SMARTEES
local social innovation

Informing agent-based models of social innovation uptake

Patrycja Antosz, Wander Jager, J. Gareth Polhill, Douglas Salt

21.01.2022

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912.
The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

Goal

Provide and discuss a real-life example of a complex research designs (i.e., combining more than two methods) that includes an **agent-based model** (ABM) **integrating information from different sources** (incl. data and theory) in a single, coherent causal mechanism responsible for eliciting an emergent phenomenon in a complex system.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

Agenda

1. **H2020 SMARTEES project**
2. **SMARTEES mixed-method research design**
3. **Integrating information in ABMs**
    - specification
    - calibration
    - validation

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

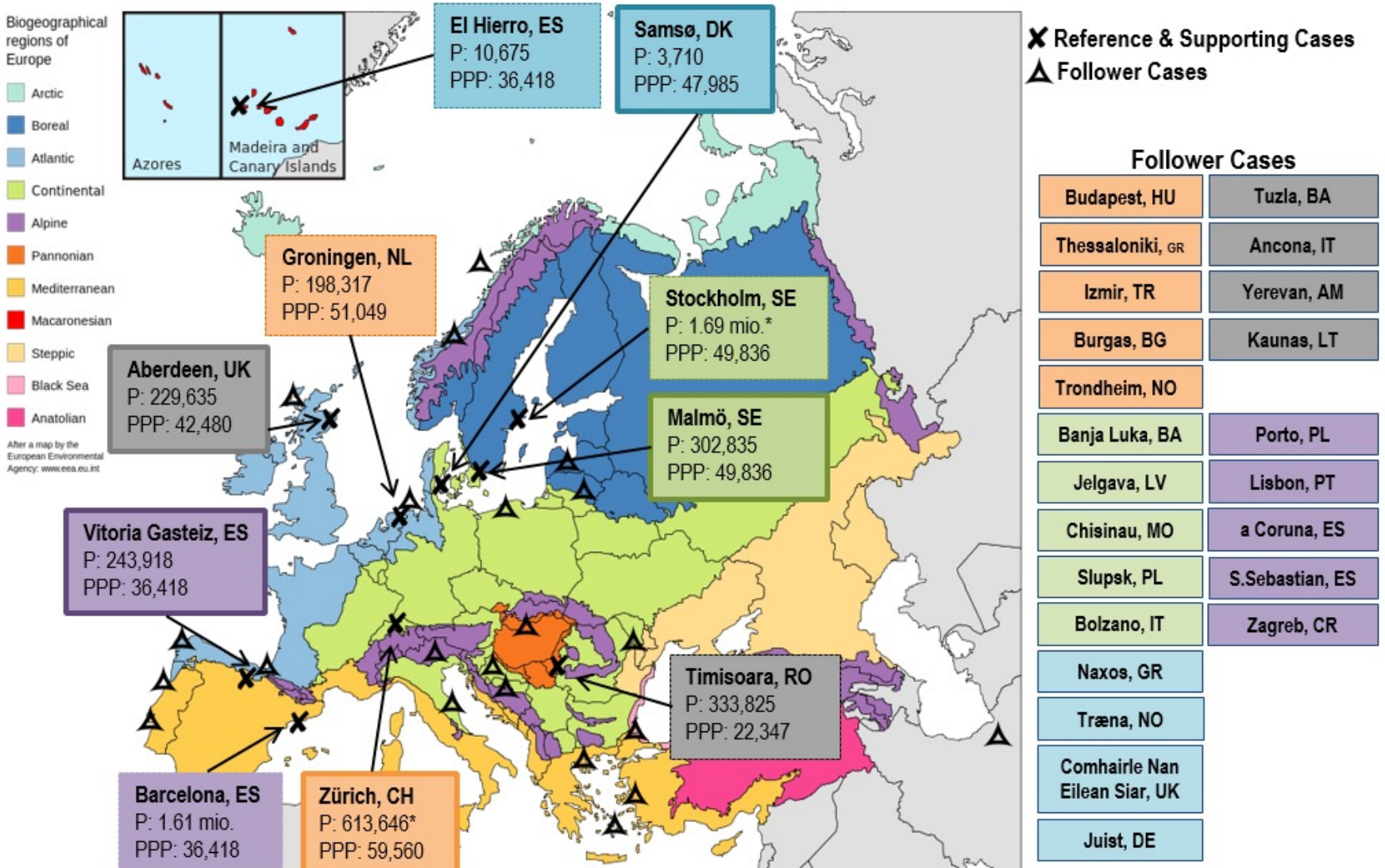
SMARTEES
local social innovation

PART 1
SMARTEES project

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

SMARTEES
local social innovation

What is SMARTEES project about?

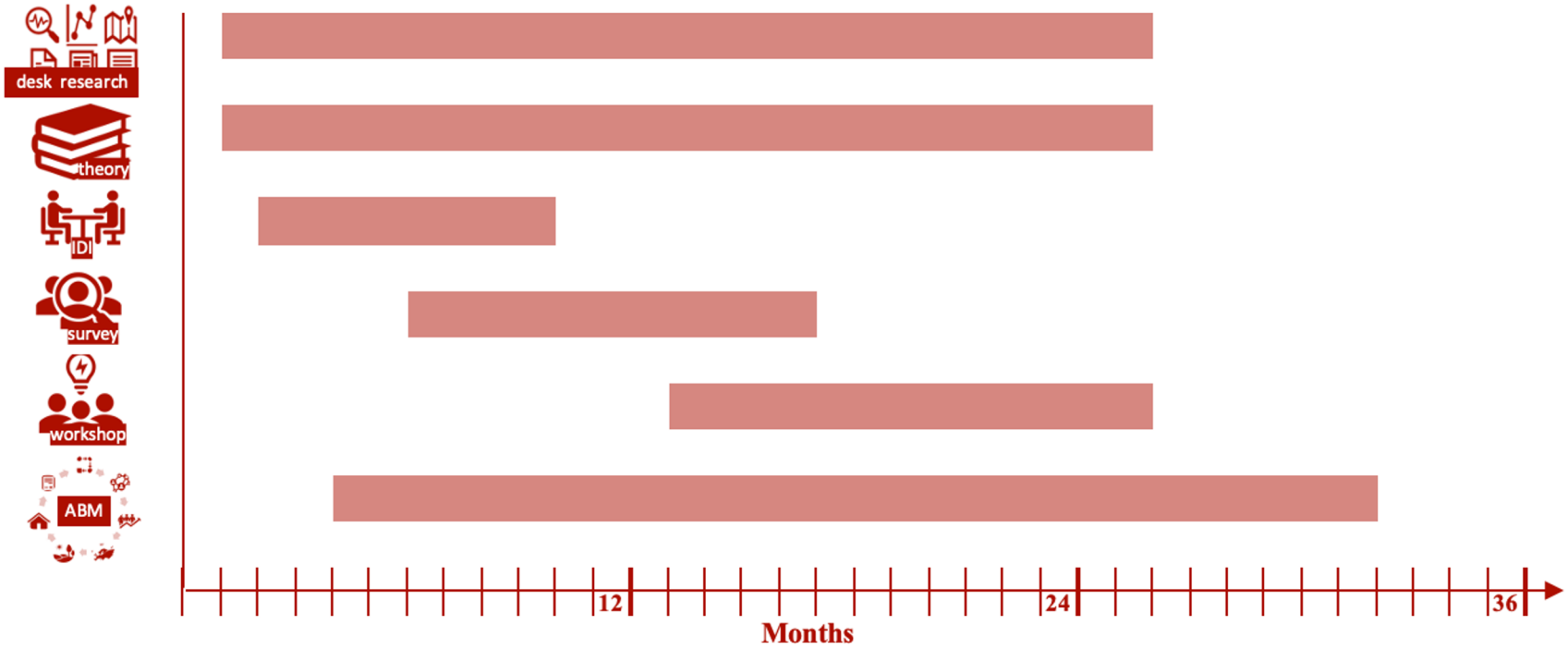


SMARTEES
local social innovation

PART 2
Research design

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

SMARTEES mixed-methods



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

Primary data collection by case

		IDI N	Survey mode	Survey N	Workshops N
CC1: Urban mobility	Zurich (CH)	8	CAWI	1001	3
	Groningen (NL)	6	CAWI	703	
CC2: Island renewable energy	Samsøe (DK)	9	-		3
	El Hierro (ES)	8	PAPI	373	3
CC3: District regeneration	Malmø (SE)	5	-		3
	Stockholm (SE)	5	-		3
CC4: Super-blocks	Vitoria Gasteiz (ES)	11	CAPI/CATI	865	3
	Barcelona (ES)	13	CAPI	643	3
CC5: Fuel poverty	Aberdeen (UK)	14	CAWI/PAPI	840	3
	Timisoara (RO)	6	CAWI	439	3

CAWI - Computer Assisted Web Interviews, **PAPI** - Pen and Paper Interviews, **CAPI** - Computer Assisted Personal Interviews, **CATI** - Computer Assisted Telephone Interviews.

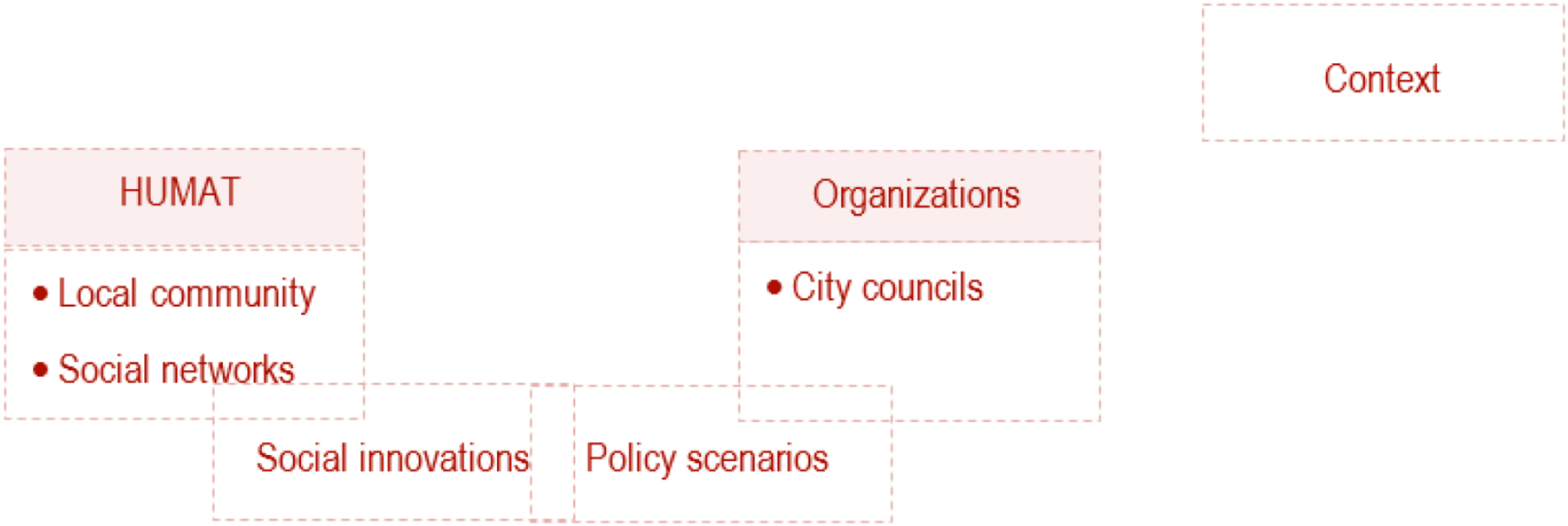
This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

SMARTEES
local social innovation

PART 3
Integrating information

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

1) ABM specification



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

HUMAT – socio-cognitive architecture

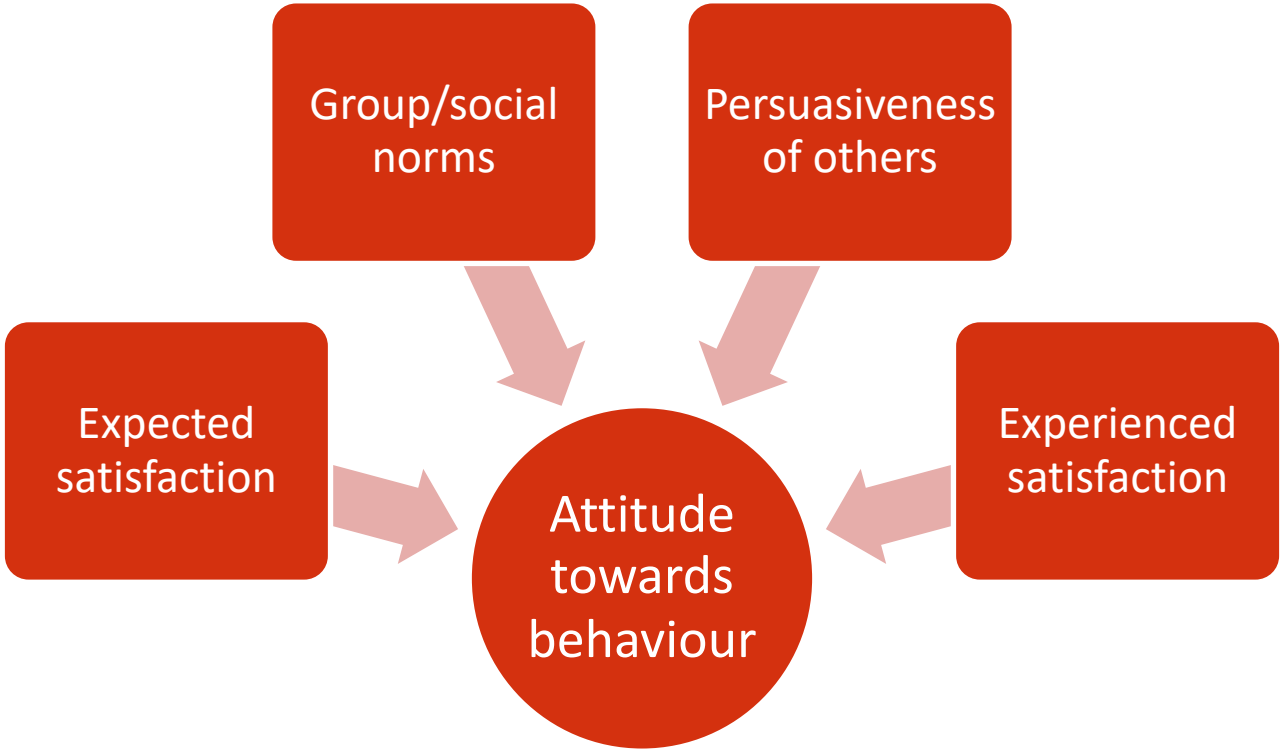
HUMAT = **Decision-making** process + **Opinion diffusion** in social networks

Individual and social factors in forming an attitude (towards a behavior):

- Should I do A, B or C?
- Am I for or against A?

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

Attitude formation in HUMAT



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

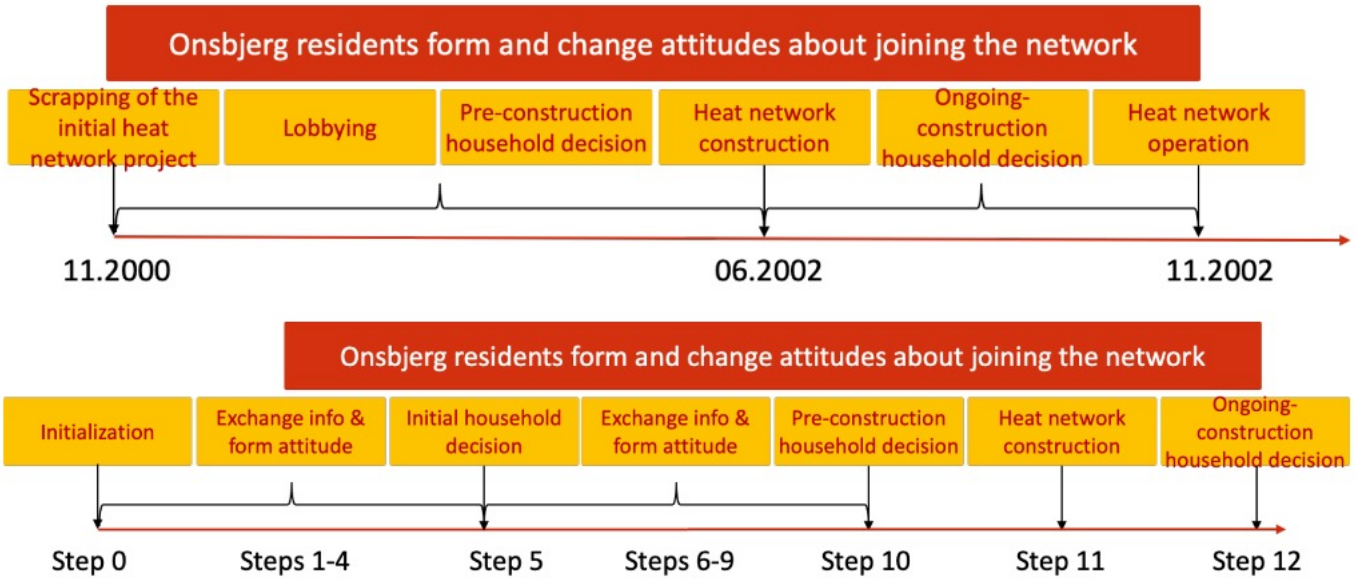
2) ABM calibration

- **Timeline of relevant events** -secondary data + IDIs
- **Geo-socio-demographic characteristics of the resident population** - secondary data
- **Motives/needs of residents** - secondary data + IDIs + SMARTEES survey
- **Social networks of residents** - IDIs + workshops + theory
- **Policy scenarios** - workshops

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

Timeline of relevant events

Samsøe case

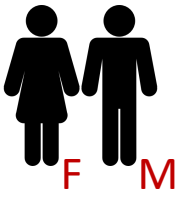


This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

Geo-soc-dem resident profiles

Groningen case

gender



age

main activity

students, employed, inactive, retired

residency

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

3) ABM validation

- the use of empirical data to test artificial data produced by the simulation, through intensive analysis and comparison with data on empirical reality (Boero, Squazzoni 2005);
- randomness in the artificial data produced by the model;
- point validation vs pattern validation.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

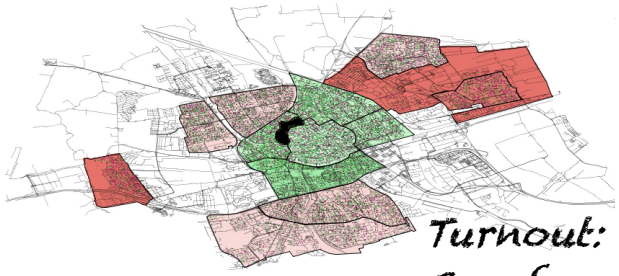
“Growing“ the past

Referendum vote in 1994

Turnout: 31%
Car-free: 51,2%

Turnout: 32%
Car-free: 50,5%

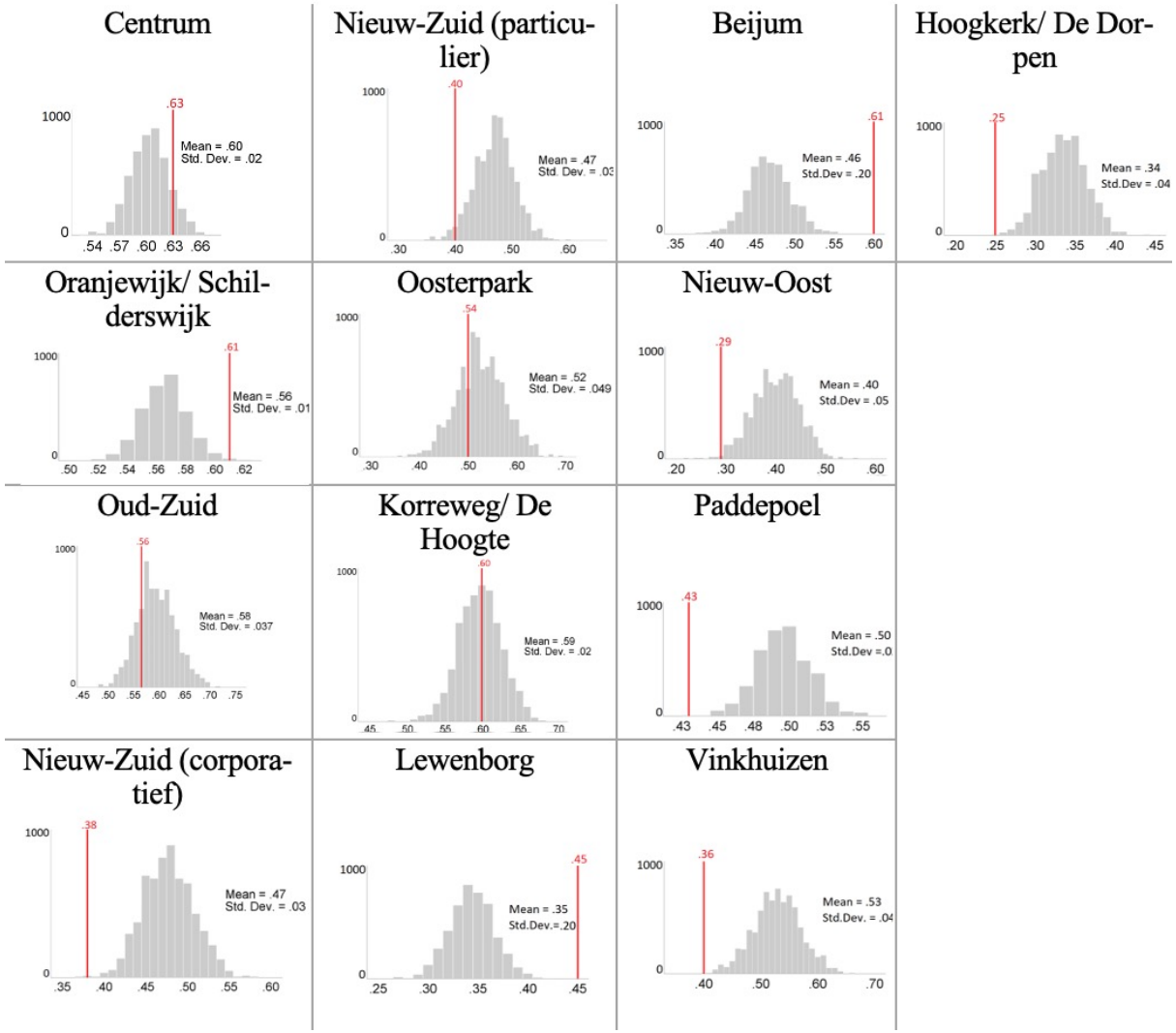
Turnout: 30%
Car-free: 49,2%



Turnout: 30%
Car-free: 47%

This project has received funding from the European Union’s Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

Validation precision



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.

SMARTEES
local social innovation

Thank you!

Stay in touch!
(add your name and email)

NTNU Norwegian University of Science and Technology

The James Hutton Institute
Science connecting land and people

K&I Knowledge and Innovation

UNIVERSIDADE DA CORUÑA

ENERGIE INSTITUT

university of groningen

ICLEI Local Governments for Sustainability

ENERGI AKADEMIET

ABERDEEN CITY COUNCIL

urbanisland

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 763912. The sole responsibility for the content of this document lies with the authors. It does not necessarily represent the opinion of the European Union.