Kick-off Meeting in Padova 20.11.2023

dSEA Dipartimento di Scienze Economiche e Aziendali 'Marco Fanno' Università degli Studi di Padova

GRINS FOUNDATION

WP3 – Individuals' vs communities' role in fostering ecological transition

Silvia Rita Sedita

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Objectives

- WP3 investigates the pro-active role of consumers/prosumers and communities in fostering the ecological transition and their economic impact.

1. Analysis of climate change perception and awareness, since a successful ecological transition requires public support and citizens' engagement
2. Identification of key factors that favor agents' engagement, i.e., attract subjects to participate in the ecological transition, individually or in groups.
3. Definition of policy recommendations to make subjects switch from passive to active players in the ecological transition.

Deliverable D3.1

- Indicators on consumers/prosumers' engagement in ecological transition (M24)
- Policy briefs (M12, M24, M36)

Lines of research

- analysis of the impact of individuals' engagement in the reduction of primary energy consumption and of waste production
- analysis of direct/spillover effects of information programs and campaigns
- elicitation of climate change perceptions, beliefs, support for climate policies
- empirical analysis of behavioural incentives, nudging and information policies for sustainable waste management practices

Milestones

- Randomized controlled trials in cooperation with two Italian utilities (energy and waste sectors) to test the impact of ecological transition nudges **(M18 – June 2024)**

Targets

- Release of a dataset on climate perceptions and beliefs, willingness to participate in energy communities, available anonymized and open access **(end of activities M24: December 2024).**

Deliverable D3.2

- Guidelines for energy communities and composting communities, and sustainable business models (M24)
- Policy briefs (M12, M24, M36)

Lines of research

- analysis of the role of energy communities in accelerating energy transition;
- assessment of the cost-and-benefit trade-offs of investments in energy communities;
- design of an inclusive market design targeted to medium and small renewable energy sources (RES) producers, prosumers, consumers and energy communities, and detailed analysis of Positive Energy Districts under construction;
- design of a business model of composting communities - energy communities - , and related actions to improve waste policies and management infrastructures;
- field experiment in cooperation with a city council and a fleet operator and/or road navigation system operator to evaluate impact of different interventions on urban congestion.

Milestones

- Survey on climate perceptions and beliefs, willingness to participate in energy communities **(M18 – June 2024)**
- Randomized controlled trials test of different instruments to elicit a "congestion management" choice and on their cost-effectiveness **(M12 - December 2023)**

Targets

- Release of a dataset on climate perceptions and beliefs, willingness to participate in energy communities, available anonymized and open access **(end of activities M24: December 2024).**
- Release of a dataset on characteristics of sustainable business models and best practices of energy communities in Italy and Europe, available open access (**end of activities M30: June 2025)**

WP3 presentations

"The role of energy communities in accelerating (energy) transitions" - Amir Maghssudipour (UNIPD)

“Unpacking Italian Perspectives and Willingness to Act against Climate Change: A Survey Experiment”- Riccardo Ghidoni (UNIBO)

“A survey experiment on second-hand consumption” - Luca Congiu (Roma Tor Vergata)

“Congestion management and navigation systems: a lab experiment on individual choices vs delegation” - Alberto Iozzi (Roma Tor Vergata)

"Low carbon policies and socio-economic sustainability" - Lorenza Di Pilla (UNIPA)

Workshop Spoke 6 Grins, 20-21 November

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The role of energy communities in accelerating (energy) transition

Amir Maghssudipour (UniPd)

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Advancements in the research

1) Analysis of existent **data sources** and **database** dealing with energy communities at Italian and European level with the identification of limits and potentialities.
2) Elaboration of a **dataset** comprised with quantitative and qualitative information about Italian energy communities, renewable and solidary energy communities, places with self-consumption experiences and socio-economic information at the municipality level.
3) Development of a **draft of a survey** to investigate the behavior and willingness to pay/participate of households in the energy sector, on the use of energy from renewable sources and on the propensity to participate in energy communities.
4) Review on the literature on **business models** for energy communities and development of a proposal of a business model canvas for energy communities.
5) Literature review on the role played by energy communities in fostering different **transitions**.

Renewable Energy Communities

There are two currently legal definitions of Energy Communities in the EU:

1- Citizen Energy Community (Renewable Energy Directive: RED-II, 2018): A legal entity that is based on voluntary and open participation, effectively controlled by shareholders or members who are natural persons, local authorities, including municipalities, or small enterprises, and micro-enterprises.

2- **Renewable Energy Community** (Internal Electricity market Directive: IEMD, 2019): A **legal entity** that, in accordance with the applicable national law, is based on **open** and **voluntary participation**, **autonomous**, effectively controlled by **shareholders or members** that are located in the **proximity of the renewable energy projects** that are owned and developed by that **legal entity**; the shareholders or members of which are **natural persons**, **SMEs** or **local authorities**, including municipalities.

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A business model of energy communities [kw: energy communit* + business model*]

Key partners: community members; technical and technology providers; external investors; public entities; distribution systems operators; networking agents.

Key activities: renewable energy generation and supply; community building; system creation and maintaining.

Key resources: community members; fundings from private/public investors; regulatory framework; material assets; networking skills (e.g., aggregators) and programs.

Value proposition: environmental value; social value; economic value; energy self-sufficiency; cost and responsibilities sharing.

Customer relationships: personal and direct contacts.

Channels: direct (e.g., face-to-face) and indirect (e.g., digital, written) channels; support platforms.

Customer segments: households; firms (e.g., SMEs); public entities.

Re-elaboration on: Osterwalder and Pigneur (2010)

Cost structure: ex-ante feasibility studies; planning; licensing; assets supply and installing; public grid connection; transactions with external entities; system maintaining and training.

Revenue stream: community members' shares; sales to other consumers; sales of energy surplus; fundings by public and private agents.

Energy communities and transitions [kw: energy communit* + transition*]

Energy transition: energy efficiency with local renewable energy production and consumption; independence from traditional energy production system and grid; independence from energy crisis and price fluctuation in the energy sector.	**Social transition:** - individual level: inclusion and better living conditions for vulnerable, low income, and at risk of poverty households. - local level: social innovation and socio-economic regeneration of places and empowerment of citizens ("voice"); formation of social capital and environmental benign lifestyle.
Technological change: development of new clean energy technologies and platforms; development of devices for operational compatibility and communication among different involved agents; technological transition to a decentralized electricity system.	**Economic development:** - Individual level: savings in energy bills and new job opportunities. - local level: socio-economic development mainly by new job creation and entrepreneurial opportunities.

Team UniBO

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Unpacking Italian Perspectives and Willingness to Act against Climate Change: A Survey Experiment

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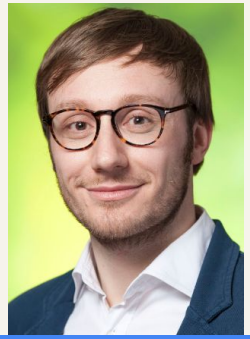
Team UniBO

Line of research

Elicitation of climate change perceptions, beliefs, support for climate policies

Members

Adrià Brochal Rueda



Riccardo Ghidoni

Viola Maone

Alessandro Tavoni

Individual Beliefs and Climate Action

- Citizens' perceptions of public engagement and the efficacy of action are key for climate policy success (Blanchard et al 22)
- The belief in widespread engagement can inspire individuals to act against climate change (Andre et al 23)
- Yet, individuals often underestimate public engagement levels **Pluralistic ignorance** (e.g. Leviston et al 13; Mildenberger Tingley 19; Sparkman et al 22)

Climate-Action Social Norms

- Pluralistic ignorance can skew perceptions about the **climate-action social norm**, i.e. the set of behaviors expected by society regarding acting against climate action
  - Injunctive norm: practices and actions one ought to do
  - Descriptive norm: actual practices and actions commonly observed in society
  - Multifaceted and not yet fully defined

This Study

- Survey experiment to elicit Italians' beliefs about the climate-action social norm
- Investigation of pluralistic ignorance in Italy
- Impacts of correcting pluralistic ignorance through an information experiment on willingness to take climate action
  - Donating to a climate charity (individual action)
  - Signing a petition on climate policy (policy support)

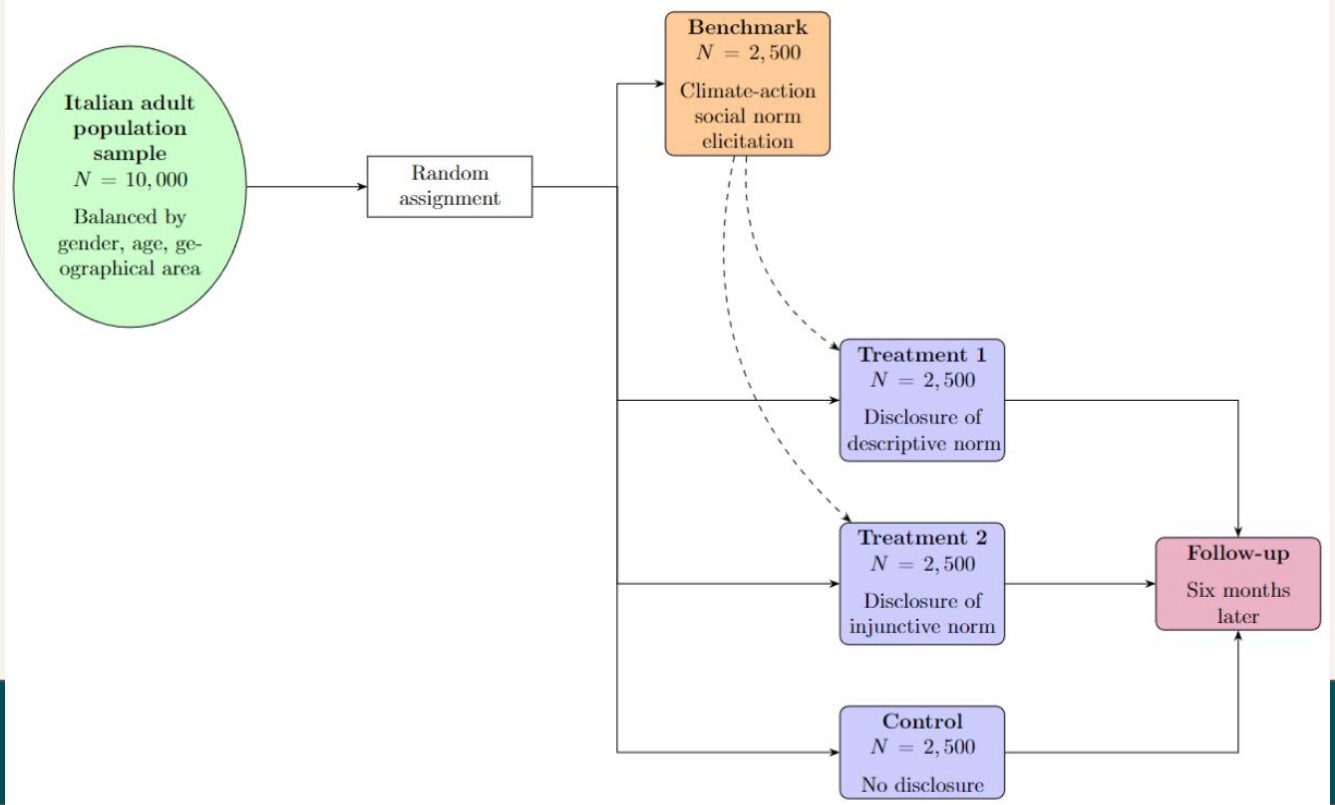
Scientific Contributions

- Alternative elicitation method of specific behaviors perceived as important (injunctive norm) and prevalent (descriptive norm) for climate action
- Estimation of correcting pluralistic ignorance on the willingness to take action, highlighting possible heterogeneities based on initial engagement levels
- The two measures of climate action – donation and petition signing – allow to explore possible crowding-out between individual climate actions and support for climate policies
- Assessment of persistence of the effects of our informational interventions via follow-up

Policy Relevance

- Understanding perceptions about effective climate actions can inform the development of targeted environmental policies and communication strategies
- The estimated effect of reducing pluralistic ignorance can provide insights into the designing of public communication to align perceptions with reality
- Understanding the interplay between individual actions and policy support aids in crafting balanced climate initiatives
- The availability of the georeferenced dataset on the AMELIA data platform will offer a valuable resource for evidence-based policy making, allowing for the investigation of regional differences

Overview of the Online Survey Experiment



Benchmark Group

- Half of Benchmark participants are asked to state actions they take to fight climate change
- The other half actions they deem Italians should take to fight climate change

Per favore rispondi alle seguenti domande, riflettendo sulle azioni/scelte che hai compiuto finora.

Fai qualcosa per contrastare il cambiamento climatico? SI' / NO

Per favore scrivi qui sotto una cosa che hai fatto (o fai) per contrastare il cambiamento climatico.

Ti viene in mente qualcos'altro che hai fatto (o fai) per contrastare il cambiamento climatico? SI' / NO

Per favore scrivi qui sotto un'altra cosa che hai fatto (o fai) per contrastare il cambiamento climatico.

[Loop stops when the participant clicks NO]

Treatment and Control Groups

- Participants in Treatments 1, 2, and Control are asked
  - For their perceptions about the climate-action norm elicited in the Benchmark group:
    - Number / type of actions Italians declare to take to fight climate change
    - Number / type of actions Italians believe should be taken to fight global warming
  - Take two **non-hypothetical** climate actions:
    - Signing a petition to support the introduction of a carbon tax
    - Dividing an amount between themselves and a charitable organization employing the funds for renewable energy projects which generates electricity via wind power

- **Informational intervention:** Before making their decision Treatments 1 and 2 participants are informed about true actions elicited in Benchmark, while Control participants are not

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Current Achievements and Future Steps

- Completed phases:
  - Literature review
  - Identification of the theoretical framework
  - Obtaining quotes from survey companies

- Upcoming phases:
  - Pilot study: Planned for December 2023 (tentative)
  - Privacy: In development
  - IRB submission: In preparation
  - Pre-registration: In progress
  - Data collection: Mid-2024 (tentative)

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Thank you!

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A Survey Experiment on Secondhand Consumption

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[1]University of Rome “Tor Vergata”
[2]University of Innsbruck

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Motivation

- Waste disposal is responsible for GHG emissions, contributing to climate change.
- To contrast the increasing waste generation, the EU Commission considers reuse a priority step in the waste hierarchy.
- The Circular Economy Strategy in Italy: legislative measures and fiscal incentives to foster reuse and second-hand consumption.
- The literature on individual motivations that drive (or hinder) second-hand consumption decisions is scarce, fragmented, and sometimes contradictory.

  ✔ **barriers**:
  quality concerns (Michaud & Llerena 2011, Weelden et al. 2016, Wilson et al. 2017; Sharifi & Shokouhyar 2021); **safety, hygiene concerns, disgust** (Yan et al. 2015, Edbring et al. 2016, Ackerman & Hu 2017); **social disapproval, stigma, shame** (Laitala & Klepp 2018, Lo et al. 2019, Silva et al. 2021; Nazlı 2021).

  ✔ **drivers**:
  lower price (Ongondo & Williams 2011, Weelden et al. 2016); **environmental consciousness/identity** (Mugge et al. 2017); **social approval, pride, guilt avoidance** (Jaeger-Erben et al. 2021, Nazlı 2021, Parajuly et al. 2023).

What we do

Research questions:

1. *What are the barriers and drivers underlying reuse in the Italian population?*
2. *Do they differ across different categories of products (appliances, furniture, clothing, and electronic devices)?*

- Survey on a **general, representative population** (N=10.500);
- We link barriers and drivers to **"neoclassical" variables** and **behavioral biases**;
- We use a mixture of **incentivized** and **non-incentivized tasks**, some of which have real-life behavioral consequences.
- **Output for Amelia:** comprehensive dataset on stated and revealed preferences of Italian consumers on second-hand products

Survey Experiment Design

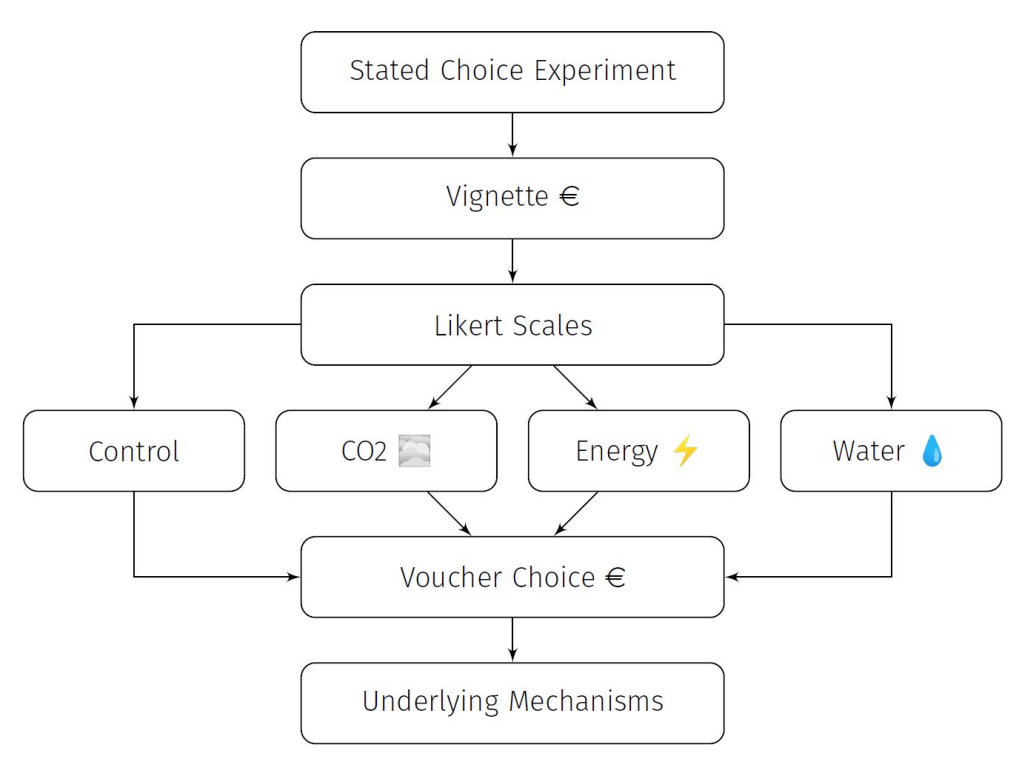
For the **first three tasks**, **randomizazion across 4 objects** (fridge, closet, smartphone, t-shirt).

For half sample: three tasks on the **same object.**

For the other half, three tasks on a **different object each**.

After Likert Scales, **4 versions of an Informative Quiz** on the environmental cost of producing clothing.

Voucher task: choice of a voucher for secondhand or traditional store



Stated Choice Experiment: Example

Suppose you need to buy a refrigerator and have found a model that interests you. You are considering an LG with a capacity of 384L, measures 59 x 203 x 68 cm, and energy class A++. Indicate the option you would choose:

Characteristics	Option A 	Option B 
Conditions	New	Used in Good Conditions
Warranty	Yes	Yes
Seller	Online store	Physical store
Price	€ 1.200	€ 900
	☐ Option A	☐ Option B

Vignette: Example (P1)

Imagine you need to buy [a refrigerator / a smartphone / a closet / a T-shirt]. You find the model you are interested in second-hand. The product is in [excellent condition/good condition/acceptable condition], has been sanitized, and you can pick it up [at an affordable price/free of charge].

1. Referring to the situation described, what is the probability that you will decide to take the product? [0% - 100%].
2. At each end of the following scales is a statement, your task is to place an X on each scale to indicate how much you agree with the following statements regarding the situation described.

   "If I decided to take the asset described..."

I would feel financial hardship	☐	☐	☐	☐	☐	I would feel that I was using money responsibly
I would feel shame/embarrassment	☐	☐	☐	☐	☐	I would have the approval of others
I would feel that I had not made a sustainable choice	☐	☐	☐	☐	☐	I would feel that I had made a sustainable choice
I would feel disgusted in using it	☐	☐	☐	☐	☐	I would not feel disgusted in using it

Vignette: Example (P2)

3. We asked this question to a representative population in your macro-region. How do you think other respondents answered this same question? Remember that you can receive additional compensation for this question, as follows: the closer your answers are to those given most frequently in the sample, the higher the compensation you can get. We will draw X participants to whom we will pay this additional compensation.

4. At each end of the following scales is a statement, your task is to place an X on each scale to indicate how much you agree with the following statements related to the situation described.

   "If I decided to take the good described, others would think that..."

I am in financial difficulty	☐	☐	☐	☐	☐	I use money responsibly
I feel shame/embarrassment	☐	☐	☐	☐	☐	I have their approval
I do not feel I have made a sustainable choice	☐	☐	☐	☐	☐	I feel I have made a sustainable choice
I feel disgusted in using it	☐	☐	☐	☐	☐	I do not feel disgusted in using it

Informative Quiz: Example (P1)

Before you answer the next question, we want to inform you about the value of 1 kg of carbon dioxide emitted (CO2e):

1 kg CO2e = 6 km travelled with an average-sized car[1]

When you buy a used garment, do you know how much CO2 emissions you can avoid[2] by not producing a new one?

____ CO2e

[1]1 kWh = 10 hours usage of a 100 watt bulb / 10ℓ = 2 minutes of open kitchen sink
[2]energy/water you can save

Informative Quiz: Example (P2)

The correct estimate is around 4 kg CO2e, that is approximately 24 km travelled by an averaged-sized petrol car.[3,4]

Based on this information, are you more inclined or less inclined to buy second-hand clothing in your daily life?

1. More inclined
2. Equally inclined
3. Less inclined

[3]The correct estimate is around 17kWh, that is approximately 170 hours of usage of a 100 watt bulb.
[4]The correct estimate is around 340 litres of water, that is approximately 17 minutes of open sink.

Voucher Choice Task: Example

Voucher A	Voucher B	Your Choice
10€	0€	□ Voucher A □ Voucher B
10€	5€	□ Voucher A □ Voucher B
10€	10€	□ Voucher A □ Voucher B
10€	15€	□ Voucher A □ Voucher B
10€	20€	□ Voucher A □ Voucher B

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Low carbon policies and socio-economic sustainability

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The *UniPa Team*

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Group Member

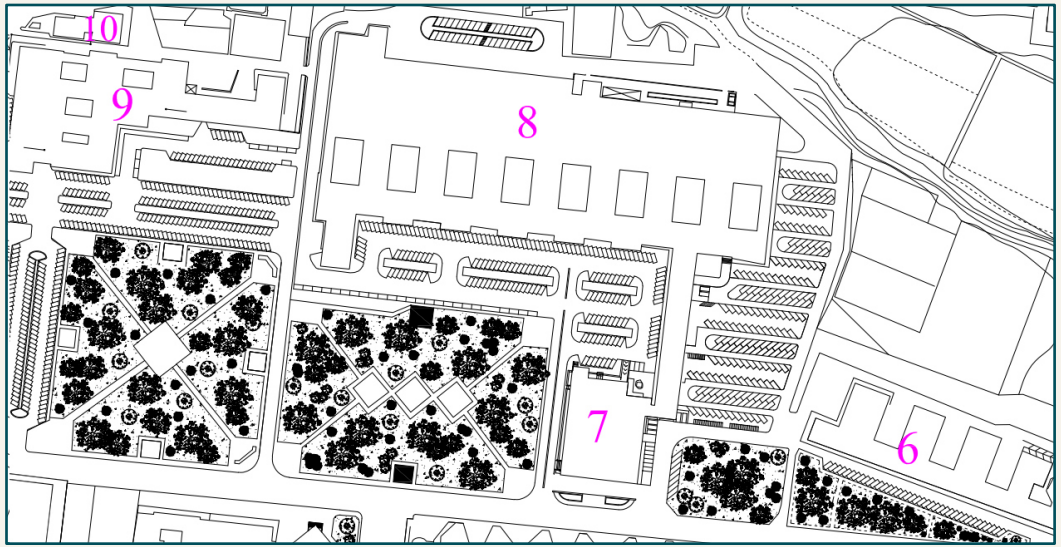
WP3 *UNIPA* – TASKS: WHERE WE ARE

SPOKE 6	WORK PACKAGE: WP 3	UniPa TASKS			2023				2024				2025			
					I Q	II Q	III Q	IV Q	I Q	II Q	III Q	IV Q	I Q	II Q	III Q	IV Q
		TASK 1	TASK 1a	Data acquisition studies												
			TASK 1b	Collection, analysis and assessment of spatial data and urban planning indicators in selected case studies												
		TASK 2	TASK 2a	Development of repository and a data visualization instrument												
			TASK 2b	Collection of Database on environmental issues												
		TASK 3	TASK 3a	Energy modeling and simulation												
			TASK 3b	Calculation of the carbon footprint												
		TASK 4	TASK 4	Planning and simulation of the renovation solutions to achieve the status of PED												

WP3 – TASK 1a: DATA ACQUISITION STUDIES

THE RESEARCH CONTEXT:
Campus UniPa – Parco d'Orleans (Engineering Buildings)

BUILDING N.6	Chemical and Nuclear Engineering Department
BUILDING N.7	Administration and Library Engineering Department
BUILDING N.8	Structural, Hydraulic, Geotechnical Eng. Department
BUILDING N.9	Electric and Energetic Engineering Department



WP3 – TASK 1a: DATA ACQUISITION STUDIES

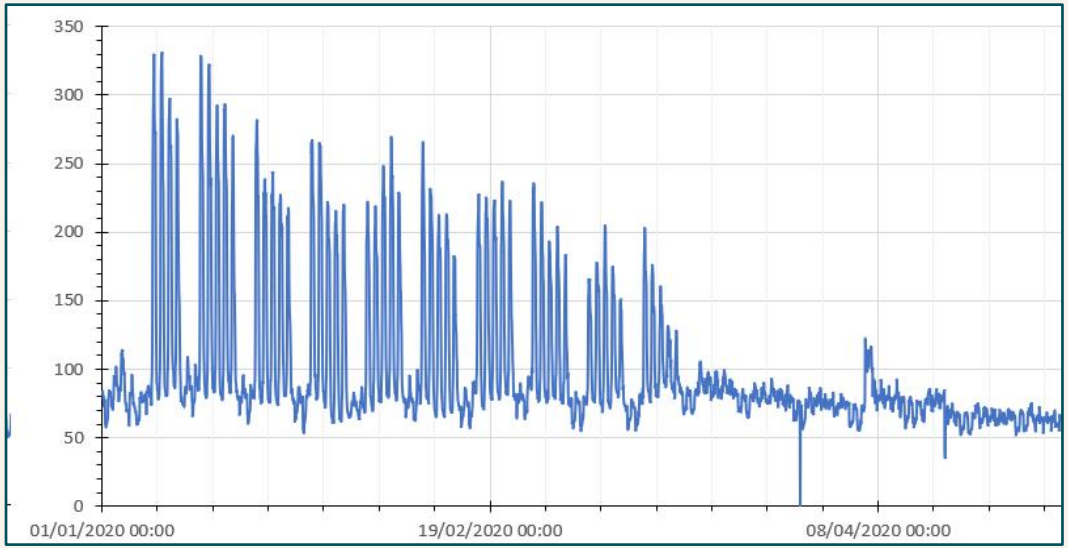
THE ANALYSED DATA
Campus UniPa – Parco d'Orleans (Engineering Buildings)

BUILDING N.6	Electricity energy consumption and heating gas needs (monthly data from 2017 to 2023)
BUILDING N.7	
BUILDING N.8	
BUILDING N.9	

WP3 - TASK 1b: DATA ANALYSIS AND ASSESSMENT

THE ANALYSED DATA
Campus UniPa - Parco d'Orleans (Engineering Buildings)

BUILDING N.6	Electric load curves and energy loads (hourly data from 2019 to 2023)
BUILDING N.7	
BUILDING N.8	
BUILDING N.9	



WP3 – TASK 1b: DATA ANALYSIS AND ASSESSMENT

THE ANALYSED DATA
Campus UniPa – Parco d'Orleans (Engineering Buildings)

BUILDING N.6	Buildings' opaque and transparent envelope details, buildings' occupancy rate, internal loads' estimation and users' profiles
BUILDING N.7	
BUILDING N.8	Creation and implementation of a repository and a database, able to describe the state of the art
BUILDING N.9	

WP3 - TASK 2

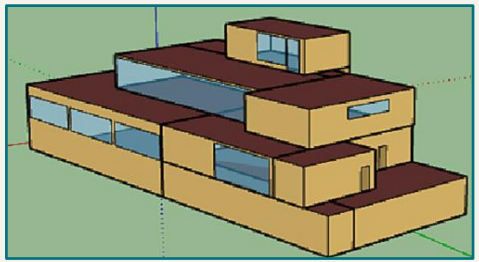
Data repository and visualization in statististical and geographical environments / Spatio-temporal methods

- Construction of the background of the topic of sustainability, described in various approaches and with external contributions (e.g. Interviews/scientific conversations with well-known international scholars on the topics of ecological and energy transition).
- Selection of urban and territorial indicators, useful for the urban and regional area.
- Methodological approach and practical experimentation of the local urban area with contents, strategies, interventions and actions aimed at sustainable urban rebalancing and ecological transition.

- Development of methods for analysing patterns in Euclidean spaces and road networks.
- Enhancements of spatial and spatio-temporal models by including individual-level and environmental covariates.
- Developing the related software in R, also proposing new model intensity, useful for describing the occurrence of real phenomena.
- Proposals of novel estimation methods accounting for local characteristics of points, improving the model.

WP3 - TASK 3a: ENERGY MODELLING AND SIMULATION

THE IMPLEMENTED DATA
Campus UniPa - Parco d'Orleans
(Engineering Buildings)

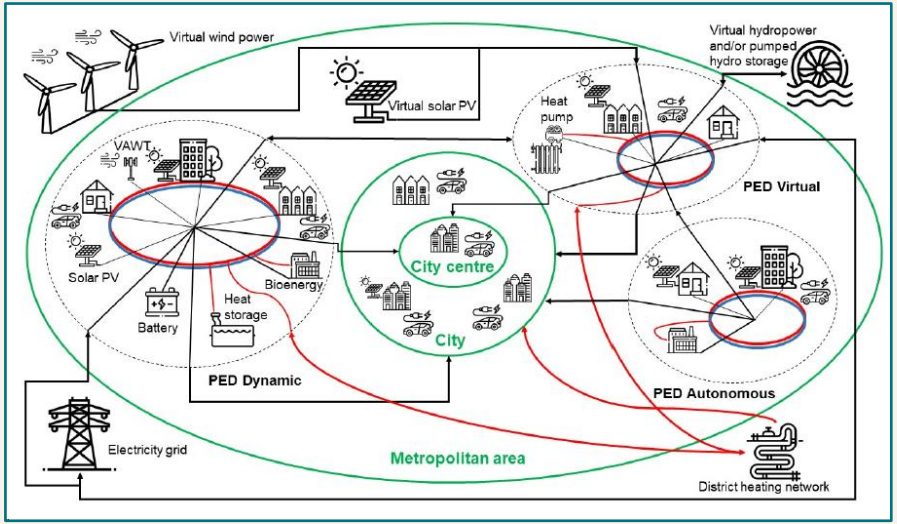


BUILDING N.6	Thermal Zones recognition, modelling, calibration, and non-steady state simulations for the existing case studies
BUILDING N.7	
BUILDING N.8	
BUILDING N.9	

SOME SAMPLES OF ENERGY MODELS
(created with
SketchUp 3D Modeling Software,
and integrated with the
Euclid-NREL EnergyPlus Plugin)

WP3 – ONGOING AND FUTURE TASKS

- Calibration of the building models and boundary conditions' refinement.
- Assessment of the multiple implications for the concept of PEDs at various levels.
- Evaluation of technical feasibility for achieving a positive balance in the specific application context (UNIPA Campus).
- Definition of useful guidelines for energy communities and sustainable business models, able to support Italian Policy Makers in the path towards European objectives.



Ref. *Positioning Positive Energy Districts in European Cities* (Lindholm, O.; Rehman, H.; Reda, F.)

WP3 – ONGOING AND FUTURE TASKS

- Ecological transition topic conceptualization and relationship with urban and regional development assessment.
- Organization and selection of urban and territorial indicators, suitable to be assessed and calibrated within a specific pilot-area.
- Assessment of the cost-and-benefit trade-offs of investments in energy communities.
- Indicators on consumers/prosumers engagement in ecological transition.

- Incorporating road geometry and environmental variables into appropriate models allows a more holistic understanding of the factors influencing efficiency levels.
- Studying the interaction-structure among observed events is crucial, especially when the observed heterogeneity cannot be associated to any environmental factor external to the process, which is neither observed, nor observable.
- Representing these interactions, maybe also in a functional form, not only enhances the accuracy of the proposed models, but also allows to formulate more precise predictions about future events.

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Thanks for your attention

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Congestion management and navigation systems: a lab experiment on individual choices vs delegation

Luca Congiu *Università di Roma Tor Vergata*	Alberto Iozzi *Università di Roma Tor Vergata and SOAS University of London*
Luca Panaccione *Università di Roma La Sapienza*	Marco Persichina *Università di Roma Tor Vergata*
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Introduction

- When private vehicles are driven by atomistic individuals, congestion externalities emerge
  - Drivers do not consider the extra cost that their decisions to drive in congested hours/places impose on their fellow drivers
- Road congestion costs are very large: 100 bln $ per year in the US
- Road congestion is one of the primary causes of CO2 emissions

	CO2 emissions by vehicles (megatonnes)	**CO2 emissions by vehicles because of congestion (megatonnes)**	**CO2 emissions by vehicles because of congestion (%)**
London	14.8	2.2	15
Berlin	4	4	10.5
Paris	21	2.8	13
Amsterdam	0.8	0.06	7

Introduction (ctd)

- The traditional tools to avoid congestion work on the extensive margin (more capacity and rationing)
- If agents are heterogenous, congestion can be mitigated by sorting travelers
- Heterogeneity in disutility from congestion costs is substantial (Small, 2012)
- Recent market/technological advancements are dramatically reducing the cost of sorting, thereby making it a viable and important alternative to managing congestion
    - Autonomous vehicles
    - Fleets
    - Navigation systems

Introduction (ctd)

We want to run a lab experiment to investigate the following questions:

- Are individuauls willing to delegate their routing choice to a socially-oriented navigation system that sort individuals to minimize the aggregate travel time and avoid congestion?
- What individual characteristics and informational features make individuals more willing to opt-in?

The framework of the experiment (ctd)

We intend to run a framed lab experiment (a variant of a threshold public bad game)

- ~1200 individuals
- Groups of 4 players
- All players have the same starting point and destination and have to choose their way to get to the destination
- Heterogeneity of players
  - Same benefit for all players in the group
  - Different costs for the different players in the group

The framework of the experiment (ctd)

- The destination may be reached by two possible routes:
  - DIRECT route
  - ALTERNATIVE route
- If 3 or more players travel on the DIRECT route, two effects
  - congestion increases the cost of those using the DIRECT route
- Without congestion, the DIRECT route is cheaper; with congestion, the ALTERNATIVE route is cheaper
- In our main treatment(s), travelers can also choose a GUIDED mode, which assigns the traveler to the DIRECT or the ALTERNATIVE route to minimize the aggregate sum of travel costs, given the choices of the other players
  - This may or may not be the route minimising private cost

Our treatments

	Choice set {DIRECT route, ALTERNATIVE route}	**Choice set** {DIRECT route, ALTERNATIVE route, GUIDED mode}
1) Full information individuals know everybody's cost	T1	T2
2) Private information individual's cost is private information	T3	T4
3) Private information + uncertainty information as in 2) and uncertainty about the cost of congestion/pollution	T5	T6

Details of the experimental design

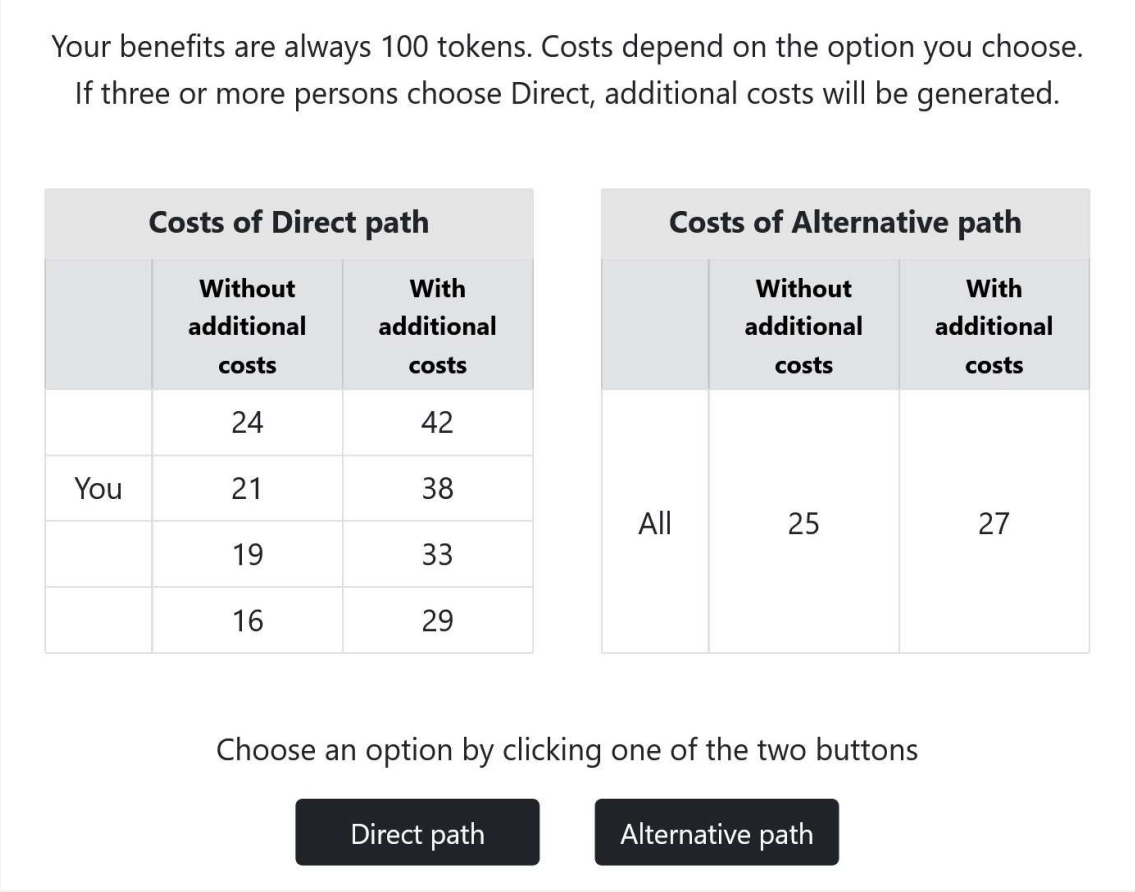
- Between-subject design
- ~1200 subjects
- All tasks are incentivised
  - expected average earning per experimental subject: ~17 euros
- Ex-ante elicitation of risk aversion and altruistic behavior
- Ex-post elicitation of environmental stated preferences and questionnaire about demographics and habits
- Repeated interaction: 16 rounds
- Groups of 4 individuals randomly rematched in each round from a larger group of 12 individuals
- Random assignment of individuals' costs in each round

Baseline treatment: the decision screen

The participant is asked to choose between **two** different **options**:

- DIRECT route
- ALTERNATIVE route

Notice that, if 3 or more players choose the DIRECT route, additional congestion and pollution costs are generated



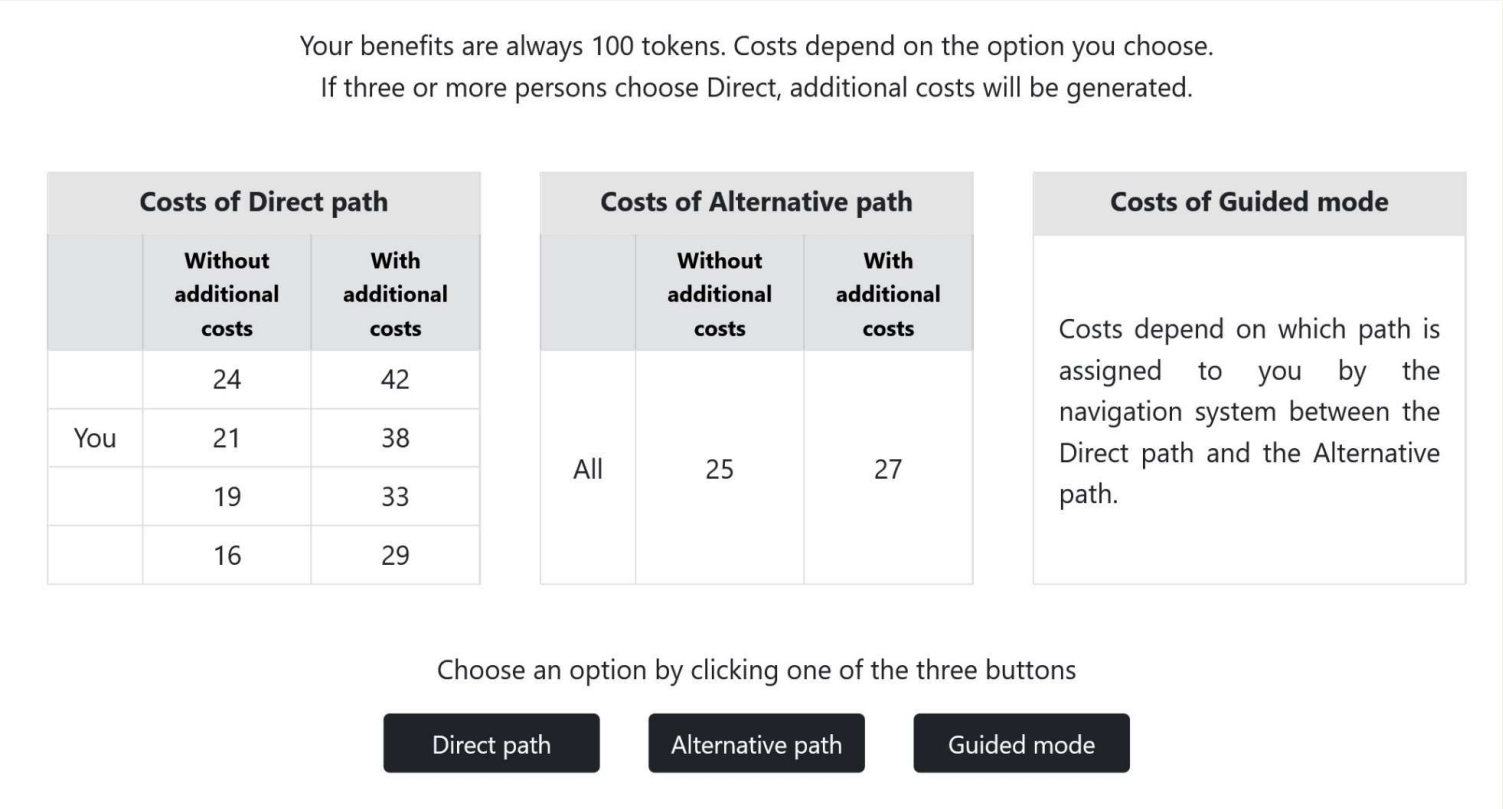
GUIDED mode treatment: the decision screen

The participant is now asked to choose between **three** different **options**:

- DIRECT route
- ALTERNATIVE route
- GUIDED mode

Remarks:

- only those who opt for the GUIDED mode are assigned to routes
- full disclosure of how the GUIDED mode works



Analysis and predictions: at group level

- Main variables
  - Cost efficiency (relative to social optimum)
  - # of individuals choosing PRIVATE
- What do we predict?
  - The presence of GUIDED mode weakly helps the coordination towards the social optimum
  - Less informed the players, the stronger the effect of the GUIDED mode
  - Possibly, a zero effect of GUIDED in the full information case
  - Less informed the players, the stronger the effect of individuals' attitudes toward risk and other individuals

Analysis and predictions: at individual level

- Main variable
  - Probability of making each choice, *P(X)* with *X*=*D*, *A*, *G*
- What do we predict?
  - *P(G)*
    - higher the less informed a players is
    - higher the higher her individual cost is
    - higher the higher the risk-aversion is
    - higher the more pro-social an individual is
  - Coordination emerges over time because of learning

Conclusions

- We introduce cost heterogeneity in a threshold public bad game where exceeding the threshold generates unfavourable outcomes for all the group member
- We introduce and test a mechanism of delegation of individual travel route decisions
- We study the effect of a guided mode in presence of full information, private info and private info + uncertainty
- The experiment is framed as making travel choices in an urban setting, with congestion
- Our experiment will help design congestion management policies in urban settings by identifying
    - Effect of a socially-oriented navigation system on congestion
    - Individuals' characteristics of those willing to opt in

Thank you!

Cost structure