



EIP-SCC

European Innovation Partnership
on Smart Cities and Communities



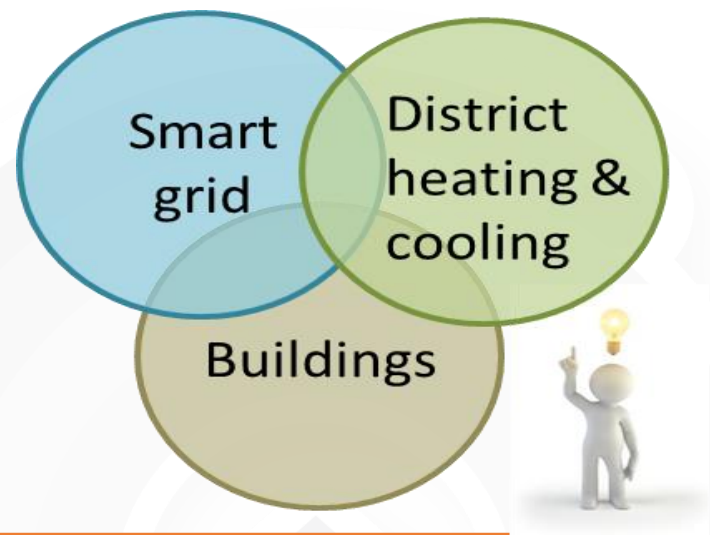
EIP-SCC

European Innovation Partnership
on Smart Cities and Communities

EIP – AC ‘Business Models’ Lessons learned from City-zen Sarah Bogaert, VITO/EnergyVille 20 June 2017



City-zen: key facts



CALL

FP7 Energy.2013.8.8.1
Demonstration of optimised energy
systems for high performance-energy
districts

DEMONSTRATION CITIES

Amsterdam and Grenoble

DURATION

2014 - 2019

PARTNERS

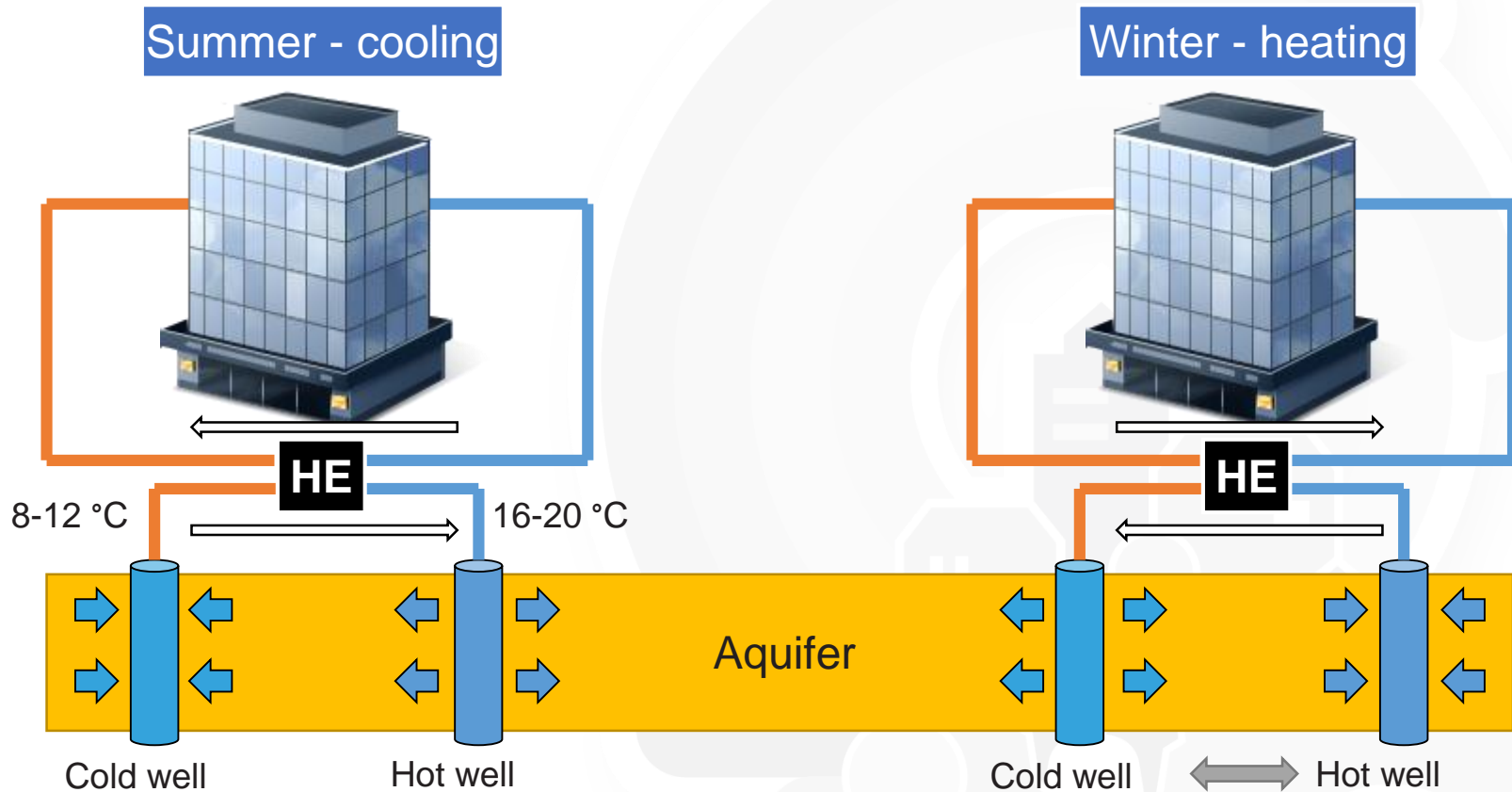
25

WEBSITE

<http://www.cityzen-smartcity.eu/>



Cooling buildings with drinking water in Amsterdam



Cooling buildings with drinking water in Amsterdam: unraveling the business case

Parties involved	Service delivered/used
public drinking water company Waternet	delivers cold through a main water transportation pipeline connected through a heat exchanging installation
Blood bank/pharmaceuticals company Sanquin	uses cold from water pipes for cooling of primary processes
End user	Warmer water in winter

COOLING BUILDINGS WITH DRINKING WATER IN AMSTERDAM

Benefits and costs Drinking Water Company	Benefits and costs Bloodbank	Benefits End-user
Extraction of cold in winter -> higher temperature of the water -> less pre-heating	Considerable initial investment	Less heating of the water in winter
Summer: Cold from ATES can be used	30% lower total cost of ownership compared to traditional electric cooling (based on installation's foreseen lifetime of 30 years)	
Considerable initial investment 1.8 Mio (cold exchanger + building + piping + automation)(earned back)	Considerable initial investment 1.3 Mio + yearly fixed charge of 6,000 EUR/yr Avoided investments in peak electrical power (and thus emergency power)	
Variable costs: additional variable component per GJ (not fixed; depending on Waternet income; current GJ price around 30% of normal cost); initial volume at least 20.000 GJ/ year, growing to 40.000 GJ.		
Environmental benefits: CO2 reduction, space savings in buildings, noise reduction		

REPLICATION POTENTIAL - SUCCESSION FACTORS

- Geographical conditions: along drinking water pipes throughout EU (or in a broader perspective next to rivers)
- Clients at little distance from DW pipelines
- Availability of seasonal storage
- Large customer to use large-scale system
- Transparency between business partners



Surface water regeneration for comfort cooling (Houthaven - Amsterdam)



Parties involved	Service delivered/used
Westpoort Warmte (joint venture AEB Waste-to-Energy company and Nuon)	Extracts cold from river 'IJ' Stores cold in ATES Delivers cold in summer Combined heating and cooling installation in dwellings
Residential newly built dwellings, offices and schools	Obliged combined cold/heat connection

COOLING BUILDINGS WITH DRINKING WATER IN AMSTERDAM – COSTS AND BENEFITS FOR EACH PARTY

Company delivering cold	End user	Environment
Guaranteed business case (incl. 10-15% profit) because of city obligation	No possibility to opt out	CO2 reduction
	Annual fixed fee of 161 €/household covering connection fee (3000€) + operational costs + profit margin	
	Avoid traditional coolers in Summer (electricity use, noise)	Avoid environmental impact from traditional coolers in Summer

REPLICATION POTENTIAL - SUCCESSION FACTORS

- Only for newly built areas
- Large amount of connections needed to cover investment (3000 dwellings)
- More potential in countries with higher cold demand (and heating in winter)

RECOMMENDATIONS FOR REPLICATION PROCESS

Experience in City-zen with business model canvas template:

- + structured information eases sorting/filtering on keywords
- + details are useful for professionals - internal discussions and set-up of cooperation
- Too detailed for replication to a general public
- Confidentiality issues with sharing details

Recommendations:

- More open format, more descriptive and more “story telling” is more appropriate for communication with wider community
- Structure is needed in a standardised way

✚ Sarah Bogaert
sarah.bogaert@energyville.be



CHALLENGES

Did not make it in City-zen: heating with sewage water, cooling with DW at Schiphol

Main challenges:

- Find suitable business partners (e.g. lack of knowledge at potential client's side regarding cold demand, installed capacity)
- Live up to requirements of clients (e.g. not as cold as traditional coolers, contractual implications)
- Limiting geographical possibilities e.g. size pipeline, close presence of TES