A BrainBox -Tool
for Smart Sustainable Planning

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Public Issue-based (Identify Actors)

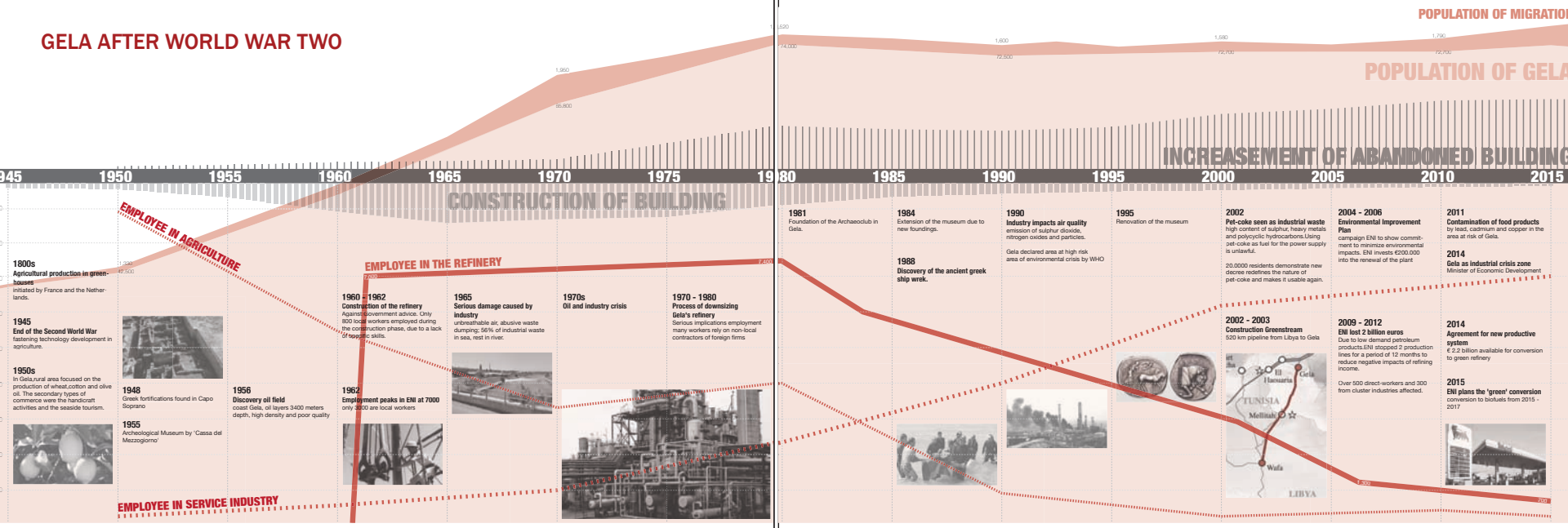
Co-Design Thinking (Action)

Multiple Stakeholders (Actors) Partnerships

"Achieving the ambitious targets of the 2030 Agenda requires a …global partnership that brings together Governments, civil society, the private sector…mobilizes all available resources"

Public -Issue- based

Gela, Sicily case (MA Educational Program 2016)



Issue- based Actor Mapping

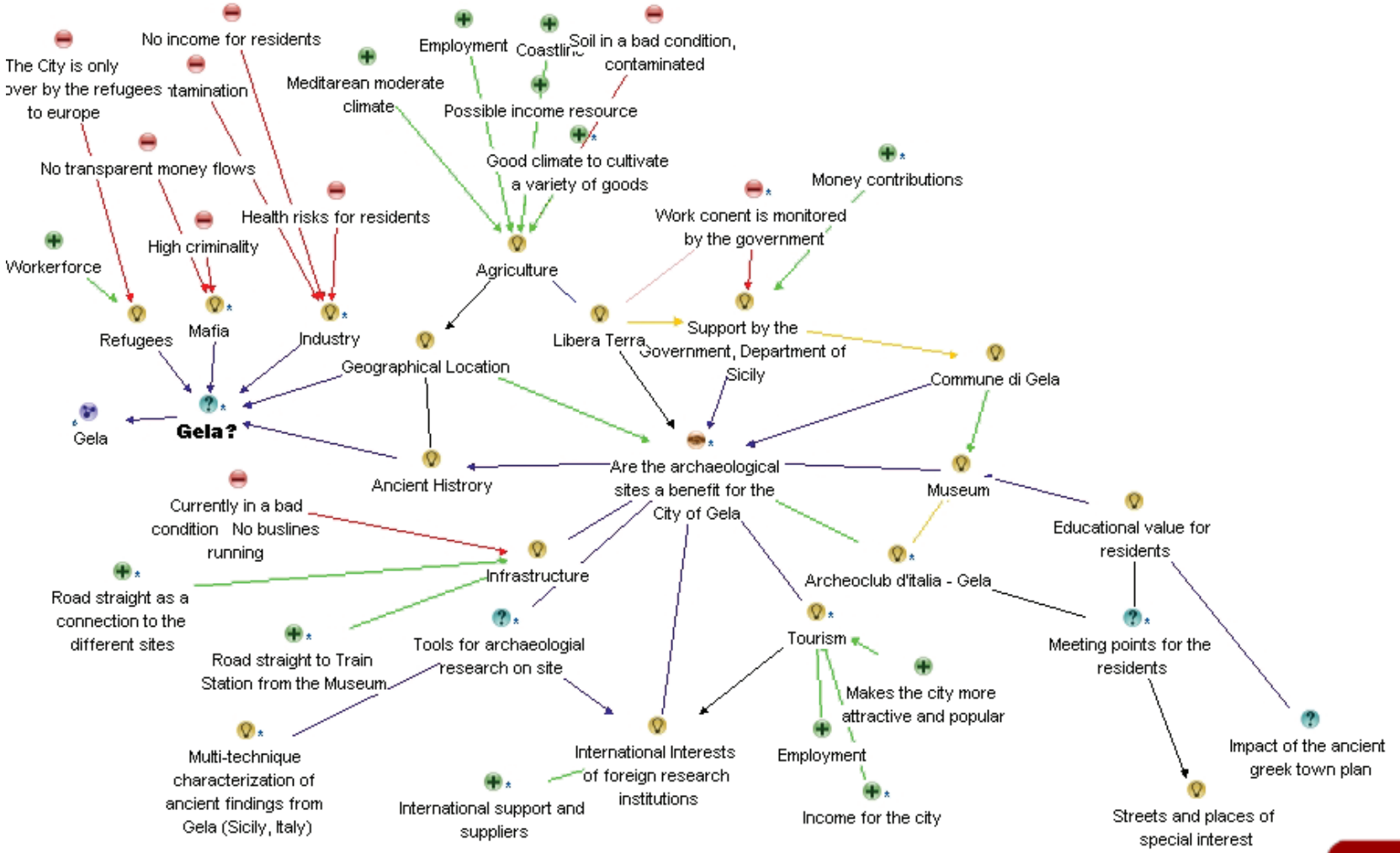
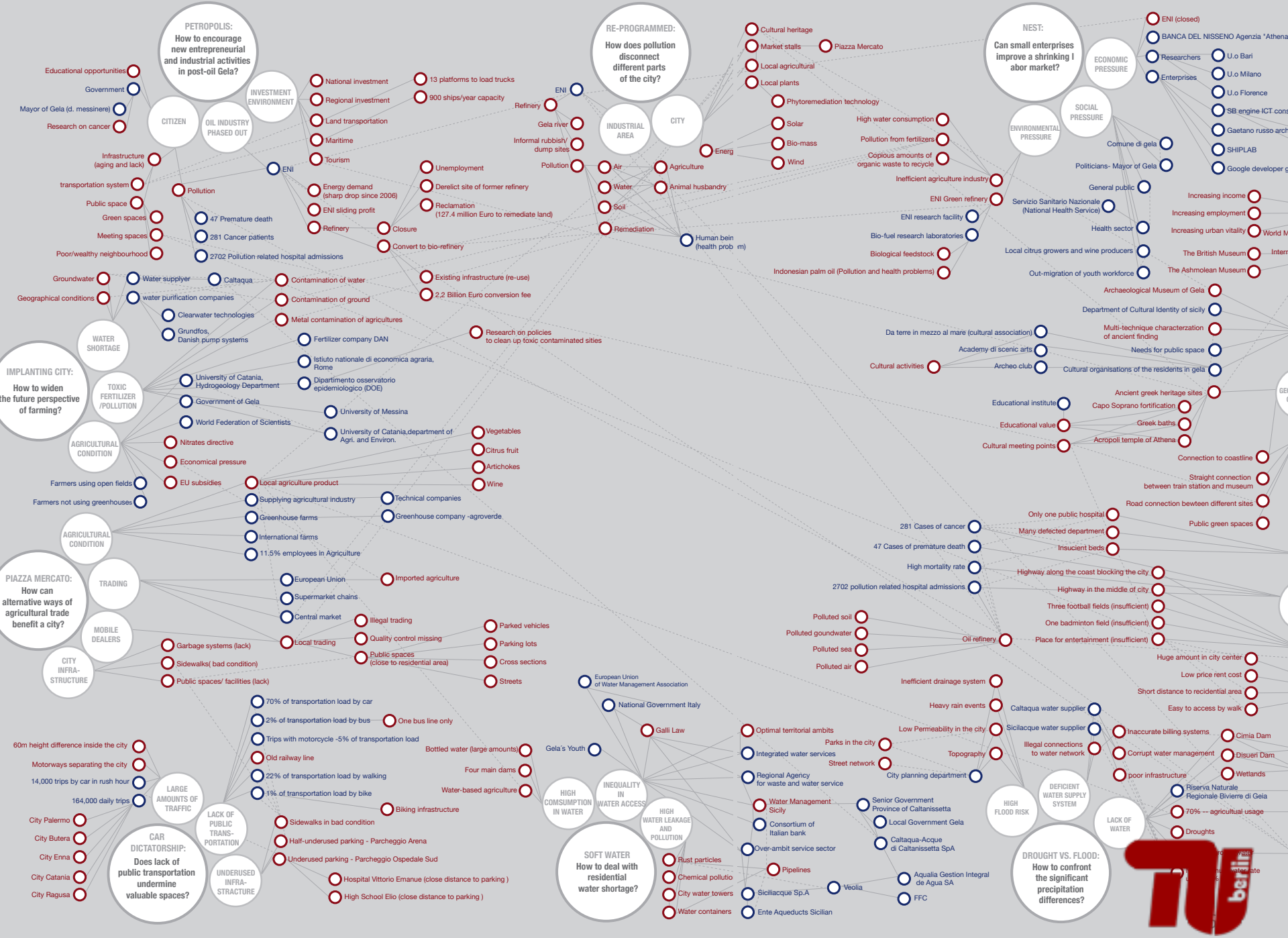
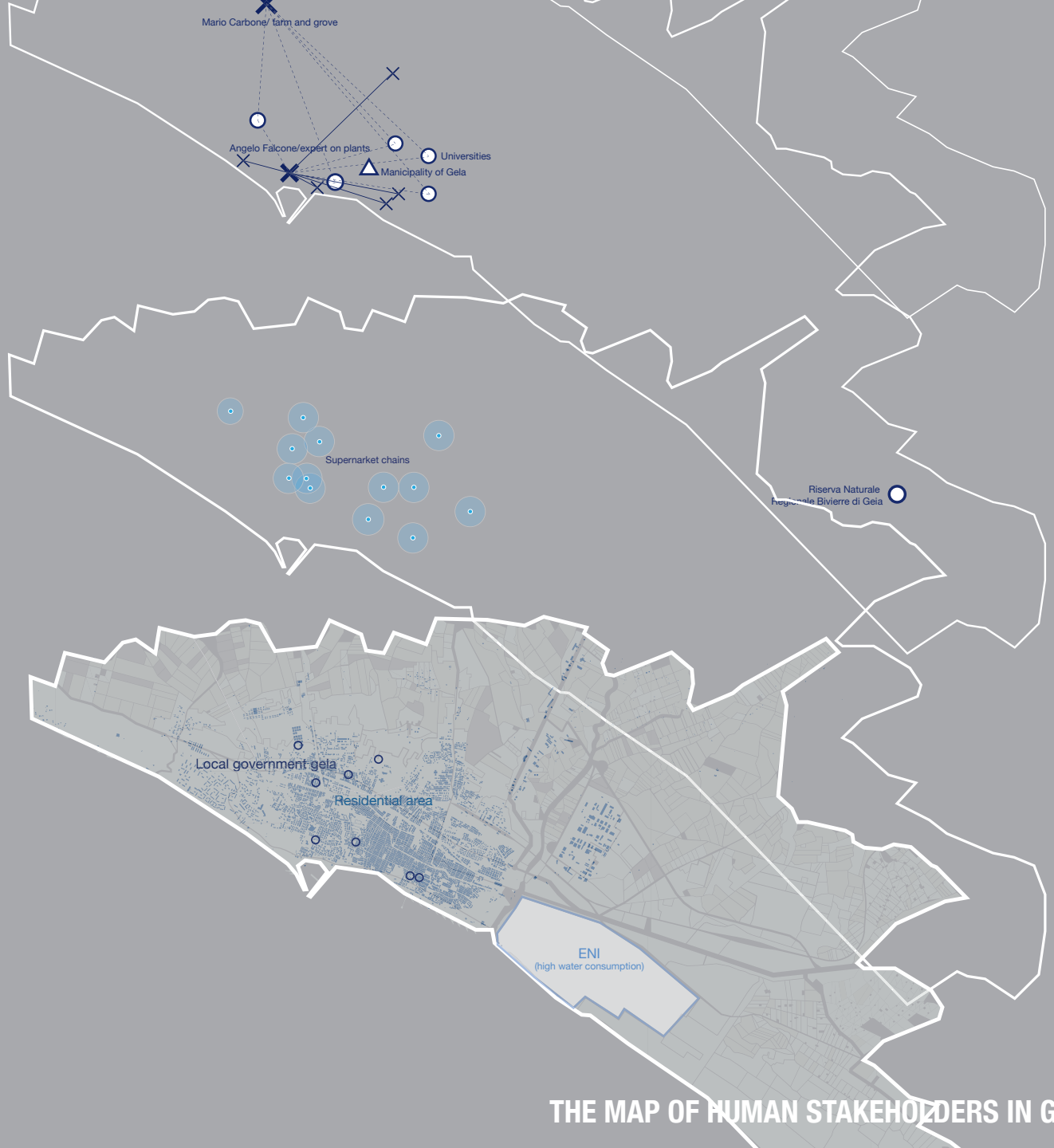


Figure 1. Discourse Mapping on “Are Archeological Sites a Benefit for the City Of Gela?”, Jana Eppler and Celine Emilia Menjaresrom


PETROPOLIS:
How to encourage new entrepreneurial and industrial activities in post-oil Gela?
CITIZEN
Educational opportunities
Government
Mayor of Gela (d. messinere)
Research on cancer
OIL INDUSTRY PHASED OUT
Infrastructure (aging and lack)
transportation system
Public space
Green spaces
Meeting spaces
Poor/wealthy neighbourhood
INVESTMENT ENVIRONMENT
National investment
Regional investment
Land transportation
Maritime
Tourism
13 platforms to load trucks
900 ships/year capacity
ENI
Pollution
47 Premature death
281 Cancer patients
2702 Pollution related hospital admissions
Energy demand (sharp drop since 2006)
ENI sliding profit
Refinery
Unemployment
Derelict site of former refinery
Reclamation (127.4 million Euro to remediate land)
Closure
Convert to bio-refinery
Existing infrastructure (re-use)
2,2 Billion Euro conversion fee
RE-PROGRAMMED:
How does pollution disconnect different parts of the city?
INDUSTRIAL AREA
ENI
Refinery
Gela river
Informal rubbish/ dump sites
Pollution
Air
Water
Soil
Remediation
CITY
Agriculture
Animal husbandry
Human bein (health prob m)
Energ
Cultural heritage
Market stalls
Piazza Mercato
Local agricultural
Local plants
Phytoremediation technology
Solar
Bio-mass
Wind
NEST:
Can small enterprises improve a shrinking l abor market?
ECONOMIC PRESSURE
ENI (closed)
BANCA DEL NISSENO Agenzia "Athena
Researchers
Enterprises
U.o Bari
U.o Milano
U.o Florence
SB engine ICT cons
Gaetano russo arch
SHIPLAB
Google developer g
SOCIAL PRESSURE
Comune di gela
Politicians- Mayor of Gela
General public
Servizio Sanitario Nazionale (National Health Service)
Health sector
Local citrus growers and wine producers
Out-migration of youth workforce
ENVIRONMENTAL PRESSURE
High water consumption
Pollution from fertilizers
Copious amounts of organic waste to recycle
Inefficient agriculture industry
ENI Green refinery
ENI research facility
Bio-fuel research laboratories
Biological feedstock
Indonesian palm oil (Pollution and health problems)
Increasing income
Increasing employment
Increasing urban vitality
World M
The British Museum
The Ashmolean Museum
Archaeological Museum of Gela
Department of Cultural Identity of sicily
Multi-technique characterization of ancient finding
Needs for public space
Cultural organisations of the residents in gela
Da terre in mezzo al mare (cultural association)
Academy di scenic arts
Archeo club
Cultural activities
Ancient greek heritage sites
Capo Soprano fortification
Greek baths
Acropoli temple of Athena
Educational institute
Educational value
Cultural meeting points
Connection to coastline
Straight connection between train station and museum
Road connection bewteen different sites
Public green spaces
Only one public hospital
Many defected department
Insucient beds
281 Cases of cancer
47 Cases of premature death
High mortality rate
2702 pollution related hospital admissions
Highway along the coast blocking the city
Highway in the middle of city
Three football fields (insufficient)
One badminton field (insufficient)
Place for entertainment (insufficient)
Oil refinery
Polluted soil
Polluted goundwater
Polluted sea
Polluted air
Huge amount in city center
Low price rent cost
Short distance to recidential area
Easy to access by walk
IMPLANTING CITY:
How to widen the future perspective of farming?
WATER SHORTAGE
Groundwater
Geographical conditions
Water supplyer
water purification companies
Clearwater technologies
Grundfos, Danish pump systems
Caltaqua
Contamination of water
Contamination of ground
Metal contamination of agricultures
TOXIC FERTILIZER /POLLUTION
University of Catania, Hydrogeology Department
Government of Gela
World Federation of Scientists
Istiuto nationale di economica agraria, Rome
Dipartimento osservatorio epidemiologico (DOE)
University of Messina
University of Catania,department of Agri. and Environ.
Fertilizer company DAN
Research on policies to clean up toxic contaminated sities
AGRICULTURAL CONDITION
Nitrates directive
Economical pressure
EU subsidies
Farmers using open fields
Farmers not using greenhouses
Local agriculture product
Supplying agricultural industry
Greenhouse farms
International farms
11.5% employees in Agriculture
Technical companies
Greenhouse company -agroverde
Vegetables
Citrus fruit
Artichokes
Wine
AGRICULTURAL CONDITION
PIAZZA MERCATO:
How can alternative ways of agricultural trade benefit a city?
TRADING
European Union
Supermarket chains
Central market
Local trading
Imported agriculture
MOBILE DEALERS
Illegal trading
Quality control missing
Public spaces (close to residential area)
Parked vehicles
Parking lots
Cross sections
Streets
CITY INFRA-STRUCTURE
Garbage systems (lack)
Sidewalks(bad condition)
Public spaces/ facilities (lack)
European Union of Water Management Association
National Government Italy
Galli Law
Gela's Youth
Bottled water (large amounts)
Four main dams
Water-based agriculture
HIGH COMSUMPTION IN WATER
INEQUALITY IN WATER ACCESS
HIGH WATER LEAKAGE AND POLLUTION
Optimal territorial ambits
Integrated water services
Regional Agency for waste and water service
Water Management Sicily
Consortium of Italian bank
Over-ambit service sector
Pipelines
Siciliacque Sp.A
Ente Aqueducts Sicilian
Veolia
Senior Government Province of Caltanissetta
Local Government Gela
Caltaqua-Acque di Caltanissetta SpA
Aqualia Gestion Integral de Agua SA
FFC
Rust particles
Chemical pollutio
City water towers
Water containers
SOFT WATER
How to deal with residential water shortage?
Inefficient drainage system
Heavy rain events
Low Permeability in the city
Topography
Illegal connections to water network
Parks in the city
Street network
City planning department
Caltaqua water supplier
Sicilacque water supplier
HIGH FLOOD RISK
DEFICIENT WATER SUPPLY SYSTEM
Inaccurate billing systems
Corrupt water management
poor infrastructure
Cimia Dam
Disueri Dam
Wetlands
LACK OF WATER
Riserva Naturale Regionale Bivierre di Gela
70% -- agricultual usage
Droughts
DROUGHT VS. FLOOD:
How to confront the significant precipitation differences?
70% of transportation load by car
2% of transportation load by bus
Trips with motorcycle -5% of transportation load
Old railway line
22% of transportation load by walking
1% of transportation load by bike
One bus line only
Biking infrastructure
Sidewalks in bad condition
Half-underused parking - Parcheggio Arena
Underused parking - Parcheggio Ospedale Sud
Hospital Vittorio Emanue (close distance to parking)
High School Elio (close distance to parking)
LACK OF PUBLIC TRANS-PORTATION
UNDERUSED INFRA-STRACTURE
60m height difference inside the city
Motorways separating the city
14,000 trips by car in rush hour
164,000 daily trips
LARGE AMOUNTS OF TRAFFIC
City Palermo
City Butera
City Enna
City Catania
City Ragusa
CAR DICTATORSHIP:
Does lack of public transportation undermine valuable spaces?



THE MAP OF HUMAN STAKEHOLDERS IN GELA


Because you have to fight with all the people that,
once you started something, they want it.


The 34 students and specialists
came to Gela and stayed here for ten days,


The aim is to change the image of the city,
starting from entrepreneurial activities,


and many things to reflect upon,
to develop with you and with those like you,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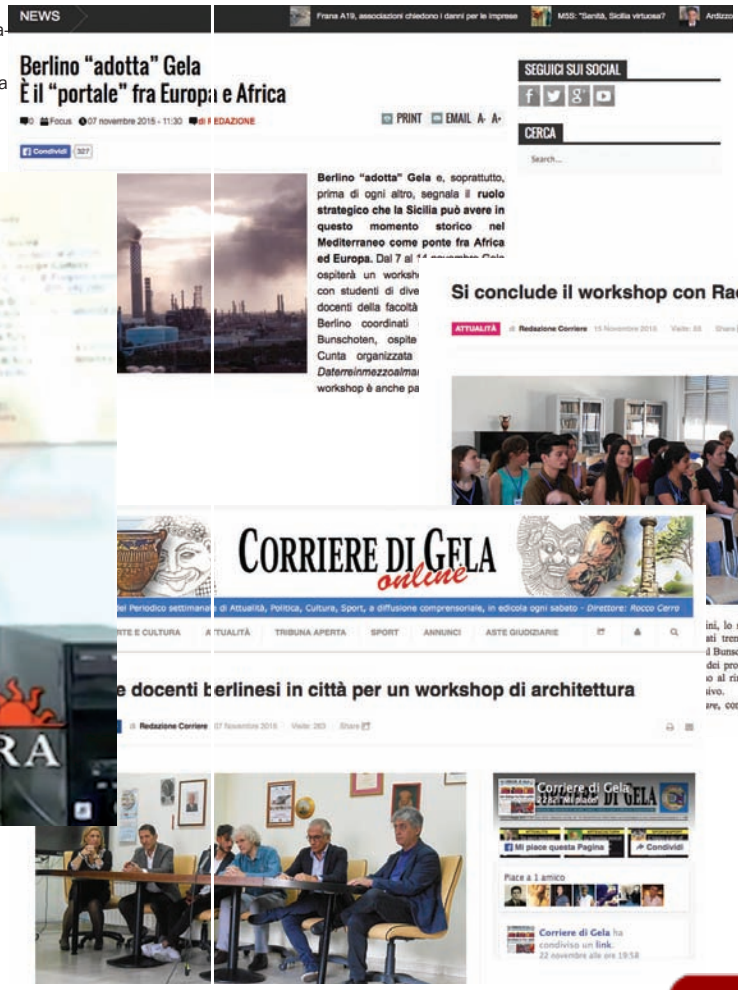
TOOLBOX

MEDIA COVERAGE

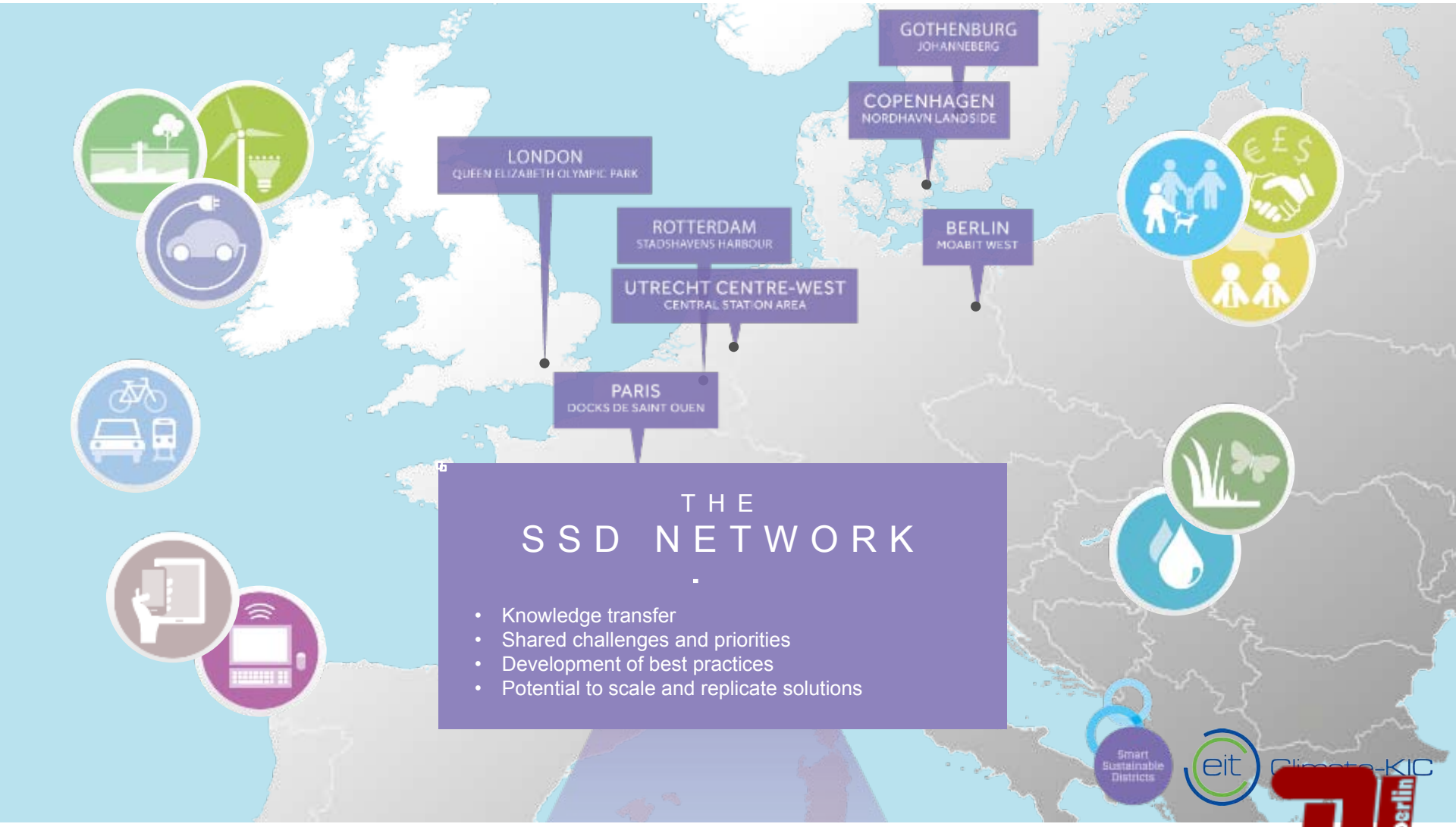
VIDEO DOCUMENTATION-BRAIN BOX

Marketing was an essential component in our action based research. Media operation allowed our activity to gain more visibility and credibility. It gave our program leverage. During the research process we created numbers of media statements, a documentary, and interviewed by newspaper and local TV News.



Smart Sustainable District

(Moabit, Berlin Research Program 2013-)



SMART SUSTAINABLE DISRTICTS (SSD)

MOABIT WORKSHOP

SCENARIO GAMES

Theme I: Sustainable Water Management

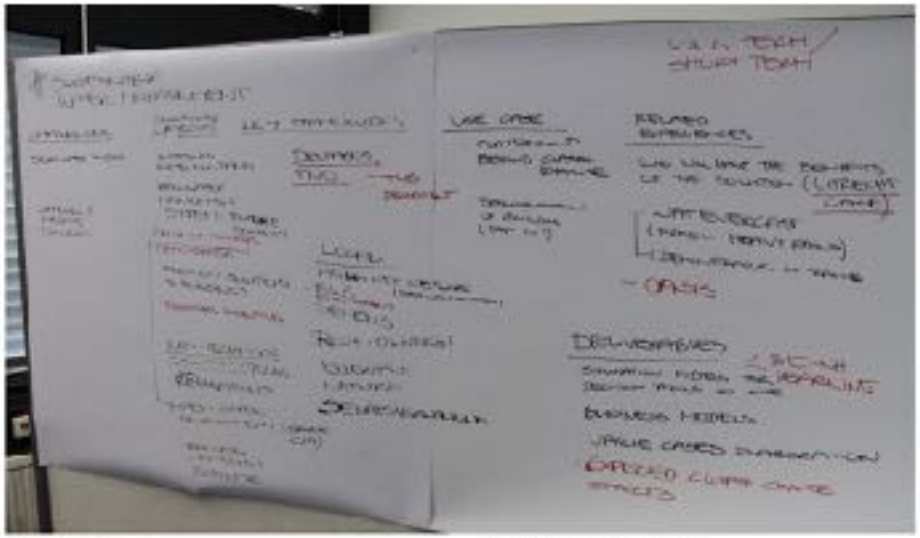
Opportunity #1: Sustainable Water Management

Theme II: Energy and Heat Efficient

Opportunity #2: Energy and Heat Efficiency Accelerator

Theme III: Low Carbon Transportation

Opportunity #3: Low Carbon Mobility



Challenges
- storm water flooding
- different private owners

Solutions/objects
- installing retention tanks
- rainwater management system – future strategy
- proof of concepts
- demonstrator
- add-on solutions to buildings
- economical incentives
- non-technical solutions/tools
- legal regulations
- open space development (sponge city)
- rainwater management software

Key Stakeholders
- Deltares
- TNO
- TUB Departement Urban Hydrology

Local Stakeholders
- Aqua net network (Smart City commitment)
- BWB
- SIEMENS
- roof owners
- enterprise network
- senatsverwaltung

Use Case
- playground behind classic remise
- transformation of building itap in?)

Related experiences
- who will have the benefits of the solution (Utrecht case)
- watenemast (predict heavy rains)
-sustainable water management concept by district Mitte

demonstrator in France
- OASIS

Deliverables + benchlearning
- simulation models for decision making on site
- business models
- value cases elaboration
- expected climate change effects

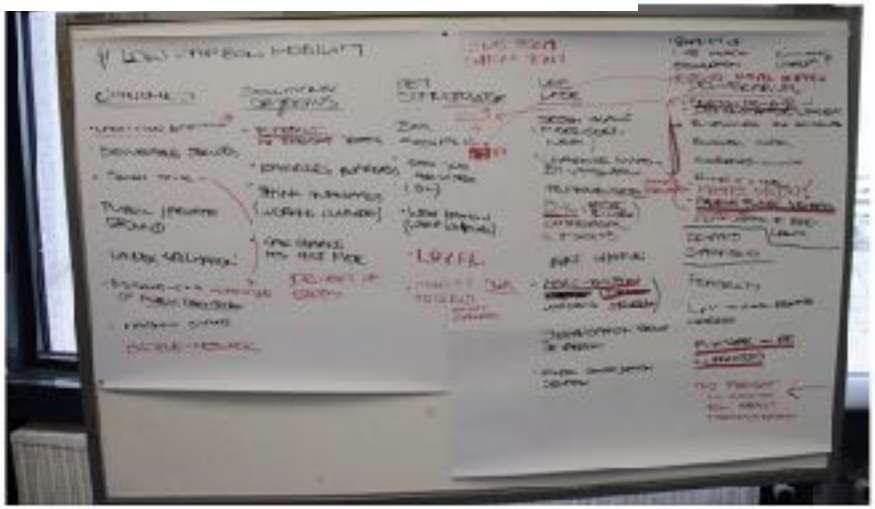
Challenges
- understanding social and technical barriers
- identity obstacles for implementations
- not another portal but rather a collaboration with one company to achieve
- identify the largest emitters
- benchmarking
- awareness
- data problem!
- building identity and community
- basic timeframe
- low-hanging fruits (the 20% leaders go forward and the other 80% gonna follow)
- co working (consulting) > financing (models)
- district heating status quo (connected to Mobility – Related Experiances – TNO)
  - 1/3 district heating
  - 1/3 gas
  - 1/3 oil

Solutions/objectives
- tool for potential refurbishment
- finance models
- contract service
- portfolio of potential solutions
- supply vs. demand improvement smart grid?
- side-effects of energy saving: LED-lights for more safety
- game to save energy (for citizens)?
- LOWEXTRA: coordinating supply side + optimizing
- industrial symbioses

Key Stakeholders
- cradle logistics
- vattenfall + Syntec
- LOWEXTRA? -> looking for projects
- TNO (1)
- Chalmers
  ICL (2)
- Netzwerk E (Vorschlag von Hr. Homann, SenStadt)
- Utrecht University (3)
- TU Delft/ Reading University Tim Dixon
- Missing:

Use-case
- Rotterdam
- "Renovation stories" (from technological solutions to matchmaking/ destressing) as neutral partner
- pilot project (sustainum, Vattenfall)
  - for energy monitoring (awareness creation)
  - but no budget for instruments
- community collectives:
  - buying electricity collectively
- free energy scans?
- best-practice example cradle
- market study Berlin: Klimaneutral 2050
  - option: by district heating
  - transition to Siemens
- Wüstenrot: Lowex
  - change of the complete housing infrastructure
- Schwedt: closed heating network
- Technikerei Columbiadamm artis Workshop

Deliverables + Benchlearning
analysis of existing stock (connected related experience via N-Demol
- right communication? feasibility study on Extralow
- why are people using it?
  - activity modelling
- Innovation system scan
Related experience
- Utrecht: Atos integration
- Horizon 2020
- Fuster-Reg (TNO) – collaborative analysis for improvement of Energy efficiency in urban regeneration areas
- locally produced energy
Long term/short term:
working session to clarify priorities



Challenges
- last-mile logistics
- deliverable services
- public/private ground
- under-utilization
- missing link of public transport especially for short trips of commuters
  parking space
- bicycle network

Solutions/Objectives
- Emobility of freight traffic
- barriers awareness
- think integrated (working culture)
- carsharing as test ride
- delivery of goods

Key Stakeholders
- BSR
- SIEMENS
- ARIA (connection to Deliverable - measure local impact)
- IGL (connected to Challenge Last Mile Logistics)
  service providers (BVW for drive now)
- Westhafen (logistical hubs)
- local
- mobility TUB to grid EUREF Campus
- ZTE (TU Berlin)

Use case
- green island (Mierendorffinsel)
- charging system by Vattenfall
- Helmholtzviertel
- DHI (Smart Users)
- Commercial E-Fleets
- Bike Sharing
  Zero Emission logistics (Green Deal)
- Digitalisation group of Berlin
- London consolidation centre

Deliverables (here mostly as scenario development) + Bench-learning
- study/analysis on demands (as biggest impact of this opportunity?)

- Demonstrator/concept
- e-vehicles for companies
- business model
- synergies concept
- funding model
- Master studio
- probing future scenarios + simulation tool
- demonstrator of bike lanes

Related Experiences
- feasibility
- link to real-estate market
- purpose to be understood
- TNC: freight as storage for locally produced energy (?)
  (connected to Energy - Challenges - District Status Quo)

Long term/short term
- "quality of life' impact simulation

Design Thinking Workshop

Final draft December 2014

Integration Workflow

part A

District Introduction

15 minutes

part B

Defining District Challenge

20 minutes

part C

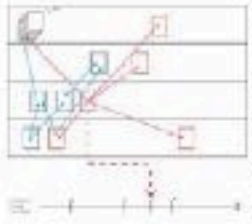
SSD Resource Filtering

40 minutes

part D

Form Resource Clusters

25 minutes

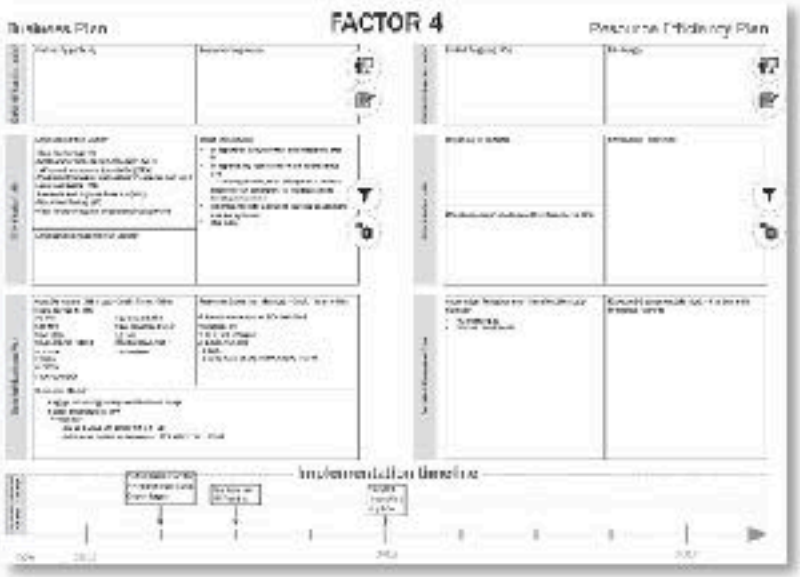


part E

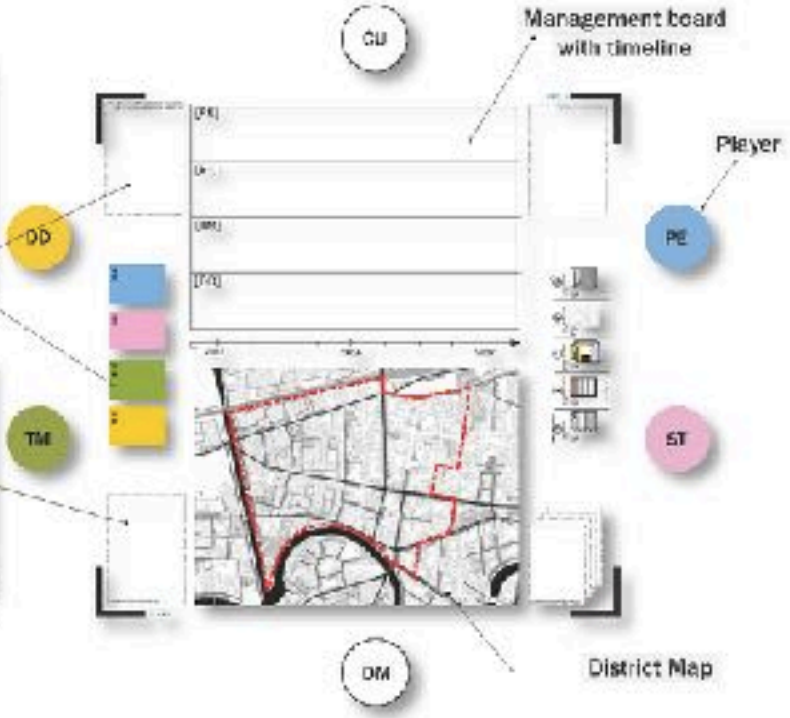
Implementation Plan

30 minutes

Integration Materials



Implementation Plans



PE = Physical Elements (WP 1)
S = Socio-technical (WP 2)
CU = Curator (WP3)

TM = Tools/Models (WP 3)
DD = Data/Digital (WP4)
DM = District Account Manager (WP6)

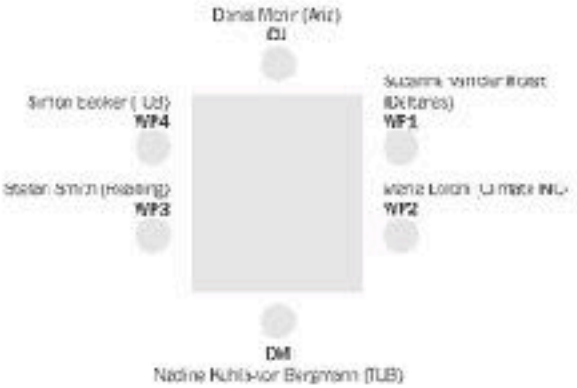
Project Moabit Day 1

Group discussion

The challenge discussed at the first workshop day for Moabit primarily addressed an existing established environment with stakeholder networks, urban development plans, and the district authority contacts. It is related to sustainable water management and there is a tender currently being launched in the district on how to deal with surface water issues, rainfall and floods.

An opportunity to assist the district was seen in optimising space use and water storage on site, developing in phases: Phase 1: Gathering data and any existing sources of info; Umwelt atlas / 3D city model; Phase 2: Improve monitoring data found within the district including participatory monitoring. Phase 3: Lead to further aspects of modelling and feedback. Consider urban heat island effect and water runoff.

(Phase 1-3:) an offshoot of all of these phases will need to be stakeholder analysis covering adaptation issues, engagement and business models (districts are currently charged per square meter of covered non permeable land areas). There seems to be an opportunity to illustrate various scenarios. New opportunities could present themselves from the tender being launched, so this is worth engaging with.



Resource Cluster

- C60 Urban energy and water balance (University of Reading)
- C81 Virtual 3D City Model of Berlin (TU Munich)
- C79 LondonMet and Climate Data (University of Reading)
- C42 Data & Innovation System Scale (Utrecht University)
- C35 Stakeholderanalysis (University of Reading)
- C23 URBAN FORUMS (FIWA technologies)

Impact

- Flood damage reduction
- Reduction of water usage
- Sealed land area decrease
- Enterprise: "rainfall fee" reduction : 50% of the total savings available for the new product –> imposed on every sealed m^2, that creates a runoff in rainfall water systems
- Having measurable impacts in social terms
- Looking at the potential 'multifunctional spaces' (e.g. green park and green roofs used for rainwater storage and amenities)
- Looking at more complex multi-functional spaces (e.g. parking lots), improving the relationship between the housing and industrial areas

Project Moabit Day 2

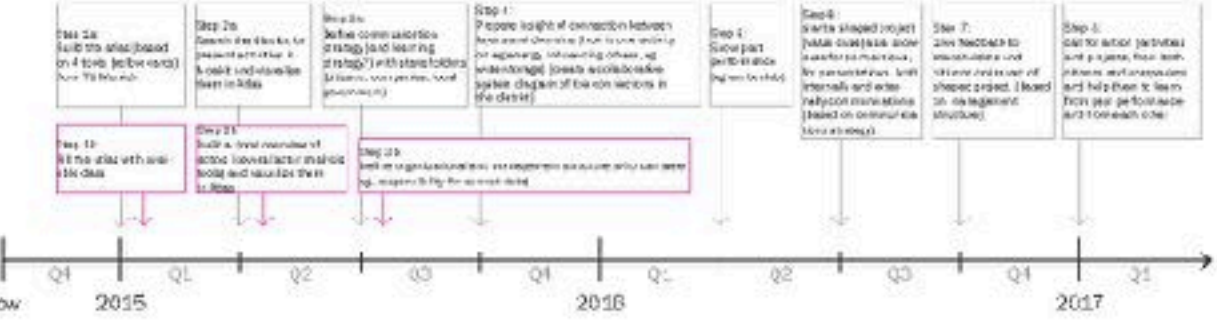
District approach

Moabit had a total of five predefined opportunities including Sustainable water management, Mobility, Living Smart Green Tech, Built Environment retrofit, and Smart Citizen Network. During the two workshop days, a challenge was developed addressing Living Smart Green Tech. The integration process crystallised into proposing a monitoring platform called 'Atlas', which would record future activities on the urban scale.

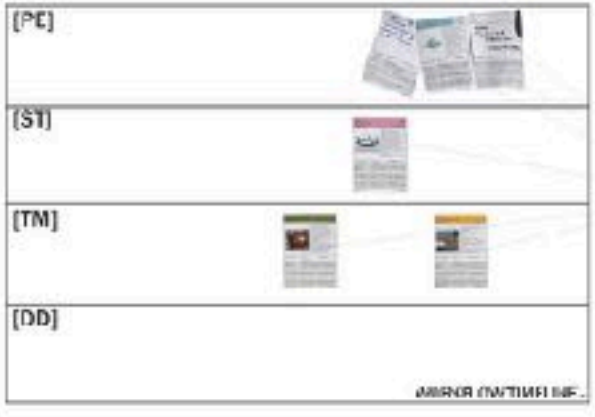
Impact

- Mini SSD project to induce any resources that may be of benefit to the district
- The Atlas would be open for not only companies but individuals, charities, and community groups
- Useful to track hard (city planning, physical make up) and soft (community networks, shared data) infrastructures to highlight possible relationships
- Useful feedback loop with actual residents to potentially minimise requirements placed on hard infrastructure by using soft infrastructure and data
- Local knowledge of these infrastructure issues helps reducing demands, capital investments and thus, achieve Factor 4

Implementation Timeline



Urban Gallery Board



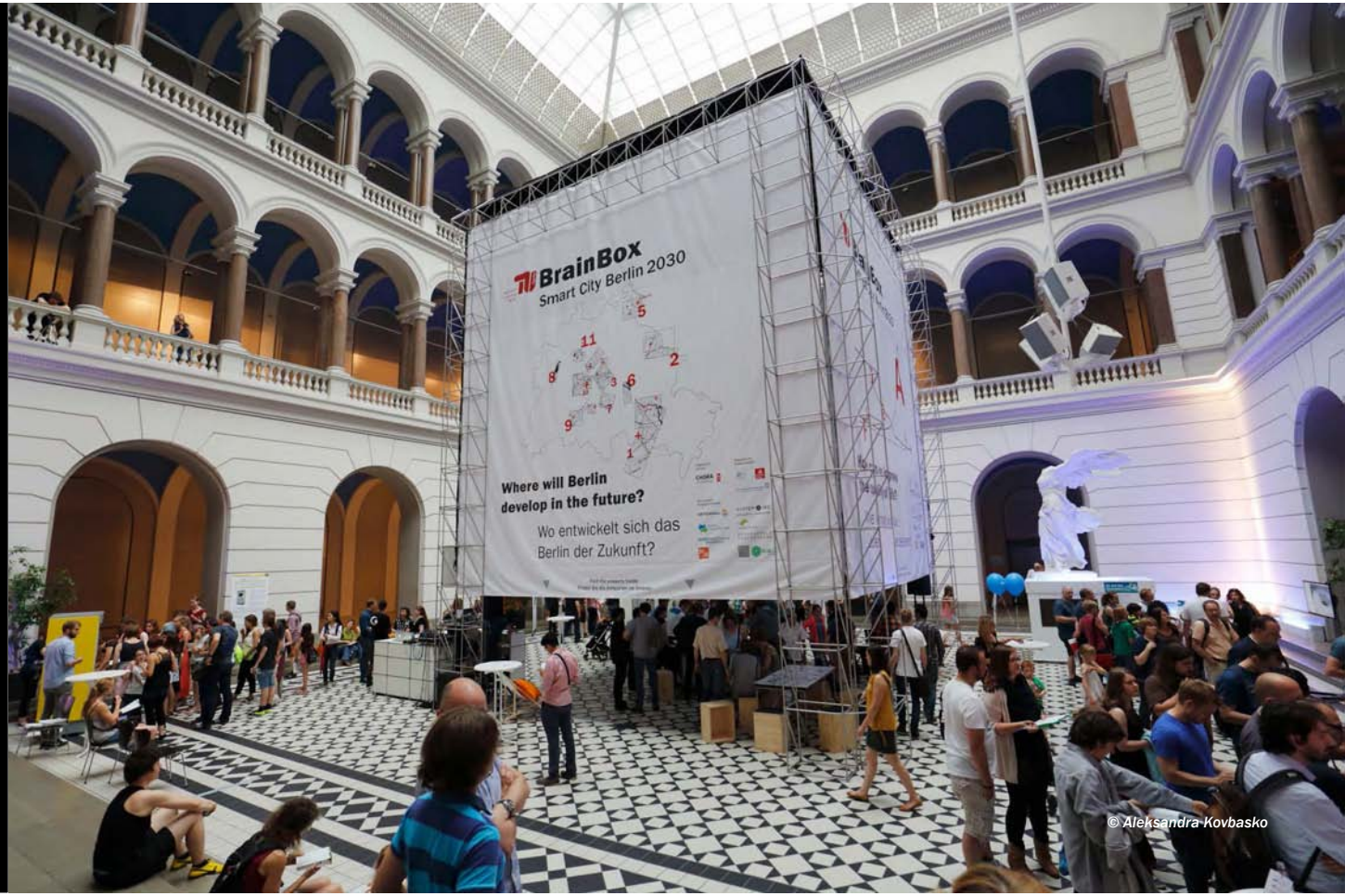
Resource Cluster

- 087 3D GeodataWeb Client (TU Munich)
- 083 3D City Database (3DCityDB) (TU Munich)
- 086 3D City DB Importer/Exporter (TU Munich)
- 084 Virtual 3D City Model of Berlin (TU Munich)
- 068 Energetic Building Evaluation (TU Munich)
- 052 CloudCities SmarterBetterCities All)
- 067 Urban Gallery (TU Berlin)
- 064 Footprint Assessment (TNO)
- 033 Geldermalt Analysis (University of Reading)
- 036 Actor Interaction Analysis (TNO)
- 028 ReBa Model (Dutch res University)
- 094 Participatory Monitoring (Dutch res)
- 035 Stakeholder Analysis (University of Reading)
- 012 Mini Sensor Network (University of Reading)

District Map

Interactive Planning Table

FÜR
METROPOLITAN SOLUTIONS UND
LANGE NACHT DER WISSENSCHAFTEN
2016



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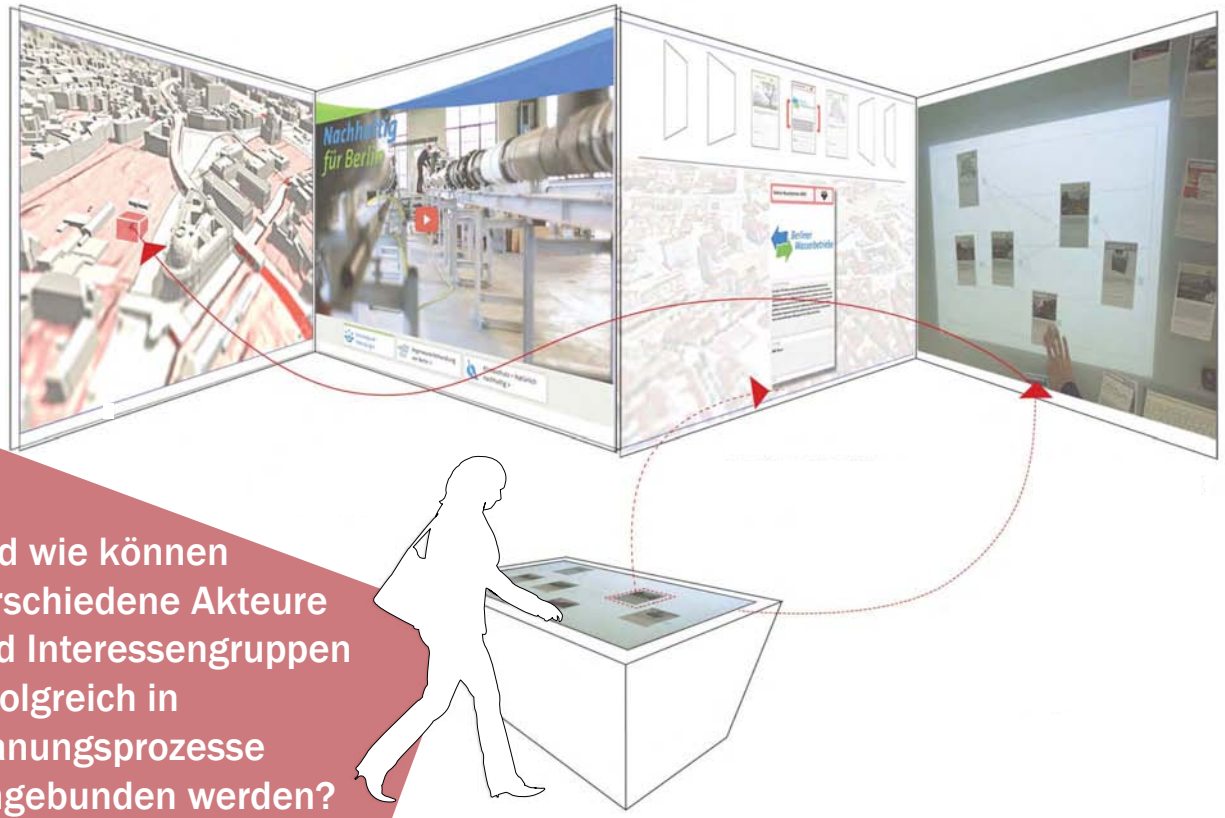
GESTALTEN SIE DIE STADT VON MORGEN ALS PARTNER DER BRAINBOX

Wie sieht die Stadt von morgen aus?

Welche zukunftsweisenden Technologien und Projekte gibt es schon heute?

Und wie können verschiedene Akteure und Interessengruppen erfolgreich in Planungsprozesse eingebunden werden?



Wie sieht die Stadt von morgen aus?

Die BrainBox bietet eine öffentliche Bühne für diese und andere Fragen die die Zukunft unserer Städte betreffen. Gerade die Stadtplanung hat die Aufgabe, die immer komplexer werdenden “intelligenten Systeme” der Smart City für Bürger sichtbar und verständlich zu machen. Die knapp zehn Meter hohe Installation ist eine Art schwebender Würfel, dessen Innenwände als 360-Grad Interaktionsraum und Projektionsfläche für Videos, Präsentationen und der Sichtbarmachung von Daten dient. In der Mitte steht ein interaktiver Tisch, über den Besucher anhand von Spielkarten die Zusammenhänge zwischen aktuellen Problemen und möglichen Lösungsansätzen entdecken und spielerisch in Form von Szenarien verhandeln können.
Hier wird der Besucher zum Mitmachen und zur kritischen Reflektion eingeladen. Mit Hilfe der BrainBox als interaktivem Kommunikations-, Simulations- und Planungsraum, wird Smart City Entwicklung nicht als rein technische, sondern hauptsächlich als kulturell-gesellschaftliche Aufgabe begreifbar.

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METROPOLITAN SOLUTIONS

31. Mai - 2. Juni 2016, Berlin
(CityCube, Messegelände)
www.metropolitansolutions.de

Auch in diesem Jahr wird die BrainBox wieder bei der Metropolitan Solutions vertreten sein und als Plattform zur Visualisierung von Smart City Projekten dienen. Ein besonderer Schwerpunkt liegt hierbei auf Forschungsthemen, die dazu beitragen die vom Regierenden Bürgermeister von Berlin und TU-Präsident Thomsen initiierte be-digital.berlin-Agenda umzusetzen.
Als eine der weltweit größten Messen zu urbanen Themen, wird die Metropolitan Solutions von über 5.000 Fachexperten besucht. Davon kommen mehr als 40% aus dem Ausland, die über 300 Städte und zahlreiche Unternehmen repräsentieren.

Über die Ausstellung im CityCube hinaus bietet die Metropolitan Solutions Zugang zu mehr als 30 hochkarätigen Konferenzen und Workshops, die durch unabhängige Konferenzveranstalter organisiert werden. Ein Highlight der kommenden Metropolitan Solutions ist das German Habitat Forum 2016.

Zielgruppe: Internationale Fachexperten und Entscheidungsträger

Michael Müller, regierender Bürgermeister Berlin beim Besuch der BrainBox © *Aleksandra Kovbasko*

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PARTICIPATORY SPACE

C +

PERFORMANCE SPACE

Thank you

http://www.architektur.tu-berlin.de