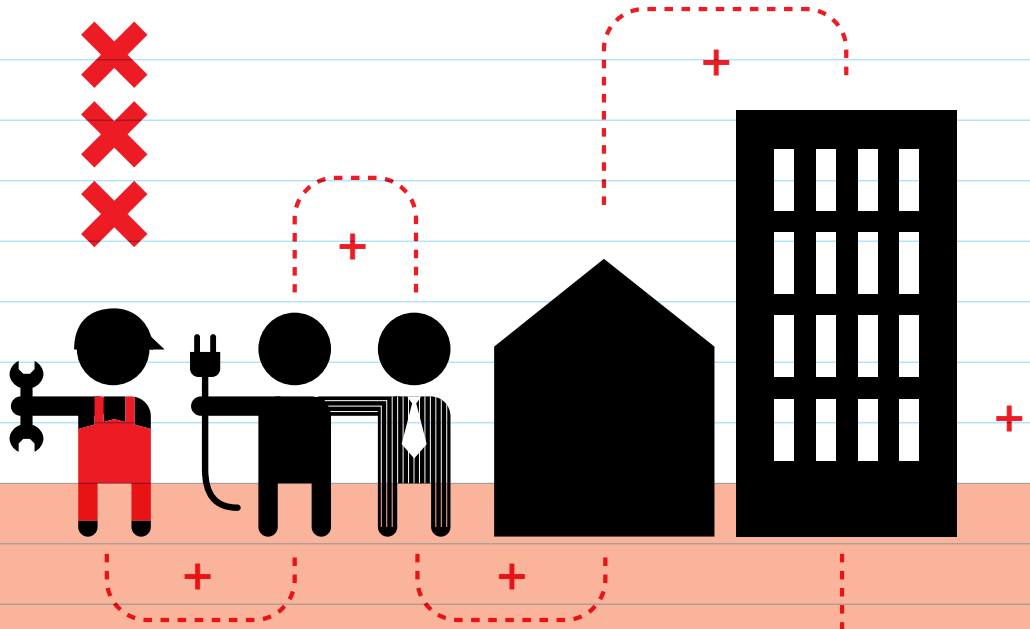
Amsterdam is an attractive city and is an excellent platform for organisations to test initiatives and technologies. For that reason, the City of Amsterdam is an enthusiastic supporter of collaborations between public and private parties. Since the start of Amsterdam Smart City in 2009 a lot of different parties have expressed an interest in having their products tested. Some of them actually started a project in close cooperation with other organisations. In short one can say it is important to have a test lab, such as Amsterdam, where this can be done. It attracts business and in the process, different types of organisations link their names to projects, as well as to the city. Finally, it is important for every organisation, whether large or small, as well as for the city, to internalize all the lessons learnt and thereby to be able to focus on large-scale implementation in the future. By doing so, all the participants contribute to the ambitions of the City of Amsterdam.



The Amsterdam Smart City Platform

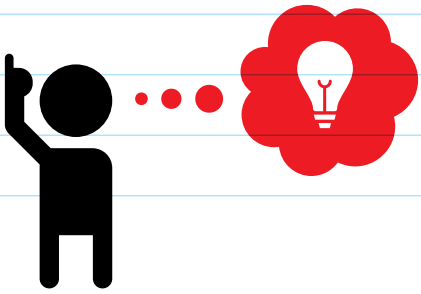
The Amsterdam Smart City platform has undergone substantial growth over the past two years. It started out with 25 partners and nowadays this has increased to over 70 partners and more than 250 contacts. In addition, many companies have shown an interest in participating and in continuing their involvement in ASC. By acting as an independent platform that brings parties together without any 'personal and financial interests', ASC has, over the past two years, come to be viewed as a 'trusted advisor'. Although some organisations have a clear view of what they would like to do, they sometimes do not yet have the right access to the municipality or other organisations to be able to achieve their goals in the short term. The fact that ASC has become familiar with what its partners and interested parties would like to do has enabled it to make a number of very successful matches.

Partners consider ASC as valuable because it knows what is going on in the field of smart technology and innovation and because it has a network that provides all the necessary entry points. Obviously some of the matches made have not been successful (yet), but some projects have certainly been accelerated thanks to the network; for example, several companies were introduced to Nemo, to help obtain their sustainability ambitions, De Balie has used the lease solution of LED lease, and The New Motion launched a successful project with Liander in the form of the *Moet je Watt* project. ASC is viewed as a reliable partner in these processes and shares the knowledge acquired from all the different projects with all the stakeholders based on the 'Think ambitious, do the feasible' principle. ASC is familiar with all the wishes of and options available to the different partners. To be able to achieve real results in the short term, however, ASC and its partners have chosen to start with small initiatives and to assess the possibilities for upscaling implementation based on the lessons learnt. That way, it is possible to achieve short term results rather than to become stuck with potential solutions that will only be feasible in the long term. By engaging the most suitable network and by remaining up to date on the wishes of its partners, ASC is able to act as an accelerator of climate and energy projects.



Collaboration as a requirement for innovation

A lot of different forms of innovation were considered in all the different subprojects. The innovation process is all about trying things in new, and if possible, better ways. Innovation is more than mere technical improvement and could also take place in the spheres of, for example, management and marketing. In the two years of Amsterdam Smart City, we dealt not only with innovative technology, but also with innovative partnerships, innovative financing and novel methods of communication. All of the projects were characterized by different forms and approaches. In summary, it would be fair to say that a precondition of innovation is collaboration with other partners - sometimes even with competing parties. While collaboration is the force that drives these types of projects, it can sometimes also be a pitfall, because of its delaying effects. The conclusion that can be drawn from the process of innovation through the implementation of new technologies and the reduction of CO_2 is that a collective approach, the stimulation of awareness, and the use of economically sustainable initiatives are important.



Value cases overall results

On average, considering all projects, an energy reduction percentage of 13.2% is attained. However, the figures vary considerably between the projects. A major reason for this is that the projects themselves differ substantially. For instance, the *Ship to grid* project does not directly reduce energy, although a major carbon emission reduction is reached: the project has focused on the transition from 'grey' to 'green' energy, without reducing the energy need. The percentages for 'work' and 'public space' projects are high because clearly some low hanging fruit has been touched. In contrast, the 'living' type projects have to work much harder to reach a meaningful energy reduction percentage. Then again, these projects have the advantage that their total potential of CO_2 reduction after large scale implementation is much higher.

The total emission reductions of all projects can easily be summed up. However, for the scaled up versions of the projects this is not possible. A household cannot apply the measures from the *Geuzenveld*, *West Orange* and *Haarlem* pilots all at the same time and expect all reductions to be applicable together. So, for scaling up projects from the 'living' category, we have taken the *West Orange* project as the basis (because apparently the approach and set of measures in this project is the most promising). The *Onze Energie* project is sufficiently different from the other four 'living' projects, so the results of that project can be added safely to the calculation of the total emission reductions.

For the other project categories ('work', 'public space' and 'mobility'), there is no overlap; neither in the projects, nor in their scaled up versions, so total carbon emission projections have been added up.

When comparing the projects at a glance, the huge potential savings from the *Onze Energie* project are striking. This because that project addresses all CO_2 reduction from participants, by completely 'greening' their energy use. The *Fuel Cell* project is more or less in the same category. Other projects have a much harder task, reducing relatively small(er) percentages by trying to influence behaviour. After scaling up, about 49% of the CO_2 reduction stems from greening energy production (*Onze Energie, Ship to Grid, Fuel Cell*), and the remaining 51% comes from reducing energy usage.

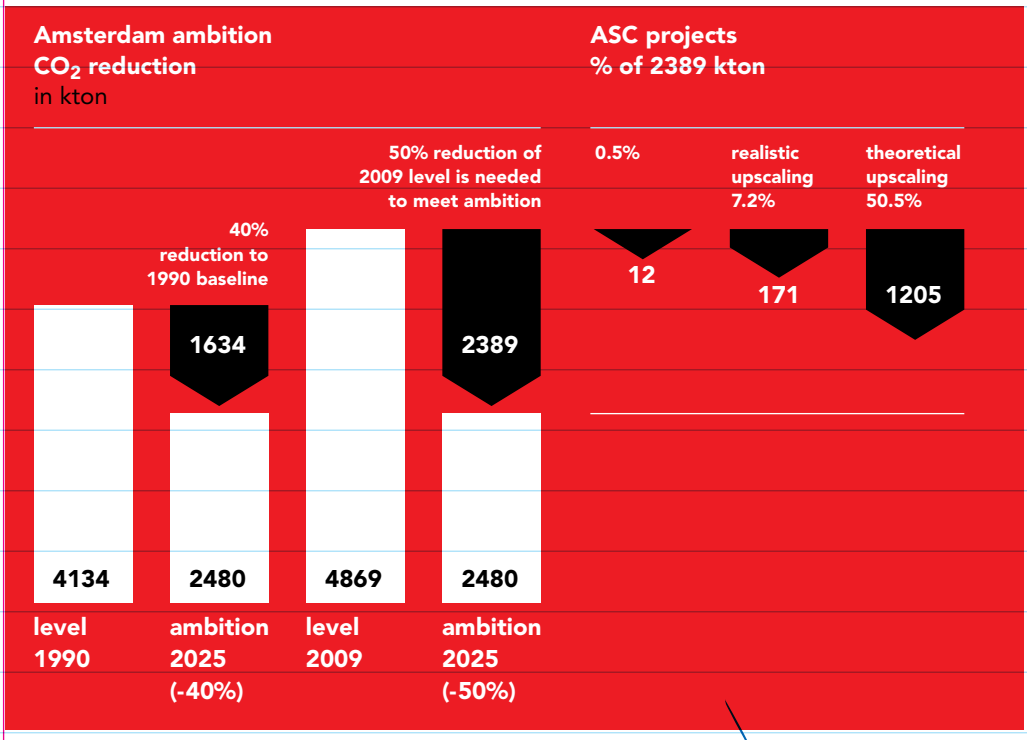
Contribution to the Amsterdam ambitions

The total carbon emissions of the city of Amsterdam were 4134 kton CO_2 per year in 1990. The ambition of the city of Amsterdam is to have reduced these emissions by 40% in 2025. That means, the emissions should be 2480 kton CO_2 per year by that time. The bad news is that the emissions have only risen since 1990: in 2009, it was 4869 kton. So compared to the 2009 emissions, at least 4869-2480 = 2389 kton CO_2 per year has to be reduced.

The ASC projects alone generate a projected saving of 12.1 kton, which is only 0.5%. That is not very much, but bear in mind that these are just isolated small scale testing projects. The 'realistically' scaled up projects have a potential to reduce 171 kton, which is 7% of the Amsterdam ambition. The full, even if unrealistic, potential of all projects combined is 50.5% of the ambition.

So yes, scaling up the Amsterdam Smart City projects can and will add to the emission reduction goals of Amsterdam. This will be a good start, but this alone will not be enough.

total	pilot		scaling up	
	savings energy	total reduction emissions	realistic	potential
	% per unit	tons CO_2/year	tons CO_2/year	tons CO_2/year
Living	7.3	1,712	84,352	702,623
Working	22.7	229	39,838	272,745
Mobility	0	9314	9,773	9,773
Public Space	22.6	847	36,982	220,148
Total	13.2	12,102	170,945	1,205,289



CHECK OUT THE VALUE CASES OF THE PILOTS ON PAGE 120 → 135

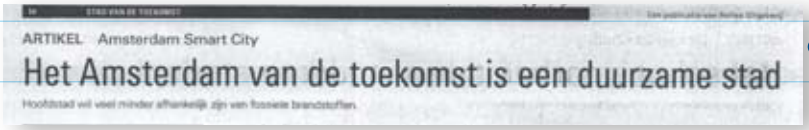
Technologies & approaches

	Current projects and activities	Technologies considered	Approaches considered
Living	• Geuzenveld • West Orange • Onze Energie • E-management Haarlem • Appollon • Amsterdam Opent • Citizen participation • Smart Challenge	• Distributed generation • Energy advice • Energy displays • Energy storage • Smart meters	• Citizen cooperation • Innovative financing • Citizen activation Programmes • Eco tours/ events • Living lab • Open innovation/ crowdsourcing
Working	• ITO tower • De Balie • De Groene Bocht • Online Monitoring Municipal Buildings • Zuidas Solar • Dialogue Cafe • Fuell cell	• Energy advice • Energy displays • Energy storage • Smart meters • Smart lighting • Distributed generation	• Smart working • Energy contest for employees • Bottum up Challenge for companies • Workshop knowledge sharing • Networking events
Mobility	• Ship to grid • Moet je Watt	• Electric vehicles • EV charge points • Electric waste collection • Sustainable logistics • Ultra fast charging	• Car sharing Programme • Organisation conference
Public Space	• Climate street • Smart Schools Contest • Swimming pools • ZonSpot • Nemo	• Energy advice • Energy displays • Smart meters • Smart lighting • Distributed generation	• Entrepreneur activation programme • Multiple collaboration (15 companies) • Educational programme • Workshop large scale implementation

Lessons learnt per focus area

	Behavior	Technology	Knowledge sharing	Cooperation
Living	• Engage households before offering solutions • Getting insight and simple tricks in energy use is highly appreciated • Benchmark information (neigbours/friends/ appliances) is crucial • Neighbours and local influentials are 'trusted advisors' • Communication via children is usefull	• Don't bother with technology • Simplicity (self installation) • Easy use is essential • Standardisation of smart meter and interface of technologies is crucial • Technology is complex and needs a lot more attention: one person to install all • Help desk / support needs to be professional from start	• Knowledge sharing can boost enhancement programs • Involve children to make contact with parents • Lots of (international) interest in how projects are running and how consumers are engaged	• More than 4 partners is often necessary but makes cooperation challenging at times • Open communication clear structures, clear responsibilities are essential for all partners • Signing of collaboration agreement upfront • Cooperation <> Collaboration • Social housing less interest in energy saving products than house owners
Working	• Start with technology and energy reduction: involvement of end user at later stage • Internal regulation (for instance; selection of lease car) can help • Spill over effect can stimulate companies to join • Total service concept (building management) is needed	• User (building manager) should be incentivized and trained to properly use the tools • LED light can be an enormous energy saver • Technology is available • Because of the low costs of energy, saving money is not an incentive • Or people are not aware of the potential savings that can be made	• Who's responsible to act? • No clear overview of financial benefits and potential possibilities • Consortium can be a stimulator	• Early involvement of building manager/ owner and direct stakeholders is essential • Trusted advisor role can accelerate initiatives • Lack of sense of responsibility (neither tenant nor owner feel responsible)
Mobility	• Ability to change will only start if all barriers are removed • Legislation and financial incentives are main drivers	• Technology exists but needs more development	• Lots of international interest in electrical solutions • The ultimate goal of sustainable mobility made it possible for all stakeholders to join forces and cooperate	• City can really drive change • For effective roll out it is important to align all stakeholders
Public Space	• Ambassadors program, use of local influentials and peer pressure work • Users of smart technologies should be fully facilitated and supported during implementation	• A lot of innovative technologies with great saving potential available	• Climate street has international exposure (added value for Amsterdam) • Effects (financial and other) should be communicated	• Alignment of stakeholders is crucial • Define who's in charge • Finding common goals is important • Collective approach to end user is essential

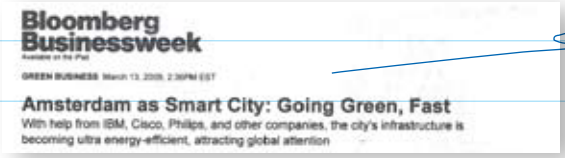
Amsterdam Smart City in the News


ARTIKEL Amsterdam Smart City

Het Amsterdam van de toekomst is een duurzame stad

Hoofdstad wil veel minder afhankelijk zijn van fossiele brandstoffen

NRC bijlage on ASC, October 2010


Bloomberg Businessweek

GREEN BUSINESS

Amsterdam as Smart City: Going Green, Fast

With help from IBM, Cisco, Philips, and other companies, the city's infrastructure is becoming ultra energy-efficient, attracting global attention

Business Week on ASC, March 2009


The Economist

Something old, something new

Making an existing city smart is a different problem altogether, as demonstrated by Amsterdam, the Netherlands' biggest city. Amsterdam Innovation Motor (AIM), a public-private joint venture created for this purpose, is not intended to come up with some master plan but to identify interesting "smart" projects, work with local firms and other stakeholders and find ways to make projects worthwhile for everybody.

So far AIM has launched a dozen projects, ranging from installing smart meters in some households to connecting ships to the electricity grid so that they no longer have to use diesel generators when berthed in the city's port. The most ambitious effort so far is something called "Climate Street", which aims to reduce the energy use of an entire shopping street.

The Economist on ASC, November 2010


ENERGIEBESPARINGSPROJECTEN BRENGEN PUBLIEKE EN PRIVATE PARTIJEN SAMEN

Amsterdam Smart City is voorbeeld voor buitenlandse steden

Energie Nederland on ASC, January 2010


AMSTERDAM, LA VILLE SMART

URBANISME Après la rue commerçante la plus durable d'Europe, la municipalité batave veut étendre le principe à la ville.

Enjeux les Echos on Klimaatstraat, February 2010


BUITEN WERKEN BIJ ZonSpot

De primeur op de Amsterdamse Zuidas is in samenwerking met 'Amsterdam Smart City', een onafhankelijke partner voor klimaat- en energieprojecten. De organisatie is een samenwerkingsverband tussen Amsterdammers, bedrijven, kennisinstellingen en overheden. Doel is om echt werk te maken van innoverende klimaat- en energieprojecten.

De Groene Telegraaf on ZonSpot , February 2011


Cool Brand: ZonSpot

Het Nieuwe Duurzame Werken


Amsterdam Smart City

Amsterdam Smart City is een onafhankelijke partner voor klimaat- en energieprojecten. De organisatie is een samenwerkingsverband tussen Amsterdammers, bedrijven, kennisinstellingen en overheden, met als doel om slim energie te gebruiken en nieuwe technologieën uit te testen in Amsterdam. Amsterdam Smart City is een initiatief van de Amsterdamse Innovatie Motor (AIM) en nettoheender Liander, in nauwe samenwerking met de Gemeente Amsterdam. Er zijn sinds de oprichting in 2009 14 projecten gestart op het gebied van Duurzaam Werken, Wonen, Mobiliteit en Publieke Ruimte.

www.amsterdamsmartcity.nl

www.zonspot.nl


proeftuin

Het startpunt van de ZonSpot in Amsterdam, uitbreiding in andere delen van het land zit al in de koker. "We spreken met verschillende partijen die met ons samen willen werken, waaronder Amsterdam Smart City die op de Zuidas bezig is voor een pilot project, samen met verschillende bedrijven die willen investeren in zonne-energie. Zo gaan ze 3.000 zonnepanelen op de daken van verschillende gebouwen op de Zuidas plaatsen. Het zou mooi zijn als we met de ZonSpot op de Zuidas locatie naar dat project verwijzen. "Toevallig heb ik vanochtend een gesprek gehad met een


Fonk Magazine on ZonSpot, February 2011

Geuzenveld krijgt slimme meterkast

Van een onzer verslaggevers
AMSTERDAM, woensdag
In Geuzenveld worden 150 huishoudens voorzien van meterkastjes met een energie-display. Daarop kunnen bewoners zien hoeveel energie in huis wordt verbruikt.
Gisteren zijn de eerste apparaatjes bij wijze van proef geïnstalleerd. „Op de displays kunnen bewoners zien hoe-

De Telegraaf on Geuzenveld, August 2010

Het Parool on Geuzenveld, August 2010

Slimme stekker helpt besparen

Geuzenveld krijgt primeur van Amsterdam Smart City

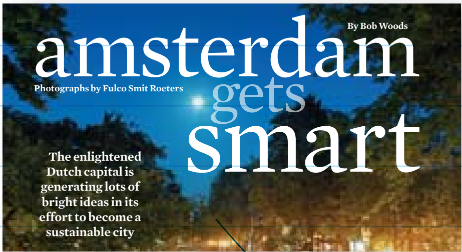
Echo on Zuidas Solar, December 2010

Zonnepanelen op Zuidas

www.levendesteden.nl on ASC, December 2010

Amsterdam Smart City lanceert nieuwe slimme projecten

Amsterdam Smart City heeft vijf nieuwe projecten gelanceerd om de hoofdstad duurzaam te maken. De opgedane kennis en ervaring van al deze testprojecten wordt meegenomen in de grootschalige aanpak van de gemeente om de CO2-uitstoot fors te verminderen.



coming a 21st-century prefix identifying increasingly intelligent phones, homes, and cars. In Amsterdam's case, "smart" describes the public and private initiatives designed to integrate energy, transportation, housing, water, waste, and other elements of the urban infrastructure, with the goal of developing a more efficient, environmentally friendly city for its roughly 760,000 inhabitants. That effort encompasses everything from installing plug-in stations for electric cars to turning trash into clean energy.

"What we're trying to do with smart meters is give people an insight into their energy usage, show in real time how much they're using, and educate them on how to better manage usage," explains Joost Brinkman, a project manager for Amsterdam Smart City. By involving several partners, each with specific expertise, the chances of success are greater, he says. "When a housing cooperative works together with IBM and Nuon and the people living in those houses, they can create a lot more sustainability than by doing things on their own," Brinkman adds.

Continental Airlines magazine on ASC, September 2010

Metro Amsterdam on Geuzenveld, August 2010

Kastje voor bewust energieverbruik

Ctimes on ASC

[illegible] (Amsterdam Smart City；ASC)，[illegible]。

[illegible] ASC [illegible] 2025 [illegible] CO2 [illegible] 1990 [illegible] 40%。

Grote ambities in Amsterdam

[illegible]

Spits on Klimaatstraat, December 2009

Energie gids on Klimaatstraat, April 2010

NOG VEEL OBSTAKELS OP DE WEG NAAR GROENE WINKELSTRAAT

Stad kleurt groener

Amsterdam moet de meest energiezuinige stad van Europa worden. Besparing op watergebruik, energie van zonnestralen en gescheiden afvalinzameling. Het rood uit het stadswapen moet groen worden. De Utrechtsestraat is uitverkoren als 'showroom' voor innovatieve projecten en is omgedoopt tot klimaatstraat.

Spits and Telegraaf on Klimaatstraat, June 2009

Slim omgaan met energie

Hoeveel energie verbruik je nu eigenlijk en waaraan? Lampen aanlaten, ja dat vreet energie, maar de laptop op standby... dat valt toch wel mee? We krijgen over het algemeen één keer per jaar de energierekening en zien dan wat we in een jaar tijd hebben verbruikt. We weten niet precies waarvoor we de meeste energie gebruiken. Tijd voor een slimme meter met energiedisplay!

Far West Post on Geuzenveld, June 2010

Display drukt Amsterdammer met neus op energieverbruik

Trouw on Geuzenveld, August 2010

5

Knowledge sharing

An important objective of Amsterdam Smart City is sharing knowledge on a national and international level. ASC shares the achieved knowledge with as many people as possible via the network, newsletters, website, but also by organizing knowledge sessions and presenting at conferences.

Knowledge Sessions

Sustainable working

In light of the Amsterdam Smart City target to share knowledge and bring parties together, Amsterdam Smart City in collaboration with AIM to Sustain organised a meeting about sustainability in office buildings. Four expert speakers explained their visions of how to make office buildings more sustainable on the DINSDAG meeting of September 7, 2010. Besides networking and gaining information, the purpose of this meeting was to identify starting points for business development in the area of sustainability. While there are plenty of innovative solutions available, the real question is: who is willing to invest in sustainability and what does it actually yield? This dilemma was presented from the perspectives of (real estate) consultants, grid operator Liander, and Amsterdam Municipality. After the presentations, the approximately 60 participants formed smaller groups to hold round-table discussions on the challenges and solutions.

http://www.aimtosustain.nl/news/verslag-dinsdag-over-duurzame-kantoren

Monumental Buildings

The project Sustainable Monumental Buildings of Amsterdam Smart City seeks to learn as much as possible in three pilots at monumental buildings in the city. To further promote awareness and sustainability ASC aims to share its results with others. On 18 November 2010, a workshop was therefore held in collaboration with Nyenrode Business University and the Office of Monuments and Archaeology (BMA) on the balance between sustainability and monuments. The three ASC pilots served as input for this session. The focus was particularly on the possibilities for monuments in the center of Amsterdam. A group of 20 professionals with various backgrounds were present at the workshop. Following a short introduction by BMA & ASC, Nyenrode presented some good and bad practices for sustainable preservation. After this, sustainable monuments were discussed from three specific perspectives in three rounds at different tables: Choices and Opportunities, Awareness and Interests. The report "The Balance between Monuments and Sustainability" is available via the ASC website.

Amsterdam Duurzaam (Sustainable Amsterdam)

On 17 September 2010 during the Amsterdam Duurzaam event, Amsterdam Smart City hosted a workshop as part of its ambition to share knowledge. During the course of a 45-minute session, ASC triggered the mixed public that attended the event to start thinking. Given the fact that ASC wishes to gain knowledge from the public in an interactive way, it was decided to present three of the problems that it has encountered in its subprojects to the public. Thanks to the general enthusiasm on the part of the public, ASC acquired a number of valuable tips and ideas that could offer added value to the applicable subprojects. The response of the public showed that the workshop contributed substantially to the awareness of the audience. The interactive way of confronting reality with a small group had a positive effect on the audience.

Conferences Amsterdam Smart City 2009-2010-2011

In light of the ambition of sharing knowledge, Amsterdam Smart City attended various conferences in the last few years and contributed through presentations, information stands, panel discussions and hosting. As travelling is a large contributor to CO_2 emissions ASC tries as much as possible to give presentations with Skype or video call and to combine attendance of conferences with other useful visits. Also, a significant number of conference hosts were Smart and chose to host their conferences in the City of Amsterdam!

	Name	Month, year	Place	Role ASC
1	Intelligent City Network	May 2009	Vancouver	Presentation
2	Amsterdam Duurzaam	June 2009	Amsterdam	Presentation
3	Creative City Lab	July 2009	Amsterdam	Panel discussion
4	Smart Metering	September 2009	Barcelona	Presentation
5	Picnic	September 2009	Amsterdam	Panel discussion
6	Intelligent City Network	October 2009	Amsterdam	Presentation
7	Eurocities 2009	November 2009	Stockholm	Presentation
8	AIM event	February 2010	Amsterdam	Information stand
9	Amsterdam na Copenhagen	February 2010	Amsterdam	Information stand
10	Smart Metering Scandinavia 2010	March 2010	Copenhagen	Information stand
11	T&D / Smart Grid	March 2010	Amsterdam	Official host
12	WCIT	May 2010	Amsterdam	Information stand
13	Symposium Duurzame Stad van de Toekomst	June 2010	Amsterdam	Host
14	Powergrid Europe	June 2010	Amsterdam	Information stand + presentation
15	Smarter Energy	June 2010	Warsaw	Presentation
16	Jaarcongres Energie, Metering en Billing	June 2010	Scheveningen	Presentation
17	Smart Cities Summit	June 2010	Auckland	Presentation video conference
18	World Expo 2010	June 2010	Shanghai	Presentation
19	NIA South Korea	July 2010	Amsterdam	Presentation
20	Electricity Innovation Smart Grid Conference	July 2010	Seoul	Presentation
21	IC Green 2010	July 2010	Athens	Presentation
22	Australian Energy & Utilities Summit	August 2010	Sydney	Keynote presentation
23	2nddegreesnetwork Webinar	September 2010	-	Presentation, webinar
24	Asia Smartricity congres	September 2010	Shanghai	Presentation
25	Amsterdam Duurzaam	September 2010	Amsterdam	Information stand + panel discussion

	Name	Month, year	Place	Role ASC
26	World Climate Solutions	September 2010	Copenhagen	Presentation
27	UN Climate Week	September 2010	New York	Presentation
28	European Utilities Smart Metering & Grids	October 2010	Stockholm	Presentation
29	Nizhniy Novgorod 'Smart cities'	October 2010	Novgorod	Presentation, Skype
30	Smart Metering 2010	October 2010	Prague	Presentation
31	Let's Act on the Future	October 2010	Capri, Italy	Presentation
32	The 2nd International Conference on U-City (Smart City) Technology (ICUT-2010)	October 2010	Gumi, South Korea	Presentation
33	Eurocities Knowledge Society	October 2010	Birmingham	Presentation
34	Smart Grids, Smart Cities, Smart Future	November 2010	Amsterdam	Presentation
35	T&D ASIA	November 2010	Ho Chi Min City	Presentation
36	2nd Annual Canadian Smart Grid Summit	November 2010	Toronto	Presentation
37	Smart Energy Network Europe	November 2010	Brussels	Presentation
38	Nationaal Energie Forum	December 2010	Scheveningen	Presentation
39	Congres op weg naar Intelligente netten	January 2011	Utrecht	Information stand
40	Global Energy Basel	January 2011	Basel	Presentation
41	Sustainable Cities Today	January 2011	Paris	Presentation
42	Smart Cities, Rotterdam	February 2011	Rotterdam	Presentation
43	Power & Electricity World New Zealand	February 2011	New Zealand	Presentation, Skype
44	Sustainability Week	February 2011	Madrid	Presentation
45	Smart Grids: Vision, Strategy, Implementation	March 2011	London	Presentation
46	Smart Cities Summit	March 2011	Dublin	Presentation
47	China Smart Grid Summit & Expo 2011	March 2011	Beijing	Presentation
48	The 2nd Electricity Innovation Smart Grid Conference	March 2011	Seoul	Presentation
49	Smart Energy Summit	March 2011	Paris	Presentation
50	ABI Forum - Smart Cities	April 2011	Hangzou, China	Presentation
51	Smart City Event	May 2011	Amsterdam	Official host
52	Smart Cities World Australia 2011	October 2011	Melbourne	Presentation, Skype

6

There is more smartness in this city

This publication is a summary of the projects and activities of Amsterdam Smart City. We are fully aware that the success of Amsterdam Smart City is nothing more than the success of it's partners.

Amsterdam Smart City collaborates with all kinds of partners and initiatives. But there is more Smartness in this City. Amsterdam is one of the cities in the world that is driven by innovation. Here are a few different initiatives, but since the story continues...

Ambitious Climate Program

Gemeente Amsterdam

Photo: Picture gallery City of Amsterdam

The Municipality is working hard to make Amsterdam a clean, healthy, accessible and liveable city. Greater attention is being paid to the quality of life, innovation is becoming increasingly important, and the city has an ambitious climate programme. The City of Amsterdam is working for its future. The Municipality has a vision of sustainable progress, with sustainable construction and sustainable energy. As a result, in 2020, Amsterdam will be one of the most sustainable cities in the world.

www.amsterdam.nl/klimaat

Amsterdam Electric

Amsterdam elektrisch

Amsterdam Electric is a project initiated by the municipality of Amsterdam and a number of partners. The aim is to create a strong incentive for electric transport. After all, electric transport is cleaner, quieter and more economical. By 2040, the City of Amsterdam expects that almost all vehicular traffic within the city will be electric, powered by green electricity generated by windmills, solar panels and biomass plants. Electric boats will be the primary mode of canal transport. Thanks to electric mobility, air quality will improve and noise pollution will be reduced. Cargo transported by road or water will use electric power. Fossil fuels will be unnecessary, and harmful emissions and electric mobility will be dramatically reduced. This will make Amsterdam an even more attractive city for residents and businesses. In large part, this will be thanks to developments that are being put in motion today. By 2015, Amsterdam is expected to have 10,000 electric vehicles on the roads. More electric cars are being produced, and although they are currently more expensive than traditional vehicles, their prices will fall as the market for them increases.

www.amsterdamelectric.nl

Amsterdam opent

From December 2009 through May 2010, the Amsterdam Municipality has been experimenting with crowd sourcing, co-creation and open innovation in public issues. The Amsterdam Opent platform challenges the public to help come up with new solutions to typical Amsterdam issues, such as bicycle parking, the Future of the Red Light District in Amsterdam and Collaboration in Energy. How can we stimulate Amsterdam's homeowners to produce their own domestic energy? Amsterdam Smart City has put this question up online for the public, as well as for the experts. By doing so, it wishes to stimulate knowledge exchange and co-creation (collective policy-making). After all, the more heads, the more knowledge.

www.amsterdam.nl/amsterdamopent

AIM to sustain

AIM to Sustain: The network for sustainable organisations in Amsterdam. The strength of the network is innovation with a focus on sustainability, entrepreneurship and a highly dynamic network. AIM to Sustain, an initiative of the Amsterdam Innovation Motor and businesses in the Amsterdam region, and has been operative since September 2008. The Amsterdam region has major ambitions in the field of sustainability. Amsterdam is now looking for solutions that will help achieve those ambitions. Innovation is the most important core ambition of AIM to Sustain. In the past two years management support has been given to 21 start-ups. At the moment, 55 companies from the region participate financially. The coming years, this will be expanded and the platform will support about 60 companies / start-ups.

www.aimtosustain.nl

Dialogue Café

Amsterdam Smart City is increasingly being invited to present its concept and experience at different conferences around the world. Living in a Smart World also means that we can use new technologies instead of travelling all over the world. Amsterdam Smart City wants to use Dialogue Cafe to share knowledge. Dialogue Cafe enables face to face conversations

between diverse groups of people from around the world so that they can share experiences, learn from each other and work together to make the world a better place. Dialogue Cafes are now open in Rio de Janeiro, Lisbon and Amsterdam.
By using the state of the art technology of Dialogue Cafe, Amsterdam Smart City and Waag Society have organized a series of meetings about Future Smart Cities. Future Smart Cities is a series of four intercultural meetings between Brazil and the Netherlands about the future of the city in the light of recent technological developments, globalization and new opportunities for solving social, economic and environmental issues. The focus is on the actual issues that the cities are dealing with, the variety of smart solutions available for addressing those issues, and the infrastructure that is needed to implement them.

www.dialoguecafe.com

Ecomap

In December 2009, Cisco, the city of Amsterdam and Amsterdam Smart City announced the rollout of Urban EcoMap, an Internet-based tool that enables cities around the world to provide smarter climate change information to their citizens. Cities can use Urban EcoMap to create awareness among their residents by showing the impact of carbon emissions on their urban environment. It provides information on carbon emissions from transportation, energy and waste among neighbourhoods, organized by district, and delivers tips on ways in which residents can reduce their carbon footprints.

www.urbanecomap.org

Nemo

NEMO Science Communication Center

NEMO is the biggest science museum in the Netherlands. It attracts more than 400,000 visitors a year. Covering no less than five storeys of exciting and interesting things to do and discover, it is the place for visitors to encounter science and technology in a playful way. NEMO has the ambition to do everything that is technically, organizationally and financially feasible to make NEMO the most progressive green cultural enterprise in Amsterdam. Thanks to its location, the number of visitors it draws, the potentially green roof, the opportunities for innovative lighting, and the new exhibition space for sustainable technologies (e.g. Electric Vehicles), NEMO is an extremely interesting partner for Amsterdam Smart City and her partners.

www.e-nemo.nl

Living lab, Apollon

The Apollon project demonstrates the positive impacts of cross-border, domain-specific Living Lab networks by setting up an advanced pilot composed of four thematically focused European-wide Living Lab experiments. In the experiments, SMEs are enabled to take part in cross-border Living Lab experiments beyond their home markets. They are supported in that regard by large industrial companies, academic centres and other stakeholders. To that end, the pilot addresses four major domains: eHealth, energy efficiency, eManufacturing and eParticipation. The goal of the energy efficiency pilots in the Appollon project is to establish and conduct, within a period of two years, comparable energy efficiency pilots using smart meters in different international cities (including Amsterdam). The Energy Pilot is an International cooperation between different organisations in Portugal, Finland, Sweden and the Netherlands. The results will be compared to similar experiments in other European cities.

www.apollon-pilot.eu

Nudge

Consumers can stimulate a sustainable economy by joining hands and working together. This is the main idea behind the sustainable consumer platform, Nudge. Initiator Jan van Betten: 'We want to create a green economy, one little nudge at a time.' So support Nudge and join the thousands of people, who have done so already: put your dot on the website below. Nudge and Amsterdam Smart City established a partnership to share knowledge and strengthen each other's networks.

www.nudge.nl

Wij willen zon

Everyone can contribute to a sustainable society in his or her own way. This is the belief of the Wij Willen Zon (We Want Sun) Foundation. The Wij Willen Zon Foundation was founded by people of Urgenda and 'De Betere Wereld' (The Better World), who wanted to enable consumers to generate their own sustainable and affordable energy on their own roofs and to produce solar energy that is affordable for everyone. Wij Willen Zon is a purchasing

organization for solar panels, inverters and mounting hardware. By ordering 8,000 panel sets (10 MW) at once - the largest collective order in the Netherlands - Wij Willen Zon was able to negotiate a substantial discount (30% off the standard price) for high-quality panels. This is, to date, the lowest price ever paid in the Netherlands. It means that users are no longer exclusively bound to complicated and limited subsidies.

www.wijwillenzon.nl

Smart Working Centers: Amsterdam Bright City

Amsterdam is one of the best and most attractive international cities for people from all over the world to live and work. Given its rich history, this magnificent city offers its inhabitants a vast array of sporting, cultural and educational events. Amsterdam prides itself on being an open society with cultural freedom for all, thereby creating an ideal environment for equality and creativity to flourish, and for entrepreneurs and students to continuously improve themselves. Amsterdam Bright City aims to bring all these benefits together under one roof and thereby to enable the players in business, science and culture to meet and learn from one another.

www.amsterdambrightcity.nl

And so much more...

To me Amsterdam as a Smart City is...

It's the only way for the future // More than half of the population on this planet lives in a city and our number is growing. Funnily enough, in spite of the polluted air, we city people, at least in the West, have a longer life expectancy than our compatriots outside the city. So without smart cities we are not going to survive. Not enough energy, not enough raw materials, not enough healthy air. // Smart cities need to set an example. // Smart development makes the city a great place to live and creates jobs and welfare, but does not shift negative effects like pollution to other regions and does not compromise the ability of future generations to meet their own needs, by for example degradation of the landscape or depletion of resources. // It's not about optimizing just a few aspects but improving the quality of the city as an integrated system. // Smart development is future-oriented. Only when the development goes beyond the day-to-day reality, a lock-in in unsustainable behaviour can be overcome. // Involves many actors, perspectives and stakes, the trick is to mobilize and unite parties for actions towards a sustainable future. // Reduce loss of energy through (re-)use by your neighbour. Get in contact and it's fun too! // still far away // smarter than most of the cities in the world and has a leading role in new technologies // een goed en interessant platform omdat er allerlei verschillende partijen bij elkaar worden gebracht en samenwerken, waardoor innovatieve ideeën tot uitvoering worden gebracht. // a worthy pursuit - but we're not there yet // Compare to IBM program Smarter Planet campaign, i am very interested in this program // a good concept to realize sustainable ambitions // able to solve its issues by cleverly considering alternatives to the current flow of things, and organizing cooperation between its citizens and companies to try and learn. // A Smart city is a city with a vision. London thinks about it, Paris talks about it, Amsterdam has it! // To me, Amsterdam as a Smart City is able to feel and act as an individual in a worldly environment. // a perfect example of how innovative ideas can become reality by combining knowledge and expertise. // a great place to be: clean air, good transport facilities, well planned public space, good architecture, a connection point. A city benefitting from it's strong points by emphasizing them. A city that motivates and encourages its citizens to participate in making it the best place to be. // It is a central issue in my personal agenda // the future of smart new energy. // Amsterdam Smart City means enabling, scouting and fostering networks that embrace city's knowledge workers, artists en entrepreneurs, which brings good ideas and inventions into the practice of business and social innovation; eco-innovator being forerunners in this process. // Dare to explore the latest technologies/possibilities and stimulate people & companies to implement these. // a smart way to connecting people and companies to organize a better (local) world. // open minded, interested and flexible. // an essential way of improving the city quality of life. // a way forward in changing the mindset of citizens, to be able to build a more sustainable future. // The mobility concept should be exported all over the world. Amsterdam has to realize that it is the front runner in smart urban mobility!! // The future belongs to those who believe in the beauty of their dreams! So lets image a possible future in which we can all live up to our potential! And from there work backwards to understand where we need to start with right now! My wild guess it's that SMART cities are a good start... // Smart Cities are an Art: complex and depending on their context. And it is the Art I like. // something I personally think every city around the world should get involved in. Its beneficial to the economy, the environment, the people and the way we live. We all want to make sure that the next generations to come have enough resources for the city to continue to grow and develop. I feel that the EU has been incredibly active in promoting this concept to metropolitan areas, like Amsterdam. It makes me proud to know that the city I live in is thinking and acting in a SMART way. // flexible, social and green. // Smart City is Connective City // ASC is a platform for those who need sustainable solutions but don't know how to engage in all the available possibility's. // Smart is the future // ... the international internet hub and hype // The entrance to Europe // an environmentally friendly city that residents love to live in and attracts many visitors and investors. // a city in which there is no need to be physically 'at the office' so traffic will be minimized, offices will be outside of the city, people will live there again and the city will be given back to the people! // something to aspire // (international)competitiveness and (with, through?)sustainability is a major theme in our metropolitan region. // solar powered wifi can be a big asset. And what about a real metropolitan urban transport system? // where good ideas become real, and business is the driver for sustainability. // to me, Amsterdam as a Smart City is organize smart transportation to reduce pollution, have a well thought strategy about how to reduce energy consumption, to be an example for the rest of the Netherlands. // dynamic, clean, and benchmarked as one of the leading cities in how government works in collaborative networks with its citizens to be fast and smart in responding to their needs. // a creative place with respect for man and environment! // a city that is energy efficient and sustainable through the use of smart and innovative technologies in combination with smart ideas about how people use those technologies. // one of not many enough. // …a complex system that offers safety, the life conditions for wellbeing, innovation and transformation // ...an integral part of the whole, being regional and global constellations on Planet Earth // ... an example of impressively reduced ecological footprint through the collaborative development and use of innovative technologies, a socially just entity, an (new) economical beacon of sustainable production and services // a city for all its residents // a non-stop city // a city of commitment // a chance for the region to become socially and economically stronger and more sustainable in every meaning of the word through the appliance of smart ICT // a development we should speed up a bit more. Focus should be the creation of an international innovation playground and at knowledge transfer in order to 'export' our smart city expertise overseas. // ...prepared to innovate and to incorporate smart solutions, to be able to produce, act and consume independent from other energy supplying countries, in a time of economic low-tide. // an inspiring platform where ideas and solutions for a sustainable future come together. // FUN! // Riding your bike to meet people, at places where you can

be both social and adventurous. // Smart Cities need to be responsive and adaptive to the needs of all city stakeholders , involving all in the design , creation and delivery of the smart city itself. // mean and lean. And simply attractive! // an opportunity to try new ideas and solutions in a friendly environment for the benefit of a wider community. // upgrading public space. // We need smart technologies to use the benefits of sustainable energy supply. Thereby, smart technologies can help to make society consious about the amount of energy that is used. // Very creative // S pecific - M easurable - A ttainable - R elevant - T ime-bound // …a wonderful project and initiative. I suggest to share the success and lessons learned as a part of the Amsterdam city marketing. Inspire others! // a modern and attractive city to live, work and visit // smart governments = smart policies & regulations = smart citizens ==> smart city :) // in some ways an oxymoron. It has great potential to be a leader but many enterprises are afraid to take necessary risks to make it possible; choosing instead to wait to follow the big 10 companies or government funding before proceeding. // .... efficient, sustainable, accessible, and prosperous and infuses intelligence into the city-system to achieve this. // ...an easy, fun, accessible, green, open, attractive place to live. // a city to be proud of to work & a challenge as an Amsterdam based company to keep on developing and producing sustainable and smart electronic products // The Runner-Up. Kind regards from Eindhoven // a great sustainable and cultural meeting place // A resilient city // perfect collaboration between local government, innovative companies, economic goals and sustainability. // a invitation for meeting the right people and getting energy to go on // efficient and connected in every way! // Effectively integrating systems to enhance future efficiency // a challenging future and example for others. // We can present Amsterdam not only as the site where smart technologies are implemented, but also as a city where new smart technologies are invented! // essential. // Concept of smart cities inspires to think in a different way. To look at the city from a total new perspective. // a combination of smart living and working (and parking!) // The place where all smart (energy) stuffs happens! // Smart City Amsterdam is about how smart it wants to be. // We are looking at developing the smart city concept in terms of what it is and what a city needs to become a bona fide smart city i.e. what infrastructure, policy and intervention is required. I think it is important to develop the concept with other like minded European cities. // A city with space for people, ideas and experiments - and where technology supports such a smart city, rather than dictating space, people, ideas and experiments // Saving grid capacity by local energy and power storage. // taking the cumulative creative capacity of its inhabitants and using this as the ultimate problem solver // the best example in the world! // A good initiative // an interesting way to start thinking about the future and act upon it! // innovation and surprise // a place where urban processes and services are optimized but also offers room for the unexpected and serendipity; a city that harvests and aggregates information flows while allowing creative reuse and respecting privacy; a city that makes strategic choices for the future while also stimulating the power of its citizens to come up with innovative ideas. // I am really curious in what way we can apply your lessons learned in the Utrecht region. // simple, smart and kind! // a innovative and sustainable way of working and living. // A city where both private and businesses create opportunities to enable a sustainable way of enjoying and living in this beautiful city now and in the future. // a concept to enable and boost sustainable opportunities // innovative, inspiring, smart // It is the way to a new life style, which today is a must. // With this company ideas and thoughts can become reality. // I reckon it is just what we need at the moment to convince people that there are other, better ways if we just are willing to accept and change. // necessary. // An exciting initiative to try to reduce CO2emissions including stimulating behaviour of the residents of Amsterdam. A better world start with yourself. // a city in which companies, knowledge institutes and local government work together to find small solutions that improve productivity and help to solve societal problems. // Though I am already involved for around 6 years in smart metering and dynamic benchmarking, it seems hard for my company to find a connection with Smart city Amsterdam. To me, at this time, it seems like a closed community of several companies. I hope Amsterdam can match up with sustainable activities in other Dutch cities. // I haven't formed an opinion yet. A friend alerted me to your Event and this will be the first time I will attend. // an opportunity to creative start-ups. // a place that is vibrant and engaging across cultures, generations, ways of working, and disciplines // a place that serves as a healthy local habitat for its citizens and that is a portal of (social) innovation to the wider world // a platform where citizens can be engaged in the issues that matter to them // an example for the rest of Europe! // Smart cities has great contribution to consciousness among the stakeholders and the future factor adds to an understanding of the rapid changes. // a way of life. // a piece of the future if this city if it wants to be in the top ten creative cities of the world. // The concept is a good initiative. But smart City can evolve in some more thematic issues relevant in the cities. Perhaps it is also an idea to combine several smart city projects in a more national and international way. A lot of activities in other cities seems similar. Exchange of knowledge is a good thing // I think it is a useful term to capture the concept of marrying energy, information and sustainability but one that means different things to different people // a city able to cope with the challenges of the future in a flexible, efficient and scalable way. // The initiative is great! Good that an organization like AIM takes the lead in inspiring, enthusing and stimulating people and organizations to look differently to the world. There is a lot out there and in a concept like Smart Cities idea's and new developments are brought together. Meeting people, sharing knowledge and picking brains helps us to go in the right direction. // the necessary roadmap to the future. // the vibrant center of life in Holland // okay because it saves on several sites // Cities are complex systems of systems. As our planet becomes instrumented, interconnected and intelligent, we have the opportunity to connect these systems and make our cities smarter. Together we will achieve this for a better society. // Smart Cities are important for a sustainable future: // Use as little energy as possible! // Try to solve your energy need with renewable energy // Use the most efficient fossil energy technique for your additional energy need //

Colofon

Smart Stories is a publication of

amsmartcityerdam

Amsterdam Smart City
Amsterdam, April 2011
info@amsterdamsmartcity.com
www.amsterdamsmartcity.com

Production
Amsterdam Smart City
Editorial office
Amsterdam Smart City
Text
Amsterdam Smart City and
dbate business english services
Concept/design
Enchilada
Print
227 – Kampen

Mixed Sources
From well-managed sources
FSC
www.fsc.org Cert no. FSC C021068

www.AMSTERDAMSMARTCITY.COM