

am **smart** erdam **city**

Amsterdam Smart City (ASC) Concept introduction



Amsterdam Smart City tackles the key challenge for sustainability programs and smart grid development and creates value for all partners

Agenda

- **External recognition**
- **Problem definition**
 - **Context**
 - **Burning Platform**
- **Solution description**
 - **Concept**
 - **Focus areas**
 - **Approach**
 - **Roles**
 - **Governance & stakeholders**
 - **Successful Execution**
- **Research**
- **Initiator and Partner value**

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Amsterdam Smart City is widely recognized by cities, partners and media

- ASC is launched on June 3rd 2009
- Climate street is launched on June 5th and there has been an international press tour on November 26th
- Many international parties (energy companies, cities etc.) have visited ASC
- Official host of Smart Grids Europe 2010 congress
- ASC identified as 'Benchmark of Excellence' by EU Covenant of Mayors



- ASC has received lots of media attention

Congresses

AIM congress
Smart Metering
Scandinavia 2010
Smart Grid Europe
WCIT 2010
Powergrid Europe
Amsterdam Duurzaam



MEDIA

Business Week
Der Spiegel
La Stampa
Spits
Telegraaf
Het Parool
De Pers
Chosun Daily (25 mln daily circulation)



Climate change needs to be halted and current electricity networks need to be upgraded – these changes can best be initiated in cities

The climate is changing ...

- EU inhabitants use twice as much energy than the global average
- Only 7% of 2006 EU energy consumption was renewable
- Fossil fuel reserves are limited
- Climate is changing fast due to increasing greenhouse gas emissions (mainly CO₂)

... and new electricity grids are required

- Energy trends include: decentralized energy generation, energy storage, electric vehicles and (more fluctuating) renewable reverse energy flows
- These developments require flexible 'smart grids'
- Current EU electricity grids are not ready for these changed energy dynamics and need to be upgraded

Start in cities

- Over half of greenhouse gas emissions are created in and by cities: 80% of the population lives and works in cities, where up to 80% of energy is consumed *
- Mayors can address the development of alternative energy or pollution control, energy management or changes in behavior by public authorities and citizens in a coherent way *
- At the city level, the required coalition of private parties with ideas & technologies and public parties with trust of inhabitants can be brought together to build effective, scalable concepts
- Therefore, cities are the most suitable platform to start the movement towards a more sustainable future, enabled by a new generation of grids

The key challenge is to bring parties together and mobilize them to start projects to address climate goals & the upgrade to smart grids

Amsterdam Climate Goals

Climate goals with challenging deadlines are set:

- 40% CO2 reduction in 2025 from 1990 baseline
- 20% energy reduction in 2025 from 1990 baseline
- Municipal organization CO2 neutral before 2015

Smart Grid opportunity

The required upgrade of current grids presents the perfect opportunity to implement Smart Grids:

- Smart Grids / Smart Meters are seen as a key enabler to address climate issues, since they use two way communication to maximize energy efficiency

Progress

Although individuals and businesses everywhere are willing to change, too little action has been taken so far due to the limited capabilities and different interests of separate stakeholders. The required parties do not team up, and therefore too little projects are being initiated. There is a gap between intentions and actions *

Key Challenge

In order to create successful initiatives with substantial impact to implement Smart Grids and reach the sustainable energy and carbon reduction goals, the key challenge is to:

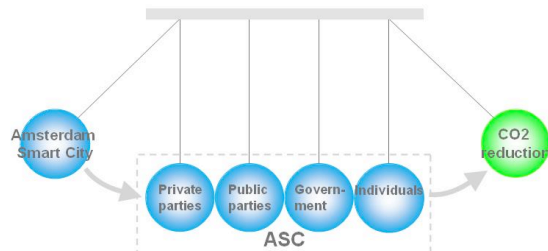
- Bring the parties together that are required to deliver a substantial impact
- Initiate action between these parties to deliver this required substantial impact

ASC aims to fulfill its goals with a collective effort that combines innovative and economically viable technology with behavioral change

Solution Concept

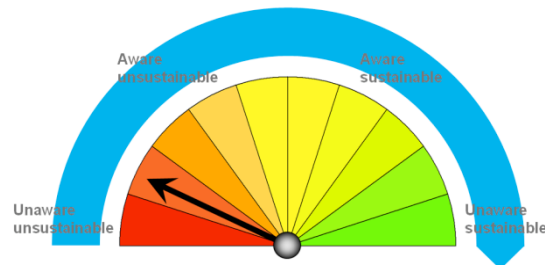
- Amsterdam Smart City is designed as an accelerator for climate/energy programs, bringing parties together and initiating projects that reduce CO2 and yield local best practices for full scale roll out
- Amsterdam Smart City is based on 3 key principles:

Collective effort



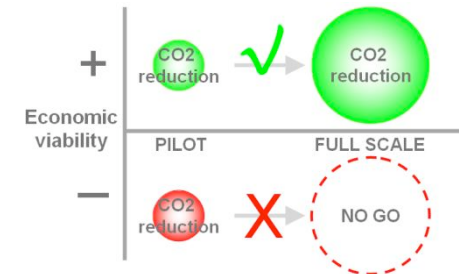
- The momentum for CO2 reduction is stopped without result if any of the required parties in society does not cooperate
- Therefore a collective effort of activating and involving all parties is required to realize CO2 reduction

Tech push / demand pull



- Stimulation of behavioral change creates a demand pull for more sustainable technology
- Application of innovative technology results in a technology push towards sustainable behavior

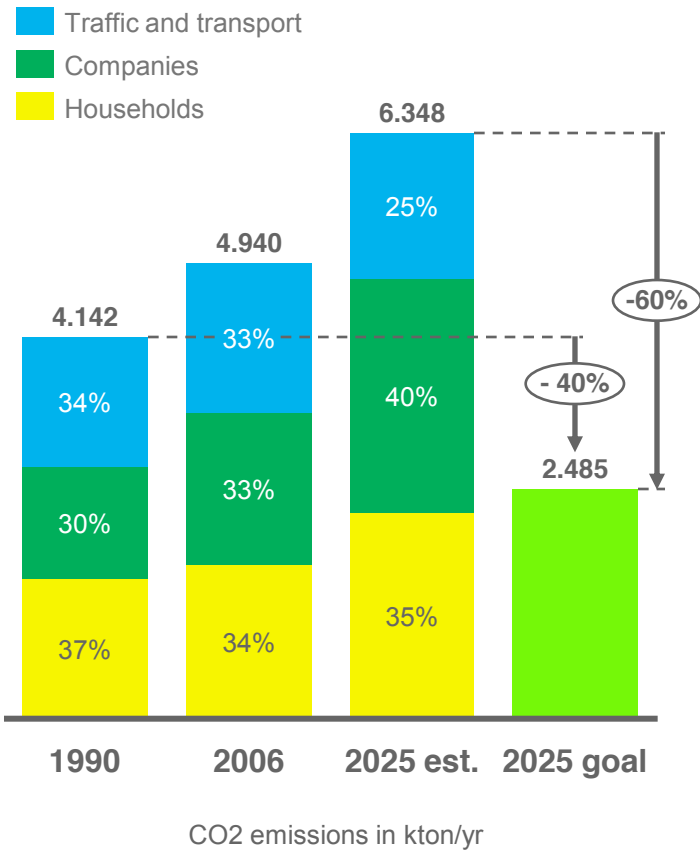
Economic viability



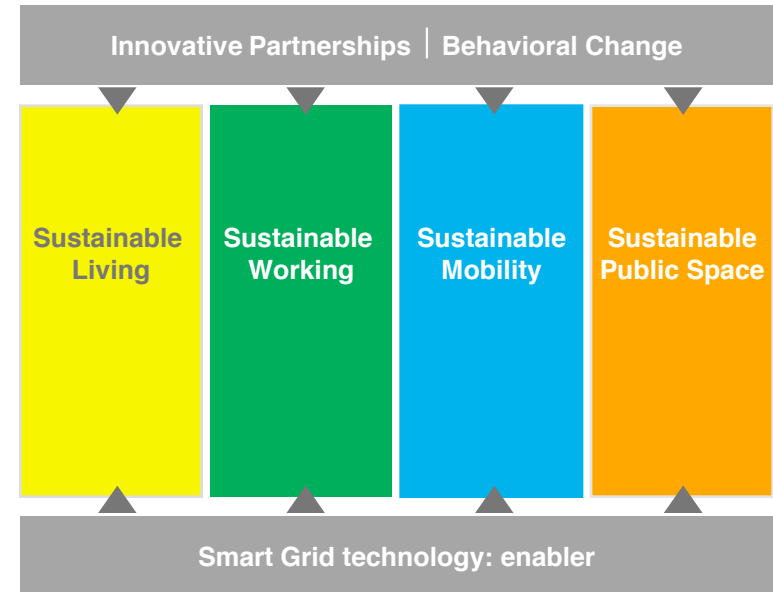
- Economically unviable initiatives will never be applied in a large scale
- Only economically viable initiatives (for all stakeholders) are interesting to apply on a large scale and can therefore have a large CO2 impact

ASC reduces emissions by focusing on Sustainable Living, Working, Mobility and Public Space enabled by Smart Grid technology

CO2 emissions Amsterdam

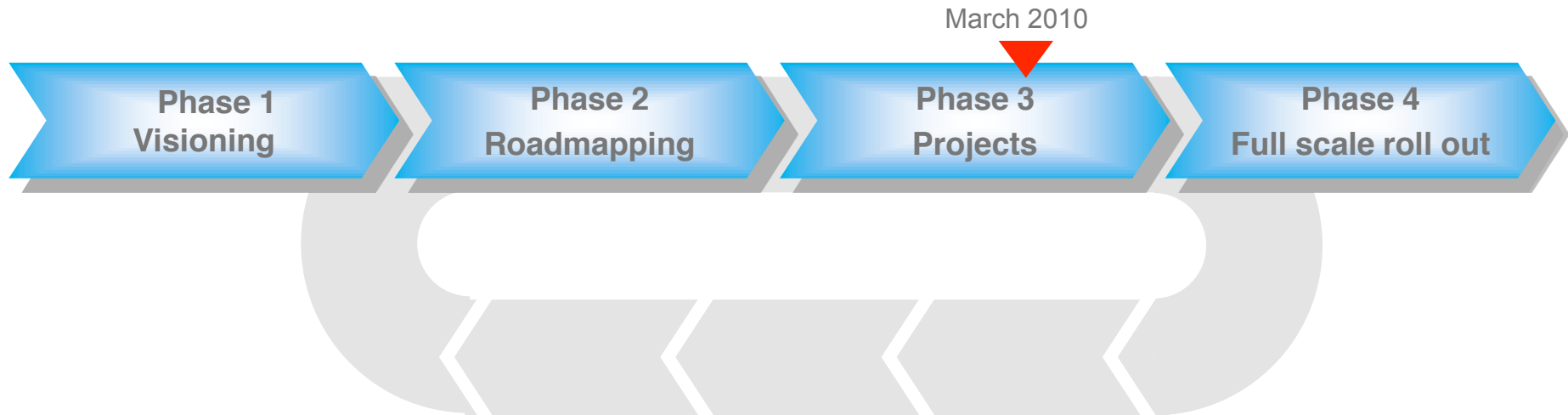


Focus areas ASC



Municipality is treated separately because of scope and ambitious internal climate targets

ASC follows a clearly structured pathway of continuously selecting, developing and scaling the concepts with the best (CO2) Value Cases



Visioning & Strategy

- Develop Vision & Strategy
- Define business case, principles and technical architecture
- Determine approach

Concept Development

- Pre-select initiatives on feasibility, costs and CO2 reduction potential
- Contact and organize partners
- Develop program plan and legal framework (incl. governance model)
- Secure funding from partners

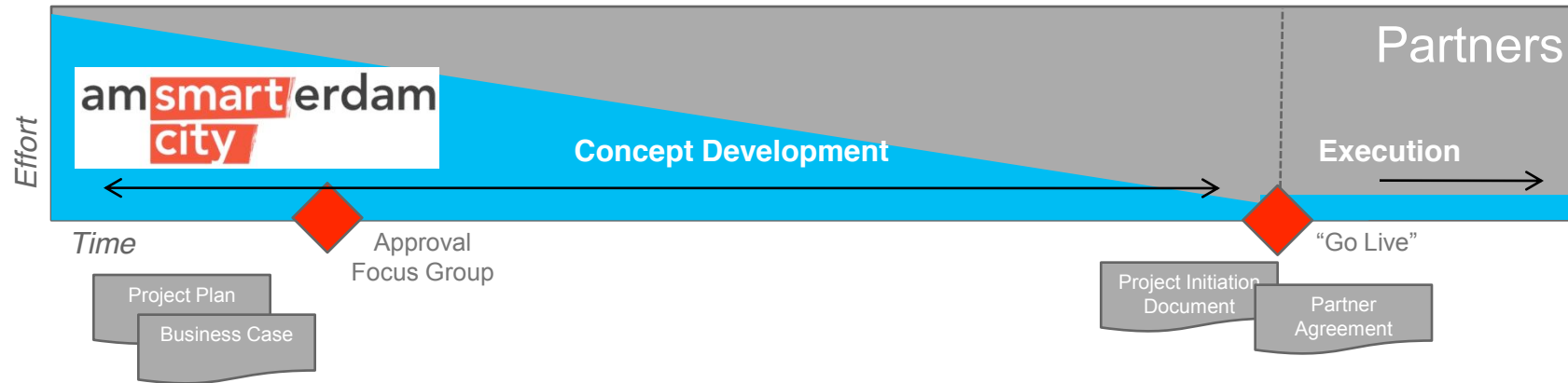
Value Delivery

- Develop project / comms plans and business cases
- Execute projects and monitor business case realization
- Scientific research by TNO

Strategy = Execution

- Evaluate and select successful initiatives and partners
- Communicate results
- Support (tenders for) full scale implementation and leverage in other cities

ASC, together with partners, continuously initiates new projects. Relevant partners ensure realization



What does ASC contribute?

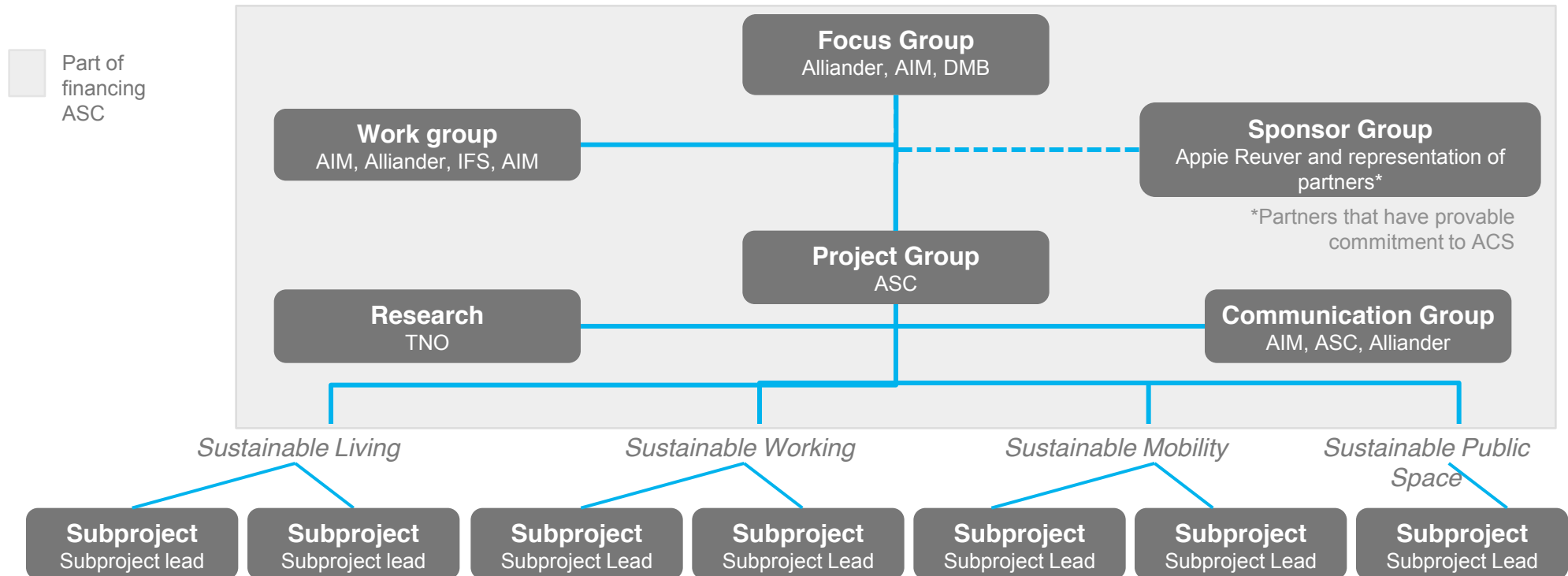
- Bringing partners together
- Offer a platform for sustainable innovative initiatives
- Communication ASC broad (congresses, website, flyers etc)
- Coordinate communication of the subprojects
- Overall program management
- Link TNO to the subprojects
- Give access to expertise (Alliander/AIM)



What do partners contribute?

- Execute project management own subproject
- Financial responsibility own subproject
- Communication own subproject
- Deliver report on progress
- Ensure showcases
- Sign partner agreement
- Ensure TNO verifies research set up
- Share research results to ensure scientific research results
- Set up CO2 value case

The founders of Amsterdam Smart City, Liander and AIM, have an active role in the project organization



Stakeholders

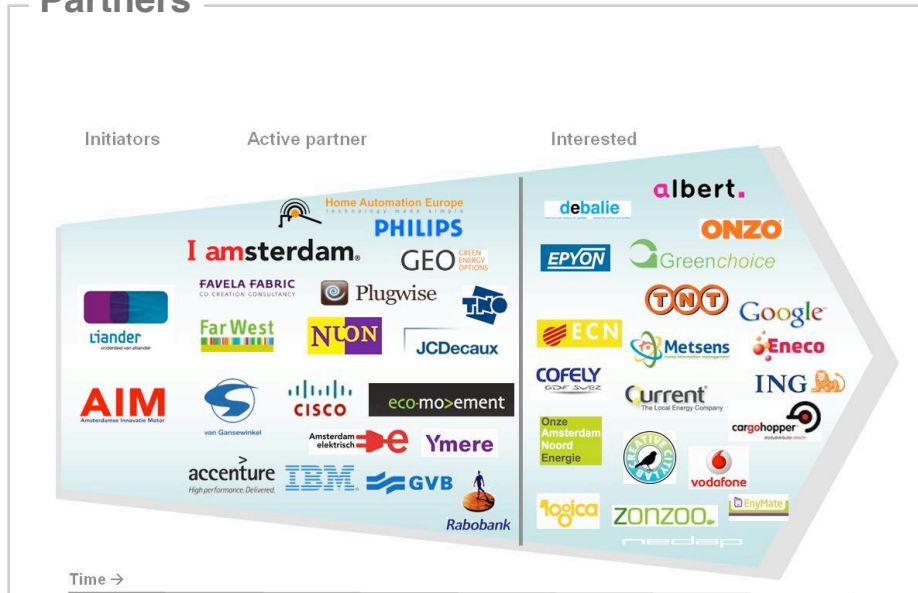
Next to the founders we identify three types of stakeholders:

- **External parties:** press, inhabitants of Amsterdam, other cities
- **Partners and interested parties:** Climate Office Amsterdam, Far West, Philips, Plugwise, Nuon etc.
- **End users:** Entrepreneurs, inhabitants, etc.

Solution description – Successful execution (Amsterdam)

ASC meets the key challenge: together with an ever-growing alliance of partners, a constant flow of pilot projects is started in all focus areas

Partners



Project overview

Sustainable Living	Sustainable Working	Sustainable Mobility	Sustainable Public Space
In progress: equip 700 Geuzenveld homes with smart meter and behavior changing initiatives	Planned Q3 2009: equip the ITO Tower (large office building) with diverse energy saving and behavior changing technology	In progress: equip the Port of Amsterdam with 73 shore power connections for inland freighters and river cruisers	Turn the downtown 'Utrechtsestraat' into a Climate-street by implementing a holistic concept of sustainable logistics and energy saving / behavior changing initiatives
In progress: equip 500 Ymere homes with smart meters and energy feedback displays to stimulate behavioral change		Electric transport market research	Provide schools with smart meters and start competition between schools
Innovative financing: together with different banks look at financing of decentral generation / electric transport		Make the Mayor's house and De Balie more sustainable by smart meters in cooperation with facilities	
Innovative smart grid technology with adjustments in applications, generation etc.			

Type of partner overview:

- Grid operators / Utilities
- Governmental org's
- Housing corporations
- Port of Amsterdam
- Techno starters
- Universities
- Financial institutions
- Telecom / ICT
- Transport / Waste
- Etc.

Technologies applied in projects:

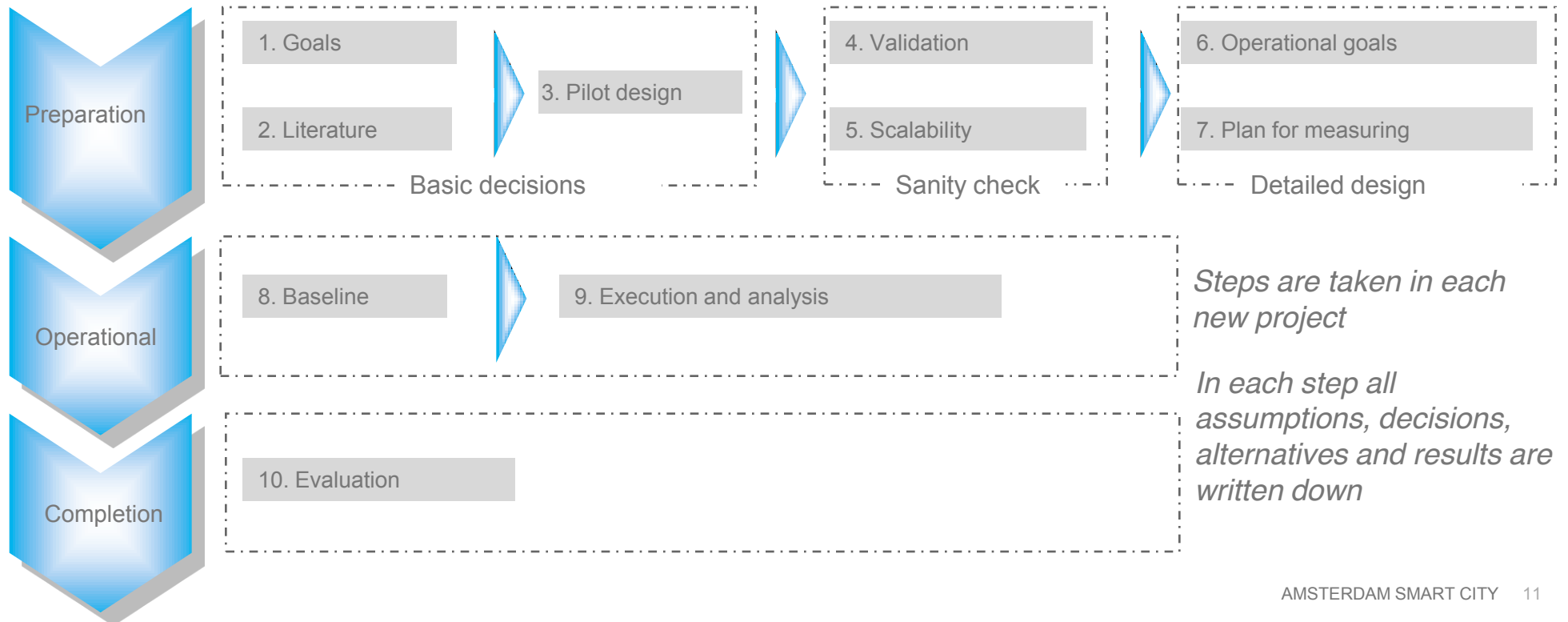
- Smart meters
- Energy displays / feedback
- New logistics/waste models
- Smart (LED/saving) lighting
- Electric vehicles
- Charging terminals
- Energy advice
- Etc.

Target: 15 pilots in 2009-2010

To identify and show the CO2 savings potential and the possibilities for large scale roll out, research is essential

Goals

- Analysis and validate new projects beforehand
- Monitor, evaluate and document the ASC projects with a scientific point of view
- Knowledge sharing



ASC enables its initiators and all other program partners to realize significant economic and social value on a city level

City value

Amsterdam

- Reach sustainability and carbon emission reduction goals
- Create a good place to live, drive creation of new economic activities
- Being an innovation leader in this area will position Amsterdam as a sustainable region ('sustainable valley')
- By investing in ASC, Amsterdam will create over 800 new jobs over the coming 3 years
- Deliver over 25% carbon reduction in scope pilots and yield best practices for full scale roll out

Grid operator / Utility value

Alliander

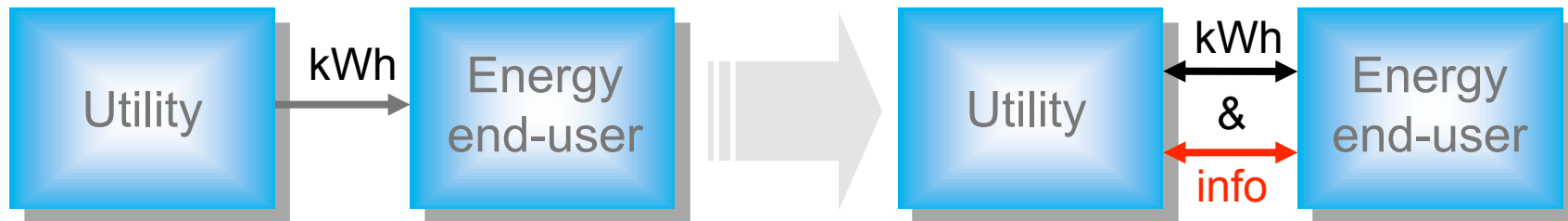
- Become a leader in smart grid development
- Create a grid suited for future developments
- Address its societal mission and community involvement
- Alliander will commercially leverage its smart grid knowledge among other grid operators
- Identify new business opportunities
- By investing upfront in ASC, the lessons learned will minimize future risks related to Alliander's investments related to Smart Grid development until 2020

Program partners value

All other parties

- Gain a lead for the future through the lessons learned from collectively working on delivering climate goals in ASC
- Profit from the reduced cost / effort of realizing pilots through facilitation & support of the ASC organization
- Realize turnover through the positive business case for all applied initiatives

Smart Grid basic explanation



In the current electricity grid

- Utilities just 'pump' energy to the end-user
- Limited insight in usage, losses, failures etc. (few measurement points through the year)

Accenture and Smart Grids

- In Boulder (Colorado), Accenture and Xcel Energy are realizing the world's first true Smart Grid City
- SmartGridCity link:
<http://smartgridcity.xcelenergy.com/>

In the future Smart Grid

- End-users are do not just use energy, but are also capable of generating their own energy and selling this energy back to the grid
- Information goes from end-user to the utility (smart meters collect real time usage data so the utility can optimize its energy generation)
- But now the utility can also send information to the end user in order to influence the usage pattern (saving tips or lower rates at night)



Project description

Concept

The Climate-street pilot is a holistic concept for urban shopping streets, targeting all aspects: hardware in the public space, logistics in the street and the interiors of shop/bar/restaurant owners and people living in the street

Project location: Utrechtsestraat



Applied initiatives

Public space

- New sustainable street/facade lighting saves energy threefold: integrating street- and facade lighting eliminates over-lighting, energy efficient light bulbs are installed and the entire system can be dimmed late at night
- Tram stops and billboards are replaced by more sustainable versions based on Life Cycle Analysis, the required power for displays & light is generated by solar panels
- Garbage bins with built in solar-powered garbage press reduce the empty frequency by 5 times! Saving fuel, money & congestion
- Reverse Osmose pillar

Logistics/Waste

- Goods of various freighters are delivered at a central location outside the city centre where they are stored and forwarded (bundled) with electric vehicles to the entrepreneurs in the street.
- As these vehicles are empty as they leave the street they collect the waste in new clean waste ‘boxes’ in the same run, thereby minimizing traffic intensity and pollution

Interior

- Smart electricity and gas meters with energy feedback displays
- Energy saving interior lighting + advice
- Smart Plugs

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Slimme projecten die de wereld gaan veranderen.
We testen ze eerst in Amsterdam.

HOU MIJ OP DE HOOGTE



BEKIJK DE VIDEO

