UNIVERSITETET I BERGEN

SPACE LAB

Spaces of climate and energy laboratory

The role of smart cities in promoting energy transitions

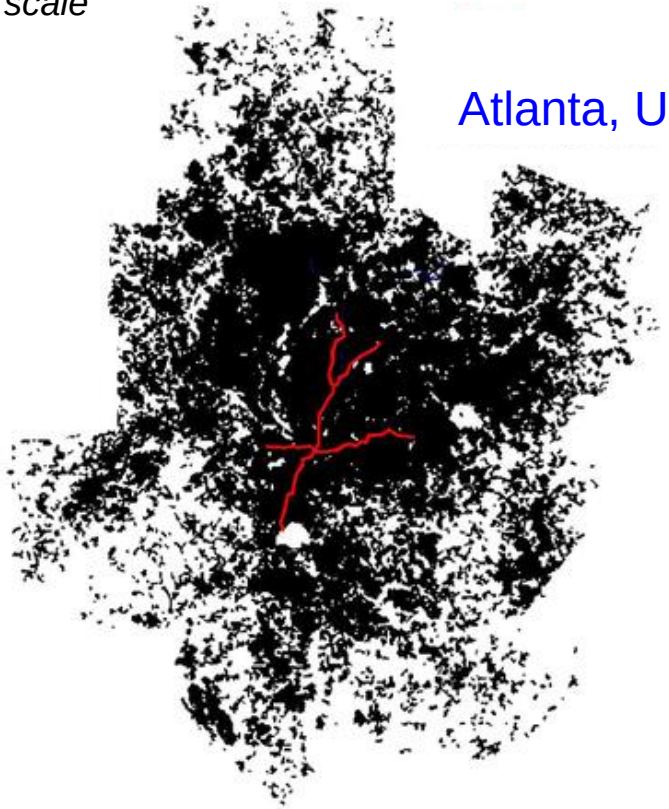
Håvard Haarstad and Marikken Wathne

UNIVERSITETET I BERGEN

Why cities?

Urban sprawl and CO2 emissions

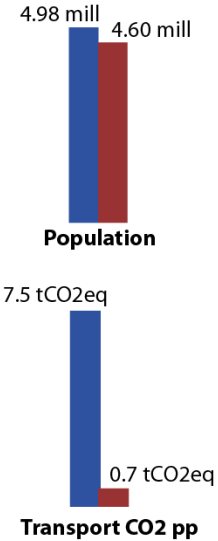
Built-up area, same scale



Atlanta, USA

Barcelona, Spania

Metro line



Source: Bertaud and Richardson, 2004, New Climate Economy 2014

What is «smart city»?

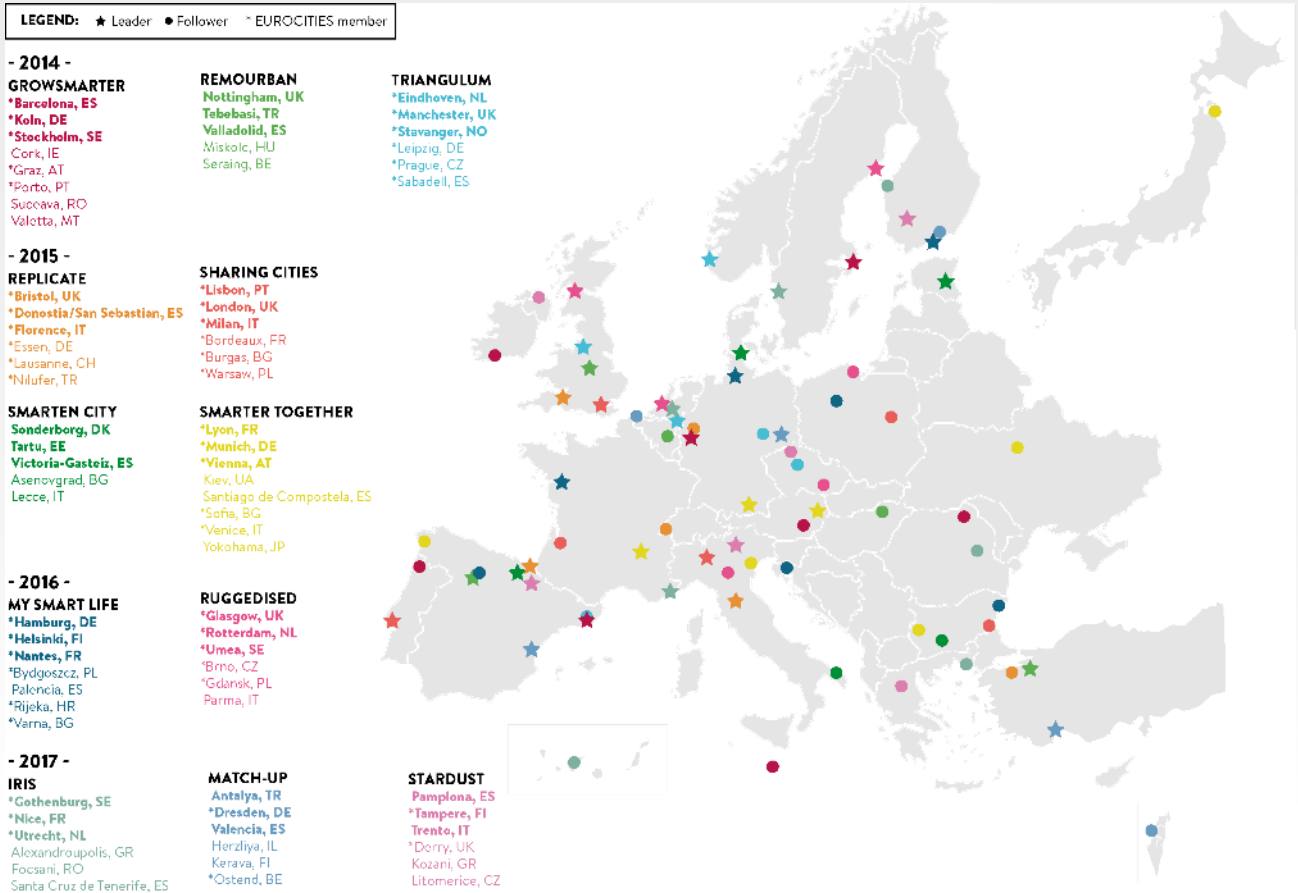
1. Implementation of technology into the city to solve urban problems

2. Holistic and interdisciplinary approach to urban planning

The smart wave

- More than half of EU cities have ‘smart’ projects (EU, 2014)
- ‘Smart’ has rapidly become a key concept in urban planning.
- ‘Everyone’ aiming to be smart

EU Horizon 2020 Smart Cities



Do smart city projects make cities more sustainable?

JOURNAL OF ENVIRONMENTAL POLICY & PLANNING, 2016
http://dx.doi.org/10.1080/1523908X.2016.1245610

Routledge
Taylor & Francis Group

Constructing the sustainable city: examining the role of sustainability in the 'smart city' discourse

Håvard Haarstad

Department of Geography, University of Bergen, Bergen, Norway

ABSTRACT

The idea of the 'smart city' is increasingly central to debates on urban development and sustainability, and a host of cities are now pursuing 'smartness' as a way to improve energy efficiency, transport, and public services. However, existing research does not provide a clear picture of how this smart city agenda actually contributes to sustainability. The social science literature has been critical toward urban smartness, with most of the empirical research focusing on the politics of data-driven and entrepreneurial urbanism. This article seeks to contribute to this debate by empirically examining the role that sustainability plays in the smart city discourse. Its distinctive approach is to investigate how urban smartness and sustainability are framed by an authoritative institution (the European Union) and then to trace these framings down to a particular city (Stavanger, Norway). The data show that the smartness approach is strongly tied to innovation, technology, and economic entrepreneurialism, and sustainability does not appear to be a very important motivating driver. Nevertheless, the 'sustainability component' of the smart city agenda becomes clearer the closer we come to the city level.

ARTICLE HISTORY
Received 8 May 2016
Accepted 24 September 2016

KEYWORDS
Smart city; sustainability; European Union; discourse; contextualization

1. Introduction

A predominant idea in the current discussions on urban sustainability is that of the 'smart city.' The promise of the smart city is to enable us to use energy in cities in more efficient ways, to make public transport more efficient and attractive, and to provide planners and decision-makers with data to allocate public resources more accurately (Townsend, 2014). The 'smartness' agenda is heavily promoted by the European Commission (EC); a European Parliament study found that more than half of European cities with over 100,000 inhabitants had implemented or proposed smart city initiatives (European Parliament, 2014).

However, the extent to which the smartness agenda contributes to urban sustainability is unclear. Much of the existing social science literature has been critical toward the idea that the smart city agenda has much to offer in terms of promoting sustainability, or resolving other societal challenges. It is often suggested that

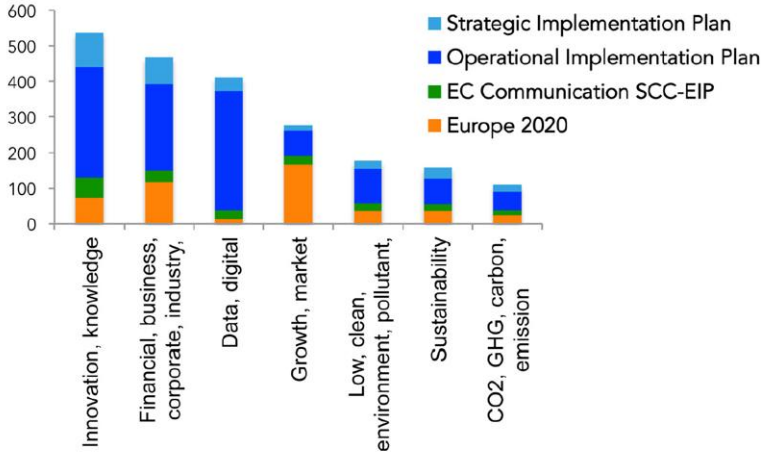
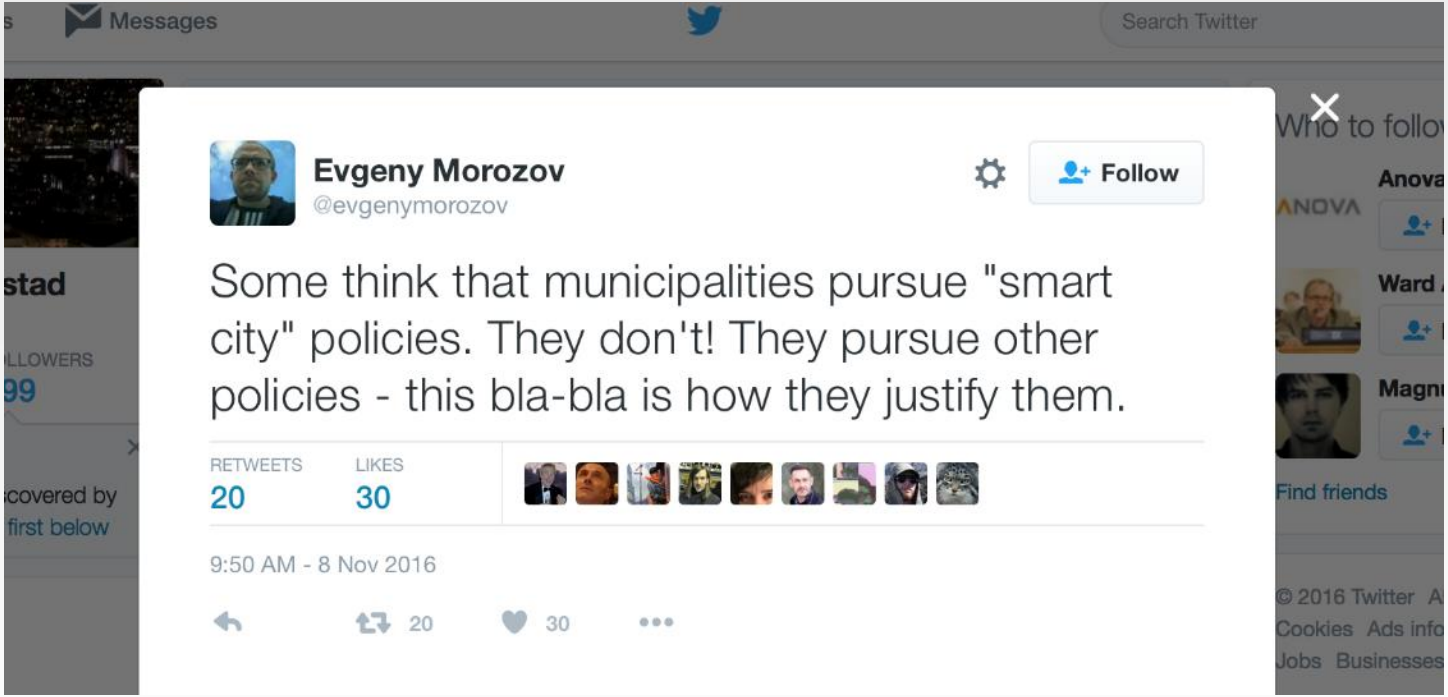


Table 1. Overview of SCC-1 lighthouse project solutions as represented on the project websites.

Project/area	Energy	ICT and infrastructure	Mobility
Remourban	Develop monitoring tools to improve energy efficiency	Create city information platform combining multiple data sources, basis for operational and decision-making improvements	Use of electric or hybrid technologies for transport vehicles
	District scale retrofitting, adding new technologies to old districts to save energy	Shared smart grid and broadband infrastructure	Use charging infrastructure for electric and plug-in hybrid vehicles
	Renewable heating and cooling	Integrated smart grid	Door-to-door multimodality in urban transport
	Electricity, distributed generation	Optimized traffic flow from intelligent transport system	Enhance logistics supply chains (last mile delivery)
	Developing and using advanced building energy management system	Use real-time, multimodal data to improve transport costumer experience	Use open data to improve urban transport and mobility services
		Cloud-based peer-to-peer transport information	Incentive schemes to stimulate collective transport and cleaner vehicles
		City monitoring systems to build resilience against adverse effects	
Triangulum	Install renewable energy plant in municipal buildings	Develop a generic gateway for 'smart home' video solutions	Smart charging of electric vehicles
	Develop infrastructure for energy generation, storage and use in heritage buildings	Smart home building automation, 100 'smart homes'	Procure and test three new battery-operated buses in real-life operation
	Establish open access marketplace for end-user and business applications	Develop cloud data hub for gathering and analyzing big data	Remove cars from major transport corridor to connect new modes of EV transport
	Transform previous industrial sites into smart districts	Develop IT-based tool to help residents access sustainable transport options	Introduce electric buses
	Energy creation from cleaning contaminated land	Use IT-based instrument to model and visualize costs and yields of energy-efficient building renovations	
	Energy-efficient renovations in social housing stock	Integrated system monitoring and controlling street lighting, mobility, homes, offices	
GrowSmarter	Smart building shell refurbishment	Smart street lighting	Sustainable delivery
	Smart building logistics	Waste heat recovery	Smart traffic management

SIDE 9


Messages
Search Twitter
Evgeny Morozov
@evgenymorozov
Follow
Some think that municipalities pursue "smart city" policies. They don't! They pursue other policies - this bla-bla is how they justify them.
RETWEETS
20
LIKES
30
9:50 AM - 8 Nov 2016
20
30
Find friends
© 2016 Twitter
Cookies Ads info
Jobs Businesses

To which degree do such smart initiatives push for environmental friendly solutions?

Field work in three EU Horizon 2020 Smart cities

- Nottingham
- Stockholm
- Stavanger

REMO URBAN

GrowSmarter

triangulum
DEMONSTRATE·DISSEMINATE·REPLICATE

How are environmental concerns integrated into the “smart” solutions?

UNIVERSITAS BERGENSIS

Nottingham

Smartness in Nottingham

- Image as hub for energy and transportation innovations
- Addressing energy poverty
- **Social sustainability**

Why smart city project?

«We are looking for the next steps. We know what we want to do, we haven´t always got the funding for it, so we are actively looking for funding»

Informant in Nottingham

Stavanger

HEALTH & WELFARE
EDUCATION & KNOWLEDGE
GOVERNANCE & DEMOCRACY
ENERGY, CLIMATE & ENVIRONMENT
URBAN ART

Smartness in Stavanger

- Filling the void of the petroleum industry
- Innovation, absorb competence
- **Economic sustainability**

Stockholm

Smartness in Stockholm

- Maintain the qualities of the city as it was growing in size and population
- Livability and easy urban life
- **Social and environmental** sustainability

‘Smart city’ framing is a flexible ‘framing’ – can be filled with different types of content

Must fit with pre-existing priorities

Sustainability outcomes depend on active engagement (often by individuals)

Value comes from networks, EU funding ‘stamp of approval’

Publications

- Haarstad, H and Wathne, M. Forthcoming. Smart cities as strategic actors: Insights from EU Lighthouse projects in Norway, Sweden and the United Kingdom. In: Karvonen., A, Cugurullo F., and Caprotti, F. (eds). *Inside Smart Cities: Places of Urban Innovation*, London: Routledge.

- Haarstad, H. 2017. Constructing the sustainable city: The role of sustainability in the 'smart city' discourse. *Journal of Environmental Policy and Planning*, 19(4), 423-437.

- Haarstad, H. 2016. Who is driving the ‘smart city’ agenda? Assessing smartness as a governance strategy for cities in Europe. In *Services and the Green Economy*, edited by Jones, A., Ström, P., Hermelin, B., and Rusten, G. Palgrave Macmillan, pp. 199-218.

UNIVERSITETET I BERGEN

BERGENS FORSKNINGS STIFTELSE

SPACE LAB
Spaces of climate and energy laboratory

CET Centre for Climate and Energy Transformation

Miljøfyrtårn®