



Med-EcoSuRe



Convegno

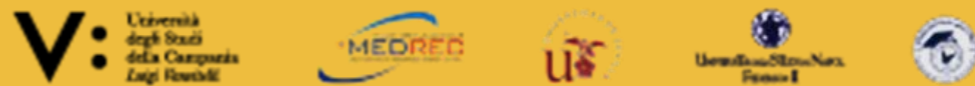
VERSO LA NUOVA DIRETTIVA EPBD

Piano di Azione politico, strategico e di progetto per edifici universitari Carbon Neutral

Napoli, Mostra d'Oltremare
Venerdì, 31 marzo 2023

Metodi e strumenti di progettazione urbana multiscalare per la resilienza e la neutralità climatica

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Urban Climate Change Research Network



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enicbcmmed.eu/projects/med-ecosure



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FROM SEAP TO SECAP - RESEARCH-INFORMED PLANNING



CLARITY DEMONSTRATION CASE 1 – NAPOLI
MULTISCALE CLIMATE & RESILIENT URBAN PLANNING

CLIMATE PROJECTIONS
Climate change profile Napoli
2020-2100

STRATEGIC PLANNING
Support to the implementation of the Sustainable Energy and Climate Action Plan for Napoli (SECAP)

CITY PLANNING
Updated of Napoli City Plan (PUC)

DISTRICT PLANNING
Ponticelli Urban Regeneration Plan (PRU)



A Green infrastructures BIOSWALES

ADAPTATION TARGETS
Heat Wave
Pluvial Flooding
Fluvial Flooding / Storm Surge

DESCRIPTION
Bioswales improve rainwater quality by removing heavy metals and other pollutants, and improve air quality through carbon sequestration from green elements. Bioswales can provide a huge variety of flora by creating habitats for wild fauna, like birds and insects, thanks to differentiated types of grasses and vegetation.

B Co-benefits in total

Environmental
Social

CO-BENEFITS
Bioswales improve rainwater quality by removing heavy metals and other pollutants, and improve air quality through carbon sequestration from green elements. Bioswales can provide a huge variety of flora by creating habitats for wild fauna, like birds and insects, thanks to differentiated types of grasses and vegetation.

A Construction materials CANOPIES

ADAPTATION TARGETS
Heat Wave
Pluvial Flooding
Fluvial Flooding / Storm Surge

DESCRIPTION
Shading systems, if integrated in public spaces can attract people, encouraging social interaction, commercial and

B Co-benefits in total

Environmental
Social

CO-BENEFITS
Shading systems, if integrated in public spaces can attract people, encouraging social interaction, commercial and

A Green infrastructures URBAN AGRICULTURE

ADAPTATION TARGETS
Heat Wave
Pluvial Flooding
Fluvial Flooding / Storm Surge

PERFORMANCE PARAMETERS
Albedo
Emissività
Runoff

CLIMATE BENEFITS
The main advantage of urban agriculture is the reduction of surface runoff, ensuring a reduction in the risk of flooding in case of extreme precipitation events. Depending on the type of vegetation, the performance parameters may vary. The contribution to heat stress reduction can be relevant, but seasonality of cultivation types must be taken into account, preferring those growing during hot seasons.

B Co-benefits in total

Environmental
Social
Economic

CO-BENEFITS
Urban agriculture offers high quality urban green spaces and preserves biodiversity by attracting birds and insects. Local food production reduces the consumption of fossil fuels and the greenhouse gas emissions associated with the transport, packaging and sale of food, thus contributing to the improvement of air quality in cities.
Agricultural areas integrated in community initiatives increase food awareness and promotes a healthier diets, with potential benefits for human health. In addition, by involving residents and providing a place for cooperation and knowledge sharing, urban agriculture strengthens community cohesion and inclusion, including positively affecting mental health diseases. Finally, urban agriculture fields contribute to the aesthetic value of the city.
Local cultivation allows saving on household expenses for food. The presence of local products and markets bring benefits in terms of job opportunities and stimulus to local circular economy. Specific interactions between urban agricultural systems and their different urban environments create opportunities for technical, social and organizational innovations. Urban agriculture can help increase the values of real estate in the surrounding areas.

Adaptation measures technical cards

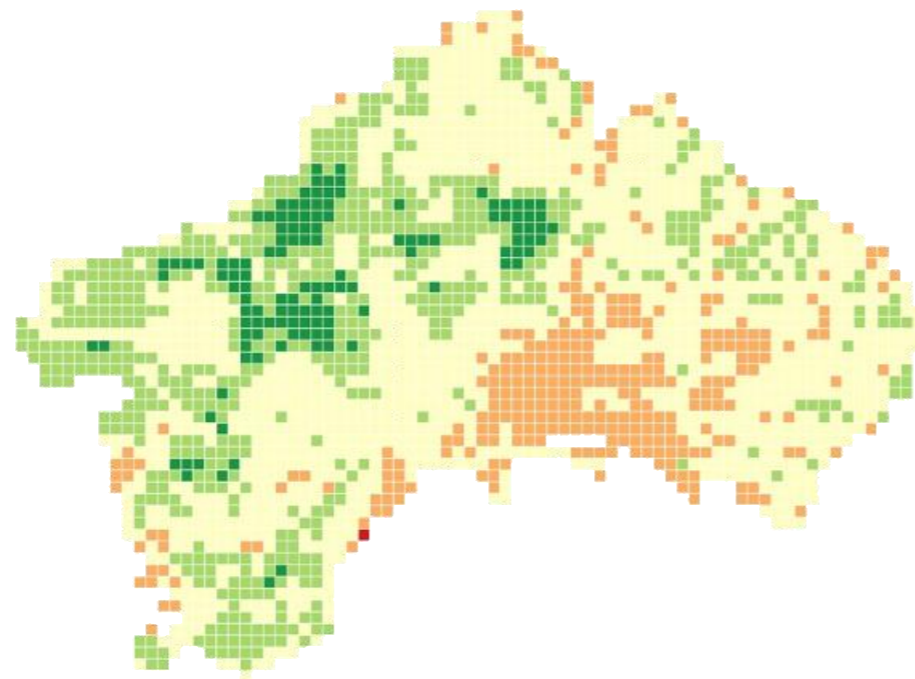
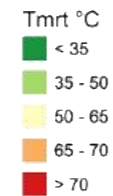


PLINIVS HAZARD/IMPACT ASSESSMENT TOOLS

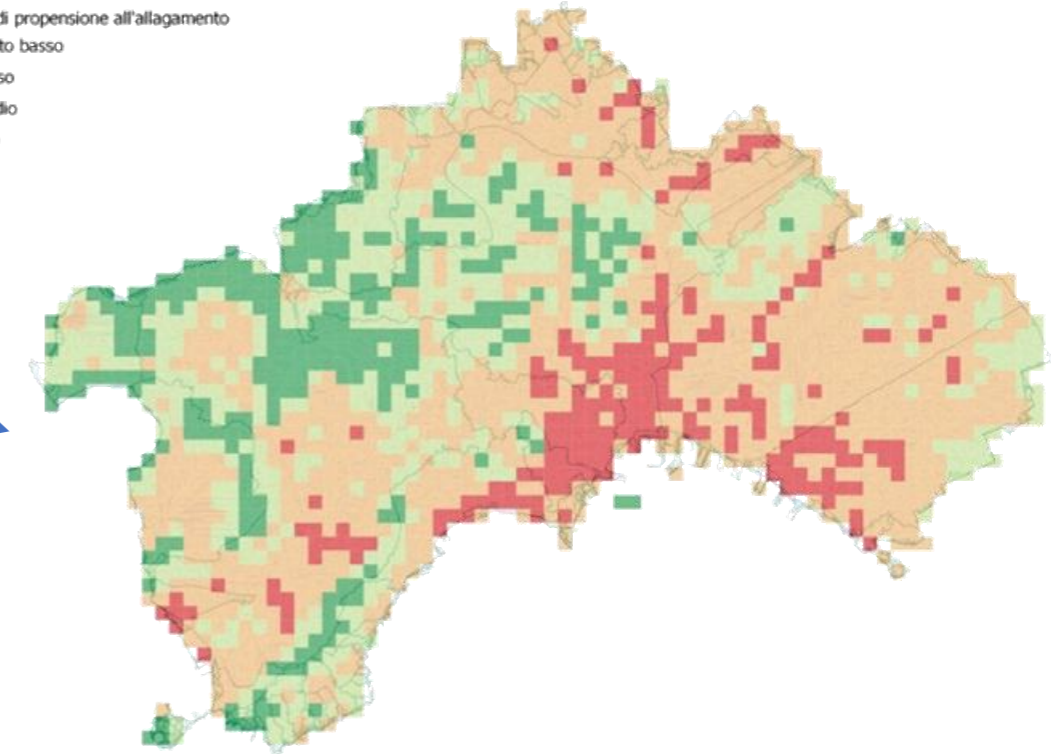
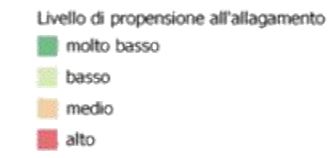
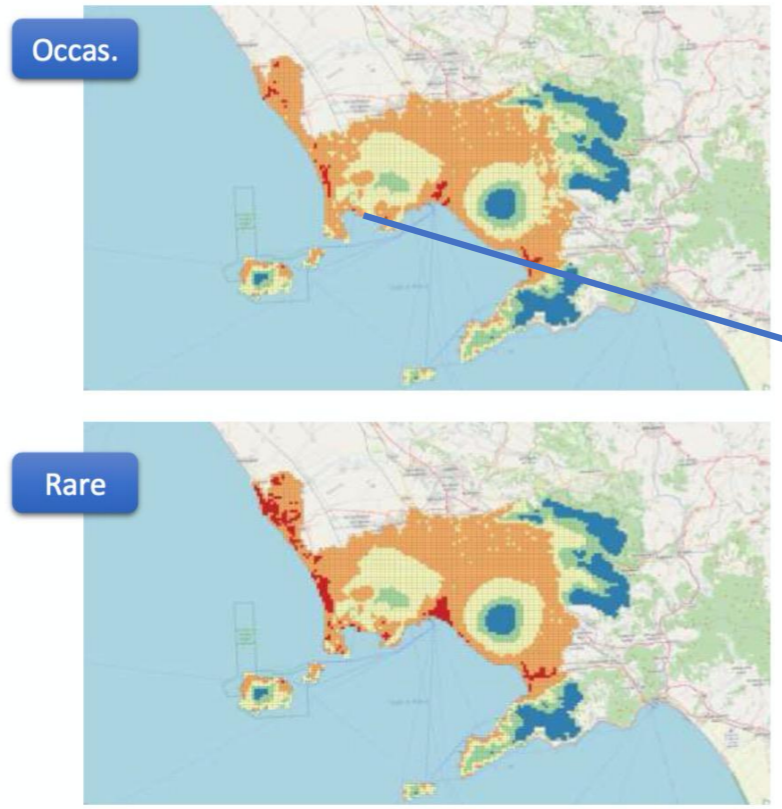
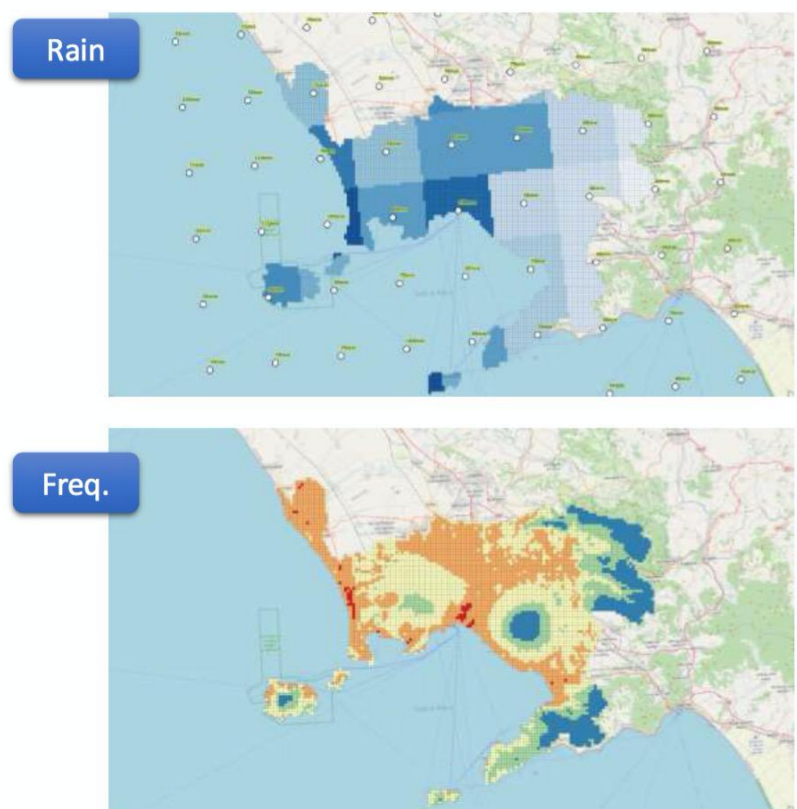
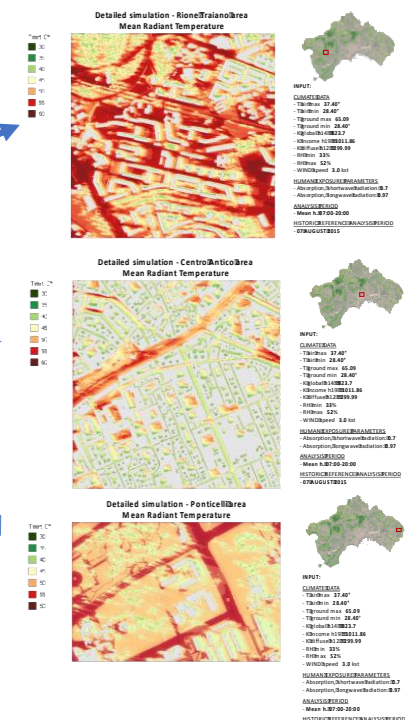
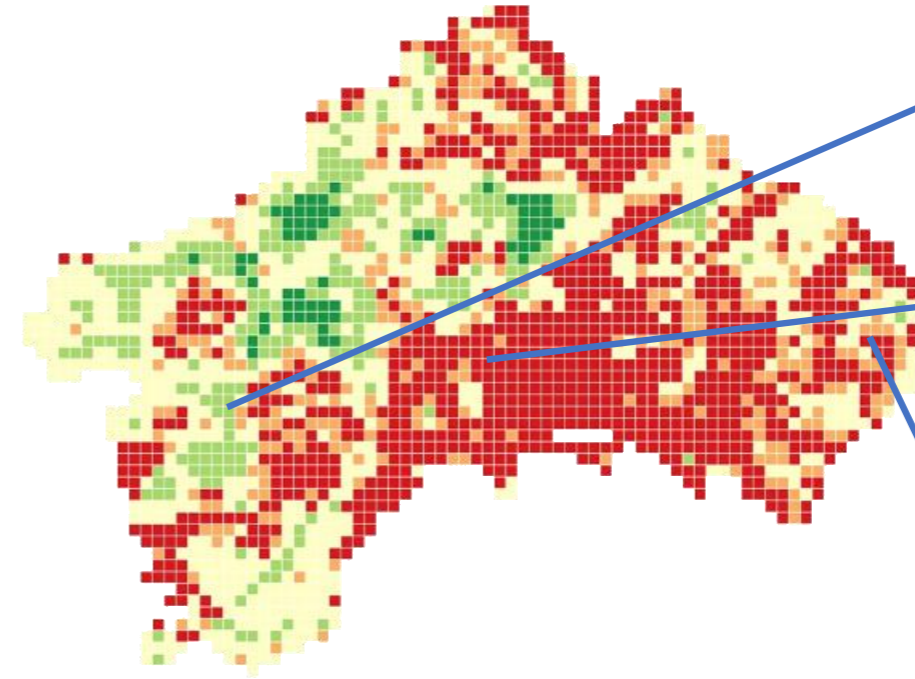
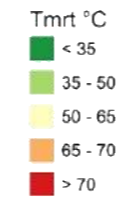


Heat Waves
Pluvial Flood

SCENARIO: rcp 8.5 frequent, 2011 - 2040, Tair 34 °C, frequency 2,766



SCENARIO: rcp 8.5 rare, 2041 - 2070, Tair 41 °C, frequency 0,066



Climate Adaptation - Multi-scale planning measures responsive geospatial DSS

PLINIVS CLIMATE&ENERGY ASSESSMENT TOOL



HDD	historical 1970 – 2000: 1389			CDD	historical 1970 – 2000: 772		
	2011 - 2040	2041 - 2070	2071 - 2100		2011 - 2040	2041 - 2070	2071 - 2100
RCP 2.6	987	714	780	RCP 2.6	1057	1014	990
RCP 4.5	827	521	432	RCP 4.5	1128	1405	1476
RCP 8.5	702	323	93	RCP 8.5	1168	1551	2065

	2011-2040	2041-2070	2071-2100
Variation of heating needs in Napoli area during cold spells			
RCP 4.5	-4%	-35%	-46%
RCP 8.5	-13%	-60%	-89%
Variation of cooling needs in Napoli area during heat waves			
RCP 4.5	+22%	+38%	+41%
RCP 8.5	+25%	+43%	+58%

Low uncertainty	Medium uncertainty	High uncertainty
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Climate Adaptation - Temperature extremes and energy needs variation

Settore politico impattato	Impatto/i atteso/i	Probabilità dell'evento	Livello atteso di impatto	Periodo di tempo	Indicatori relativi agli impatti
Edifici	Impatto degli allagamenti sugli edifici	RCP 4.5 frequente	Low	2011-2040	Impatto economico per danni strutturali e al contenuto degli edifici
		RCP 8.5 frequente	Low		
		RCP 4.5 occasionale	Medium		
		RCP 8.5 occasionale	Medium		
		RCP 4.5 raro	High		
		RCP 8.5 raro	High		
		RCP 4.5 frequente	Low	2041-2070	
		RCP 8.5 frequente	Low		
		RCP 4.5 occasionale	Medium		
		RCP 8.5 occasionale	Medium		
		RCP 4.5 raro	High		
		RCP 8.5 raro	High		
		RCP 4.5 frequente	Low	2071-2100	
		RCP 8.5 frequente	Low		
		RCP 4.5 occasionale	Medium		
RCP 8.5 occasionale	High				
RCP 4.5 raro	High				
RCP 8.5 raro	High				
Trasporto	Impatto degli allagamenti sulla rete stradale	RCP 4.5 frequente	Low	2011-2040	Impatto economico per la pulizia e la riparazione delle strade
		RCP 8.5 frequente	Low		
		RCP 4.5 occasionale	Medium		
		RCP 8.5 occasionale	Medium		
		RCP 4.5 raro	High		
		RCP 8.5 raro	High		
		RCP 4.5 frequente	Low	2041-2070	
		RCP 8.5 frequente	Low		
		RCP 4.5 occasionale	Low		
		RCP 8.5 occasionale	Medium		
		RCP 4.5 raro	High		
		RCP 8.5 raro	High		
		RCP 4.5 frequente	Low	2071-2100	
		RCP 8.5 frequente	Low		
		RCP 4.5 occasionale	Low		
RCP 8.5 occasionale	High				
RCP 4.5 raro	High				
RCP 8.5 raro	High				
Energia	Impatto dei trend di temperature estivi e invernali sul consumo di energia	RCP 4.5	22%	2011-2040	Aumento della domanda di energia elettrica per l'aria condizionata in ambito civile
		RCP 8.5	25%		
		RCP 4.5	38%	2041-2070	
		RCP 8.5	43%		
		RCP 4.5	41%	2071-2100	
		RCP 8.5	58%		
		RCP 4.5	-4%	2011-2040	Riduzione della domanda di gas per il riscaldamento in ambito civile
		RCP 8.5	-13%		
		RCP 4.5	-35%	2041-2070	
		RCP 8.5	-60%		
		RCP 4.5	-46%	2071-2100	
		RCP 8.5	-89%		

Climate Adaptation - SECAP Quantitative Impact Indicators

FROM SEAP TO SECAP - SETTING INTEGRATED MITIGATION/ADAPTATION TARGETS

Tools supporting collaborative mapping and co-design processes UCCRN → CO-FRAME_NA

- Strategic planning vision and backcasting
- Stakeholders and community engagement and co-creation of solutions



I ipotesi progettuale: il progetto degli abitanti

Legenda

- Linea blu: Asse della linea ferroviaria
- Linea verde: Vie di fuga primarie
- Linea magenta: Vie di fuga secondarie
- Linea gialla: Spazi aperti ed infrastrutture di connessione
- Linea verde scuro: Aree naturali
- Linea grigia: Convalle energetiche

Comunità energetiche

- Aparato di generazione di energia elettrica
- Efficientamento energetico degli edifici
- Miglioramento dell'isolamento degli edifici per la realizzazione di coperture verdi
- Pavimentazioni permeabili
- Biorovine
- Giardini verticali

Impianto di accumulo energetico combinato

- Biomasse, geotermia, fotovoltaico, eolico
- Hub per la sensibilizzazione della questione energetica e rischio climatologico

Legenda delle possibili funzioni

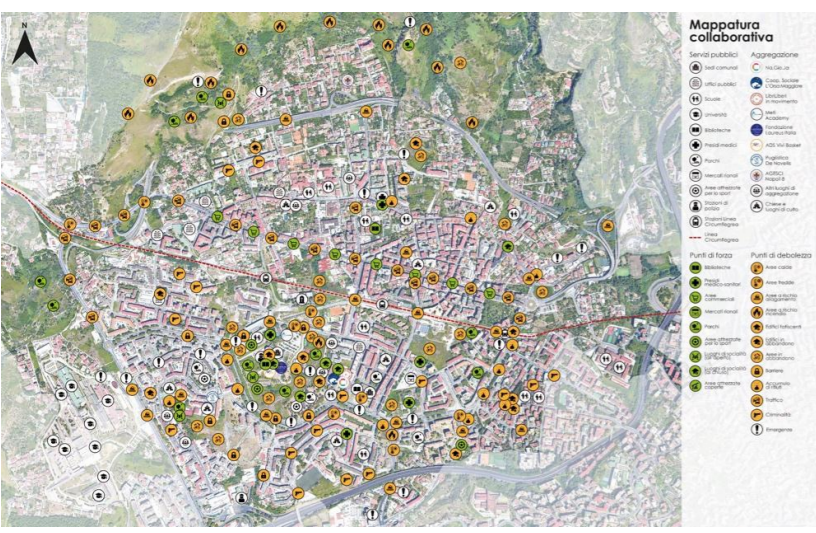
- Parco attrezzato
- Attrezzature per lo sport ed il tempo libero
- Affollamento commerciale di quartiere
- Spazi verdi
- Aree attrezzate coperte
- Librerie

Parco dei comitati

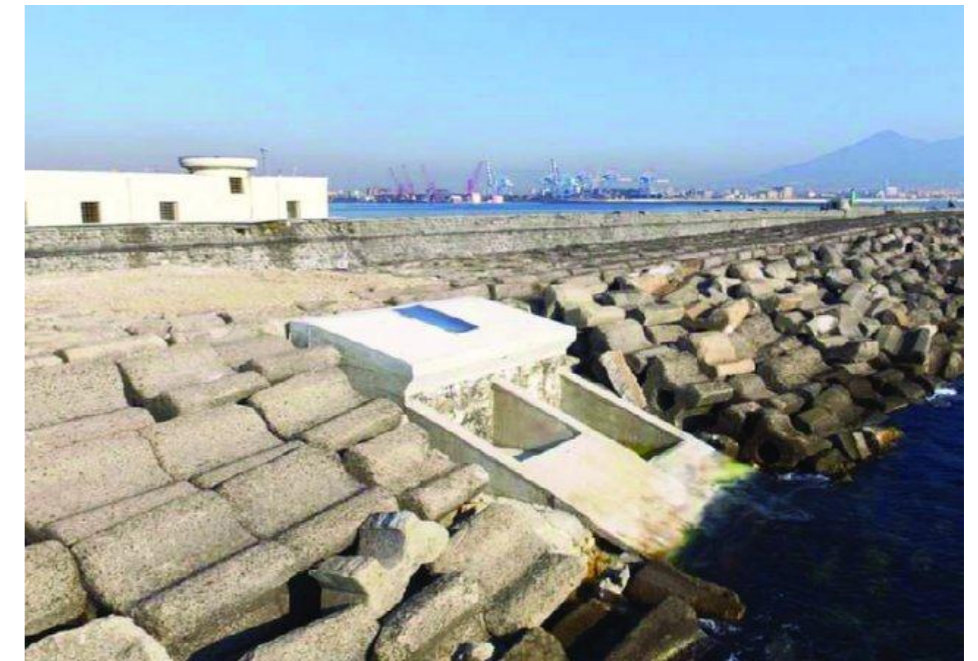
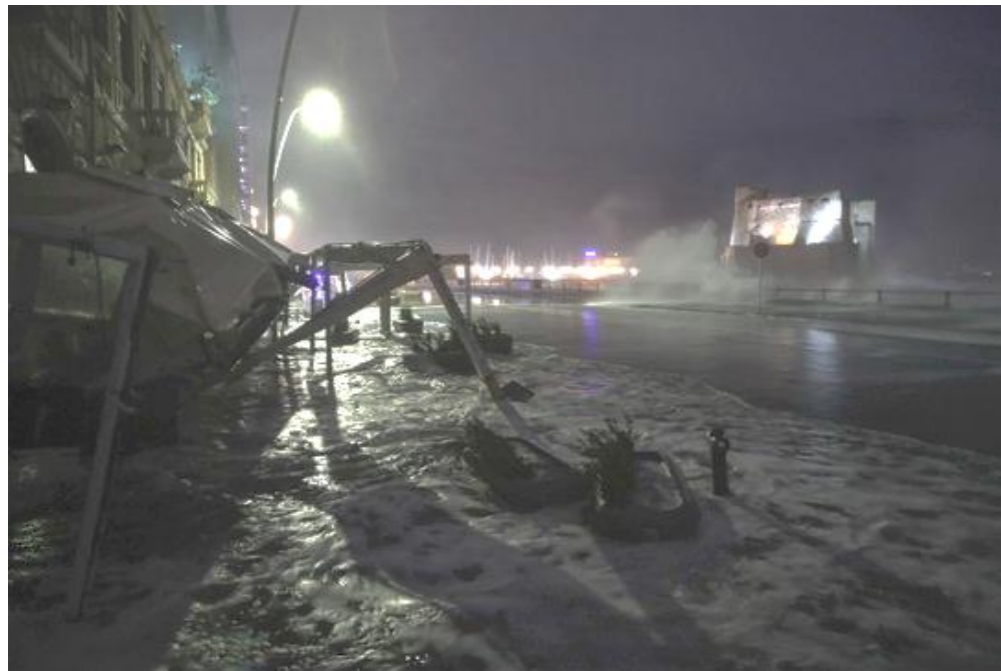
- Carico del patrimonio turistico e botanico
- Consolidamento del tessuto
- Attrezzature per il trekking ed il camping

CO-FRAME_NA Project
Comprehensive multi-hazard & multi-risk Framework_Napoli

Logos: DIARC, PLINIVS, UCCRN



FROM SEAP TO SECAP - RESEARCH-INFORMED PLANNING



NAPOLI DEMONSTRATOR FOCUS:

Heat Waves & Health

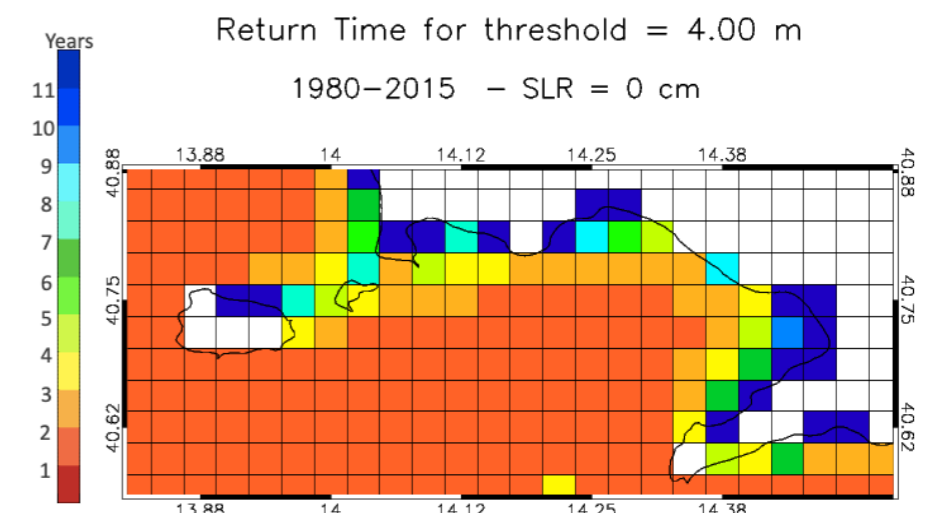
- Improve outdoor dynamic simulation
- Integrate indoor comfort and energy consumption

Coastal flooding & Infrastructure

- Implement hazard/impact assessment tools based on advanced wave+SLR model
- Nature Based Solutions and Water Energy Converters to integrate mitigation and adaptation

Stakeholders and community engagement

- Climate Local Hub establishment and 8 co-creation workshops with stakeholders and community



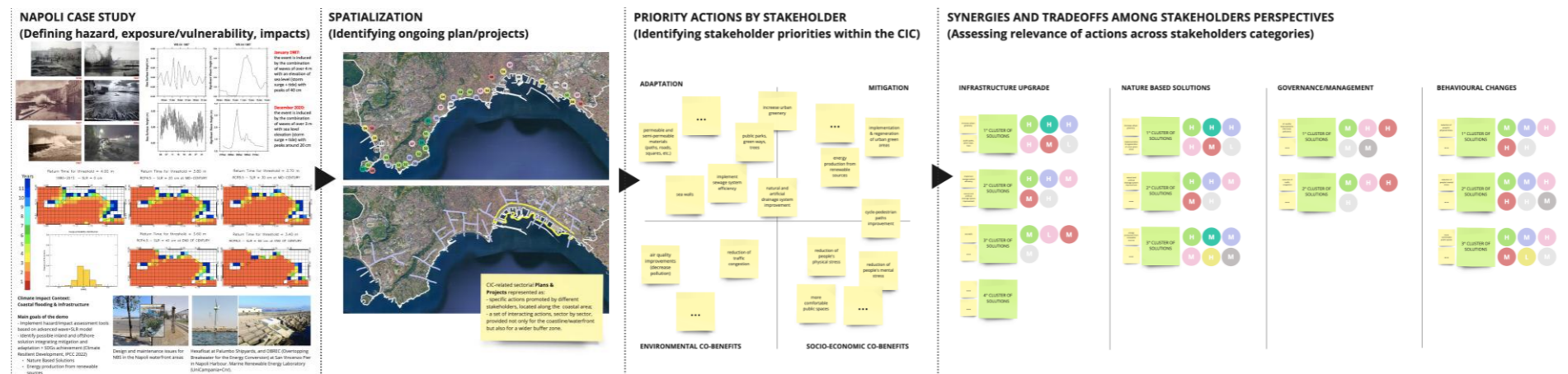
FROM SEAP TO SECAP - RESEARCH-INFORMED PLANNING

Stakeholders and community engagement

- Napoli Local Hub establishment and co-creation workshops with stakeholders and community
 - Public stakeholders (state, regional and local level)
 - Private stakeholders (business sectors and service providers)
 - Citizens and communities (non-profit organizations)



Interaction design



SEACAP4SDG PRELIMINARY ASSESSMENT OF TOOLS

IDENTIFIED TOOLS AND METHODOLOGIES	RELEVANT OUTPUT	LIMITS FOR IMPLEMENTATION
IMPULSE	Structured database of characteristics of public building stock to monitor emissions and potential reduction; GIS based KPIs-processor, financial scheme evaluation tool	Needs a systematic methodology for data collection of each public building
EDUFOOTPRINT	LCA of Carbon Footprint and environmental Footprint; high involvement of users and engagement of local communities, influence on behaviour at local scale	Needs a systematic methodology for data collection of each public building
CESBA MED S – SBT and SNT	Indicators and assessment process for retrofit strategy and scenarios, quantitative and qualitative aspects taken into account to assess both mitigation and adaptation criteria	Requires structured stakeholders involvement
MED-ECOSURE- LIVING LABS	Build effective governance structures, influence on behavioural aspects through user engagement)	Educational buildings only, methodology could be extended to other typologies

SEACAP4SDG tools/methodologies integrated in the Napoli planning and design support toolkit

SEACAP4SDG PRELIMINARY ASSESSMENT OF TOOLS

Public Building Energy Renovation - KPIs-processor's GIS plug-in and financial scheme evaluation tool (IMPULSE)



Decision-making for gradual renovation planning

Wizard displaying the characteristics of Typologies and Ambassador buildings.

PILOT-CITY (GIS) MAP (upon which the Typologies are displayed in different colors)

KPIs display

IMPULSE methodology (booklet & D3.2.1)

D3.3.1

D3.4.1

PLUG-IN

Fin schm

Source:
OUTCOME LINK: <https://n9.cl/nmq0v>
PROJECT WEBSITE: <https://impulse.interreg-med.eu/>

Selection criteria

- Integrability in GIS environment
- Quantitative indicators
- Focus on school/office buildings
- Supporting stakeholders/community engagement

School LCA Calculator (EDUFOOTPRINT)

Edufootprint calculator: conceptual structure

EDUFOOTPRINT CALCULATOR

Data entry: Products, Food, Energy, Buildings, Transport, Waste

Emission factors (specific and generic data)

Impact assessment (energy related): Indicator 1, Indicator 2, Indicator 3, Indicator n

Sources of the impact indicators: Ecoinvent 3.4 and specific LCA studies regarding products and services connected with educational service

Interreg Mediterranean EduFootprint logo

Impact categories	Unit of measure	Assessment model
Climate change	kg CO2-eq	GWP 100 years
Ozone depletion	kg CFC-11 eq	EDP model based on the ODPs of the WMO over an infinite time horizon
Ecotoxicity for aquatic fresh water	CTUe	USEtox model
Human toxicity-cancer effect	CTUh	USEtox model
Human toxicity-non cancer effect	CTUh	USEtox model
Particulate matter / respiratory inorganics	kg PM2.5-eq	RiskPoll model
Ionising radiations - human health effects	kg U235 eq	Human health effect model
Photochemical ozone formation	kg NMVOC	LOTOS-EUROS model
Acidification	Mole of H+ eq	Accumulated Exceedance model
Eutrophication - terrestrial	Mole of N eq	Accumulated Exceedance model
Eutrophication - aquatic freshwater	kg P eq	EUTREND model
Eutrophication - marine	kg N eq	EUTREND model
Resource depletion - water use	m³ eq	Swiss Ecocancy model
Resource depletion - mineral, fossil & renew.	kg Sb-eq	CM12002 model
Land transformation	kg C deficit eq	Soil Organic Matter (SOM) model

Life cycle footprint percentage by main phases, without excursions
Carbon footprint (kg CO₂e/student)

Source:
OUTCOME LINK: <https://edufootprint-plus.eu/calculator/>
PROJECT WEBSITE: <https://edufootprint.interreg-med.eu/>

SBT-Sustainable Building Tool and SNT-Sustainable Neighbourhood Tool (CESBA MED)

SBTool

SNTool PASSPORT

CRITERIA

B1.1	25%
B1.2	75%
B3.1	33%
B3.2	67%
B3.3	4%
B3.4	11%
B3.5	26%
B3.6	11%
B3.7	9%
B6.2	50%
B6.3	50%

CATEGORIES

B1 - Energy	10%
B2 - Water	12%
B3 - Material	15%
B5 - Land	10%
B6 - Buildings	15%

ISSUES

A - Environment	21%
B - Resources	21%
C - Services	17%
D - Society	8%
E - Economy	25%

CONTEXTUALIZATION PROCESS

GENERIC FRAMEWORK → SBTool → CONTEXT → 1. CRITERIA SELECTION, 2. PERFORMANCE SCALE, 3. WEIGHTS → SBTool ITALY → ITACA

Source:
OUTCOME LINK: <https://n9.cl/g0cds>
PROJECT WEBSITE: <https://cesba-med.interreg-med.eu/>

MCBLL - Mediterranean Cross-Border Living Lab (MED-ECOSURE)

KNOWLEDGE FRAMEWORK

WHAT | **WHO** | **HOW**

RESEARCHERS: provide with innovative methodologies to overcome existing limits/barriers; architects, energy engineers, technical physicists, others...

BUILDING/ENERGY MANAGERS: owning the existing documents with the needed data; current approach to the data management of building stock

STUDENTS: involved both in the organisation of collected data and in the field work to retrieve the missing data and information

COMPANIES: can supply with innovative tools; e.g. survey instruments

PUBLIC ORGANIZATION: can supply missing information; e.g. historical buildings

ANALYSIS OF CRITICALITIES: PERFORM SIMULATIONS

LIVING LAB: RESEARCHERS (SELECT THE BEST SIMULATION TOOLS), BUILDING/ENERGY MANAGERS (HAVE EXPERIENCE & CAN EXPERIENCE), STUDENTS (CAN LEARN), COMPANIES (CAN SUPPORT), PUBLIC ORGANIZATION (CAN BE INTERESTED)

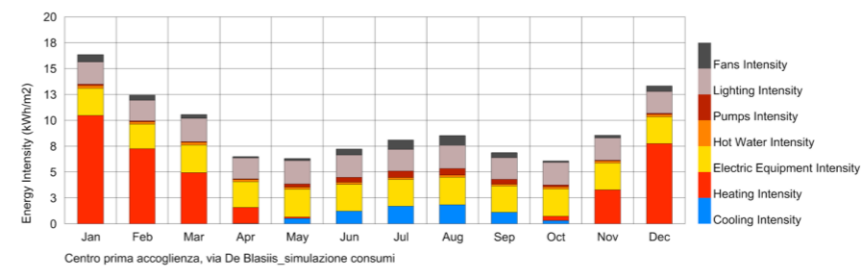
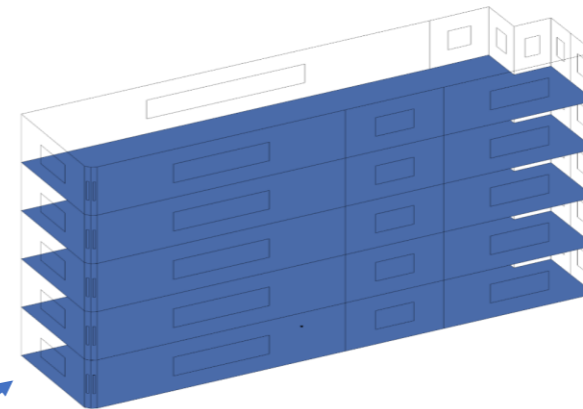
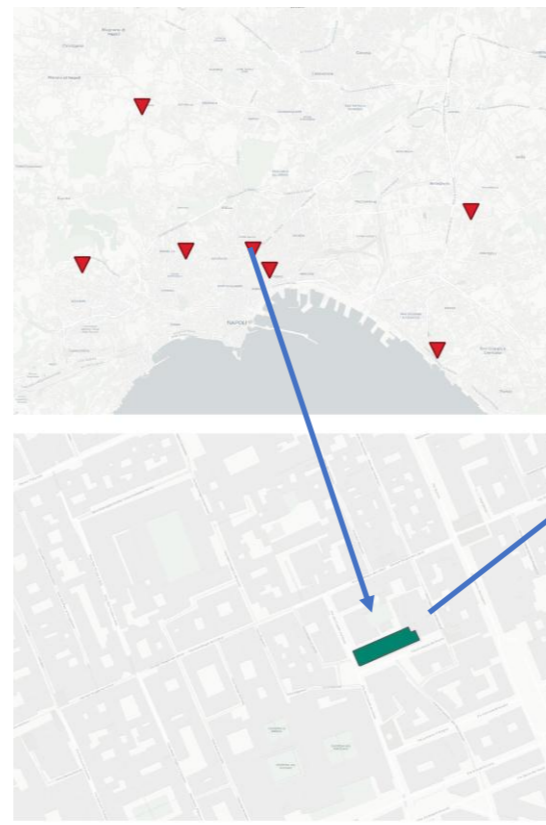
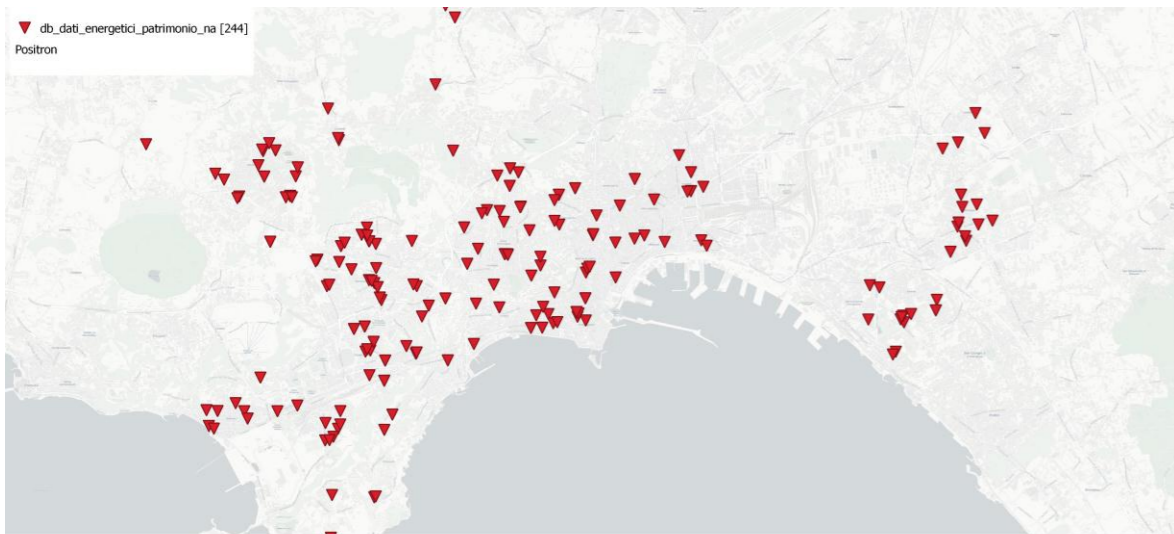
TOOLKIT STRUCTURE: RENOVATION PROCESS (LIVING LAB setting up, KNOWLEDGE FRAMEWORK, ANALYSIS OF CRITICALITIES, PLANNING AND DESIGN, INTERVENTION, POST MANAGEMENT)

Source:
OUTCOME LINK: <https://medbexlive.org/>
PROJECT WEBSITE: <https://www.enicbcm.edu/projects/med-ecosure>

INTEGRATION OF NAPOLI MUNICIPALITY LEGACY TOOLS AND SEACAP4SDG SELECTED TOOLS IN THE NAPOLI SECAP PROCESS

PHASE	ACTIVITY	SUPPORTING TOOLS	SOURCE
ASSESSMENT	<ul style="list-style-type: none"> Energy consumption and GHG emissions 	<ul style="list-style-type: none"> Napoli SECAP GIS + Energy Cadaster IMPULSE (classification parameters) EDUFOOTPRINT (LCA calculator parameters) 	<ul style="list-style-type: none"> Legacy tool SEACAP4SDG tool SEACAP4SDG tool
	<ul style="list-style-type: none"> Climate Risk and vulnerability assessment <ul style="list-style-type: none"> Heat Waves Pluvial Floods Coastal Floods 	<ul style="list-style-type: none"> PLINIVS Hazard/Impact assessment tools 	<ul style="list-style-type: none"> Legacy tool
DESIGN	<ul style="list-style-type: none"> Renovation targets and financial schemes 	<ul style="list-style-type: none"> Napoli SECAP GIS + Energy Cadaster PLINIVS Climate&Energy assessment tool IMPULSE (financial scheme evaluation tool) CESBA MED S (SBT-SNT) PLINIVS Hazard/Impact assessment tools 	<ul style="list-style-type: none"> Legacy tool Legacy tool SEACAP4SDG tool SEACAP4SDG tool Legacy tool
	<ul style="list-style-type: none"> Co-design 	<ul style="list-style-type: none"> MCBLL (Mediterranean Cross-Border Living Lab) EDUFOOTPRINT (engagement of users) 	<ul style="list-style-type: none"> SEACAP4SDG tool SEACAP4SDG tool
IMPLEMENTATION AND MONITORING	<ul style="list-style-type: none"> Consumption monitoring 	<ul style="list-style-type: none"> Napoli SECAP GIS + Energy Cadaster IMPULSE (GIS plugin) PLINIVS Climate&Energy assessment tool PLINIVS Hazard/Impact assessment tools EDUFOOTPRINT (LCA calculator) 	<ul style="list-style-type: none"> Legacy tool SEACAP4SDG tool Legacy tool Legacy tool SEACAP4SDG tool
	<ul style="list-style-type: none"> Behaviour monitoring 	<ul style="list-style-type: none"> EDUFOOTPRINT (engagement of users) 	<ul style="list-style-type: none"> SEACAP4SDG tool

NAPOLI SECAP GIS + ENERGY CADASTER



PERIODO	CONSUMI REALI	CONSUMI SIMULATI
0 GENNAIO	0 9.942	0 16.350624
1 FEBBRAIO	1 8.562	1 12.43272
2 MARZO	2 9.168	2 10.56179
3 APRILE	3 6.803	3 6.500479
4 MAGGIO	4 6.056	4 6.316332
5 GIUGNO	5 5.493	5 7.233612
6 LUGLIO	6 5.451	6 8.102179
7 AGOSTO	7 5.27	7 8.534689
8 SETTEMBRE	8 5.034	8 6.872404
9 OTTOBRE	9 5.719	9 6.08296
10 NOVEMBRE	10 6.479	10 8.564499
11 DICEMBRE	11 8.485	11 13.319538
CONSUMO REALE TOT.	0 82.462	CONSUMO TOT. SIMULATO (Kwh/m2 annuo)
		0 110.887

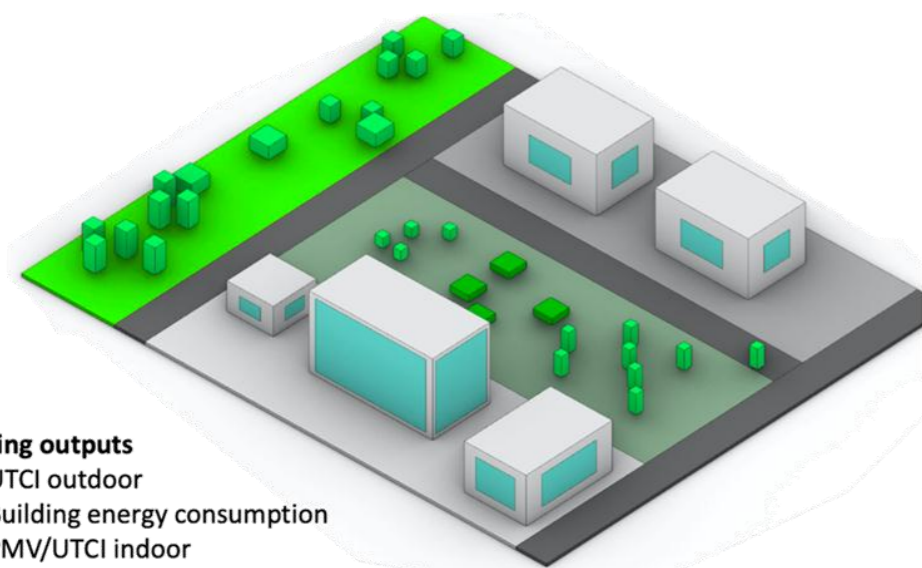
TIPOLOGIA	DETTAGLIO CONSUMI SIMULAZIONE
0 Heating	0 35.848
1 Cooling	1 6.722
2 Interior Lighting	2 25.571
3 Electric Equipment	3 30.903
4 Fcu Fans	4 5.258
5 Pumps	5 3.321
6 Water Systems	6 2.685
7 Heat Rejection	7 0.58

Id	denominazione sito	Indirizzo	anno di costruzione	latitudine	longitudine	consumo_totale_2021 [kwh]	consumo_metano_2021-2022 (mc)
117	Uffici Comunali	Via Commissario Ammaturo (ex Via Botteghele, 627)	NULL	40,83072409352719	14,324621819127554	8703	5900
273_A_acs_B	Centro di prima accoglienza	Via de Blasii, 10, 80147	NULL	40,8496552922453	14,259527813918101	82462	14582
004_A	SCUOLA 54 "C.D. "M. SCHERILLO" SCUOLA DELL'INFANZIA "G.E. NUCCIO" 20 "CIRCOLO COMUNALE (Ex 24 "CIRCOLO)	VIA S. MANNA, 23/25, 80126 tra il 1961 e il 1975	40,84733	14,19913	64699	19971	
004_B	SCUOLA 54 "C.D. "M. SCHERILLO" SCUOLA DELL'INFANZIA "G.E. NUCCIO" 20 "CIRCOLO COMUNALE (Ex 24 "CIRCOLO)	VIA S. MANNA, 23/25, 80126 Dal 1976 in poi	40,84733	14,19913	64699	19971	

gennaio_2021 [kwh]	febbraio_2021 [kwh]	marzo_2021 [kwh]	aprile_2021 [kwh]	maggio_2021 [kwh]	giugno_2021 [kwh]	luglio_2021 [kwh]	agosto_2021 [kwh]	settembre_2021 [kwh]	ottobre_2021 [kwh]	novembre_2021 [kwh]	dicembre_2021 [kwh]
940	809	744	572	522	561	823	990	717	543	587	895
9942	8562	9168	6803	6056	5493	5451	5270	5034	5719	6479	8485
8333	7752	5714	5398	5540	4153	2386	2247	3765	6511	4962	7938
8333	7752	5714	5398	5540	4153	2386	2247	3765	6511	4962	7938
7779	6697	5956	6111	3964	4311	5165	4498	4189	5178	5900	8043

ENERGY + URBAN CLIMATE SIMULATOR (building and neighbourhood scale)

CONFIGURATION EXAMPLE



BASIC ELEMENTS AND PRESET VARIABLES

TREES

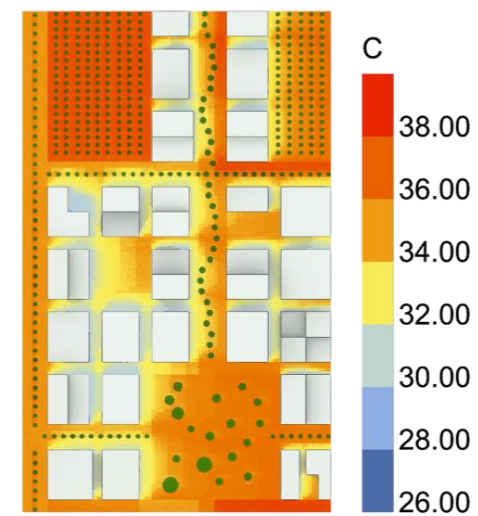
- Dimensions (height, canopy area, etc.)
- Thermal properties (emissivity, Albedo, etc.)
- Co - Benefits
- ...

BUILDING

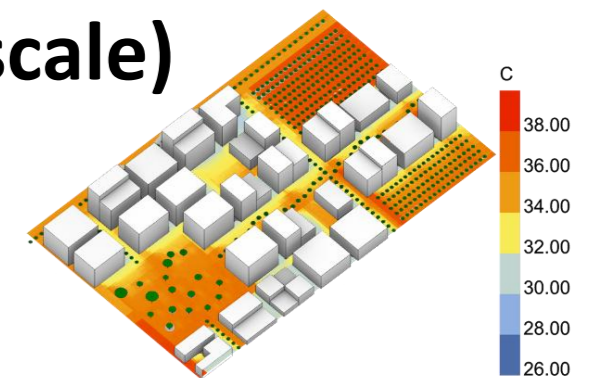
- Typology (use category, e.g. residential, office, etc.)
- Dimensions (footprint, n° of storeys, etc.)
- Envelope data (thermal data, surface properties, etc.)
- Roof data (thermal data, surface properties, etc.)
- Co - Benefits
- ...

GROUND

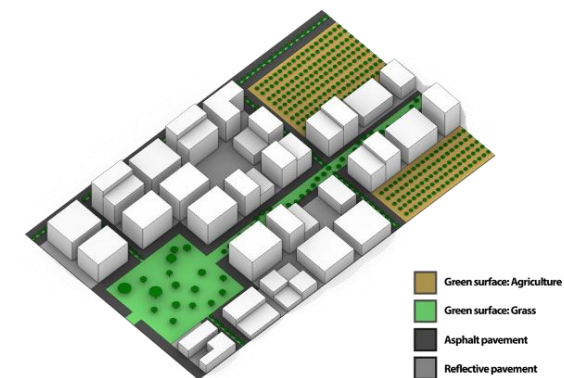
- Land use type (paved/green with sub-categories, e.g. asphalt, reflective surface, bioswale, agriculture, etc.)
- Dimensions
- Thermal properties (emissivity, albedo, etc.)
- Co - Benefits
- ...



Universal Thermal Climate Index 8/10 to 8/10 between 12 and 17 @1



Universal Thermal Climate Index 8/10 to 8/10 between 12 and 17 @1



Modelling outputs

- UTCI outdoor
- Building energy consumption
- PMV/UTCI indoor
- Building materials carbon footprint
- Carbon storage potential

INTEGRATED OUTPUT: KPI&SCENARIO-BASED SUPPORT TO IMPLEMENTATION

Adaptation potential of urban projects

- General guidelines
- Buildings and infrastructure
- Mobility and transport
- Public green areas

Development stage

- Ongoing
- Planned/in planning phase
- In final planning/construction phase
- Completed

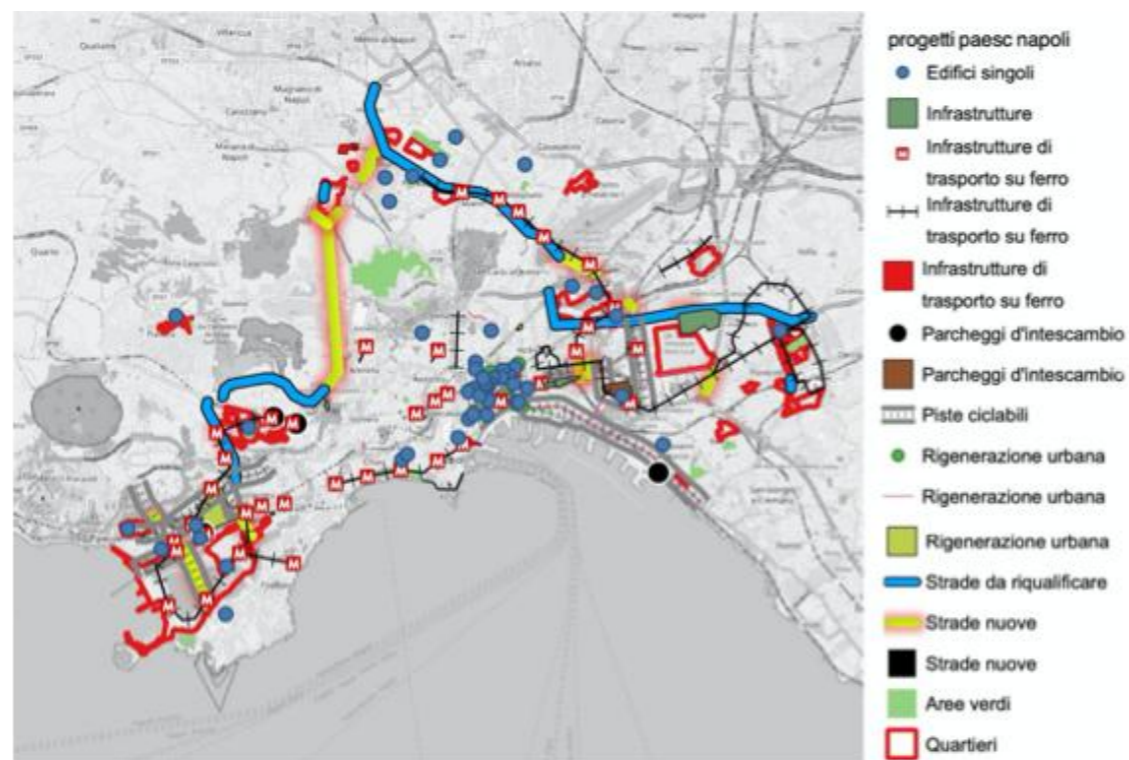


Figura 1: Classificazione dei progetti e interventi in corso nel Comune di Napoli (fonte: PLINIVS-LUPT)

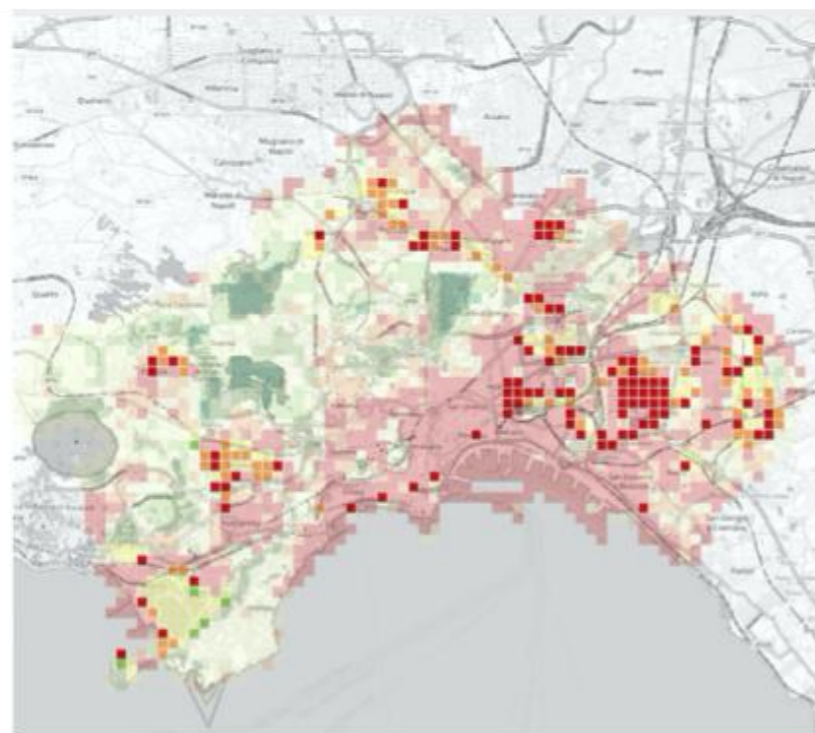


Figura 1: Evidenziazione delle celle interessate da interventi in corso o programmati, relativamente ai valori calcolati di Temperatura Media Radiante (Tmrt) (fonte: PLINIVS-LUPT)

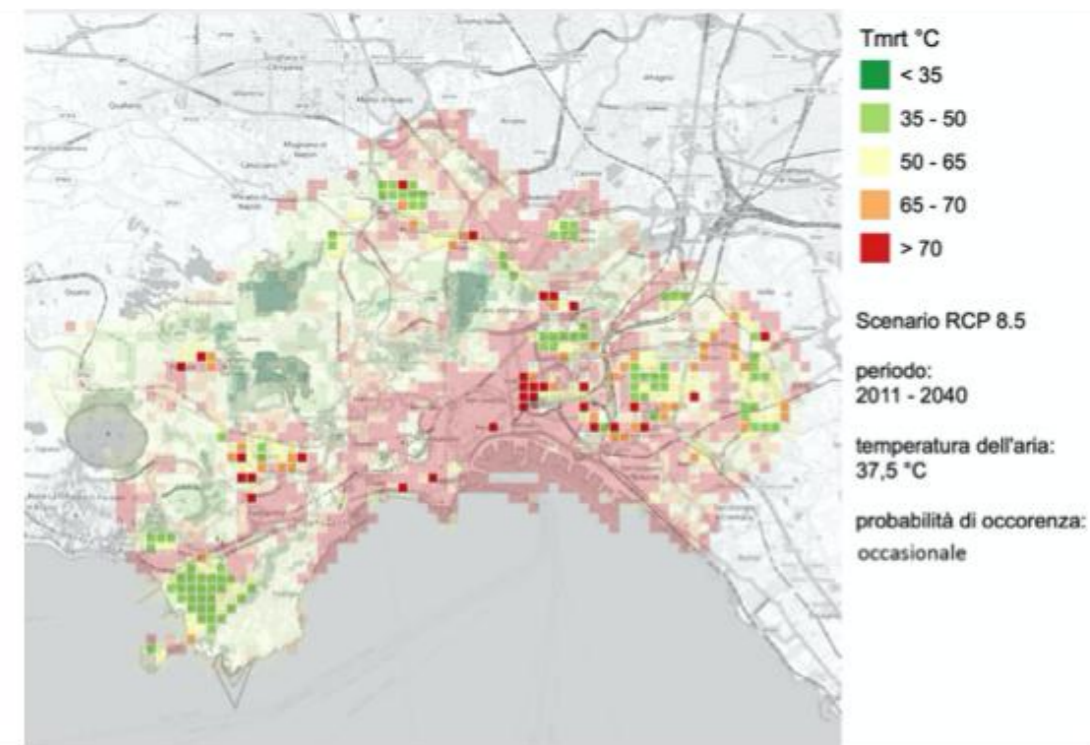
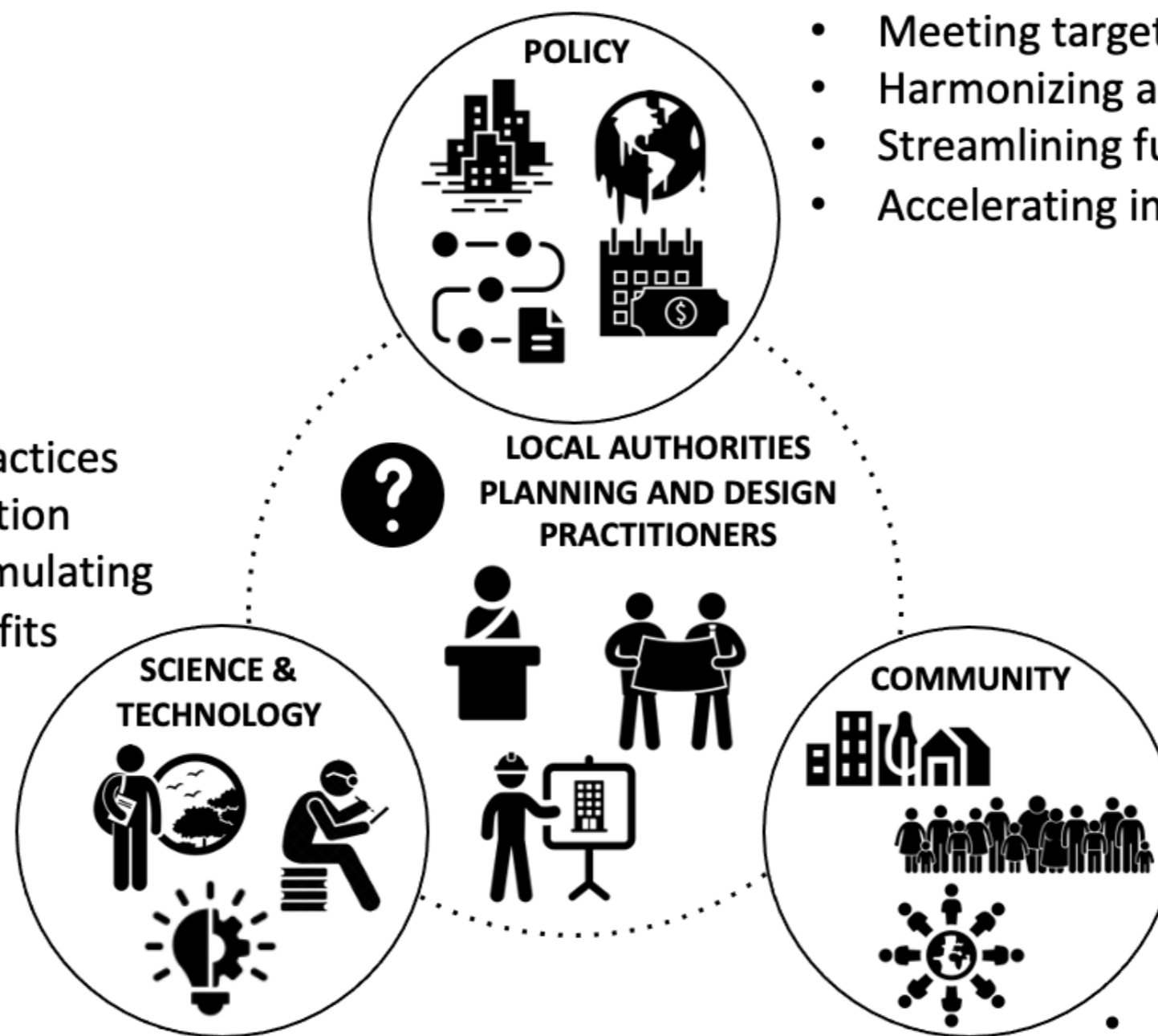


Figura 1: Analisi dei progetti e interventi in corso con indicazione del potenziale miglioramento delle condizioni di isola di calore, indicatore Temperatura Media Radiante (Tmrt) (fonte: PLINIVS-LUPT)

- Adopting best practices
- Exploiting innovation
- Modelling and simulating
- Quantifying benefits



- Meeting targets
- Harmonizing actions
- Streamlining funding
- Accelerating implementation

- Fostering equity
- Co-producing knowledge
- Co-designing
- Co-implementing
- Co-evaluating



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