City-zen Nicosia Roadshow May 8-15

Roadshow Team

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This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 608702

European Commission

CITY-zen New urban energy ROADSHOW

FUN-SHOP - WALK

To place Citizens in heart of process to create a healthier, happier and energy efficient city.

To openly invite Nicosia's stakeholders to come and get involved no matter what background and expertise.

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ROADSHOW

FUN-SHOP - TALK

Global experts combine with local stakeholder passion, knowledge and close familiarity of place to reach zero energy.

To ensure that solutions stay with the people who helped create them.

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FUN-SHOP - TALK (DUTCH EMBASSY/RESIDENCE)

Embassy of the
Kingdom of the Netherlands

- Sustainability event at the residence of the Dutch Ambassador

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FUN-SHOP - Go2Zero

- Energy Transition role playing game

FUN-SHOP - Go2Zero

- Energy Transition role playing game

FUN-SHOPS – DESIGN (URBAN & ENERGY)

Studios for energy and urban design continued throughout the week in different locations.

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ROADSHOW

Understanding the local circumstances

- **Climate** (Temperature, Sun, Wind, Rain)
- **Energy characteristics** (Energy demand, Energy mix, Infrastructures, Potentials)
- **Environmental footprint** (Resource use, Waste)
- **Challenges of Nicosia**

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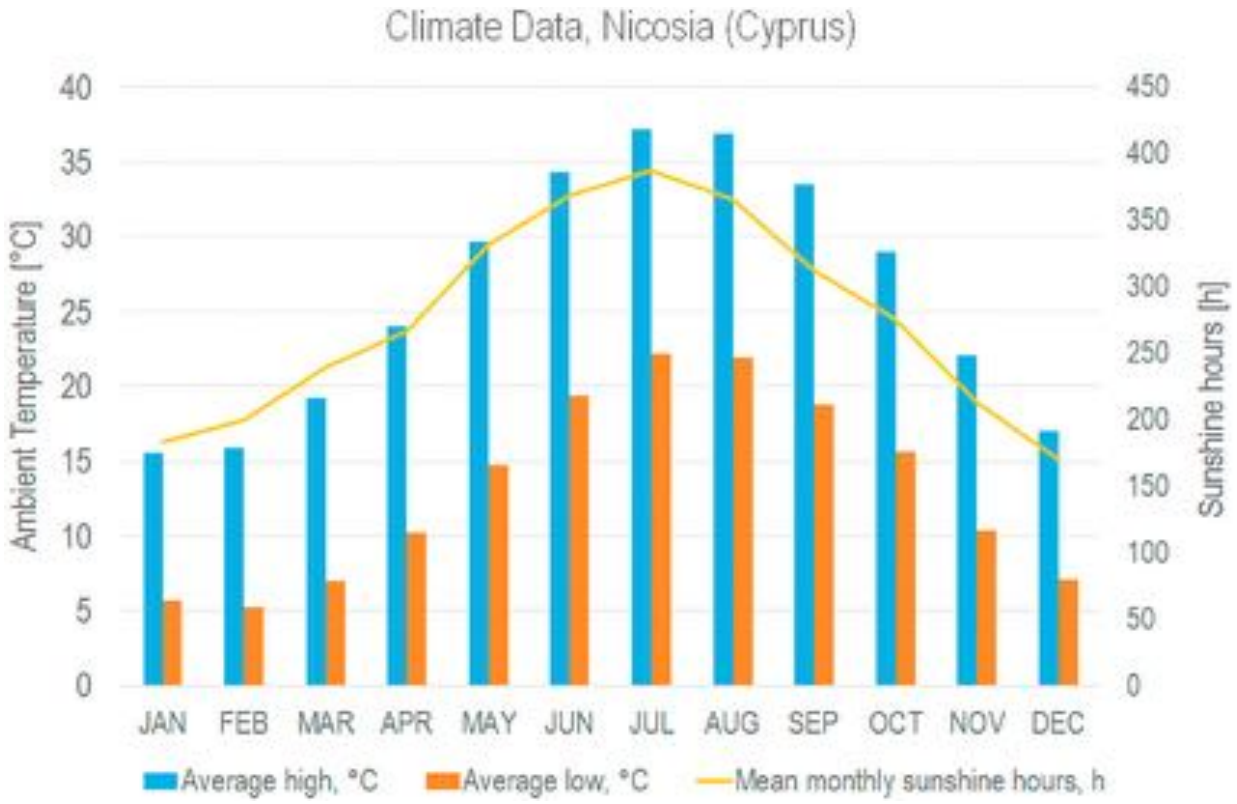
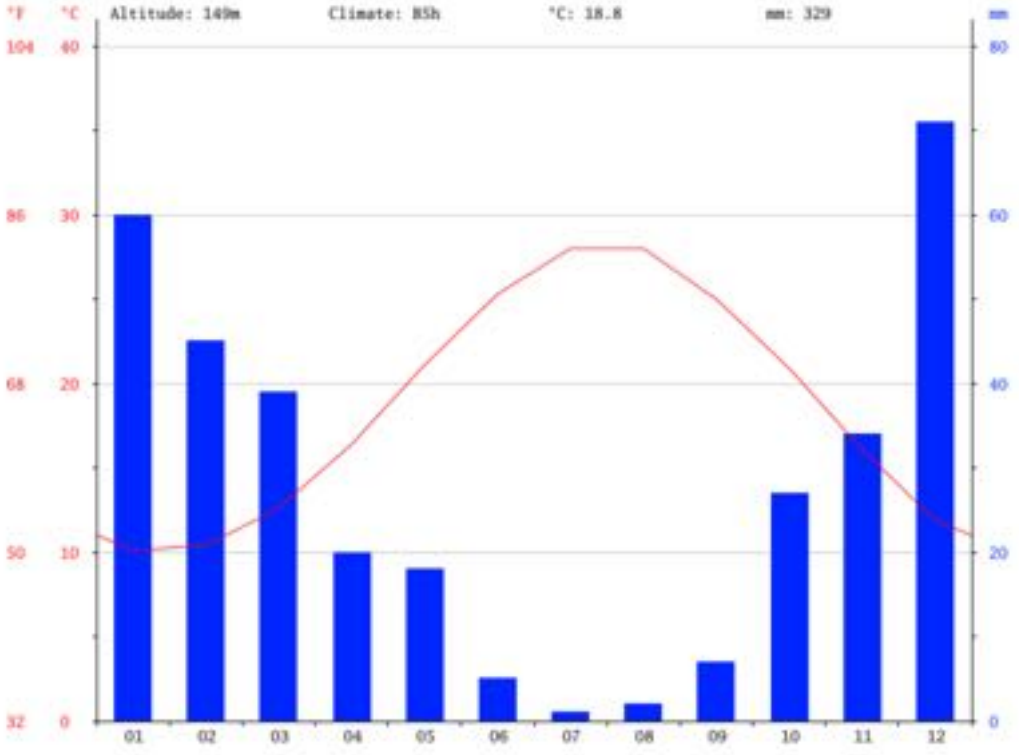
Climate: **temperatures and precipitation**





Even winter has high sunshine rates;
water stress to be addressed through seasonal buffering

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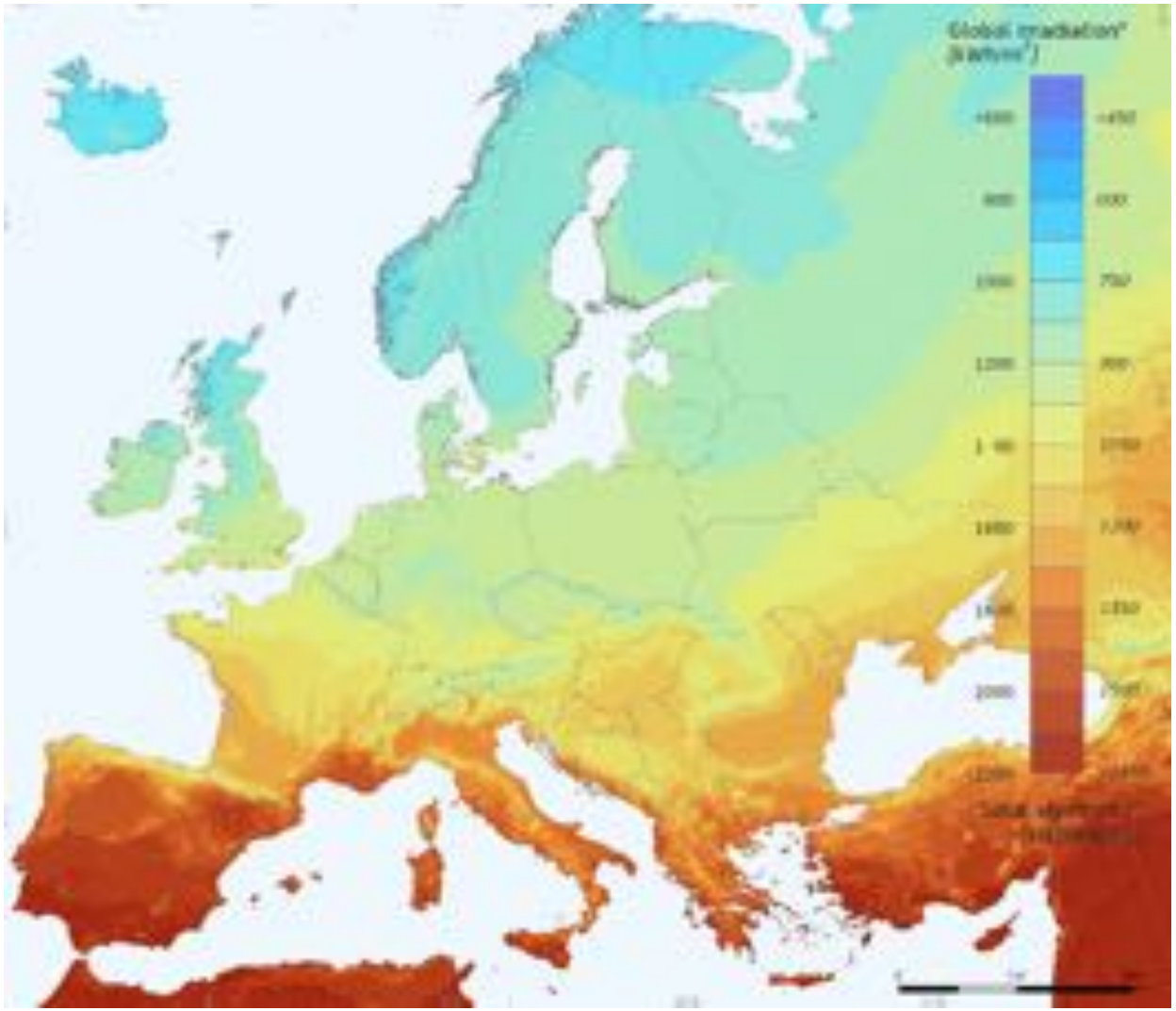
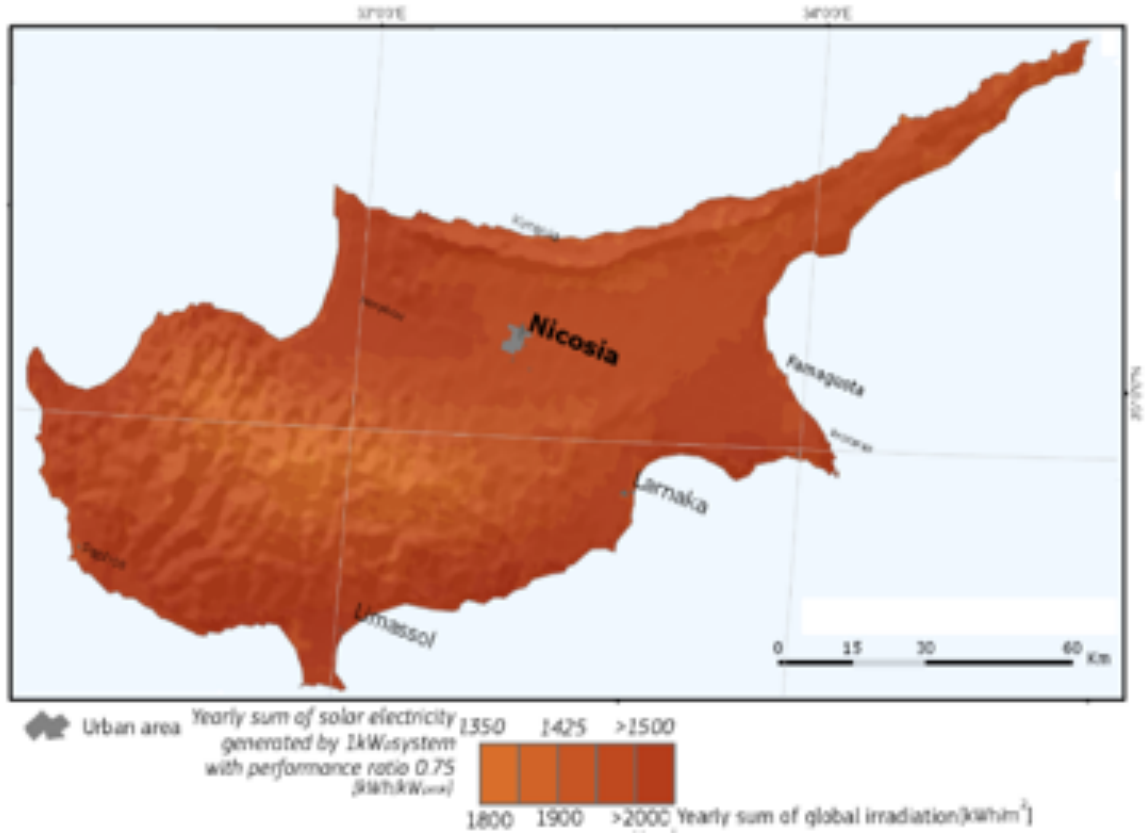
ROADSHOW

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019

Climate: **solar intensity**





Solar ‘best of Europe’

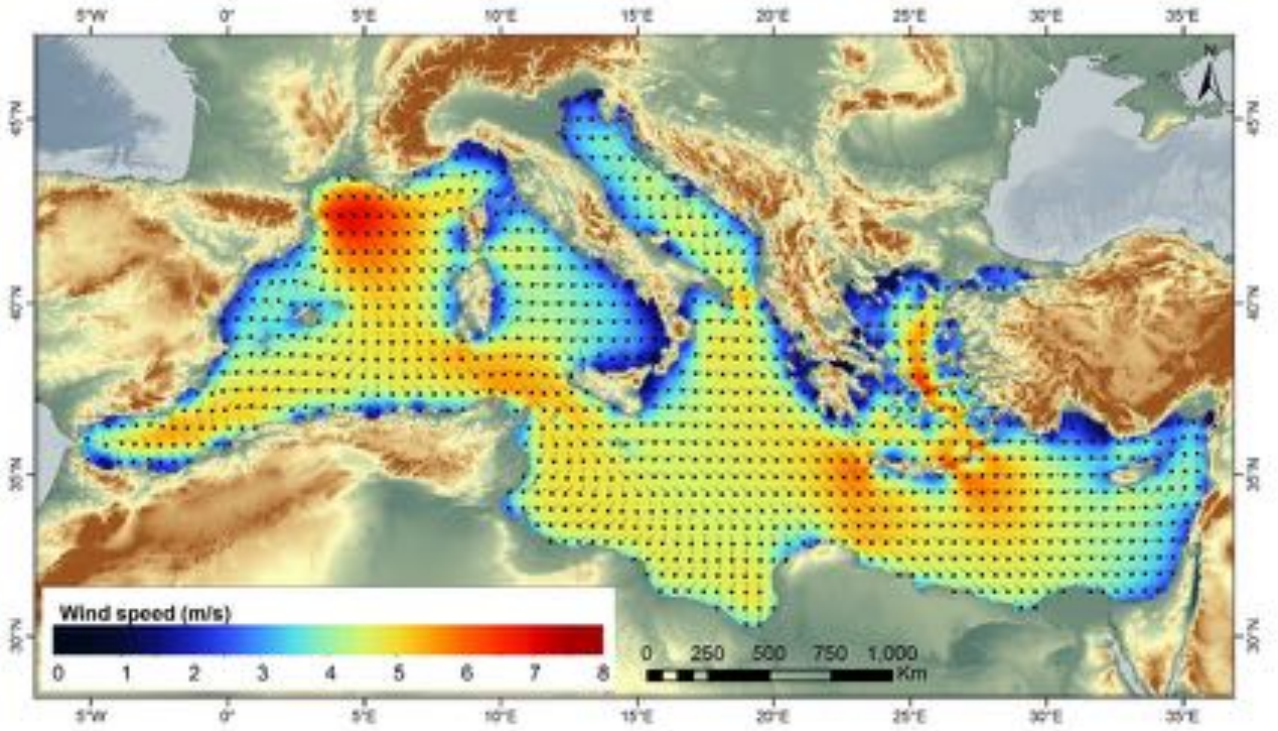
Source: FOSS Research Centre for Sustainable Energy University of Cyprus

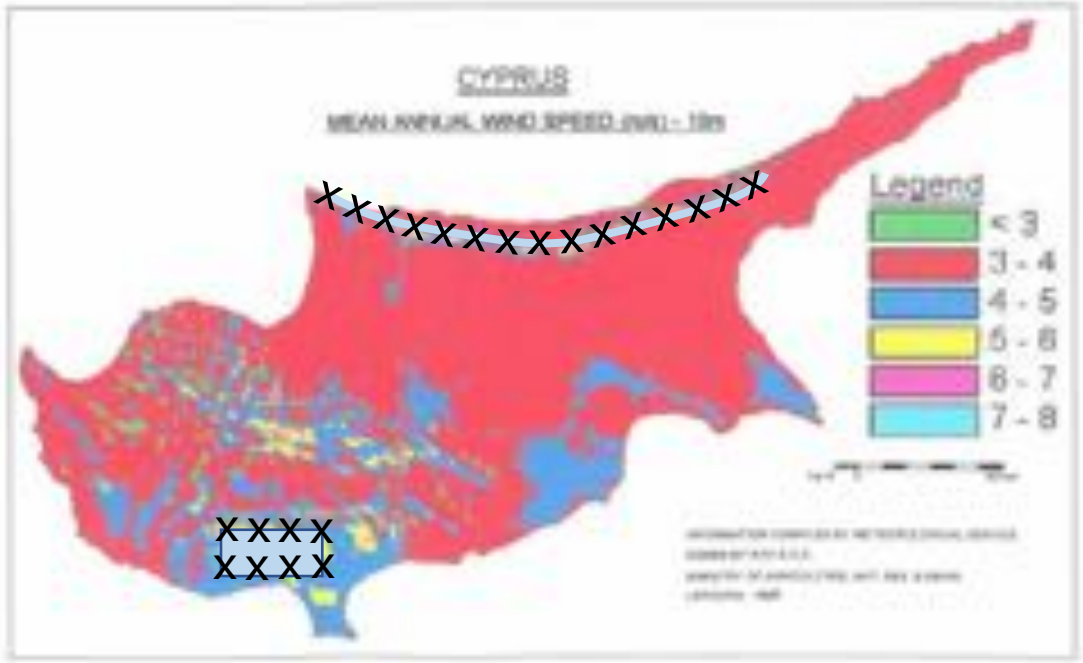
CITYzen New urban energy ROADSHOW

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019

Climate: **wind characteristics**





Both offshore and onshore wind have a limited yet given potential
> only certain areas on land (cf. existing developments)

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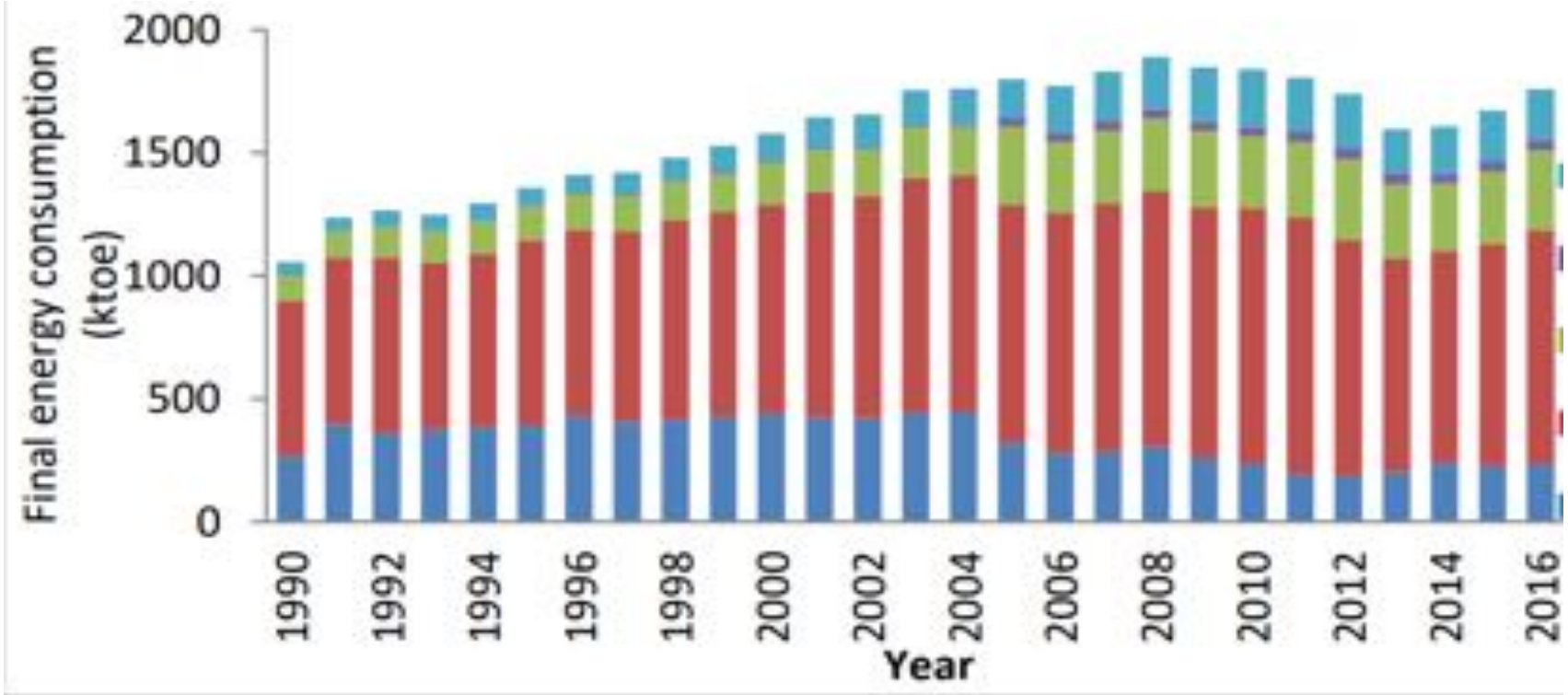
Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019

Energy characteristics: **final energy demand**



Source:

Cyprus Energy Agency

- Services
- Agriculture
- Residential
- Transport
- Industry

Energy-wise and otherwise, mobility is the number 1 issue to address

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Energy characteristics: **energy mix**

Source:
Eurostat /
Cyprus Energy Agency

The island syndrome!
(Cf. Menorca)

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Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019

Environmental footprint: **waste**

80% of waste goes to the landfill

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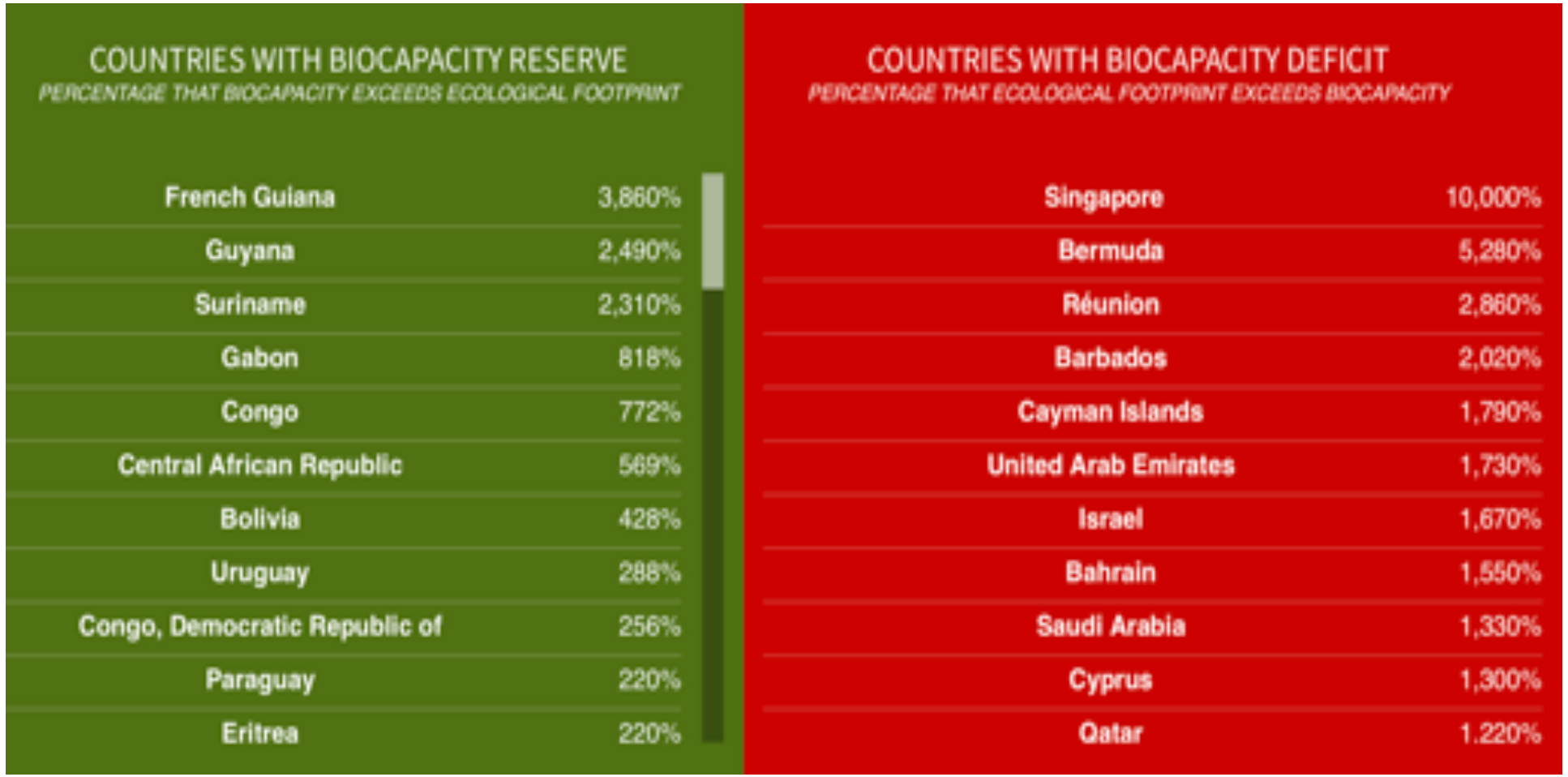
New urban energy
ROADSHOW

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019

Environmental footprint: **biocapacity**



COUNTRIES WITH BIOCAPACITY RESERVE *PERCENTAGE THAT BIOCAPACITY EXCEEDS ECOLOGICAL FOOTPRINT*	
French Guiana	3,860%
Guyana	2,490%
Suriname	2,310%
Gabon	818%
Congo	772%
Central African Republic	569%
Bolivia	428%
Uruguay	288%
Congo, Democratic Republic of	256%
Paraguay	220%
Eritrea	220%

COUNTRIES WITH BIOCAPACITY DEFICIT *PERCENTAGE THAT ECOLOGICAL FOOTPRINT EXCEEDS BIOCAPACITY*	
Singapore	10,000%
Bermuda	5,280%
Réunion	2,860%
Barbados	2,020%
Cayman Islands	1,790%
United Arab Emirates	1,730%
Israel	1,670%
Bahrain	1,550%
Saudi Arabia	1,330%
Cyprus	1,300%
Qatar	1,220%

CITY-zen
New urban energy
ROADSHOW

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019

Environmental footprint: **biocapacity**

X **CYPRUS (1964)**

GDP PER PERSON	POPULATION
-	578,627

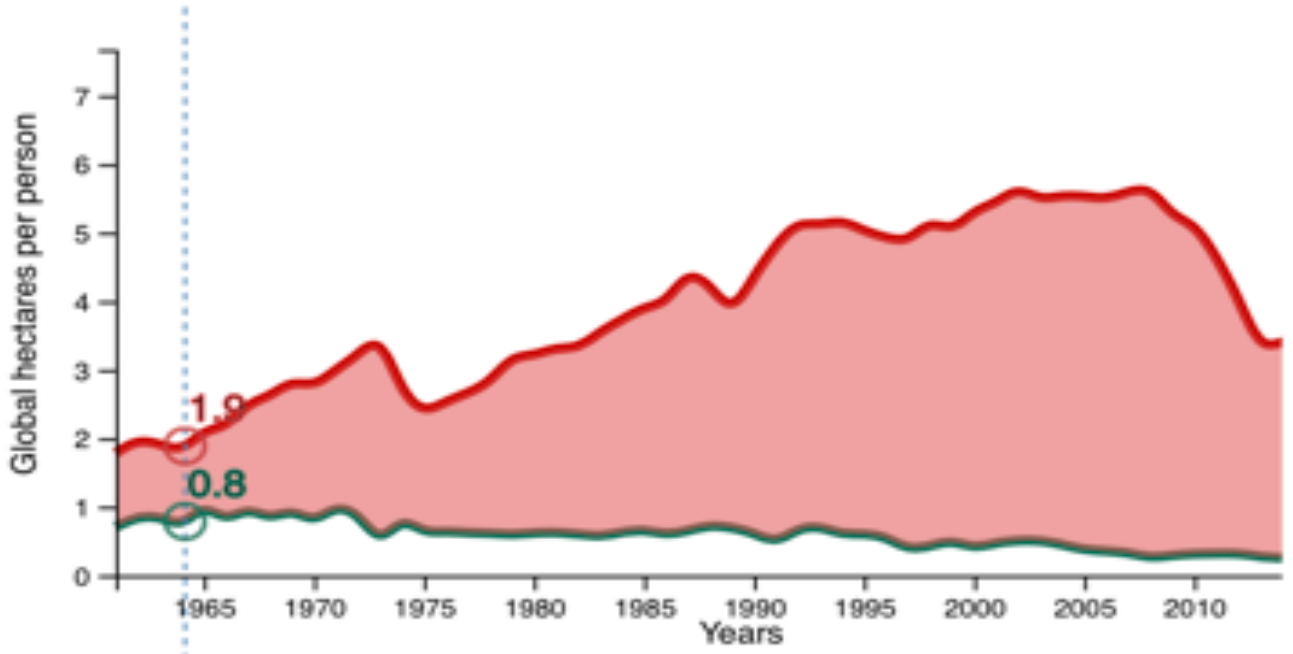
Biocapacity per person		Ecological Footprint per person		BIOCAPACITY RESERVE(+)/DEFICIT(-)
0.8 gha	-	1.9 gha	=	-1.1 gha

Ecological Footprint and Biocapacity From 1961 to 2014

Ecological Footprint per person

Biocapacity per person

Learn More



Data Sources: National Footprint Accounts 2019 edition (Data Year 2016); building on World Development Indicators, The World Bank (2016); U.N. Food and Agriculture Organization.

CITY-zen New urban energy ROADSHOW

Environmental footprint: **biocapacity**

X **CYPRUS (2008)**

GDP PER PERSON $32,652

POPULATION 1,081,563

Biocapacity per person **0.3** gha

\- Ecological Footprint per person **5.6** gha

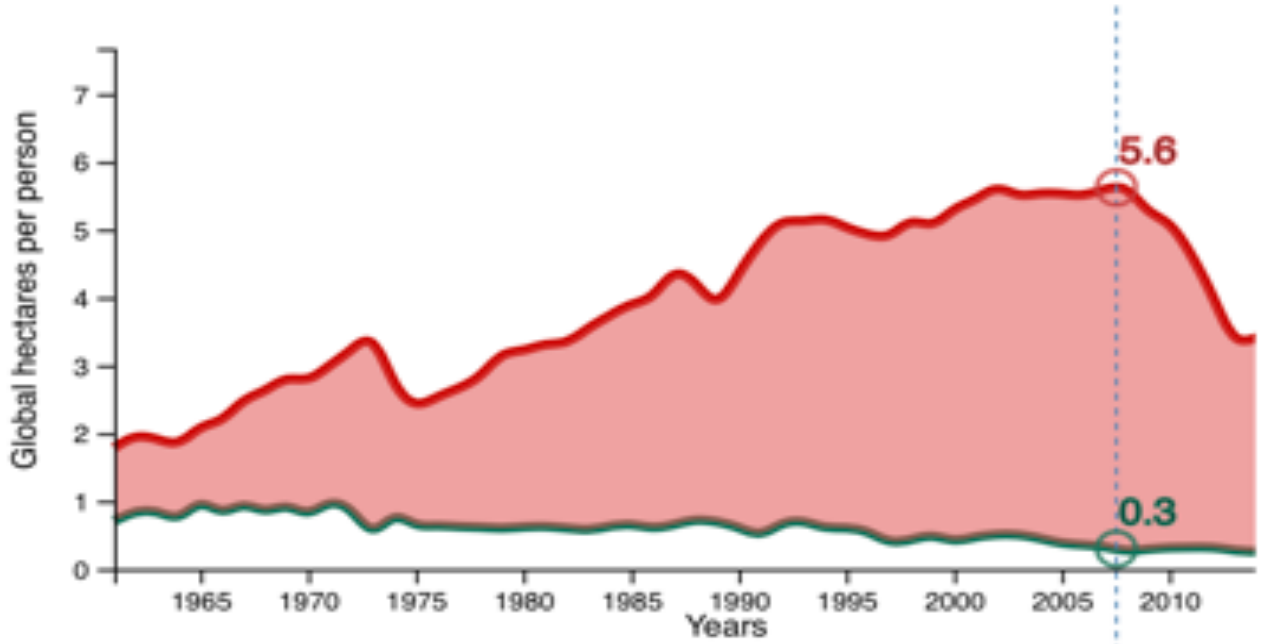
= BIOCAPACITY RESERVE(+)/DEFICIT(-) **-5.3** gha

Ecological Footprint and Biocapacity From 1961 to 2014

Ecological Footprint per person

Biocapacity per person

Learn More



Data Sources: National Footprint Accounts 2019 edition (Data Year 2016); building on World Development Indicators, The World Bank (2016); U.N. Food and Agriculture Organization.

CITY-zen New urban energy ROADSHOW

Environmental footprint: **biocapacity**

CYPRUS (2014)

GDP PER PERSON	POPULATION
$27,046	1,152,309

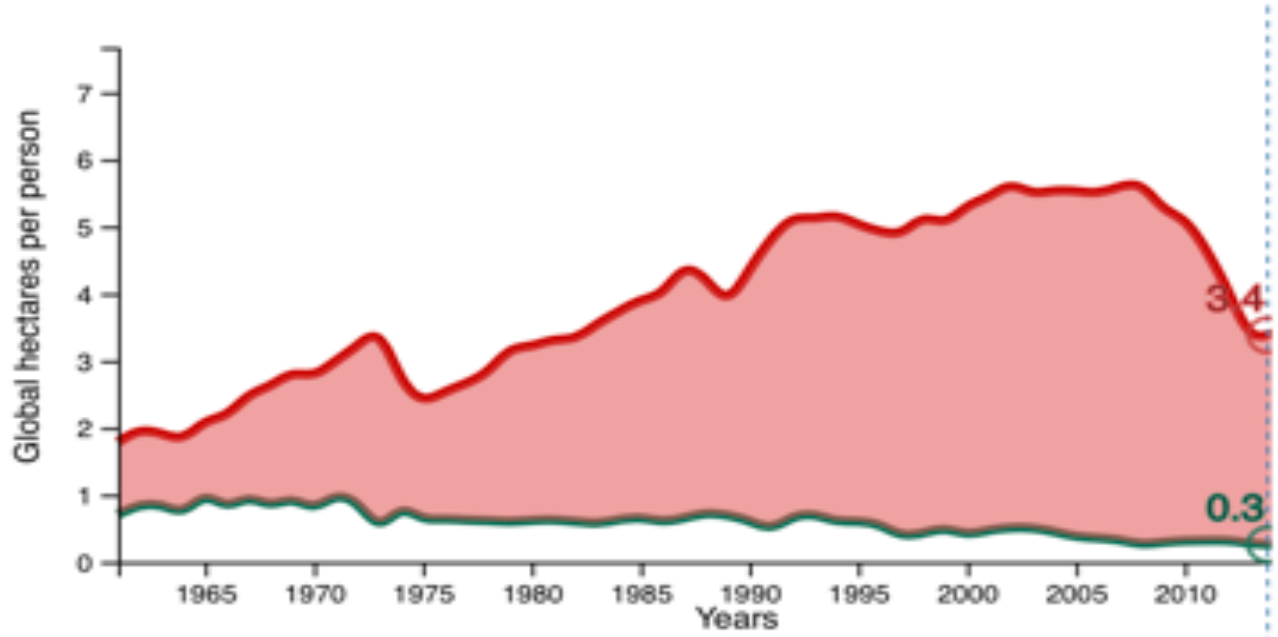
Biocapacity per person		Ecological Footprint per person		BIOCAPACITY RESERVE(+)/DEFICIT(-)
0.3 gha	−	3.4 gha	=	-3.1 gha

Ecological Footprint and Biocapacity From 1961 to 2014

Ecological Footprint per person

Biocapacity per person

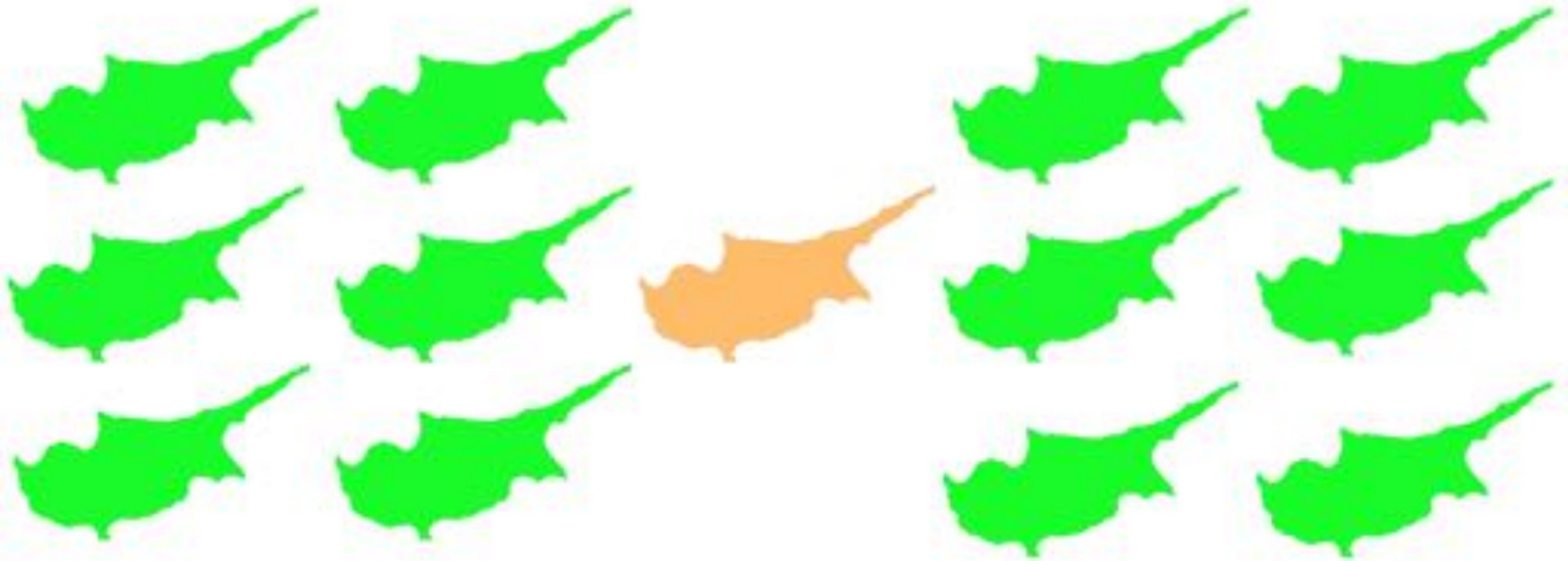
Learn More



Data Sources: National Footprint Accounts 2019 edition (Data Year 2016); building on World Development Indicators, The World Bank (2016); U.N. Food and Agriculture Organization.

CITY-zen New urban energy ROADSHOW

Environmental footprint: **biocapacity**



We need 13 Cypruses to meet the demand of the 2020 lifestyle

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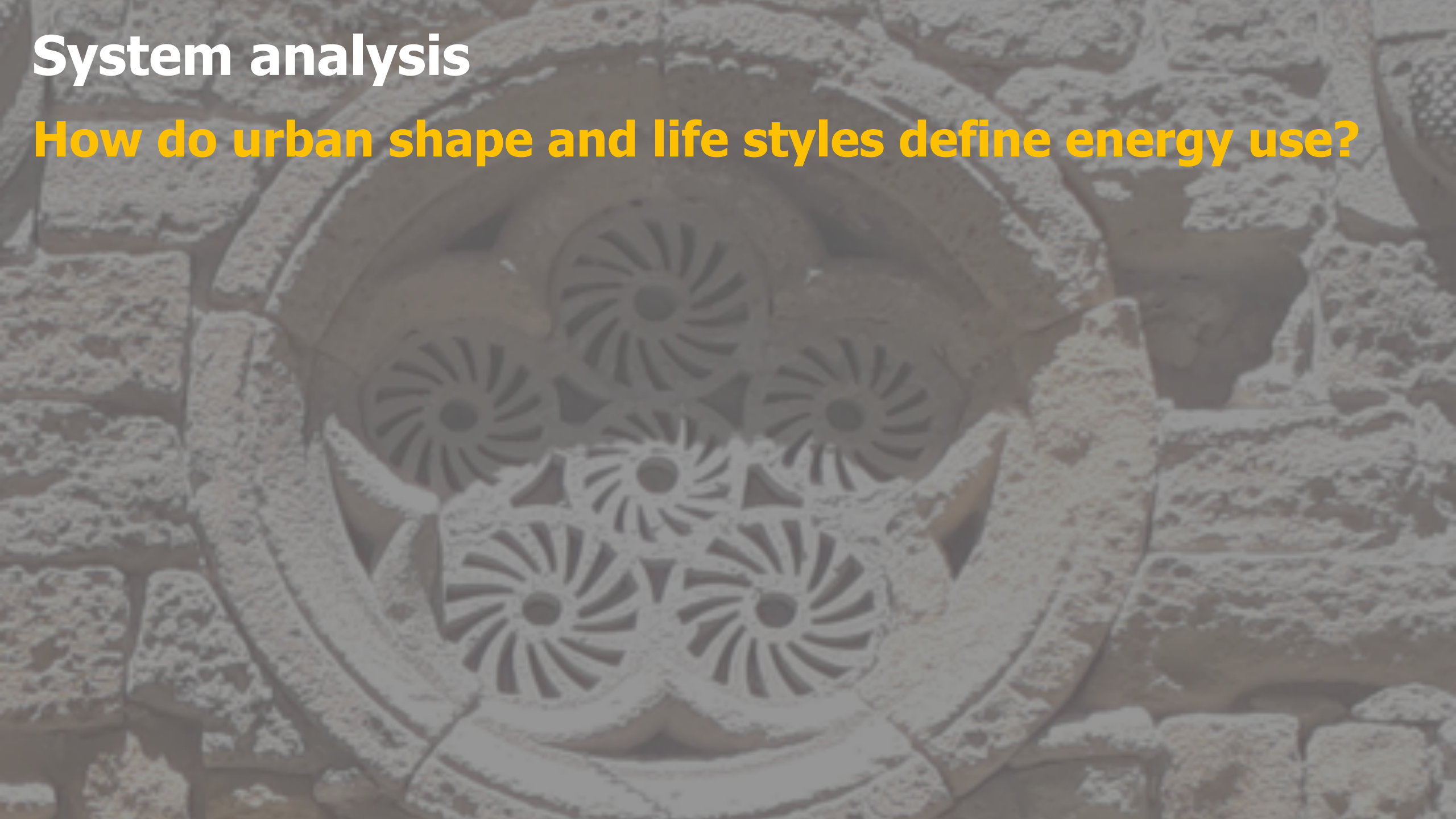
ROADSHOW

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019

System analysis

How do urban shape and life styles define energy use?



System analysis

Old Nicosia is the more sustainable place

Suburbia as a heat trap (north)

Suburbia as a heat trap (south)

Suburbia as a petrol trap

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Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019

The car as a constituent of non-places

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Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019

The car as a constituent of non-places

CITY-zen
New urban energy
ROADSHOW

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019

System analysis

With climate change already happening,

You risk to cook yourself in petrol and concrete…

But solutions are at hand


There’s a bright green
NO FUTURE

Not only a matter of tapping into the massive PV potential…

Old Nicosia is the more sustainable place

Traditional climate control strategies

High albedo roof

Traditional climate control strategies

Traditional climate control strategies

Traditional climate control strategies

Traditional climate control strategies

Traditional climate control strategies

Traditional climate control strategies

Traditional climate control strategies

Modern interpretation of climate control strategies

Modern interpretation of climate control strategies

Retrofit opportunities

Retrofit opportunities

Retrofit opportunities

Communal garden potential: ramparts

Places to live

Places to live

Goodbye Car Empire, welcome Green Mobility

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New urban energy
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Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019

The space reserved for the pedestrian

The space reserved for the pedestrian


You need a compelling offer to get people out of the car

Goodbye Car Empire, welcome Green Mobility

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019


vodafone
vodafone
vodafone

(2019) The answer is…

YES!

POLL: Will the tram be used in Nicosia?

The Rector of the University of Cyprus and the Mayor of Agatzias suggests,through twitter the creation of tram as a solution to the increased traffic.

Do you think Cypriots will use it if it is created?

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MOVING TOWARDS A TRAM SYSTEM FOR NICOSIA

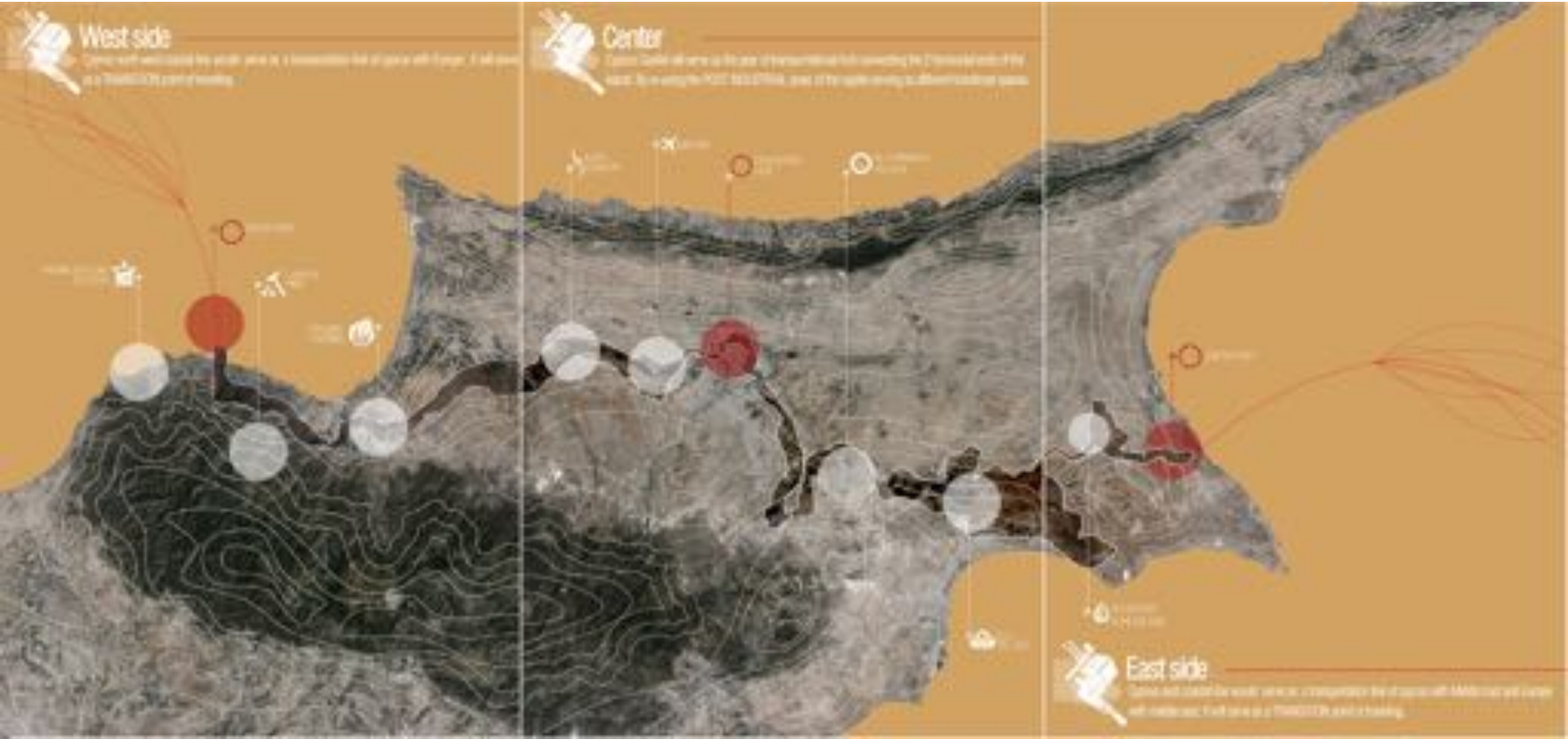
Published on: 17 June 2015

Could time final came for Nicosia to acquire a modern tram line? According to the feasibility study made, such a project is now [illegible]

The feasibility study for the creation of tram in Nicosia as commissioned by the Ministry of Transport, Communications and Works, concluded that the project is viable. The experts who conducted the feasibility study considered options for delivery of [illegible] such as [illegible] like the Central Hospital of Nicosia and the The Mall of Cyprus, as well as in fast-growing suburbs of the capital and Lakatamia According to the study, the tram will follow a line shaped horseshoe. It will start from the New General Hospital, will cross the central Archbishop Makarios Ave, and via Leonidas Str, Homer Str, Kosti Palama Str will pass from Demosthenes Severis to continue to Strovolos Ave and end at Makarios Ave in Lakatamia. Overall - The network infrastructure along the tram will be 14 km
- The train crossing frequency will be every 10 minutes
- Each day it will run [illegible] km [illegible] 216 round
- It will have 15 wagons
- Average speed of 22.9 kilometers per hour. The overall cost will reach 216 mil. eur including infrastructure, lines, wagons and parking in the two starting points in Lakatamia, and the General Hospital. The project is expected to be implemented by public funds and European Union funds. The remaining amount is expected to be covered by a strategic investor who will be selected through open competition. According to the timeline, initial bids will be submitted towards the end if the year with final implementation programmed on 2019. Source: Ant1

Anal

Cross-Cyprus tram/light rail proposal © Yiannis Paphitis



Sustainable mobility

Mobility is killing the island > modal shift & electrify

- **E-bikes, E-scooters/steps**
- **E-shuttles & E-buses, tramway**
- **HUMES (hubs for urban mobility and energy)**
- **E-vehicles private (not within rampart)**
- **Mobility as a Service (MaaS) – multimodal trips**

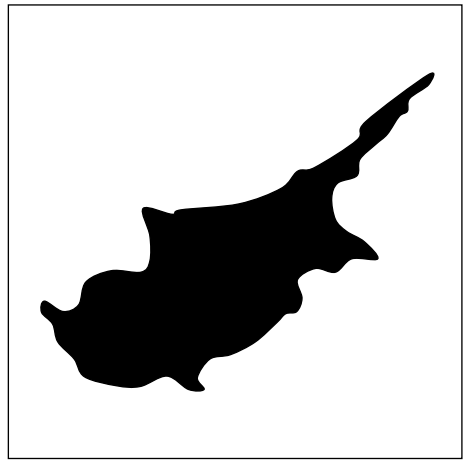

I DON'T BELIEVE IN
GLOBAL WARMING

CYPRUS GREENHOUSE GASES INVENTORY 2016

ELECTRICITY	91% heavy oil 3% PV 4% Wind 1% biomass	3197 kt CO_2-eq	37.0 %
HOUSING	51% Diesel oil 6% Kerosene 23% LPG 15% Biomass 6% Charcoal	570 kt CO_2-eq	6.6 %
TRANSPORT		1889 kt CO_2-eq	21.9 %
INDUSTRY		1901 kt CO_2-eq	22.0 %
AGRICULTURE		559 kt CO_2-eq	6.5 %
WASTE	79% landfilled 9% organic 12% recycled	466 kt CO_2-eq	5.4 %
WATER		49 kt CO_2-eq	0.6 %
CARBON UPTAKE		-168 kt CO_2-eq	1.9%

8631

kt CO_2eq



CYPRUS

Area: 9251

Citizens:

864,200

Population South: 72%

Population North: 28%

2018 7th National Communication and 3rd Biennial report under the

UNFCCC of Cyprus

Department of Environment

Ministry of Agriculture, Rural Development and Environment

Analysis: Dr Riccardo Pulselli, INDACO2 / Universitá di Siena

Nicosia, Cyprus, May 2019

CYPRUS GREENHOUSE GAS INVENTORY 2016

Cyprus area = **9251** km²

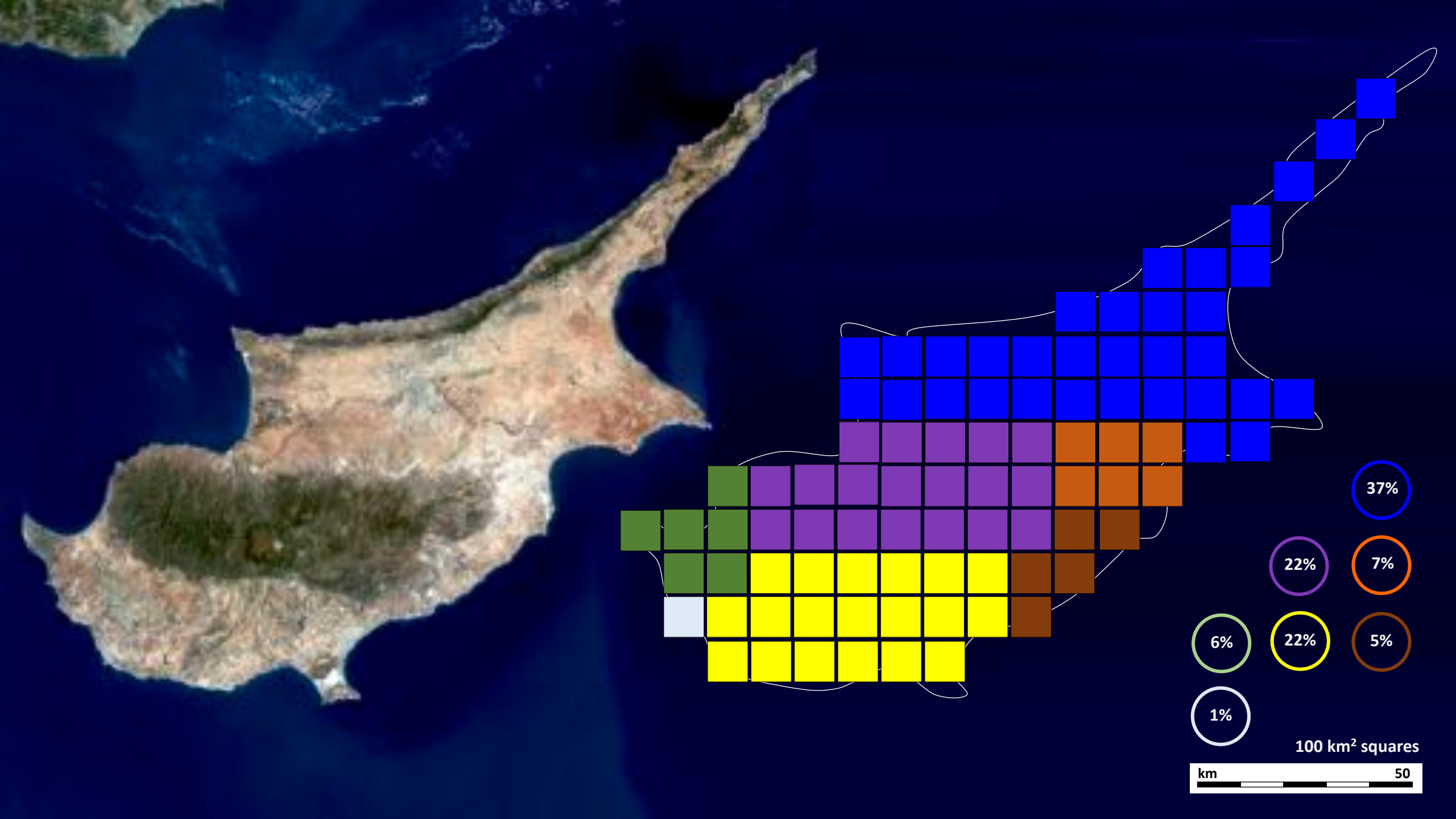
-12 km²

CF Cyprus (south) = **6394** km² forestland

CF Cyprus (total) = **8860** km² forestland

100 km² squares

km 50

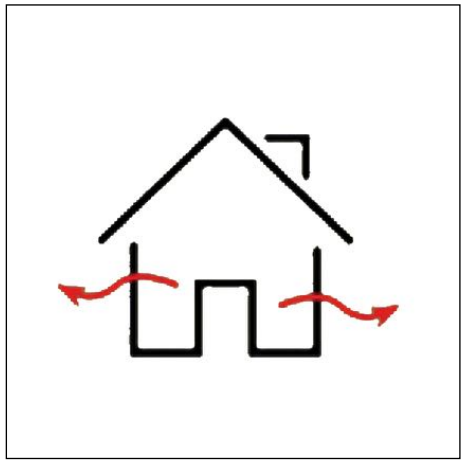

37%
22%
7%
6%
22%
5%
1%
100 km² squares
km
50

Household profiling in Cyprus

Electricity: 6500 kWh /yr	1150 space cooling 640 space heating 380 water heating 550 cooking 3780 appliances & light	4625 kg CO_2 eq	37 %	
Fuel mix: 7000 kWh /yr	5330 space heating 370 water heating 1300 cooking	1703 kg CO_2 eq	14 %	
Mobility: 26000 km /yr	16000 km/yr car 1.63 car/house	4383 kg CO_2 eq	35 %	
Waste: 1700 kg /house yr	79% landfilled 9% organic 12% recycled	1608 kg CO_2 eq	13 %	
Water: 94 m3 /house yr		55 kg CO_2 eq	0.4 %	

12.37

t CO_2eq



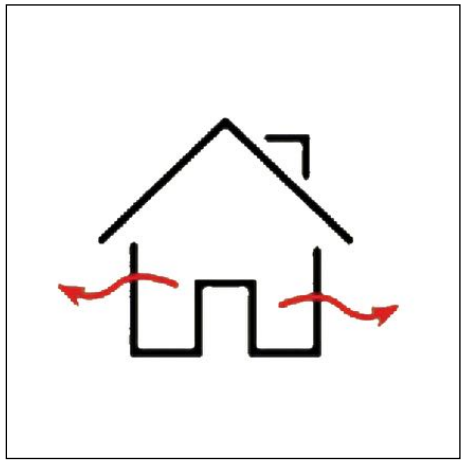
Household

2.7 citizens

Household 2009:
https://www.mof.gov.cy/mof/cystat/statistics.nsf/energy_environment_81main_en/energy_environment_81main_en?OpenForm&sub=1&sel=2

Analysis: Dr Riccardo Pulselli, INDACO2 / Universitá di Siena

Carbon Footprint per household



Household

2.7 citizens

12.37 t CO_2 eq

0.92 ha

Virtual forestland

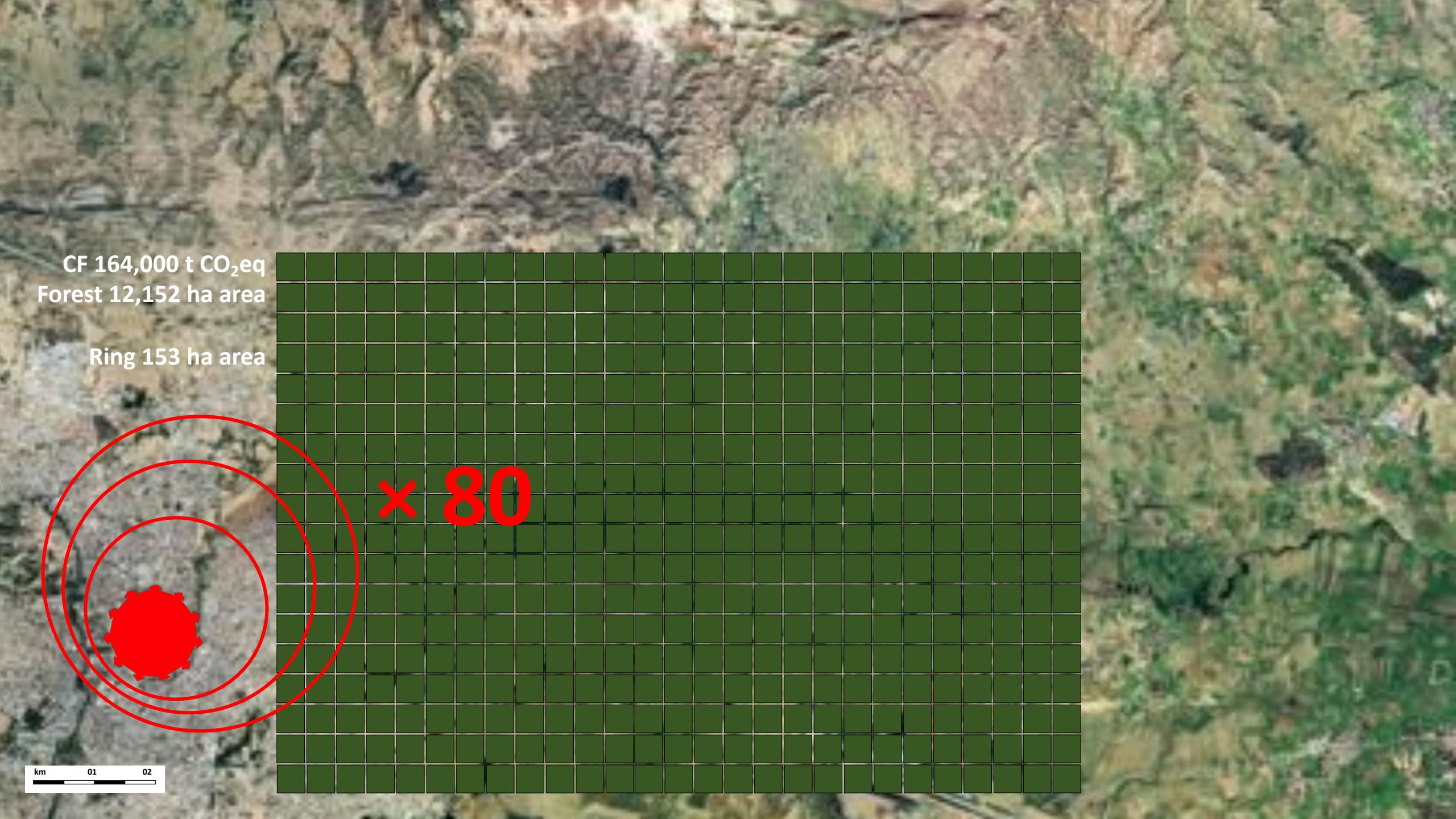
1.5 fields

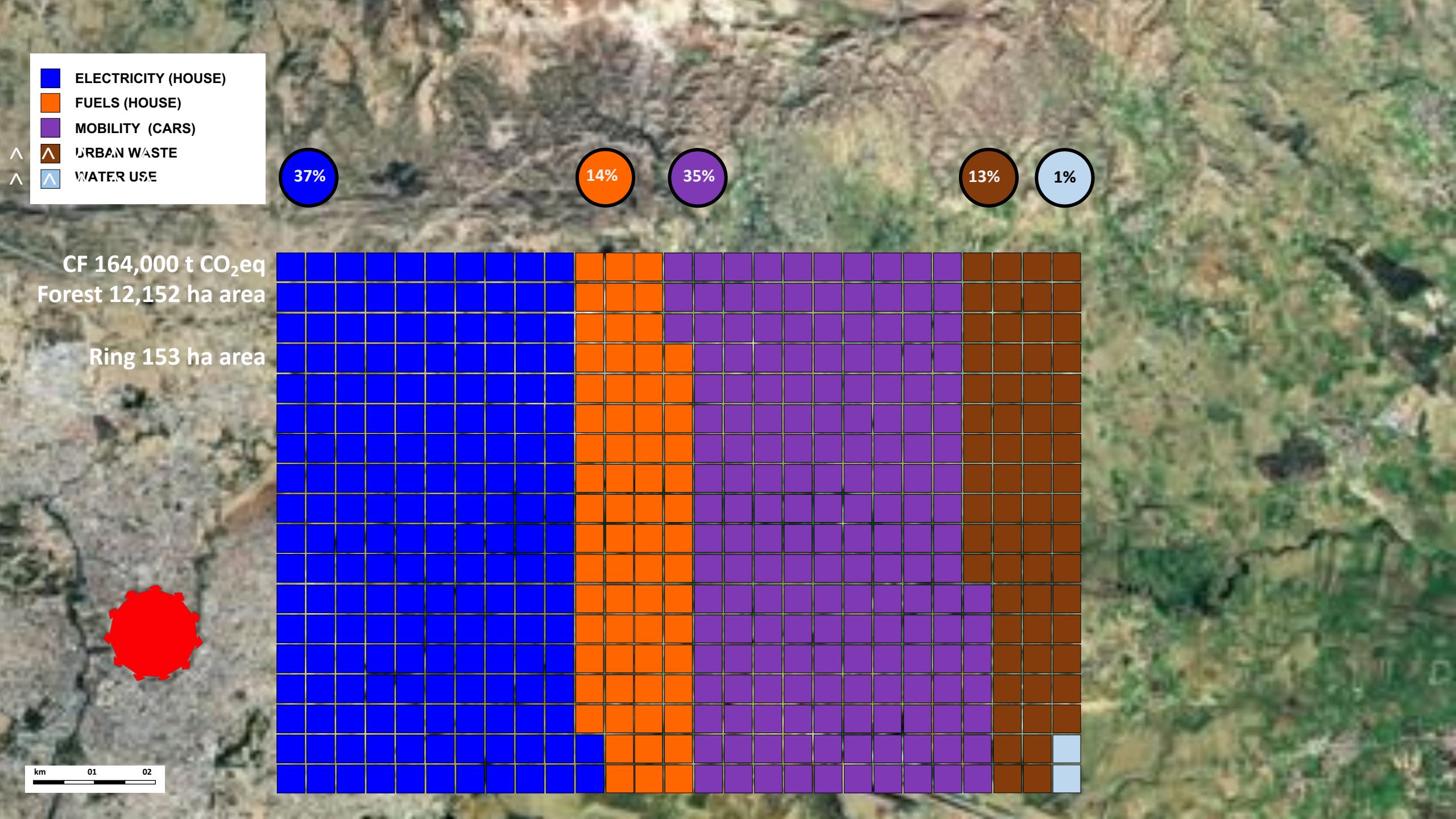
Pulselli et al."Carbon accounting framework for decarbonisation of European city neighbourhoods". Journal of Cleaner Production 208 (2018) 850-868.

Analysis: Dr Riccardo Pulselli, INDACO2 / Universitá di Siena

Nicosia, Cyprus, May 2019


Population 35,000
Households 13,258
km
01
02

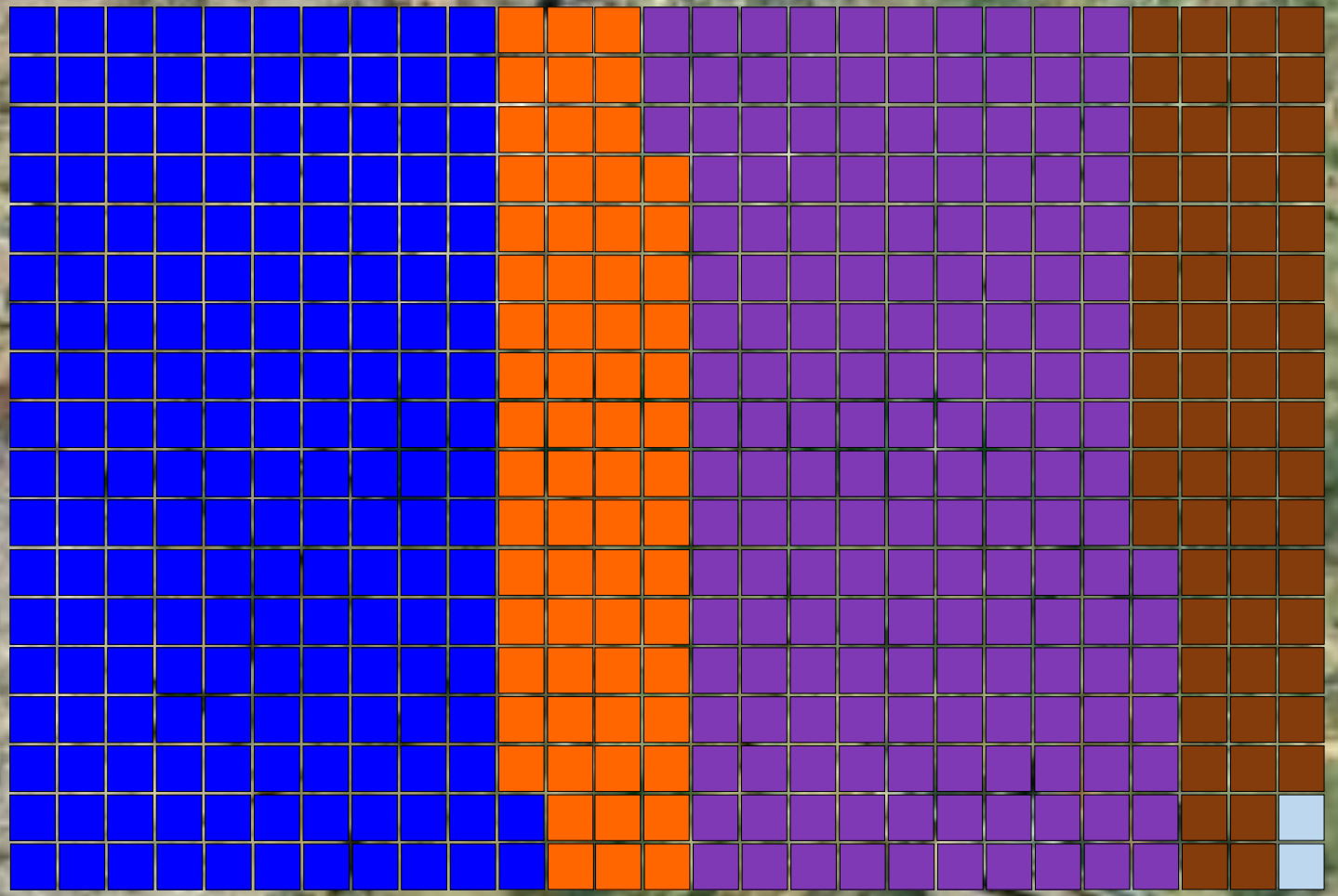

CF 164,000 t CO_2eq
Forest 12,152 ha area
Ring 153 ha area
× 80
km
01
02

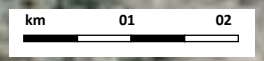

ELECTRICITY (HOUSE)
FUELS (HOUSE)
MOBILITY (CARS)
URBAN WASTE
WATER USE
37%
14%
35%
13%
1%
CF 164,000 t CO_2eq
Forest 12,152 ha area
Ring 153 ha area
km
01
02

What about food?

CF 164,000 t CO_2eq
Forest 12,152 ha area

Ring 153 ha area





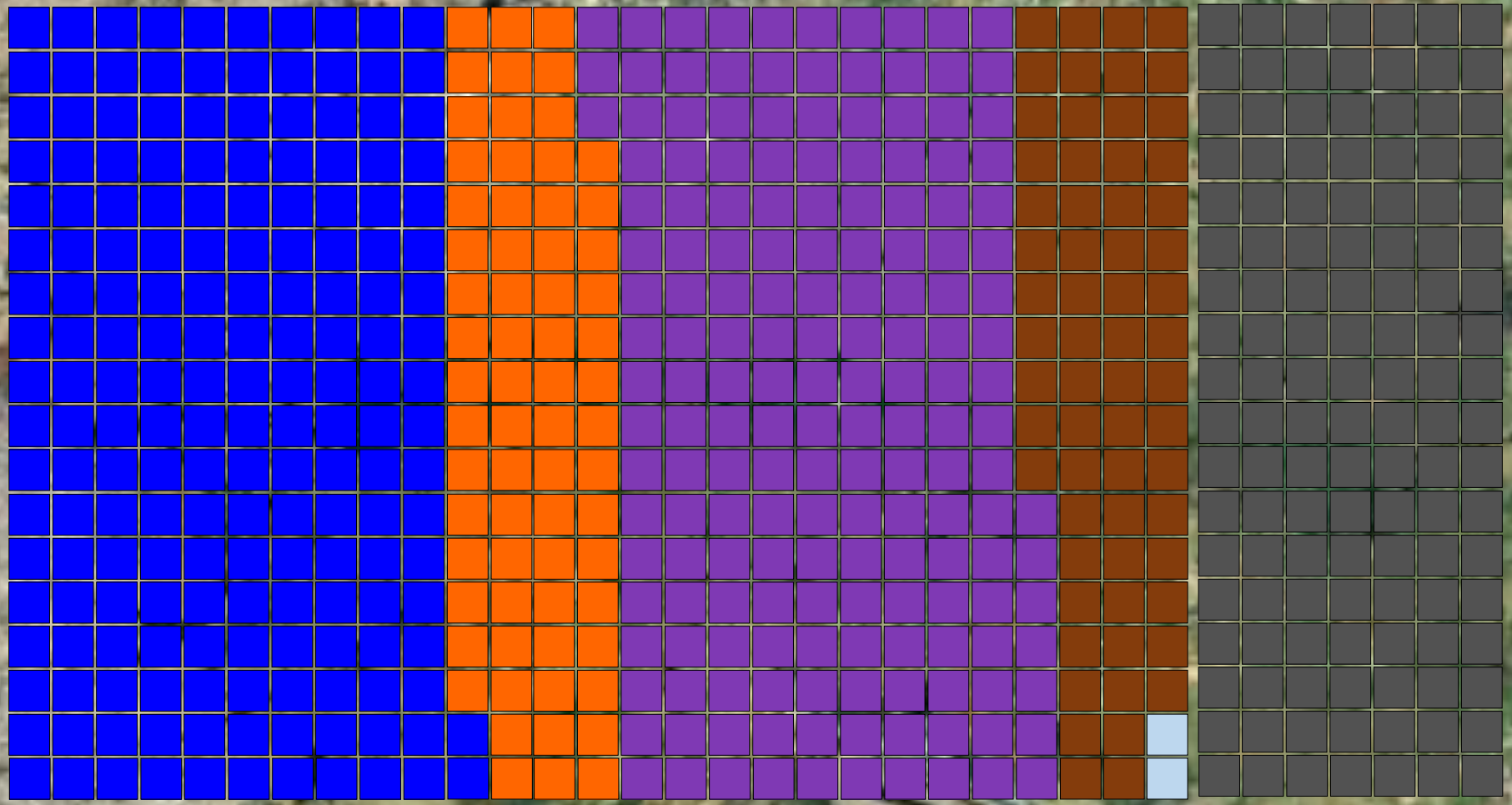
What about food?

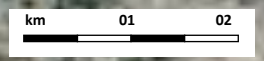
+27%

ADD CF 44,000 t CO_2eq
Forest 3280 ha area

Ring 153 ha area

×21





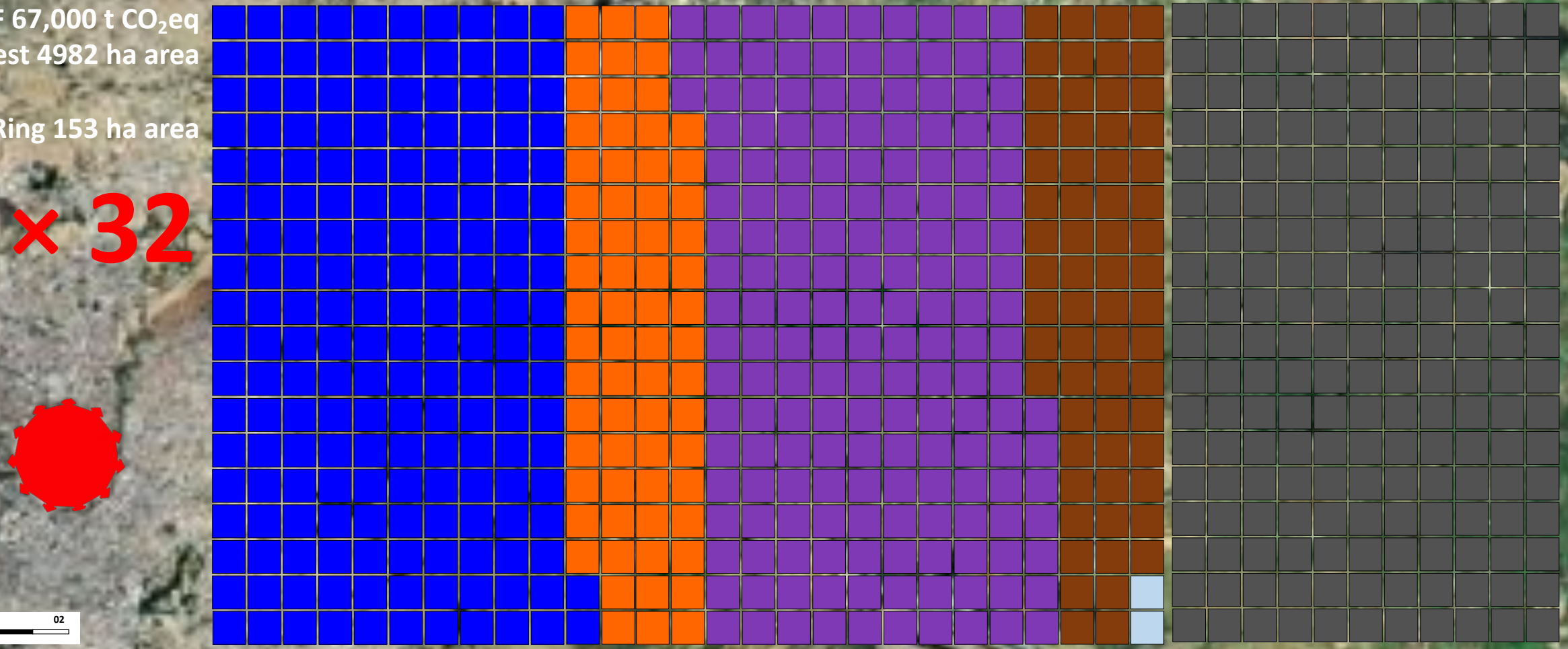
What about food?

+41%

ADD CF 67,000 t CO_2eq
Forest 4982 ha area

Ring 153 ha area

×32



km 01 02

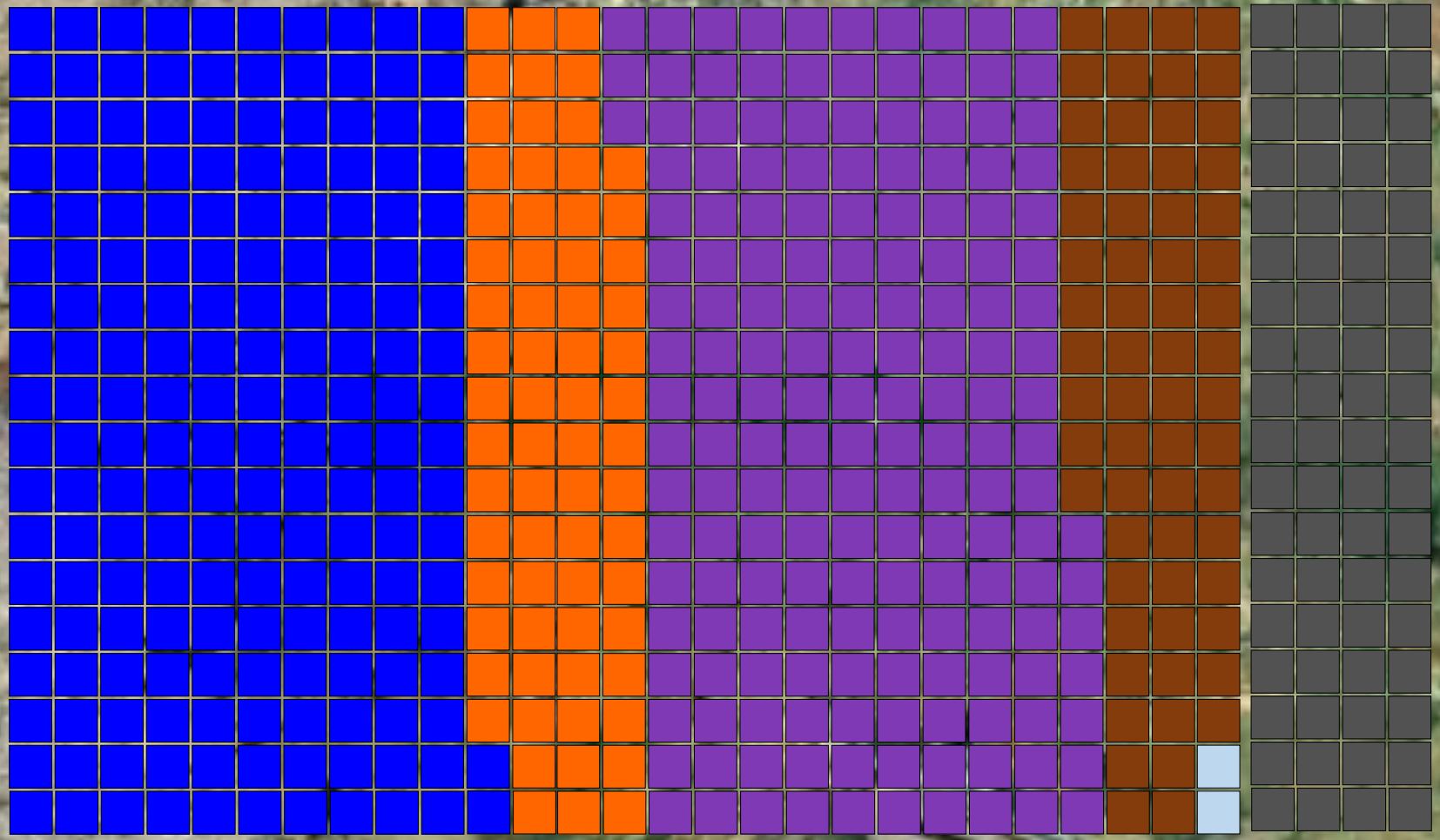
What about food?

+16%

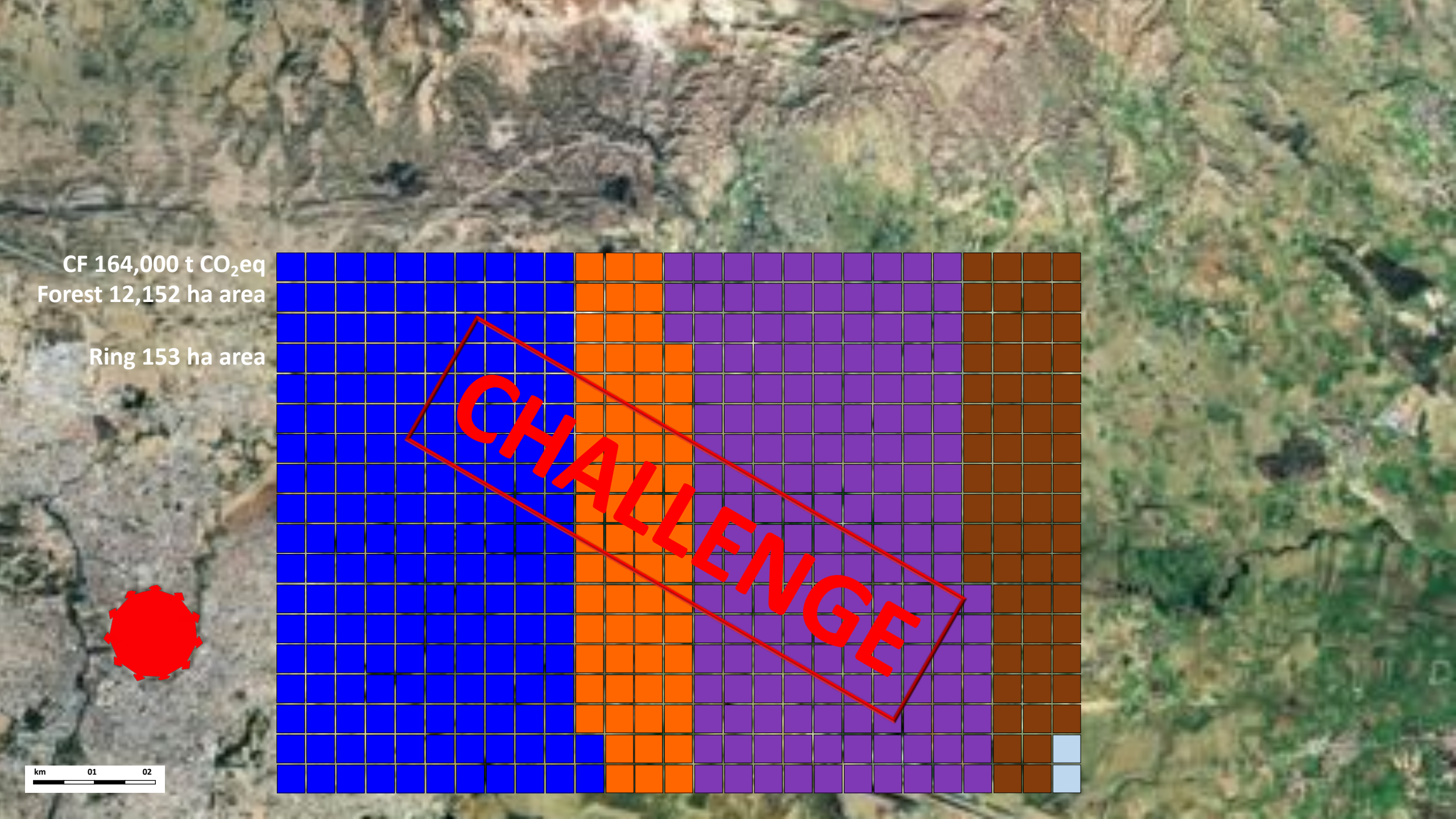
ADD CF 26,000 t CO_2eq
Forest 1944 ha area

Ring 153 ha area

×12



km 01 02


CF 164,000 t CO_2eq
Forest 12,152 ha area
Ring 153 ha area
CHALLENGE
km
01
02

Nicosia Energy Strategy

- **Prof. Andy van den Dobbelsteen** – TU Delft, The Netherlands
- **Dr. Riccardo Pulselli** – INDACO2 / Universitá di Siena, Italy
- **Prof. Han Vandevyvere** – EnergyVille, Belgium / NTNU, Norway
- **Achille Hannoset** – Th!nkE, Belgium
- **Anneleen Vanderlinden** – Th!nkE, Belgium

With support of:

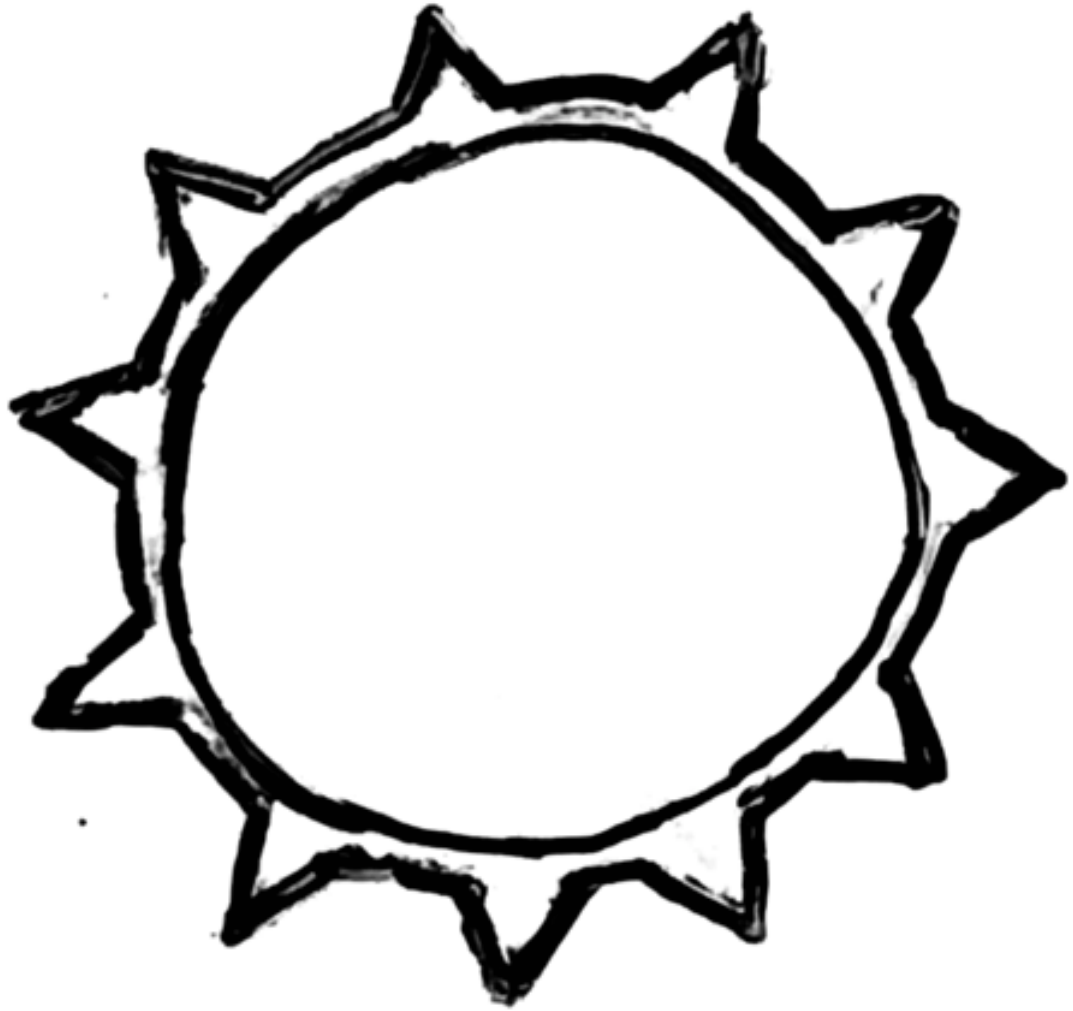
- **Sam van Hooff** – AMS / TU Delft, The Netherlands
- **Maryam Al-Irhayim** – UCLAN, Preston, UK
- **Rainer Townend** – UCLAN, Preston, UK
- **Christos Xenofontos** – UNIC, Nicosia
- **Andreas Prokopiou** – UNIC, Nicosia
- **Alexandros Postekkis** – UNIC, Nicosia

CITY-zen
New urban energy
ROADSHOW

Nicosia, Cyprus, May 2019

A vision on the sustainable city

Nicosia, City of the Sun



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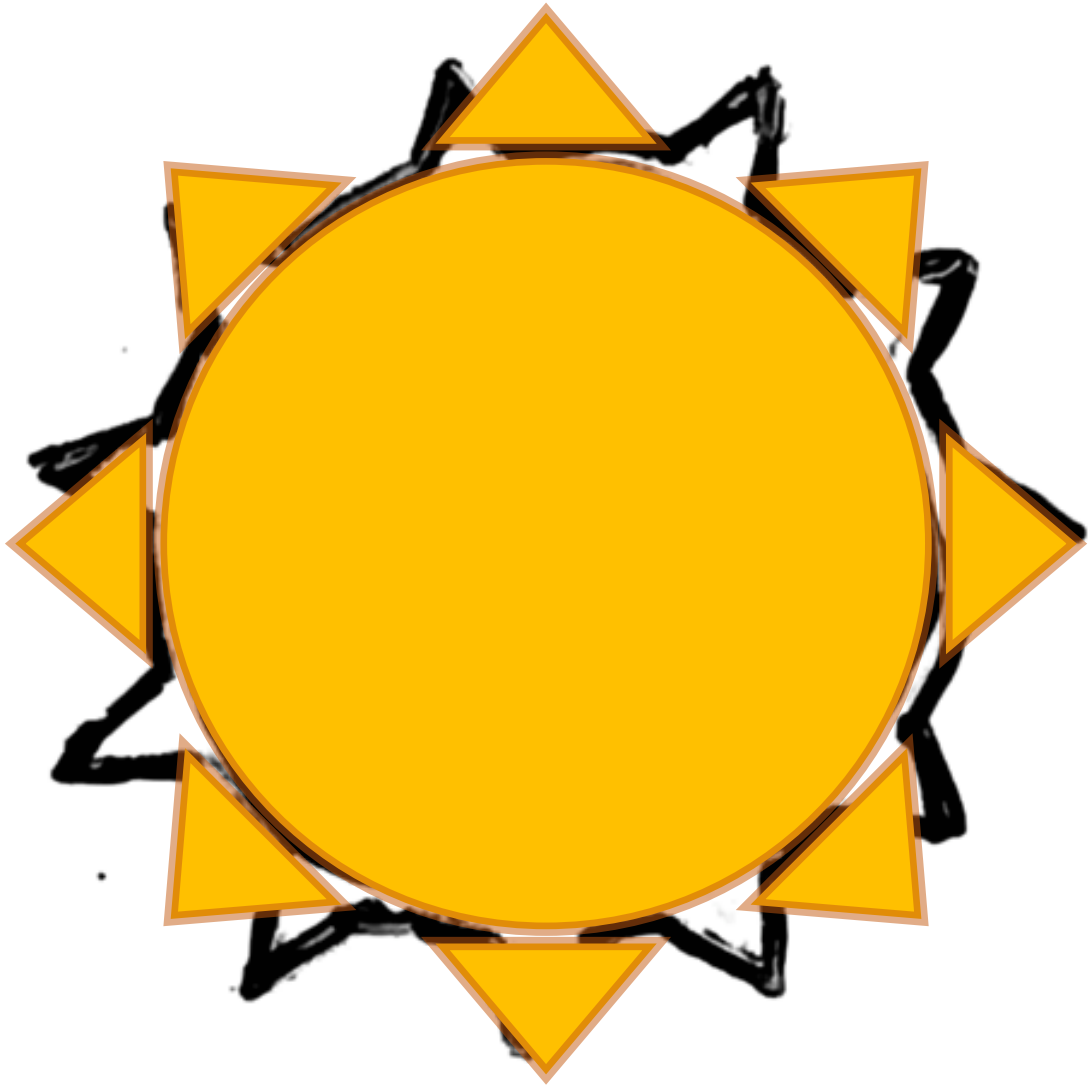
Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology

Nicosia, Cyprus, May 2019

Nicosia, City of the Sun



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Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology

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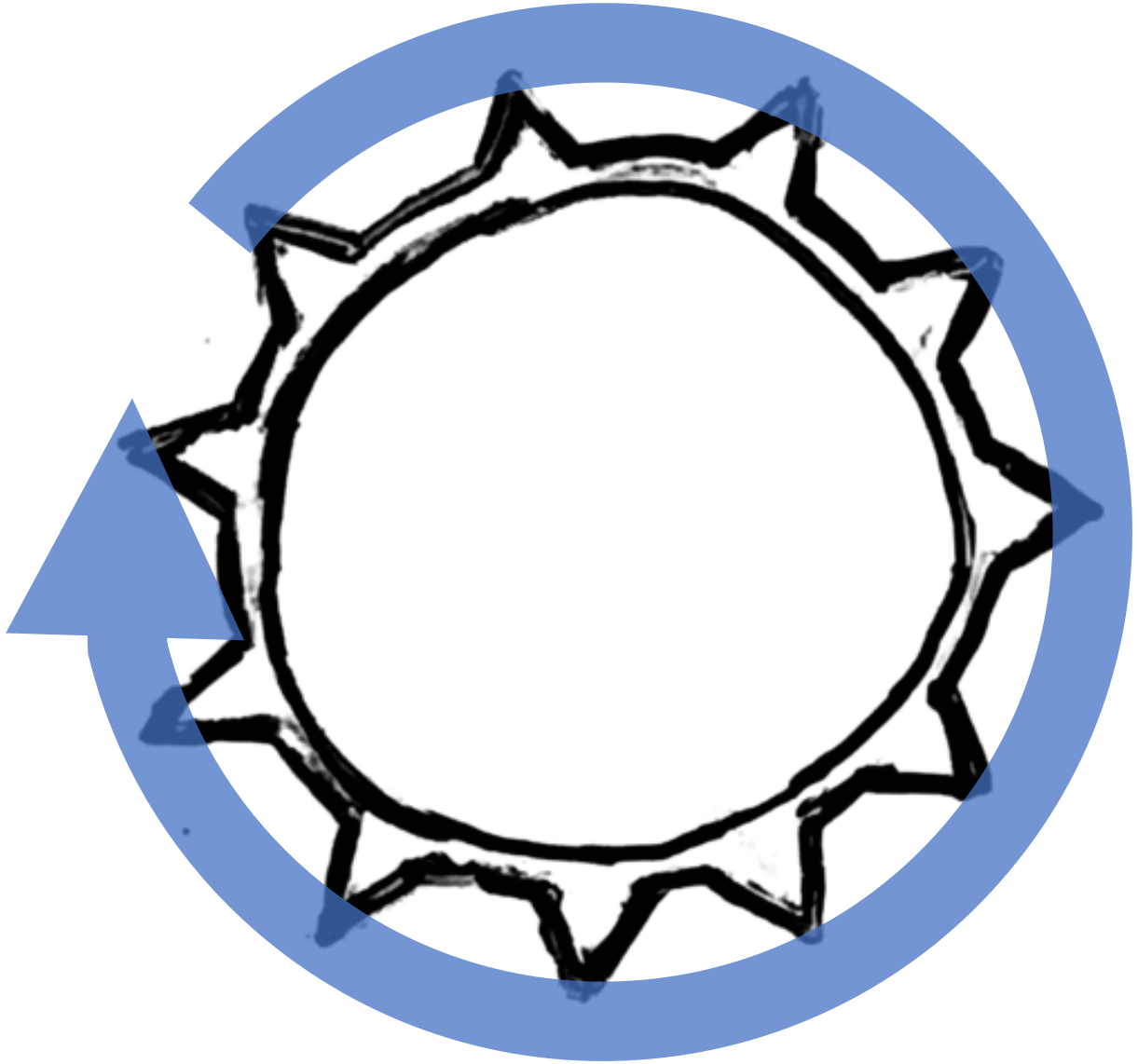
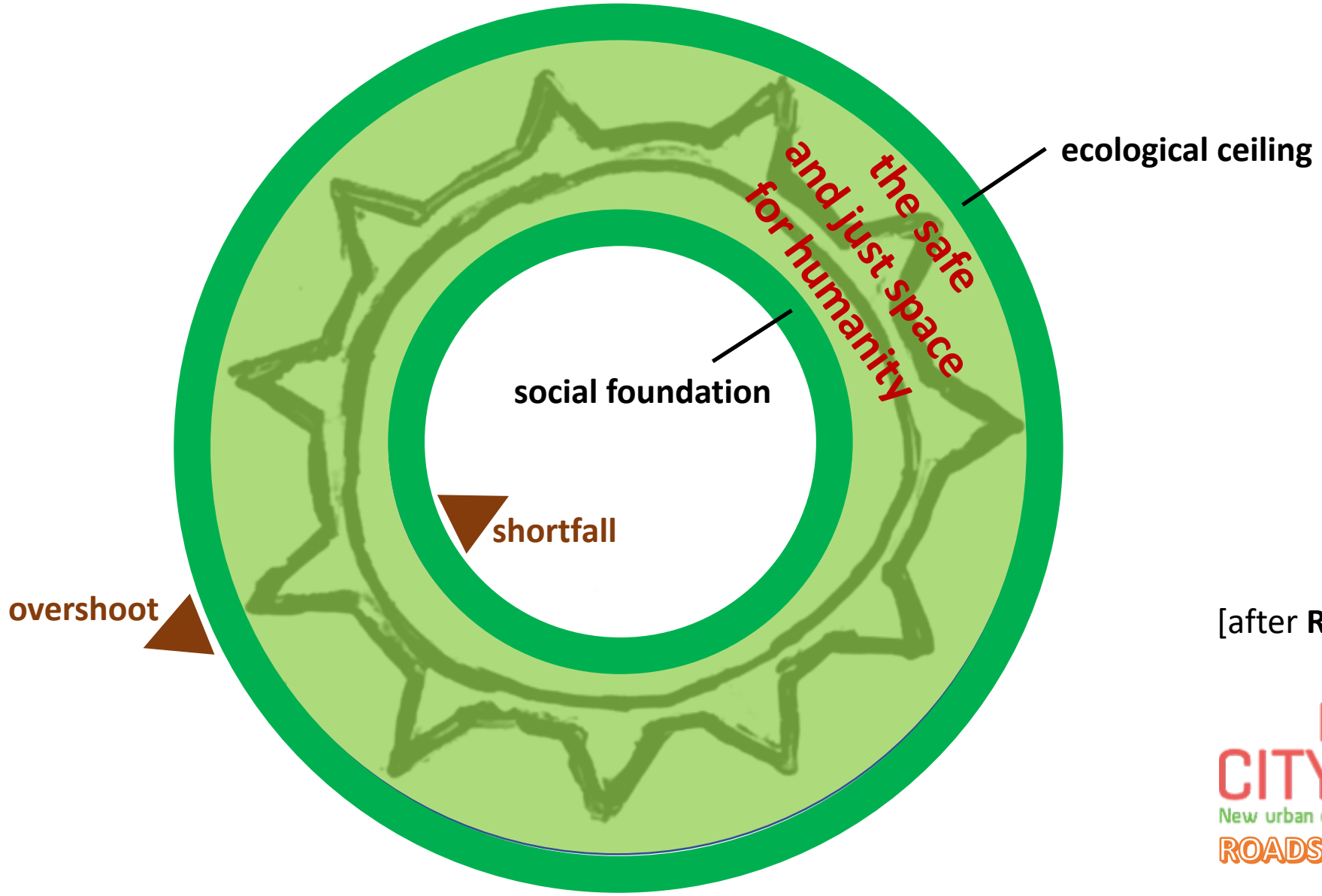
Nicosia, Circular City



Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology

Nicosia, Cyprus, May 2019

Nicosia, Doughnut Economy



[after **Raworth, 2017**]

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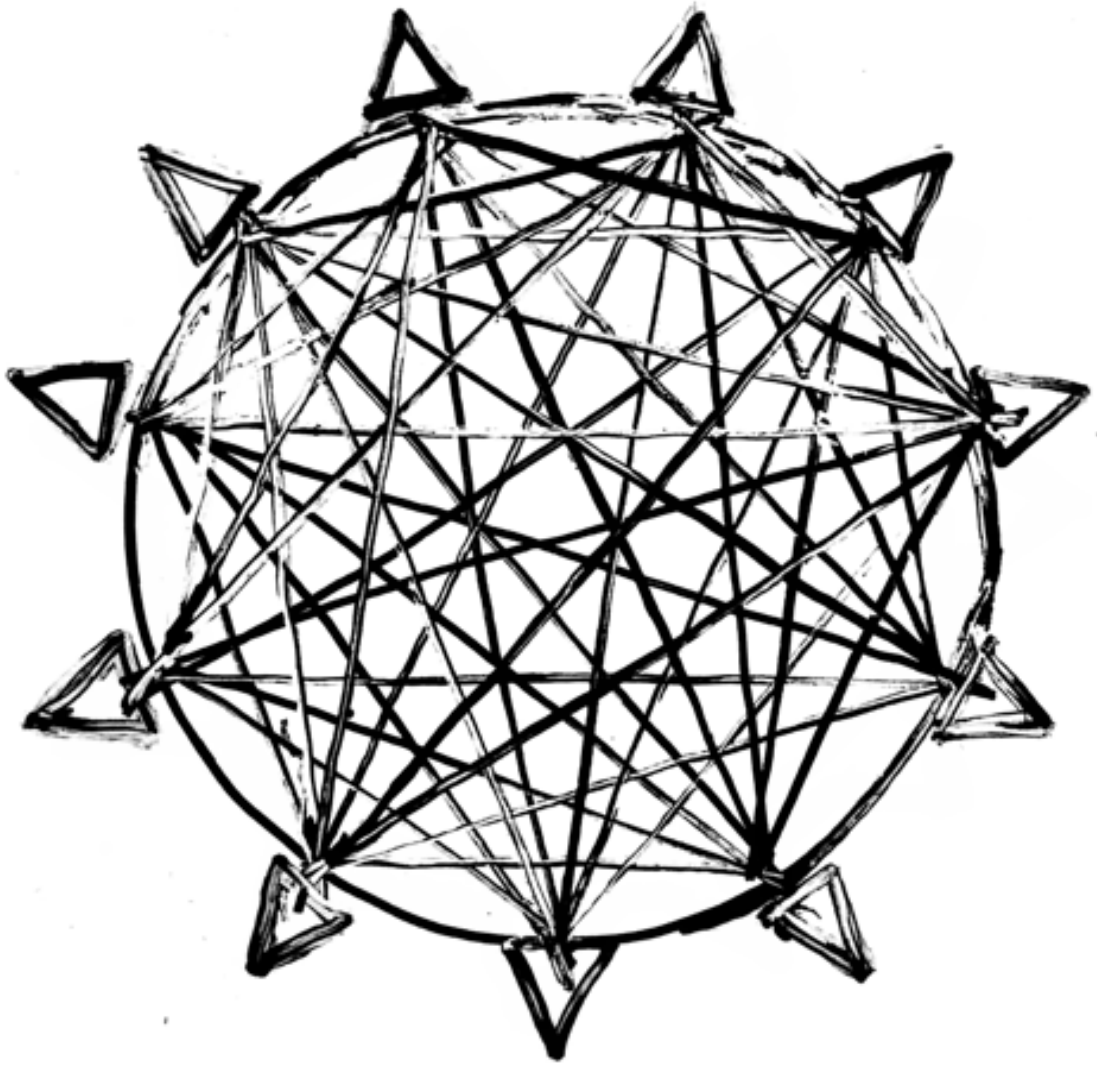
Nicosia, Connected City



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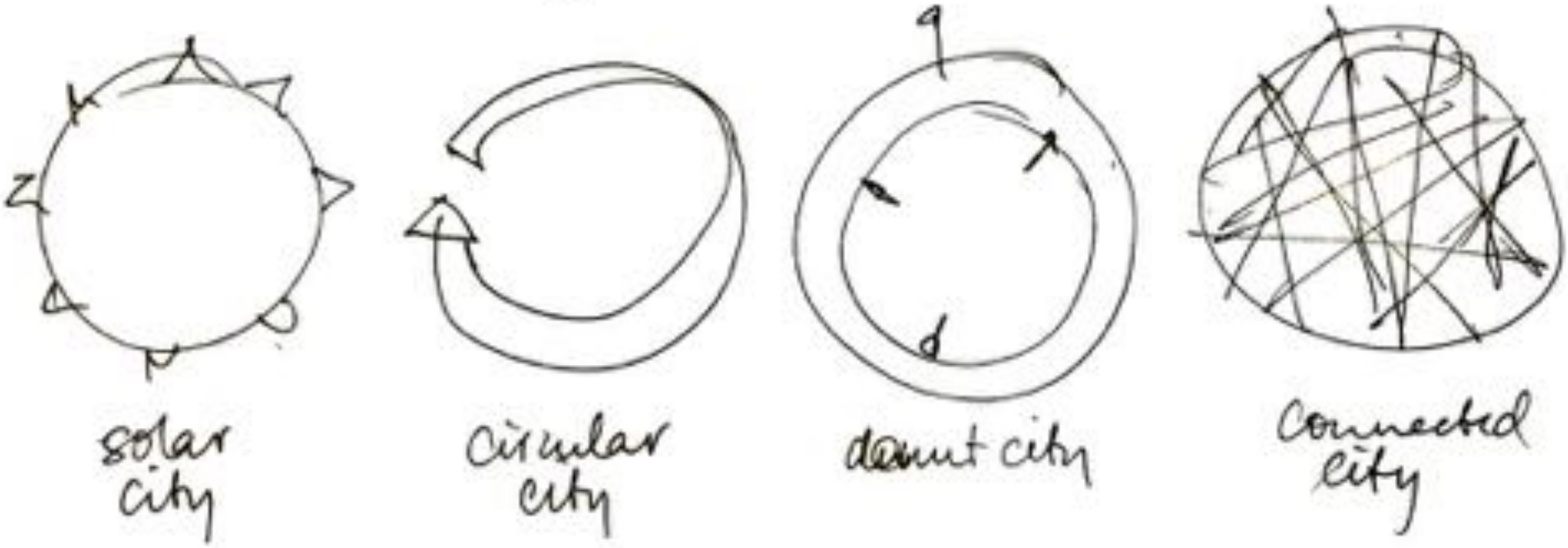
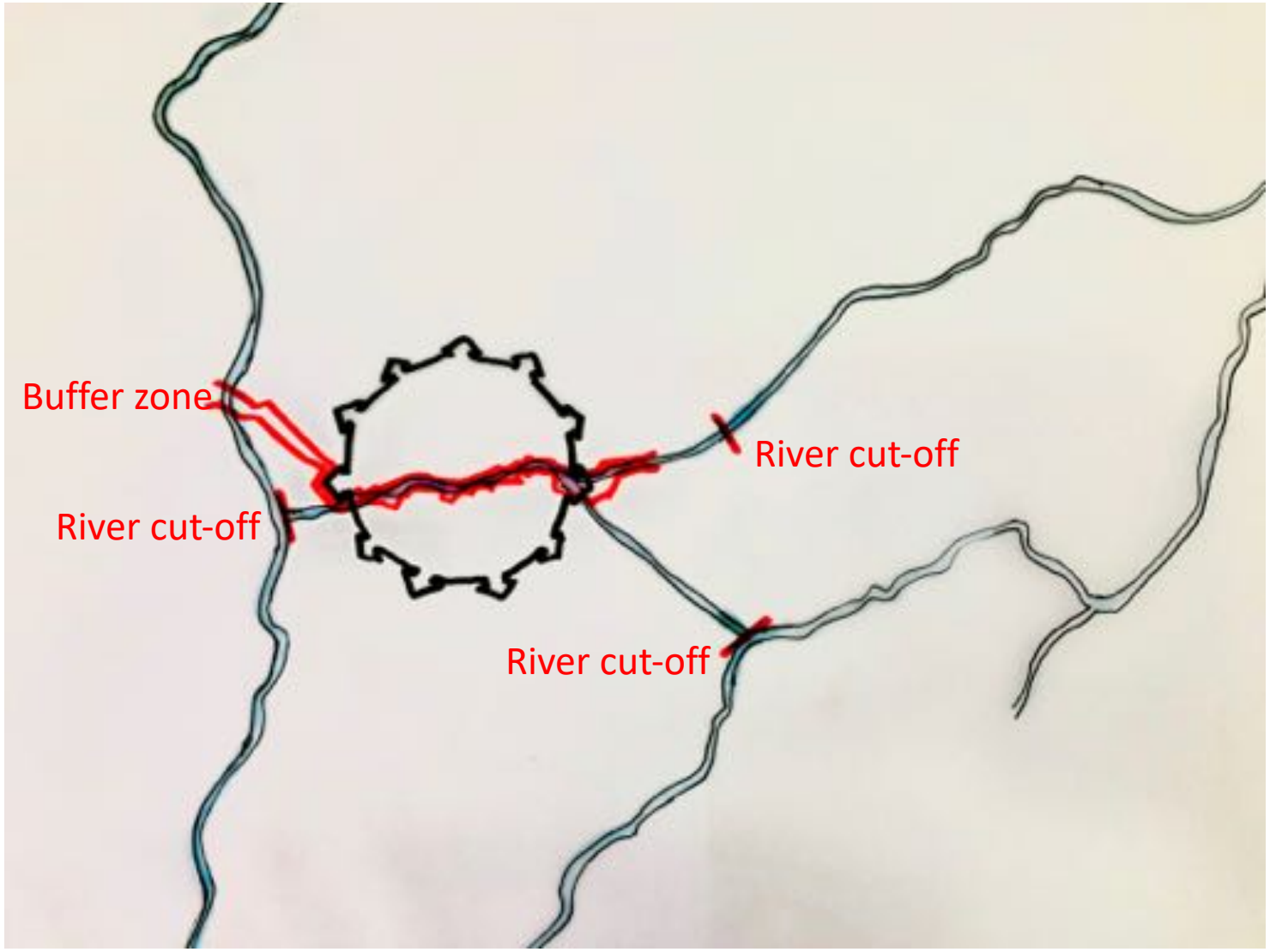
Different strategies



Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology

The river and connection lost



The ancient city of Lefkosia was situated on a **river** that ran right **through the centre**.

The Venetians built a **circular city wall** that blocked the old river course.

It became a **marshy waste dump**, which in turn became a **barrier** within the renaissance city.

At present, the **UN buffer zone** runs exactly along this barrier that once was a vital river.

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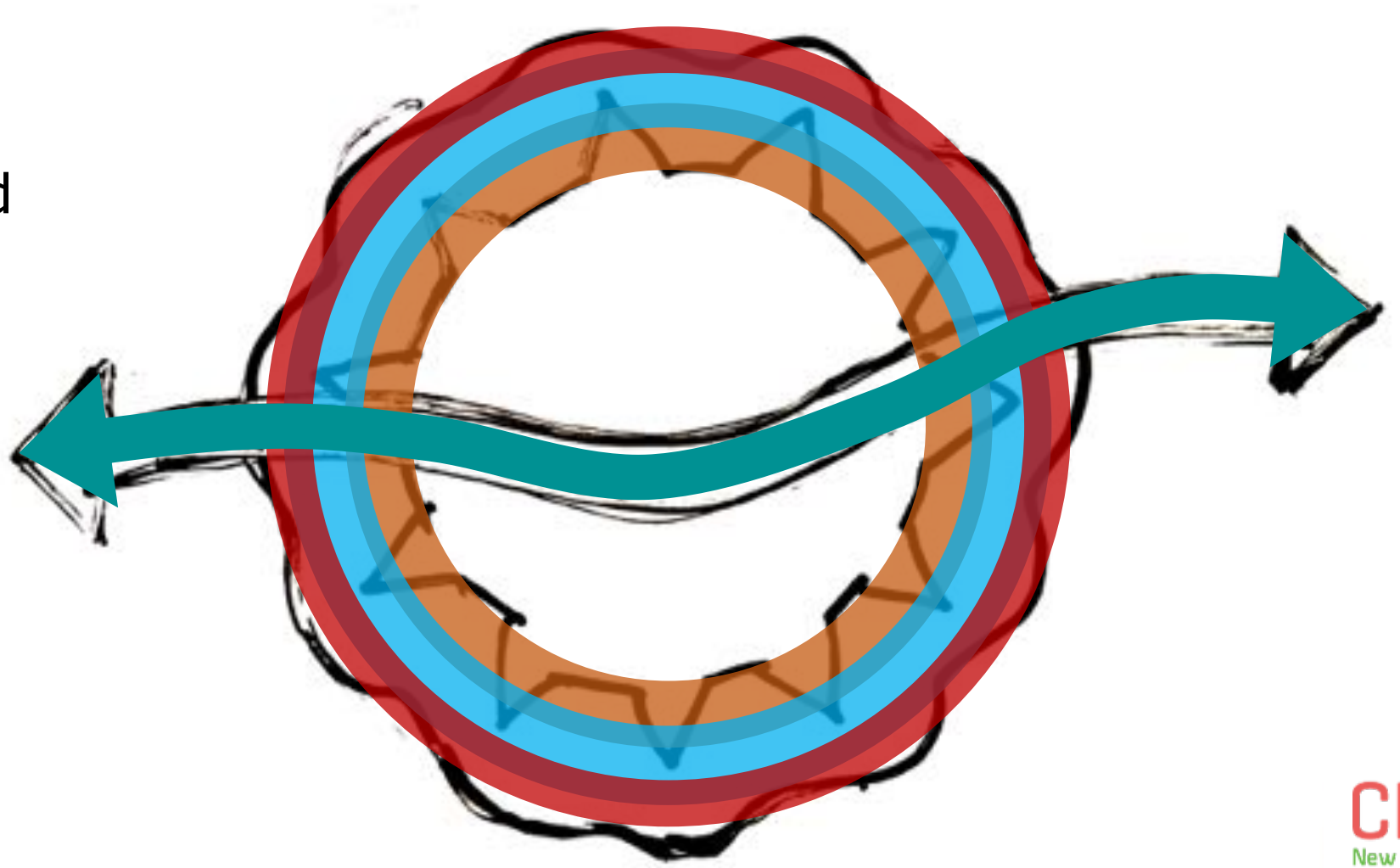
Proposing green-blue-red connectors for Nicosia

A top-touristic **UNESCO** world heritage city

A connecting green-blue **park zone**

A connecting green-blue-red **city ring**



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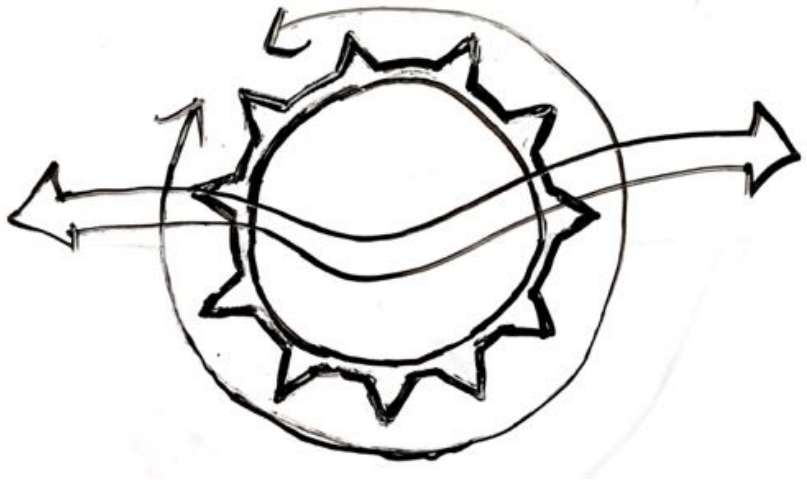
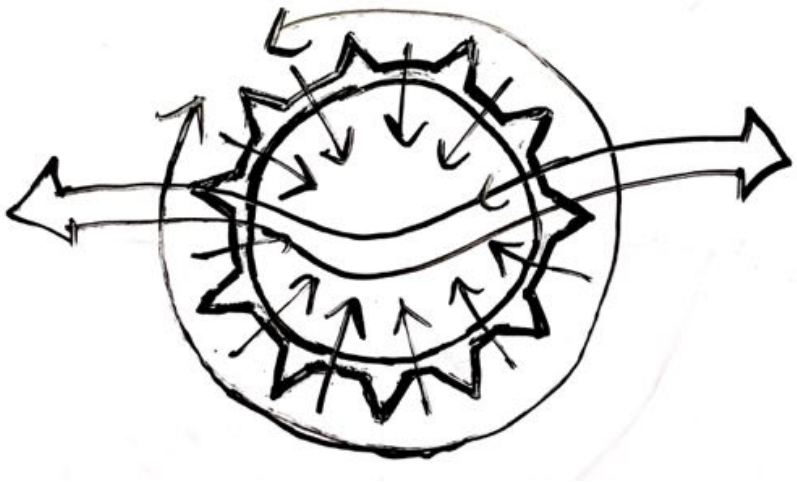
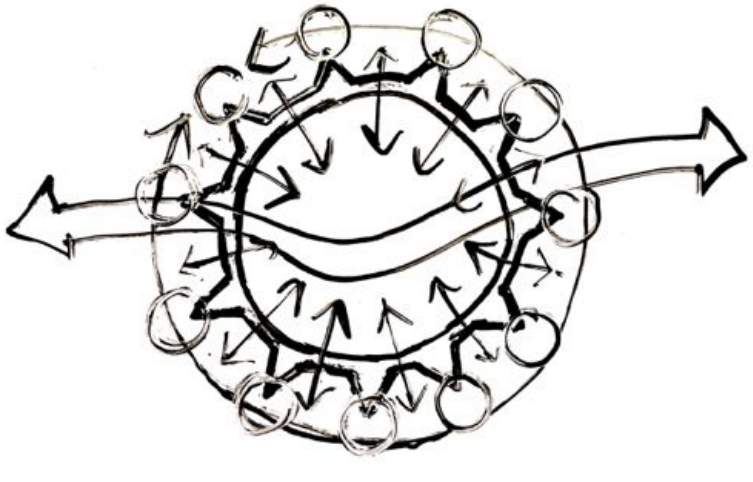
Strategy for the communal energy system



Ring network for energy mains



Branches into the city



Energy storage in the batteries

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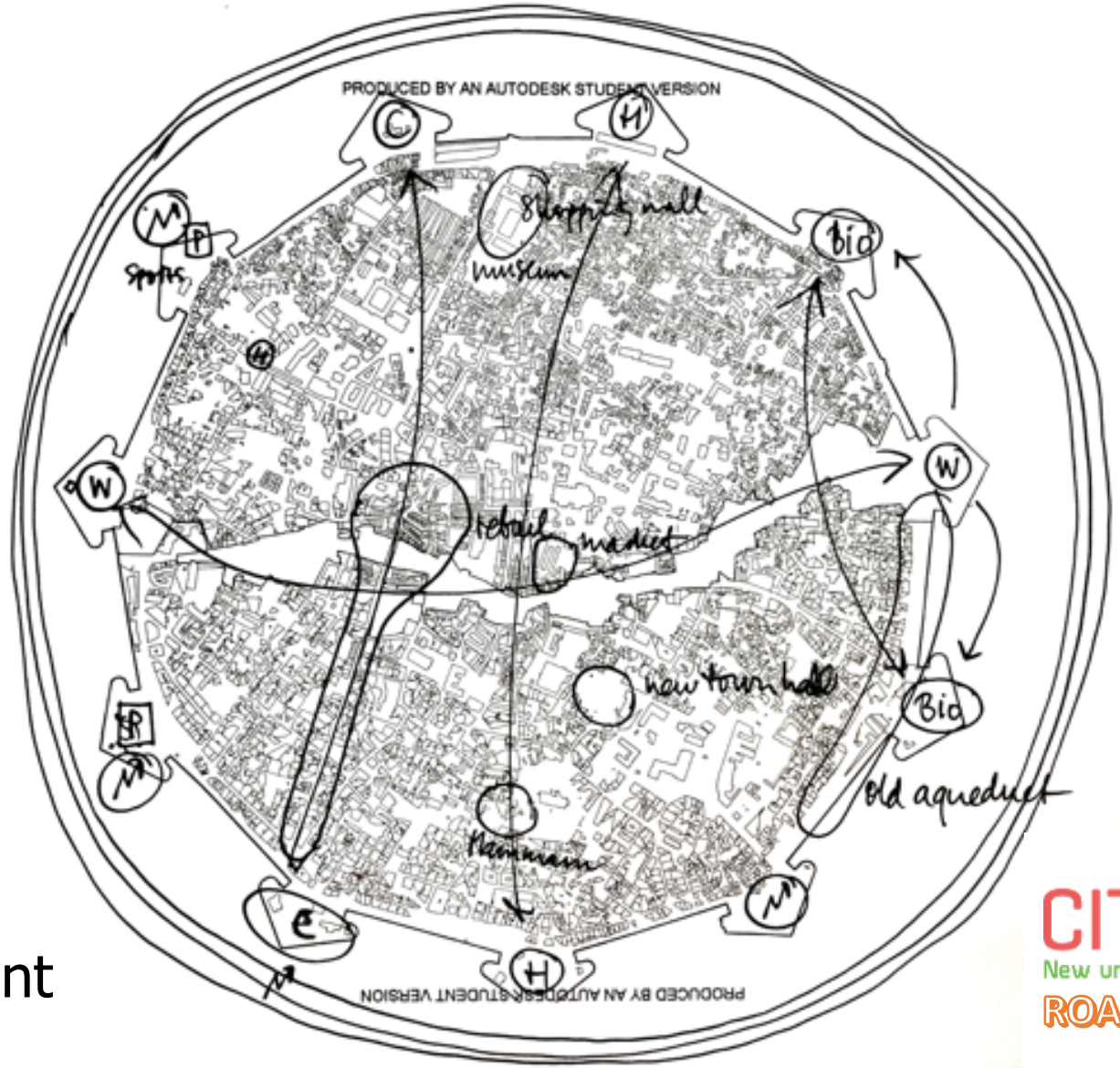
New energy utilities in the historic city ring

- **Ring networks around the city**
- **Storage facilities**
  - Electricity storage
  - Cold storage
  - Heat storage
  - Water storage
  - Waste water treatment
  - Bio-digestion
- **Strategic positioning**
  - Near logical demands
  - Helping circular management



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From bastion battery to bastion battery

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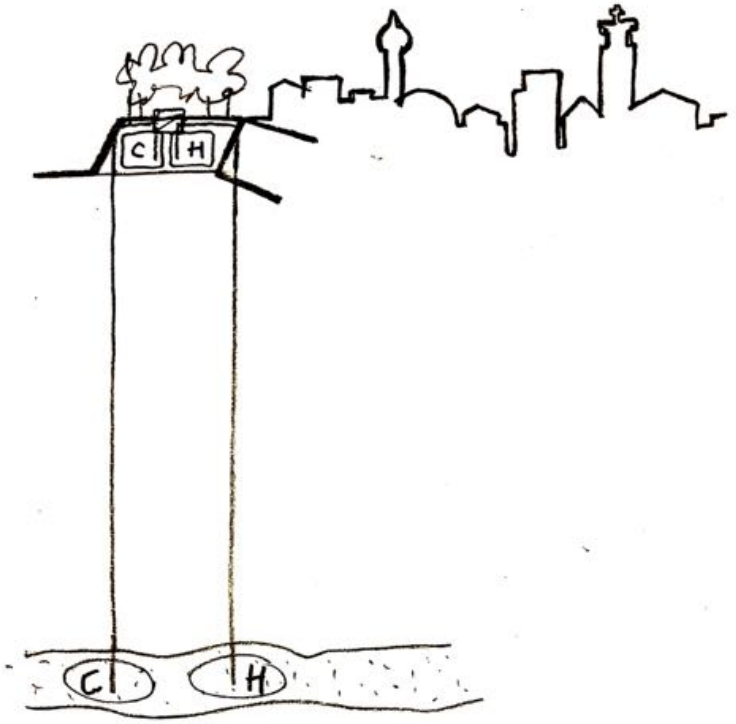
Bastion heat and cold storage



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Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology

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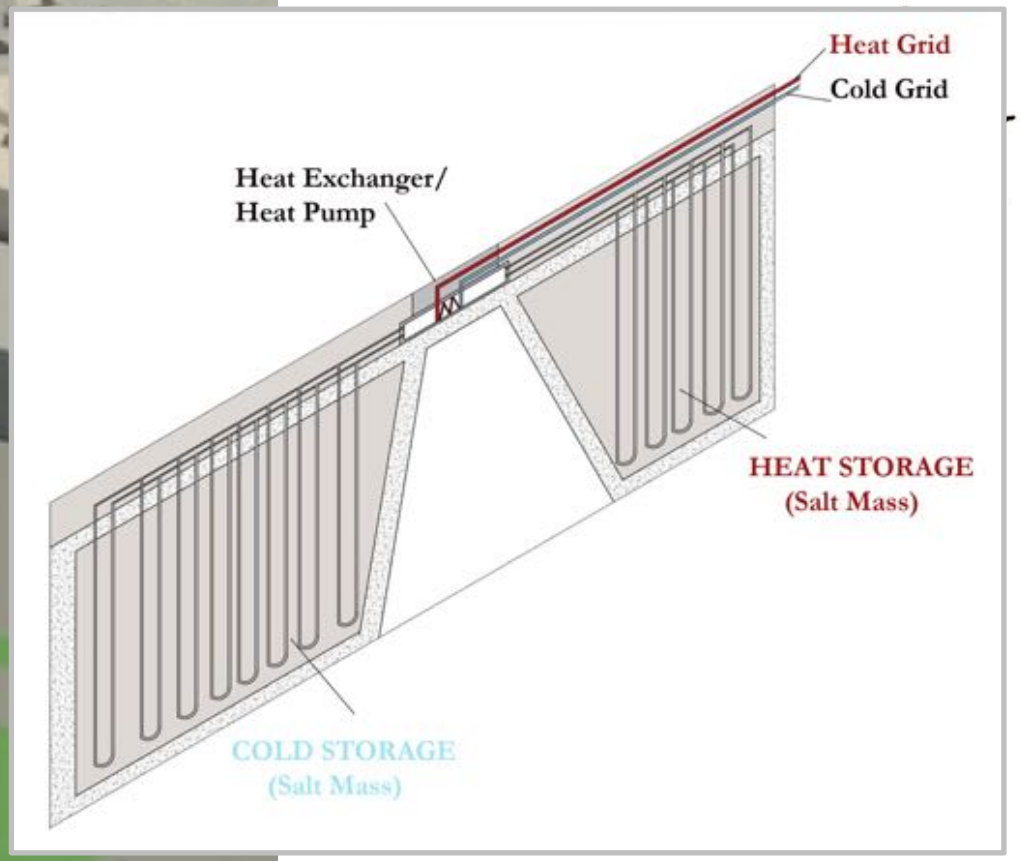
Bastion heat and cold storage



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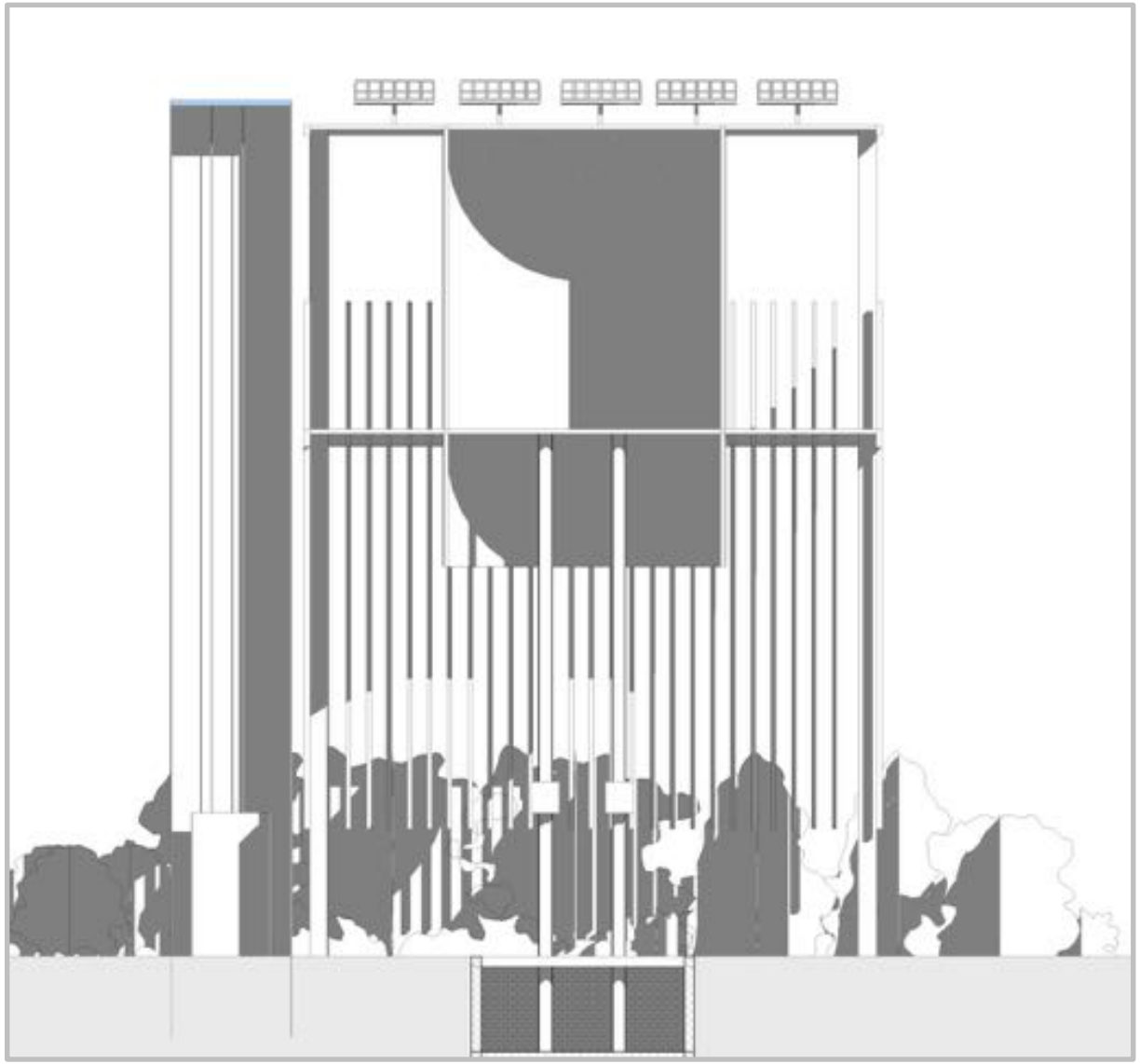
Hydro-power water tower look-out



Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology

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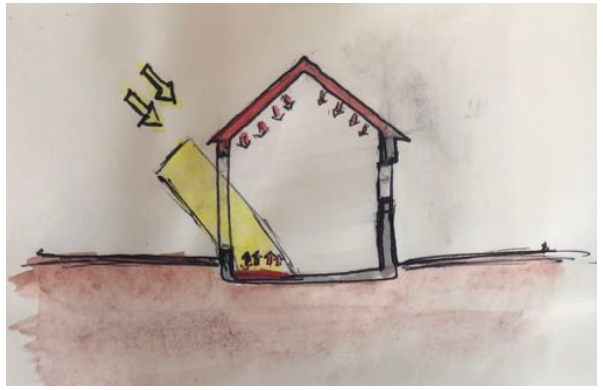
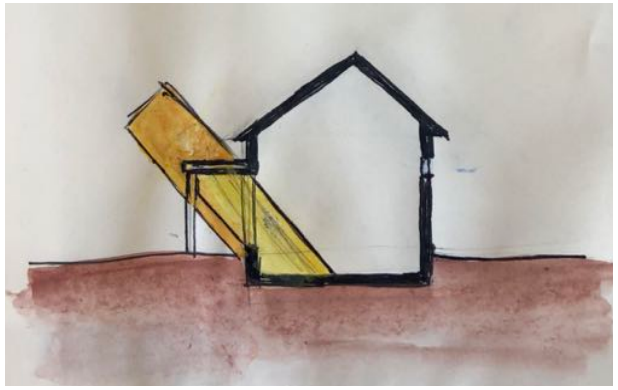
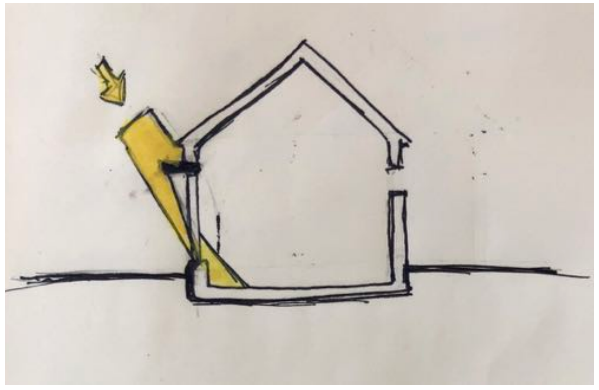


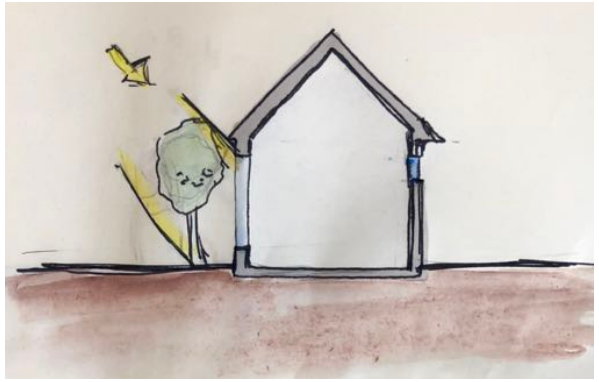

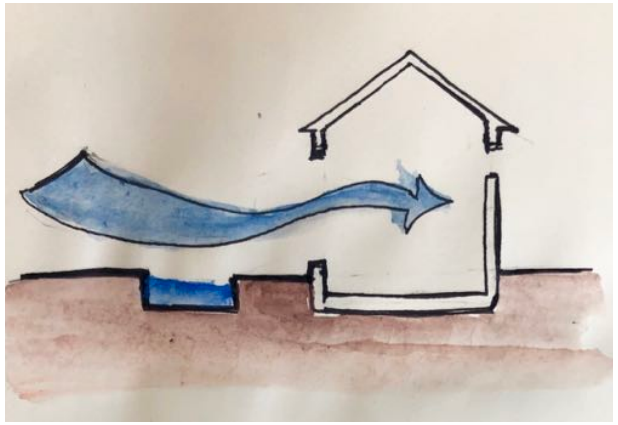


Bioclimatic principles for Nicosia

[drawings by Maryam Al-Hiryahim]

- Learn from local historic architecture
- Learn from buildings in warmer regions
- Use the local future climate smartly
- Use the geological features
- Use local materials

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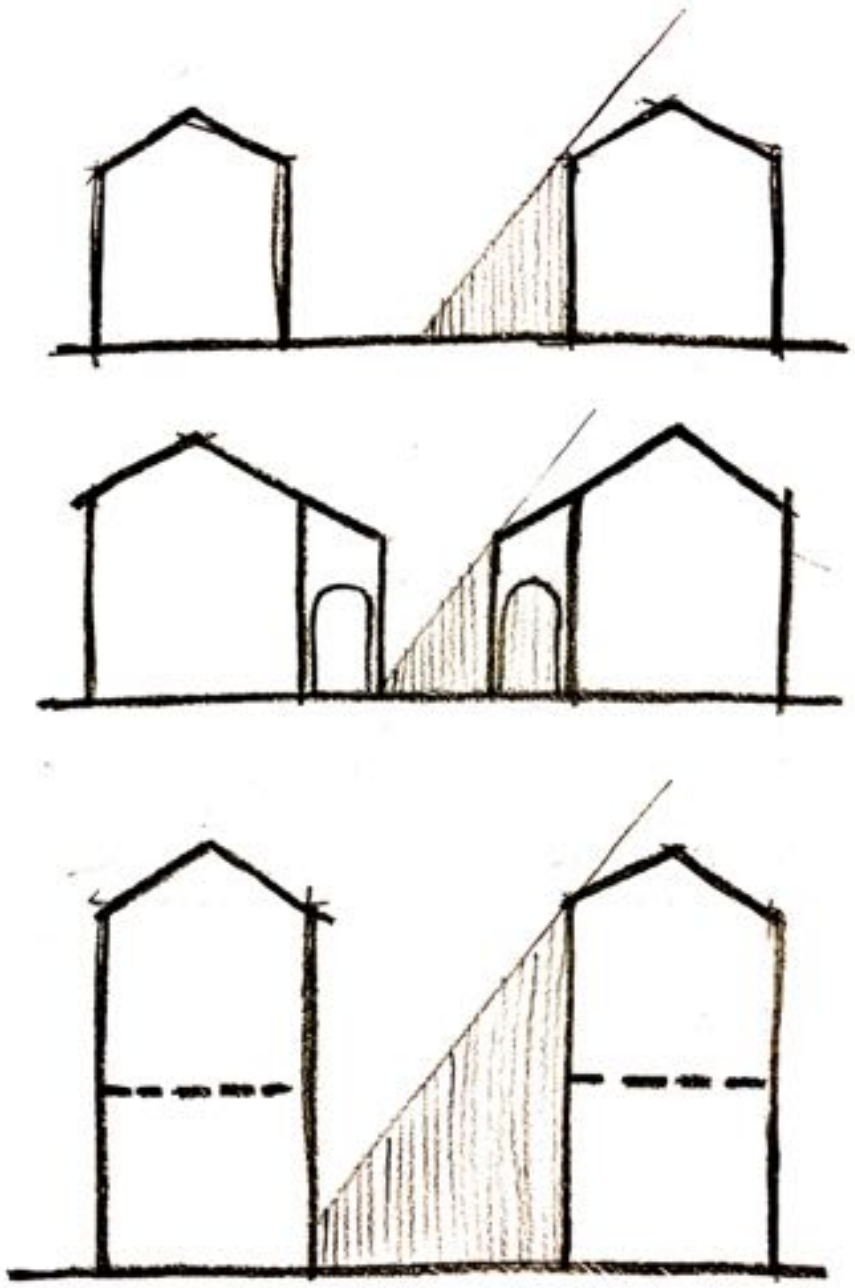

Passive measures

- **Narrower streets / higher buildings alongside**
- **Design to block / admit the sun** (awnings, louvres)
- **Create buffer spaces** (balconies, loggias, verandas)
- **Insulate the building envelope** (roof, façade, floor)
- **Use building mass / phase change materials**
- **Create thermal draft / wind-driven ventilation**
- **Use plants / fountains for evaporative cooling**

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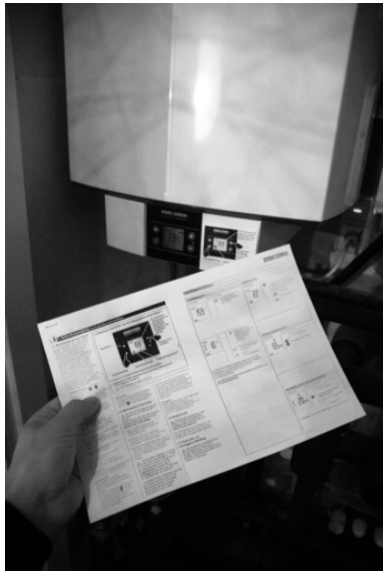
Active energy saving measures

- **Low-temperature heating, high-temperature cooling**
  (underfloor/wall system, air system)
- **Energy-efficient lighting**
  (LEDs or e-saving fluorescent lighting)
- **Energy-efficient appliances**
  (washing machines, televisions, fridges, freezers, air-conditioners)



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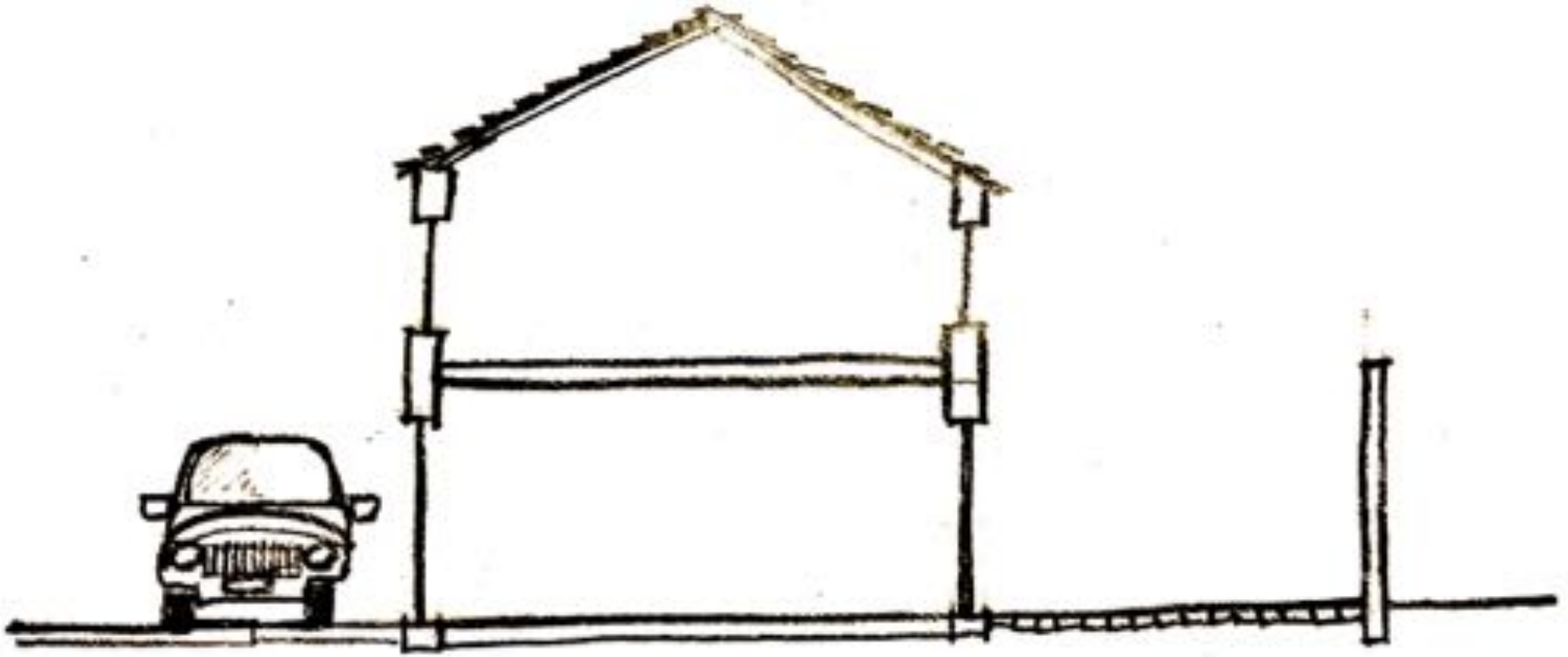
Energy retrofit



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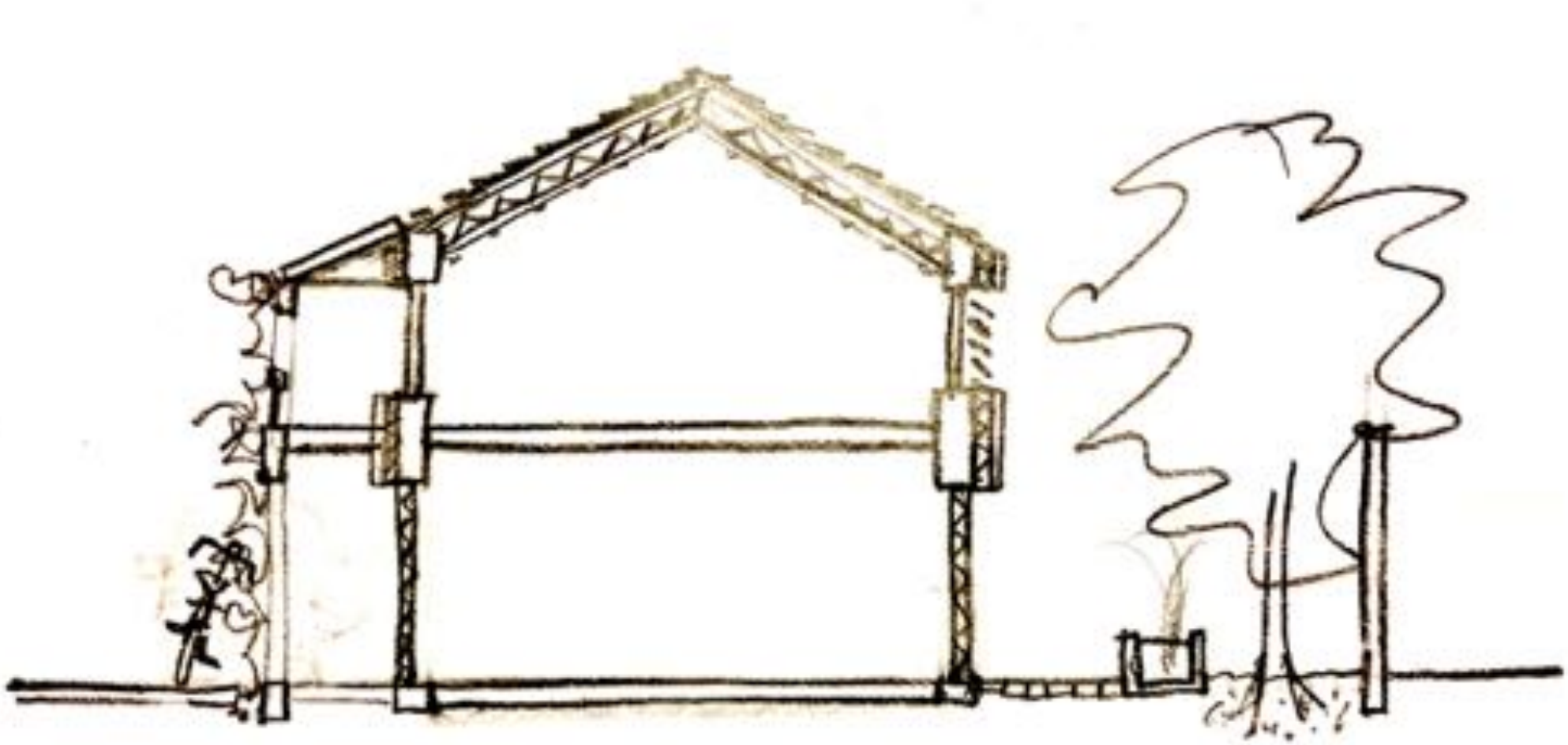
Energy retrofit



- Roof insulation
- Wall insulation
- Double-glazing
- Insulated doors
- Loggia
- Flowering climbers
- Garden tree
- Garden water
- Solar roof tiles
- Solar collector
- Bicycles

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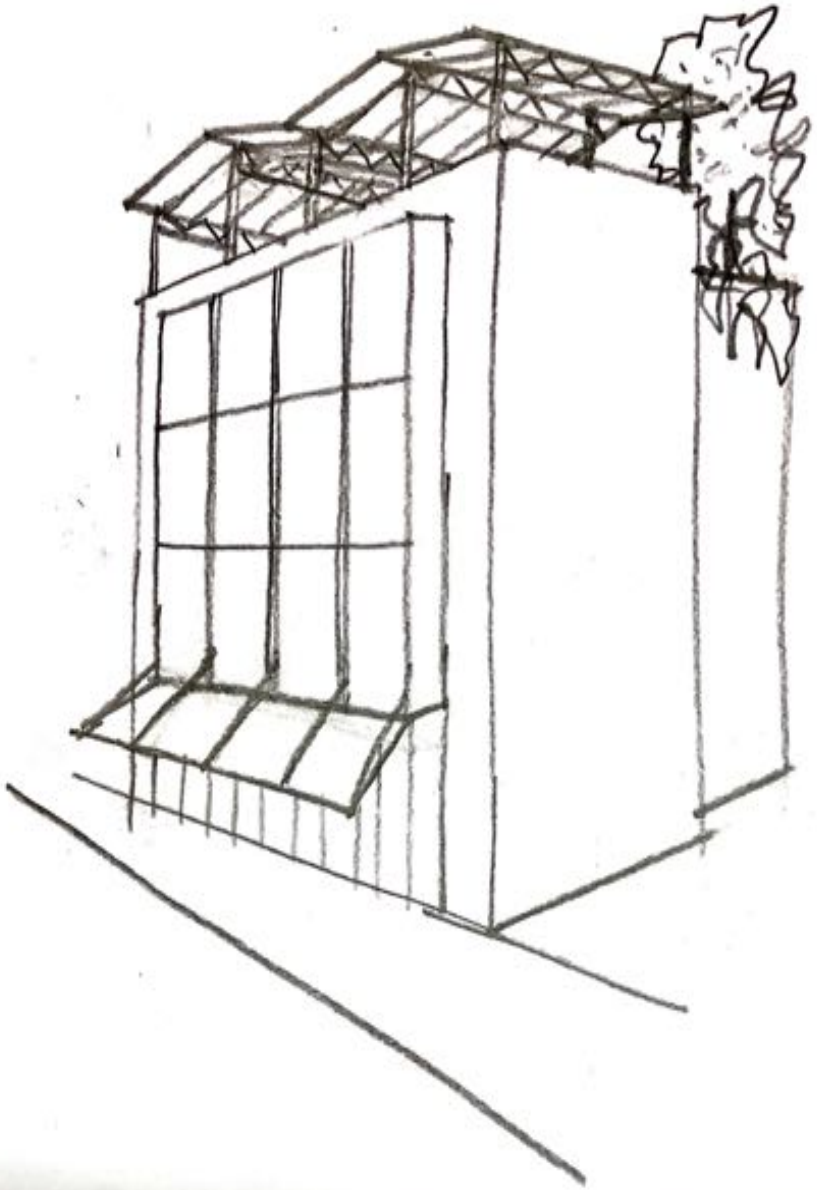

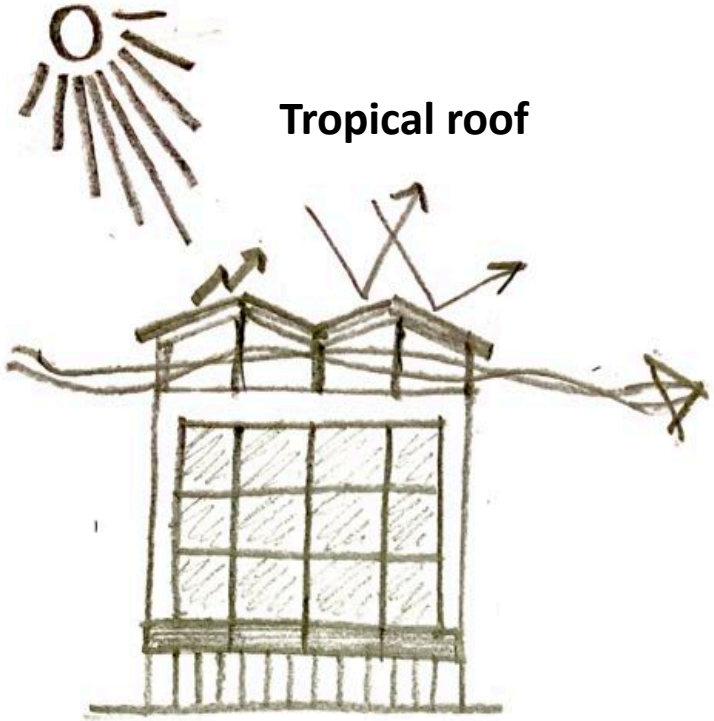

Tropical roof

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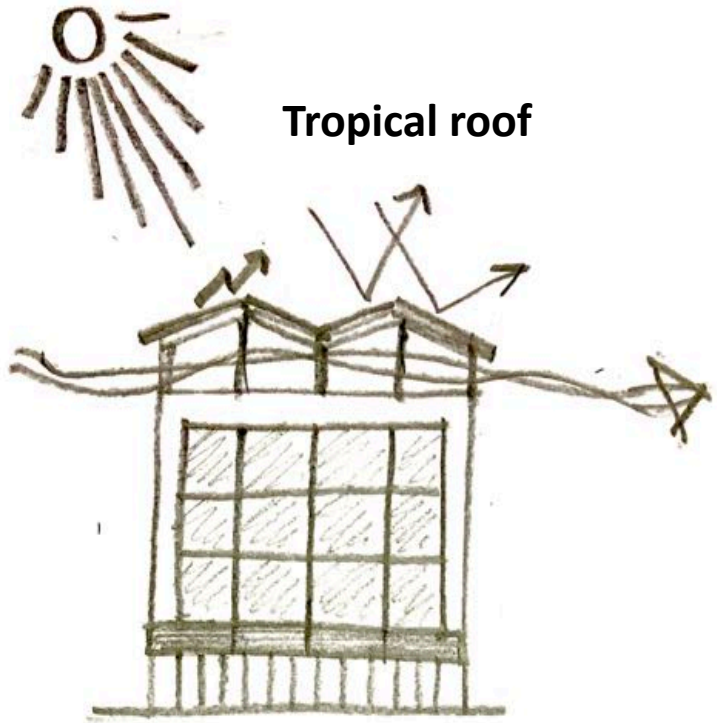
Tropical roof



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Household retrofit + solar electricity panels

- **Retrofit investment a home: € 15,000**
  Thermal insulation, highly performant windows, new energy-efficient appliances and LED
- **Combined with 3 kW PV panels for € 3,900**
- **65% savings on energy bill**

→ **Payback time: 16 years**

Yearly cost for mobility for 1 family:

- **2 cars**: annual costs **€ 15,000**
- **1 car, 2 electric bikes, € 800 for public transport**
  → annual costs: **€ 9,400**
- **Annual savings: € 5,600!**

Immediate profit:
keep 1 car, sell 1 car (€ 500),
buy 2 electric bikes,
spend € 800 on public transport
→ annual costs only **€ 11,700**

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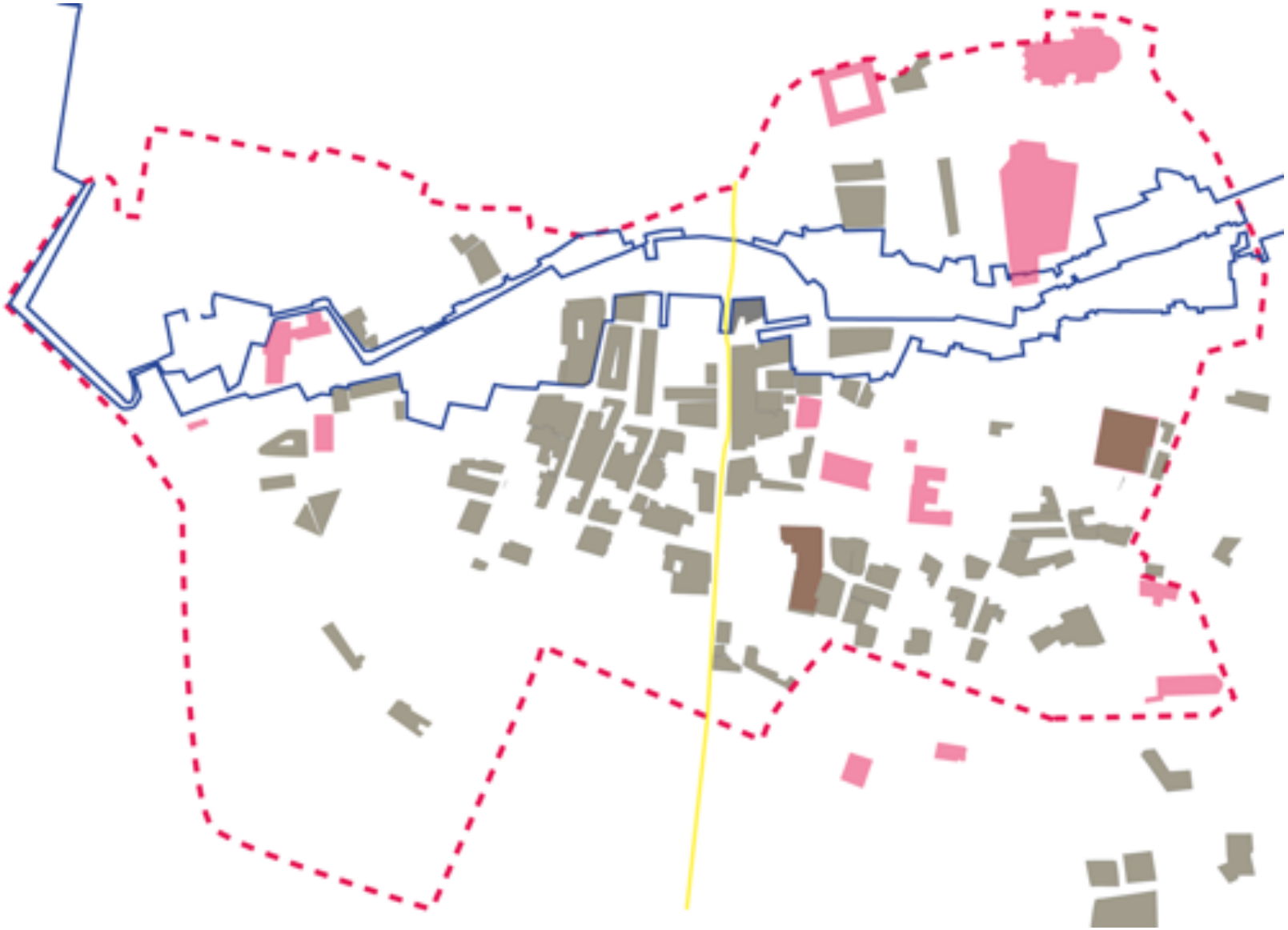
Flat roofs in our area: potential for solar panels



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Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology

Nicosia, Cyprus, May 2019

This could be PV!

This could be PV!

Solar art

These could be PV cloths

Heritage PV?

Ramparts in disarray

Solar potential of the ramparts

Traditional PV

Temporary, until Nicosia has sufficient solar power?

Heritage PV on the ramparts

Finding the right, historically acceptable solution

This could be done in a local energy company (LEC)

A community looking for

- **Energy independence**
- **Participation in the energy market**
- **Lower electricity prices**
- **Reduced CO_2 emissions**

They are involved in energy

- **Production**
- **Storage**
- **Distribution**
- **Sharing and trading**
- **Supply**
- **Aggregation**

6 years!

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Benefits

For citizens

- Involvement in the energy transition
- Spread initial financial investment in smart technology and RE production
- Energy independence
- Local economic development

For society

- The uptake and integration of renewables
- Enable cost-effective grid expansion or operation
- Promote energy savings and electro-mobility

Proposal for Nicosia

- **Communities in Nicosia**

People living in apartment blocks

A group of local shops offices

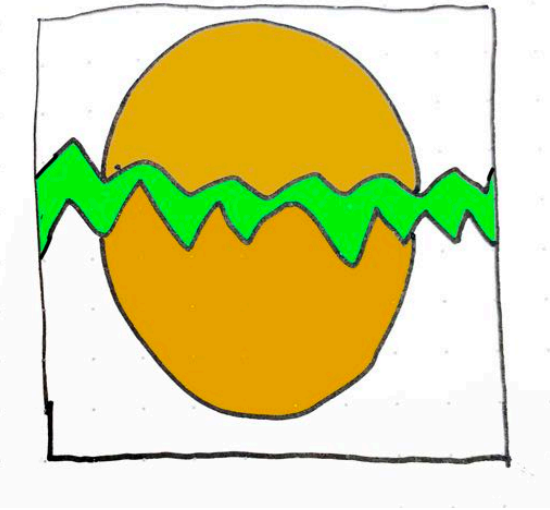
- **Location of communal solar panels**

Buffer zone

The city wall

Rooftop of apartment blocks

Urban Design



Problems

Division

Not the biggest.....

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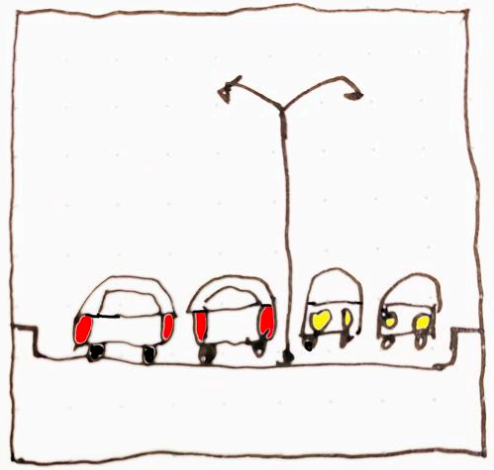
Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design



Problems

Car usage

Bigger…

Heat island

Climate change
Sustainability

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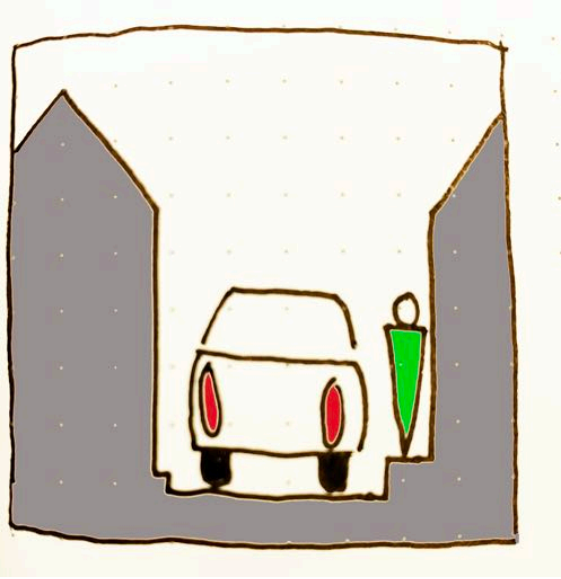
Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design



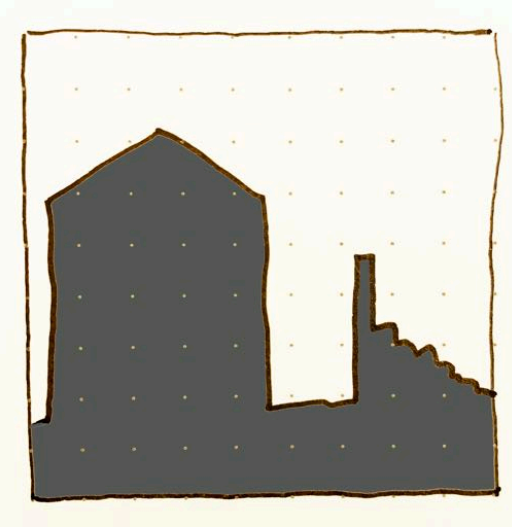
Problems

People unfriendly space

Car dominated…

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Urban Design



Problems

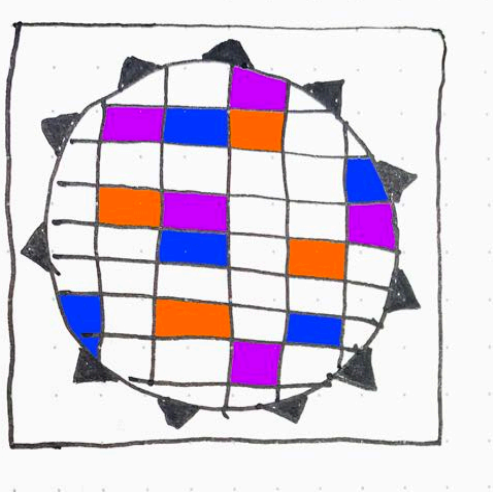
Heritage at risk

The possibilities are endless……

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design



Problems

No obvious centre public space in the city

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Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

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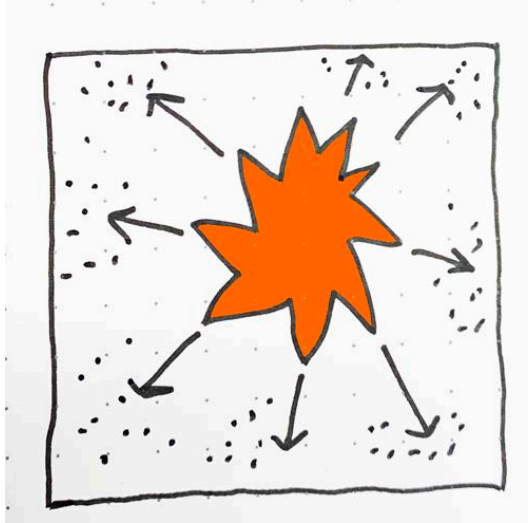
Problems compounded by

Suburban growth



Problems

Suburban growth

No transport infrastructure

Car-based transit

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Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

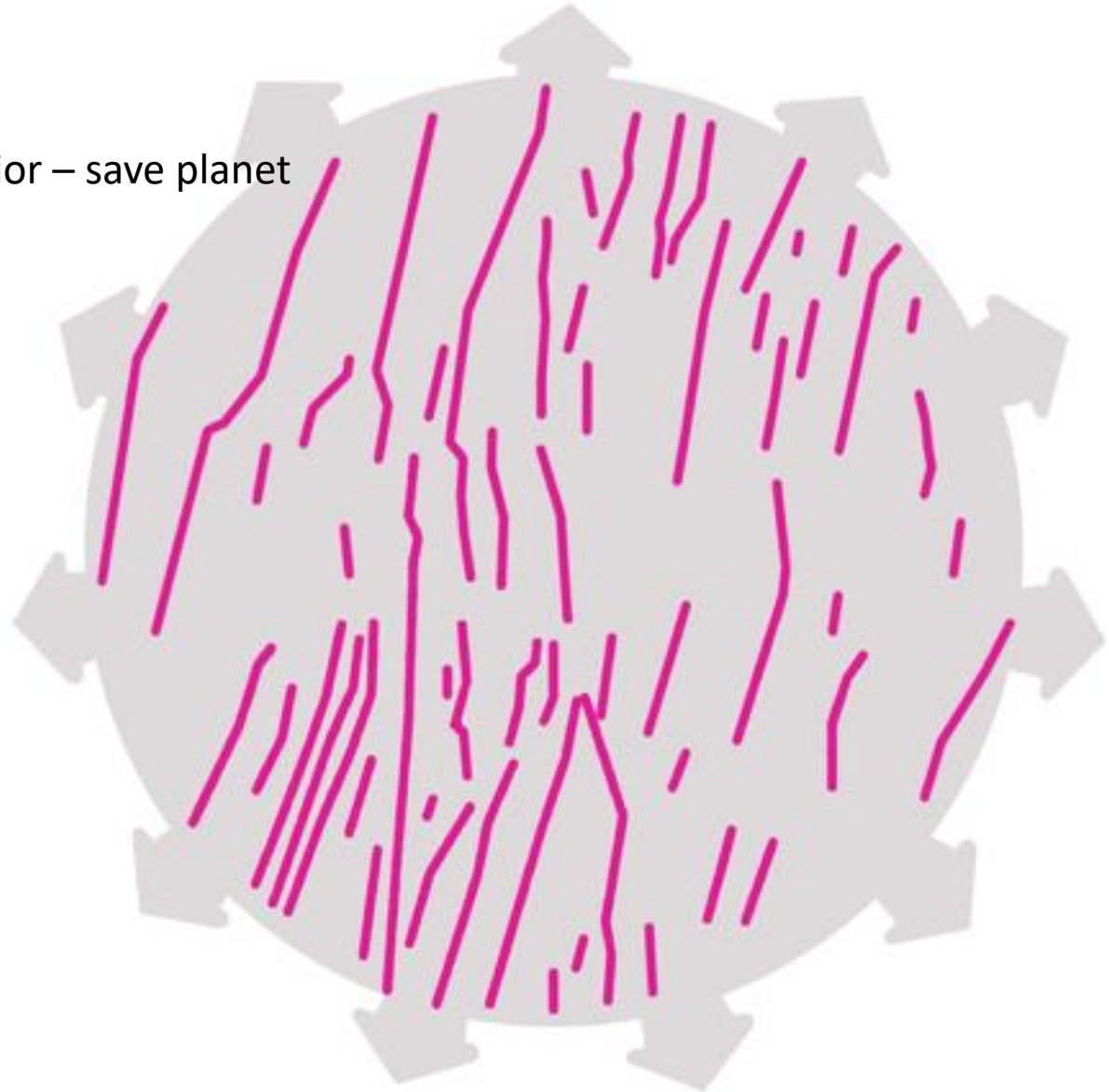
Urban Design

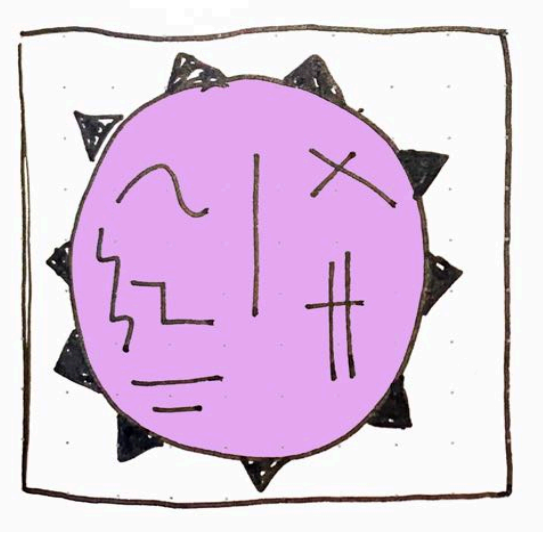
Key Premise

Change space – change behavior – save planet

Network issues

N-S





Network issues

Change space

Change behaviour

Save lives

Save planet

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New urban energy
ROADSHOW

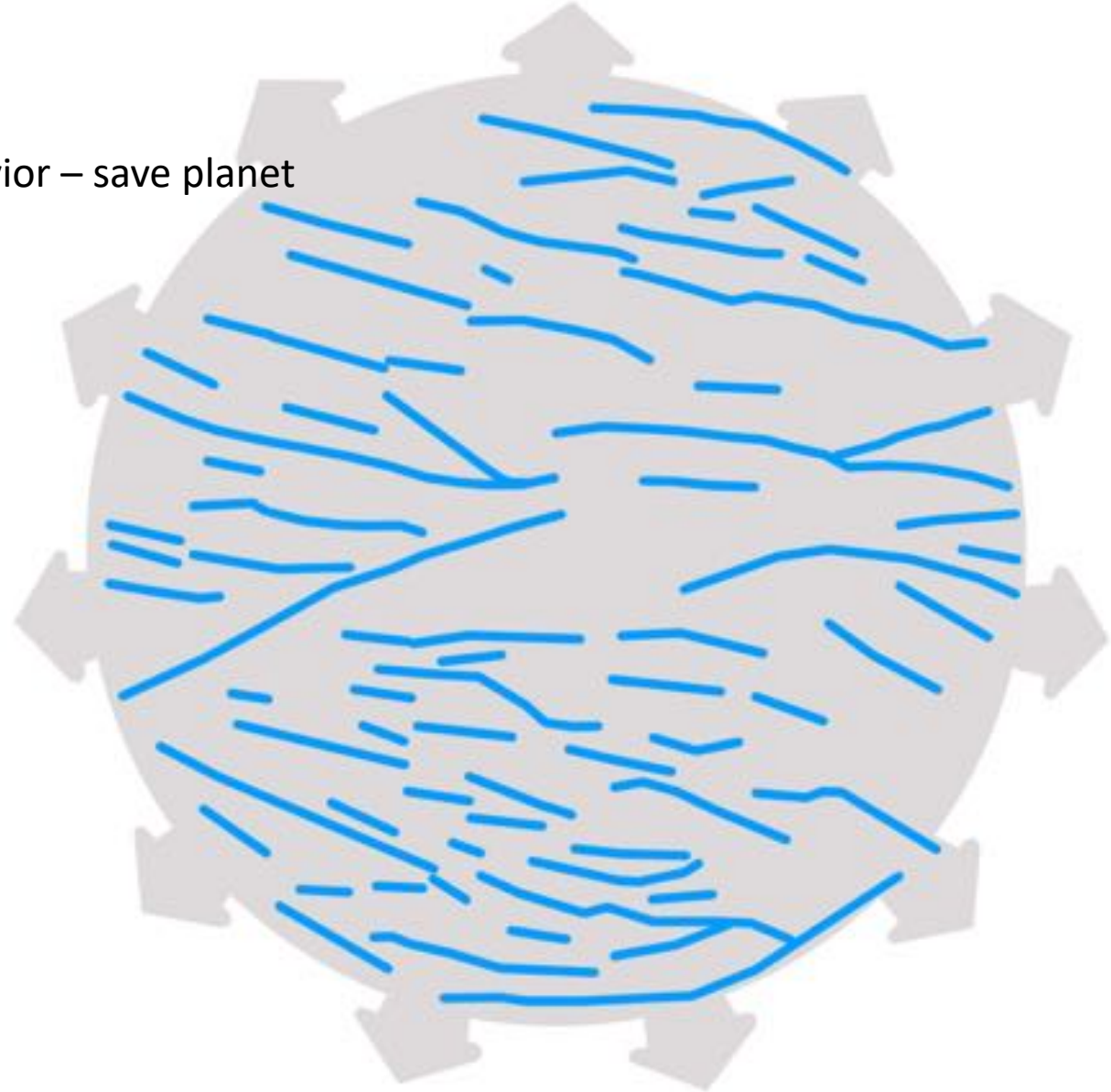
Urban Design

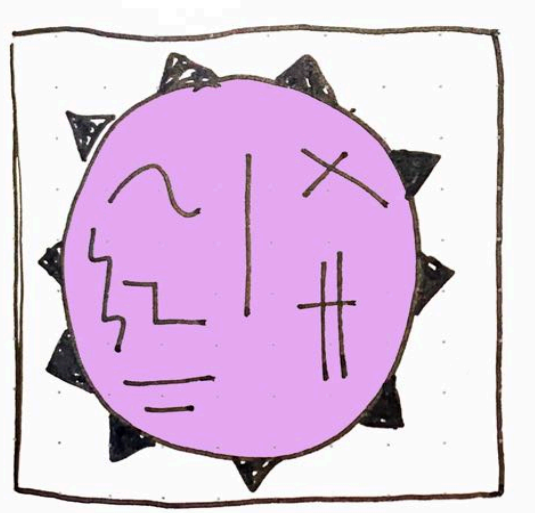
Key Premise

Change space – change behavior – save planet

Network issues

E-W





Network issues

Change space

Change behaviour

Save lives

Save planet

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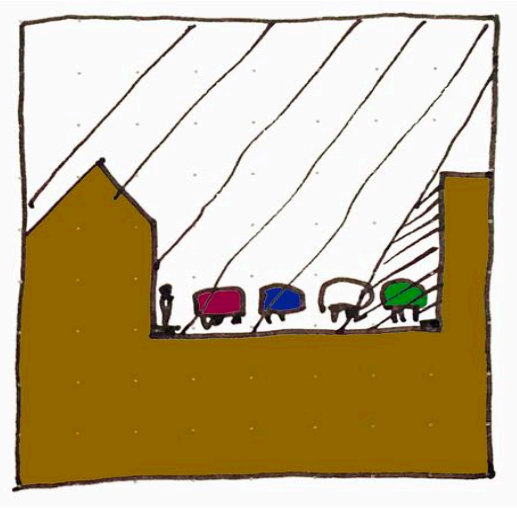
Urban Design

Key issues

Change space – change behavior – save planet

Get people out of the car…. 2000 deaths a year from circulatory problems….



Get people out of the car

- Change space
- Change behaviour
- Save lives
- Save planet

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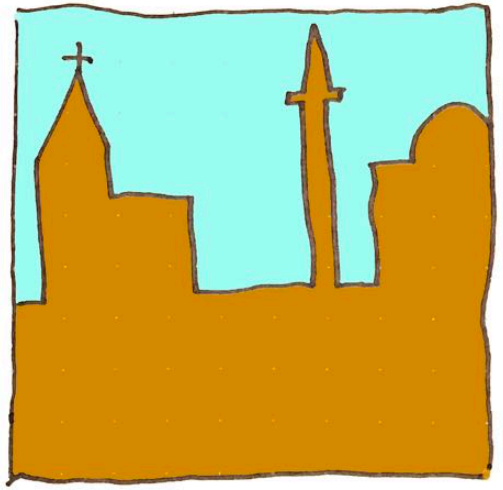
History to heritage

How do we unlock resilience and keep all histories……



History to heritage

History

History

History

People

Local global

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The Challenge

Invent something that you will actually do !

Affordable

Time-bound

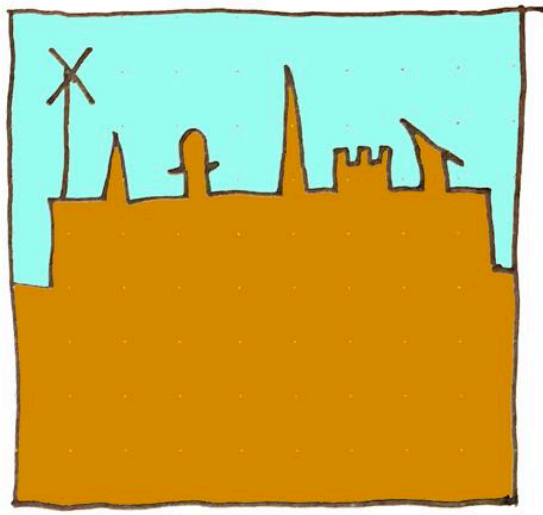
Methodological and Emergent

Politically acceptable

Understandable by all

Yet…….

Radical – because it’s an emergency!!



The Challenge

Community buy-in

But radical change

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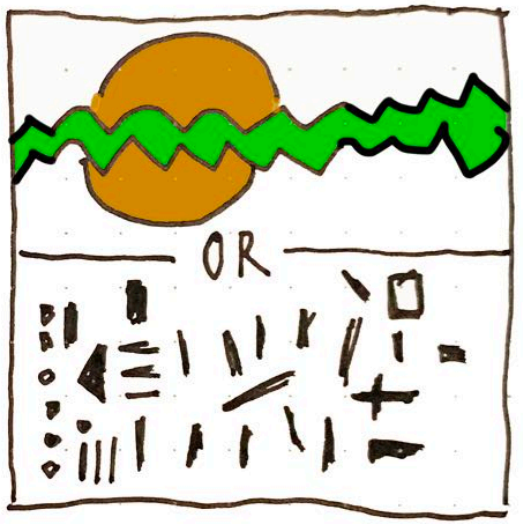
Urban Design

Greenzone



Green zone analysis

Green zone

Geographically immense

Spatially invisible

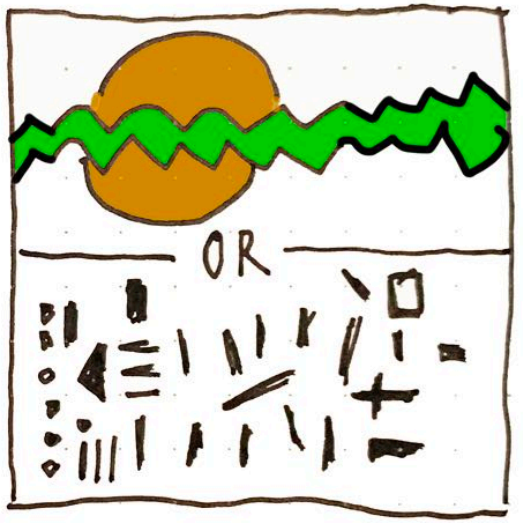
CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Greenzone



Green zone analysis

Green zone

Geographically immense

Spatially invisible

CITY zen
New urban energy
ROADSHOW

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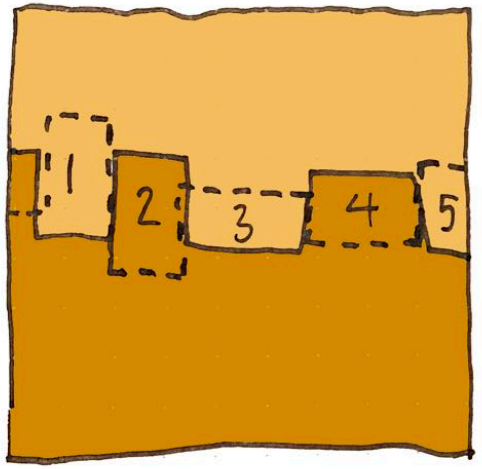
Nicosia, Cyprus. May 2019

Zoning the Greenzone



Peacemeal Green-zone

Green zone

To complex to remove wholly

So do in bits.....

Benefit each side

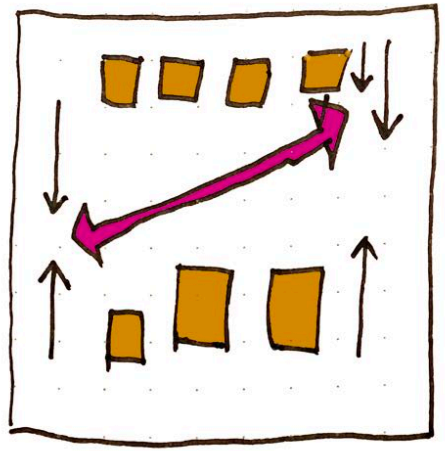
CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Create a centre. Green Line changes



Create a shared Centre

New centre

One new gate

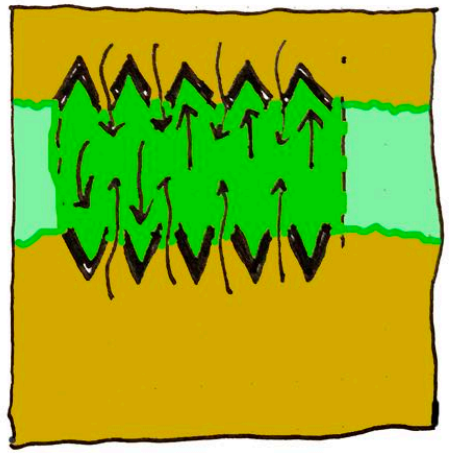
Neutral space

Co-developed

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Create a centre. Green Line changes. Airline pass



Create a centre

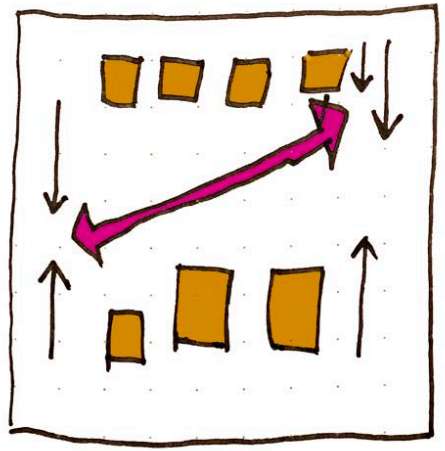
- Airport pass
- All cypriots
- Tourists pay in advance
- One side or both side clearance

CITY-zen
New urban energy
ROADSHOW

Urban Design

Create a centre. Green Line changes

From



The Bazaar

New centre

One new gate

Neutral space

Co-developed

CITY-zen
New urban energy
ROADSHOW

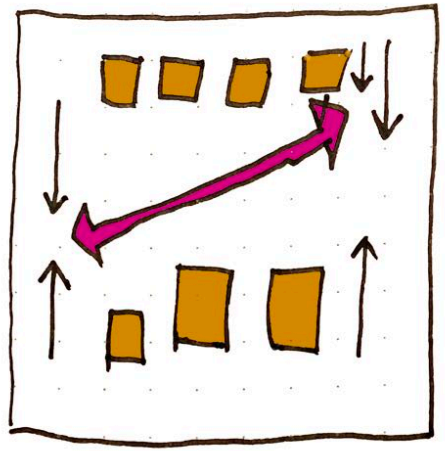
Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Create a centre. Green Line changes

To



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One new gate

Neutral space

Co-developed

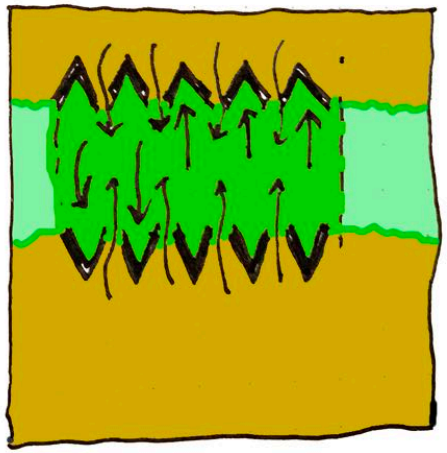
CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Green line moves Central zone. Ledra Street westwards.



Green line detail

Check-in to zone

Airport gate… register in advance

Seamless check in and out

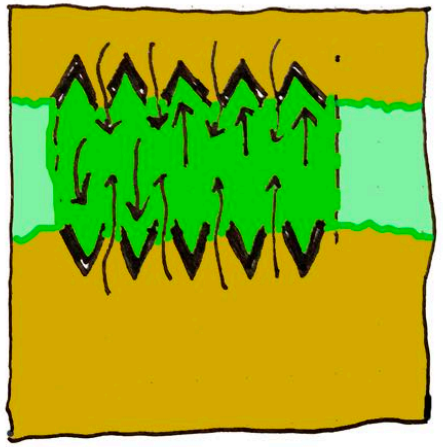
CITY zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Green line moves Central zone. Ledra Street westwards.



Green line detail

Check-in to zone

Airport gate… register in advance

Seamless check in and out

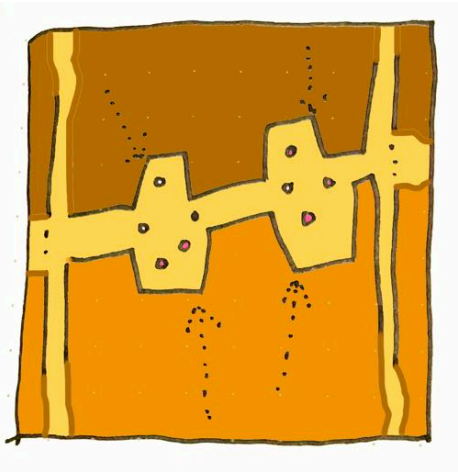
CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Green line moves
New streets, New square.



New shared centre

New streets

Shared heritage

CITY-zen
New urban energy
ROADSHOW

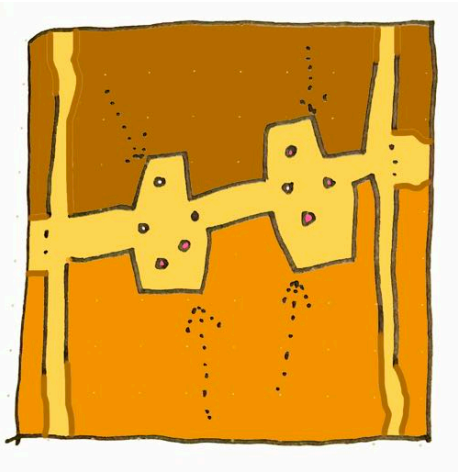
Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Green line moves

New street



New shared centre

New streets

Global/Local infrastructure

CITY-zen
New urban energy
ROADSHOW

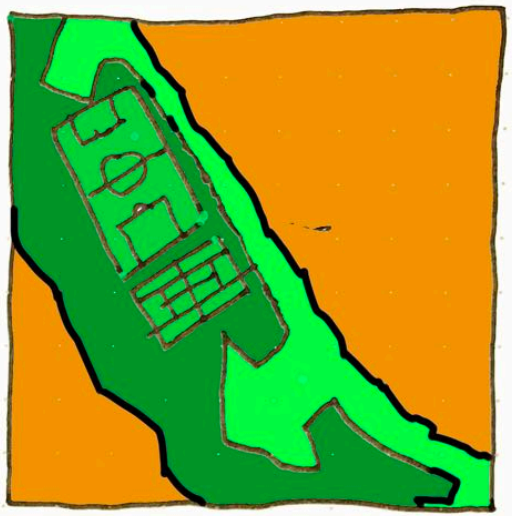
Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Green line moves

New Sports place.



New shared centre

Shared sports in between the bastions….

Click in/Click out

CITY-zen
New urban energy
ROADSHOW

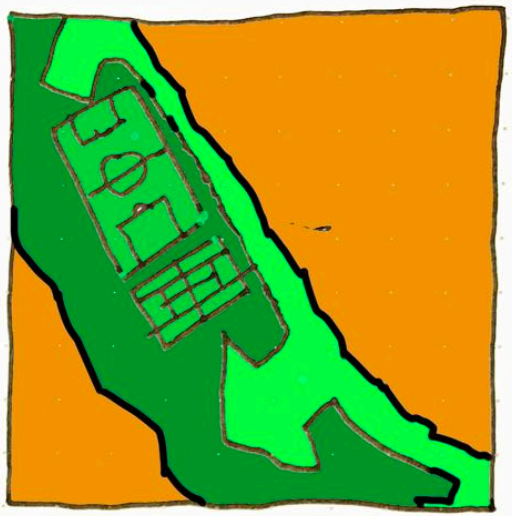
Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Green line moves

New Sports place.



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Shared sports in between the bastions….

Click in/click out

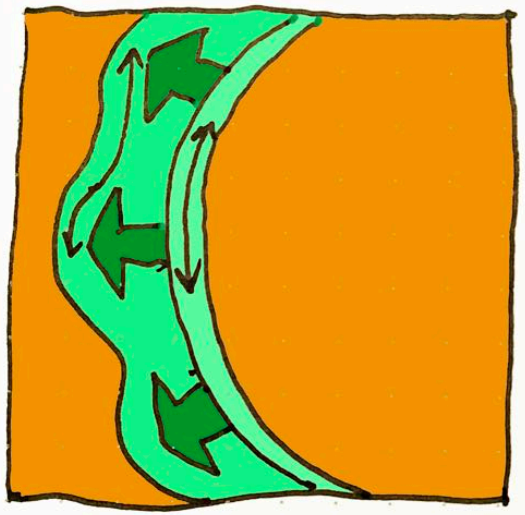
CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

The Green ring……



New green park

Sports

Cycle routes

Tree nursery

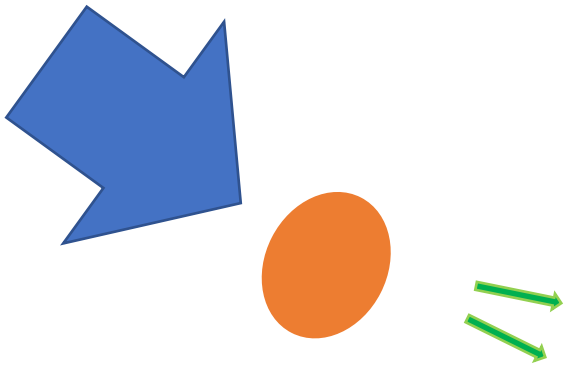
Climate protection

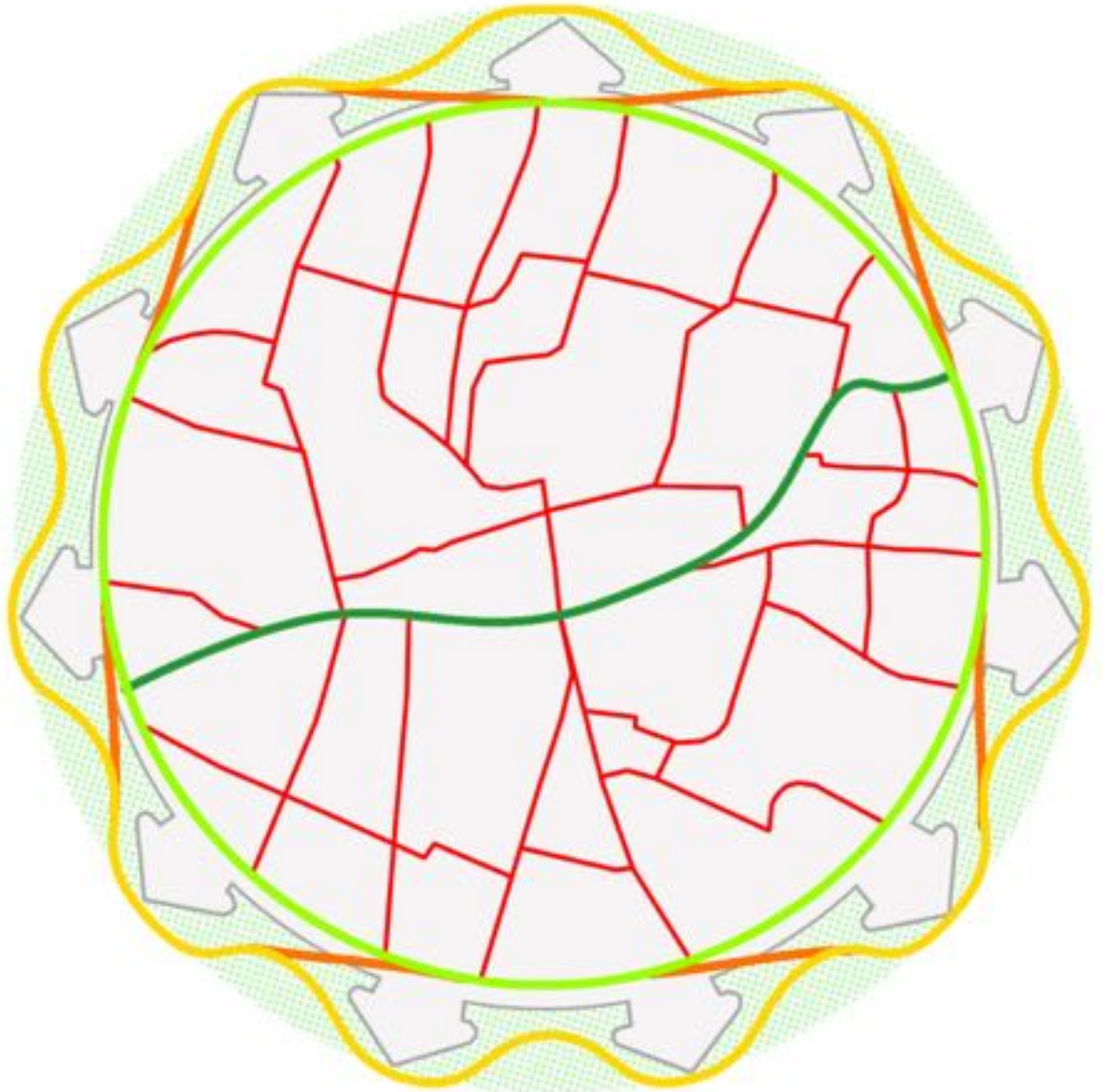
CITY-zen
New urban energy
ROADSHOW

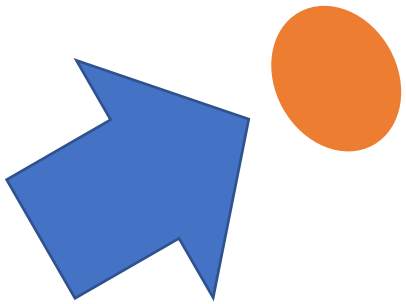
Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

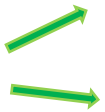
Nicosia, Cyprus. May 2019

Urban Design



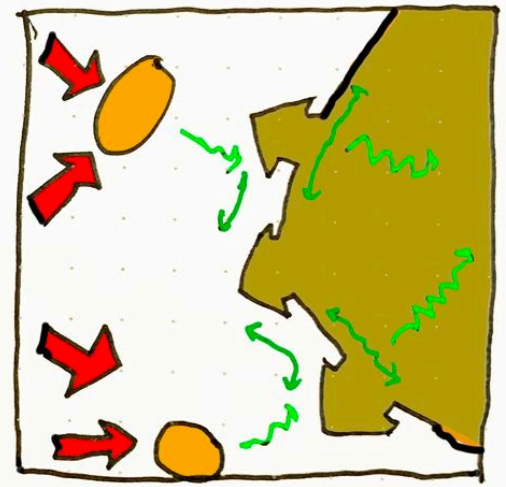






Remove the car from the centre

Use the Bastions and moat as a park



Car removal

- reduced intensity
- Everyone exercises
- Shaded routes
- Lower temperatures

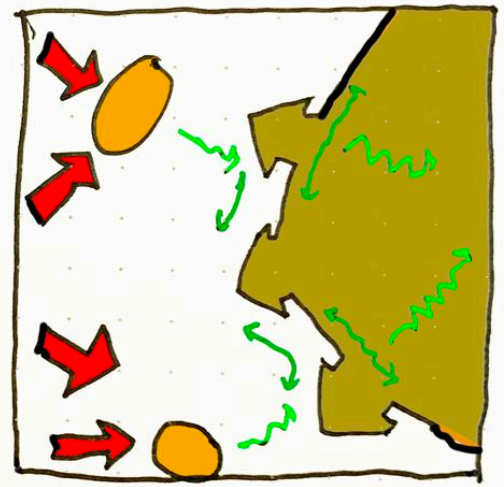
CITY-zen New urban energy ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Car removal Park and Ride (a bike) or walk



Car removal

reduced intensity

Everyone exercises

Shaded routes

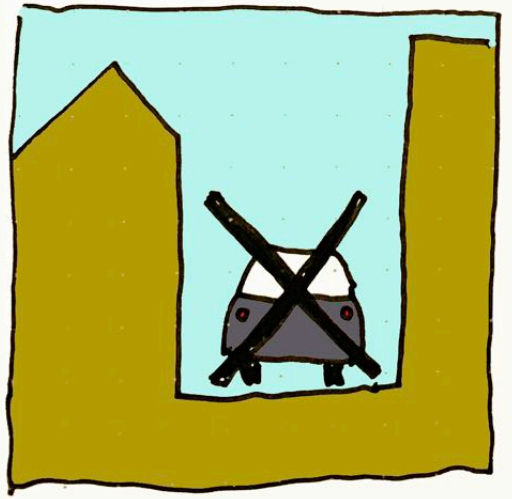
Lower temperatures

CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Car removal inside the ring



Car removal

Inner city changes

People first

Green infrastructure

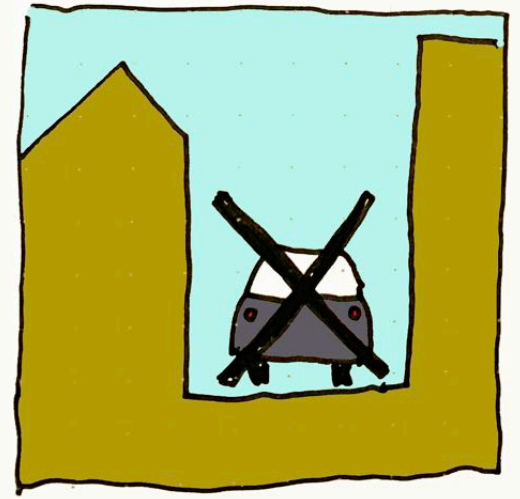
CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Car removal inside the ring
Creates people space



Car removal

Inner city changes

People first

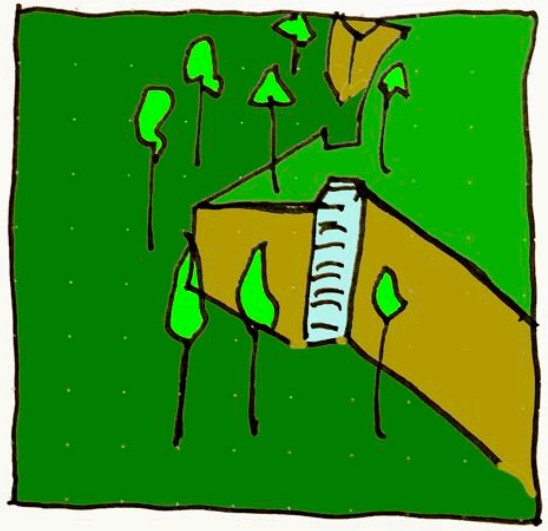
Green infrastructure

CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Urban Design

The Bastion park



The Bastion Park

Increased green

New infrastructure

Energy/mobility/social

Tourist/heritage enabling

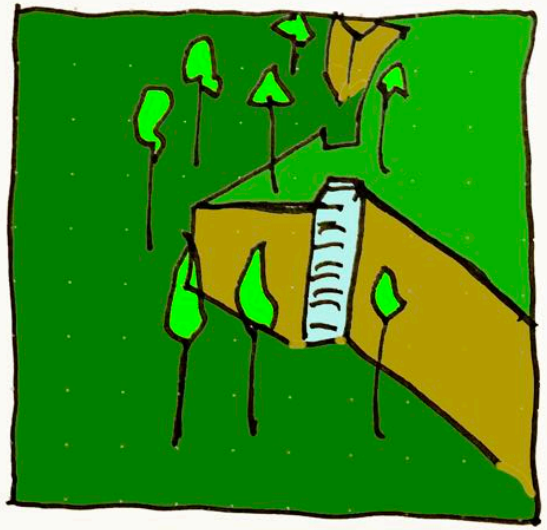
CITY-zen New urban energy ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

The Bastion park



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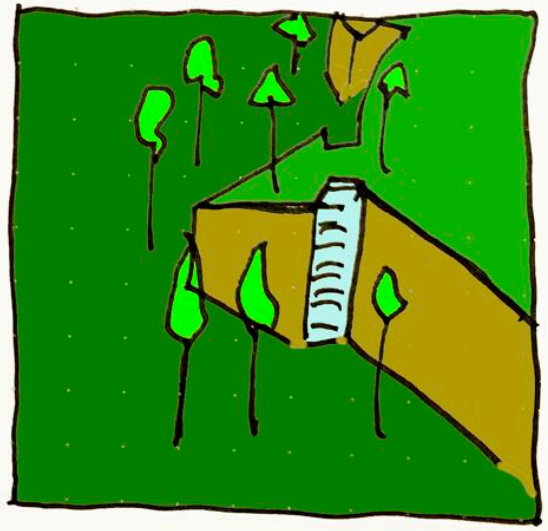
Nicosia, Cyprus. May 2019

Urban Design

The Bastion Park



The Bastions

Increased green

New infrastructure

Energy/mobility/social

Tourist/heritage enabling

CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

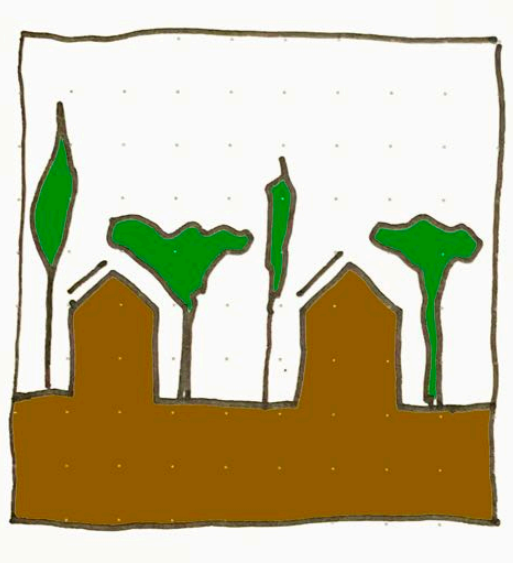
Nicosia, Cyprus. May 2019

Urban Design

City as forest

Hide the city in a forest

Hide a forest in the city…..



City as forest

Increased intensity

Community services

Increased density

Reason to visit

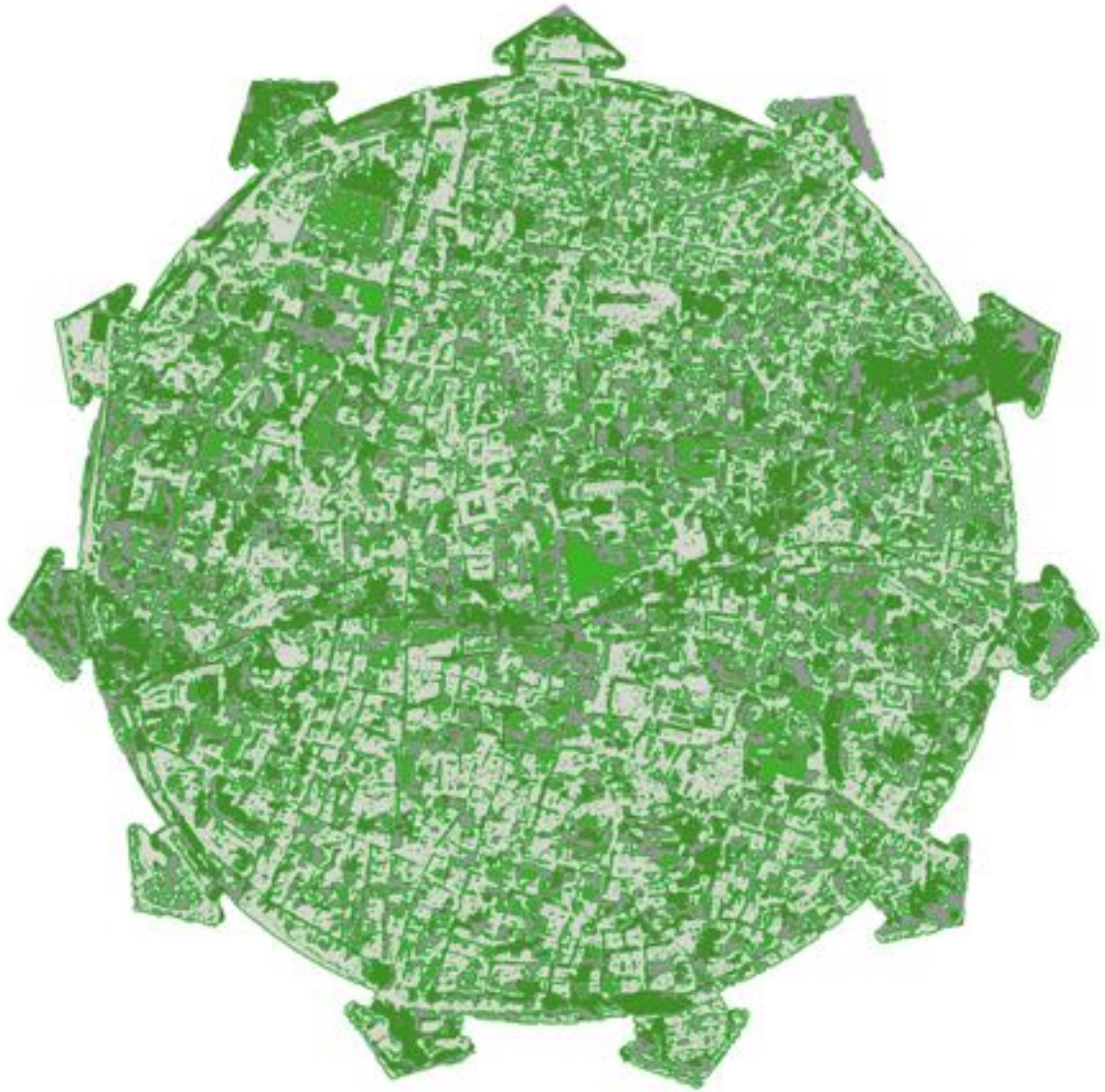
CITY-zen
New urban energy
ROADSHOW

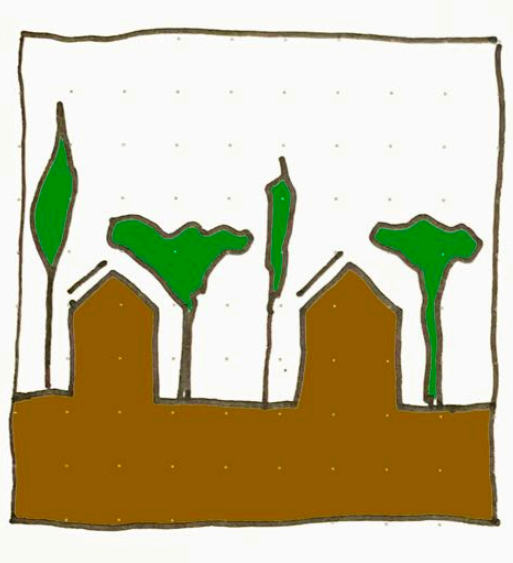
Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Green the city





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Community services

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Reason to visit

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New urban energy
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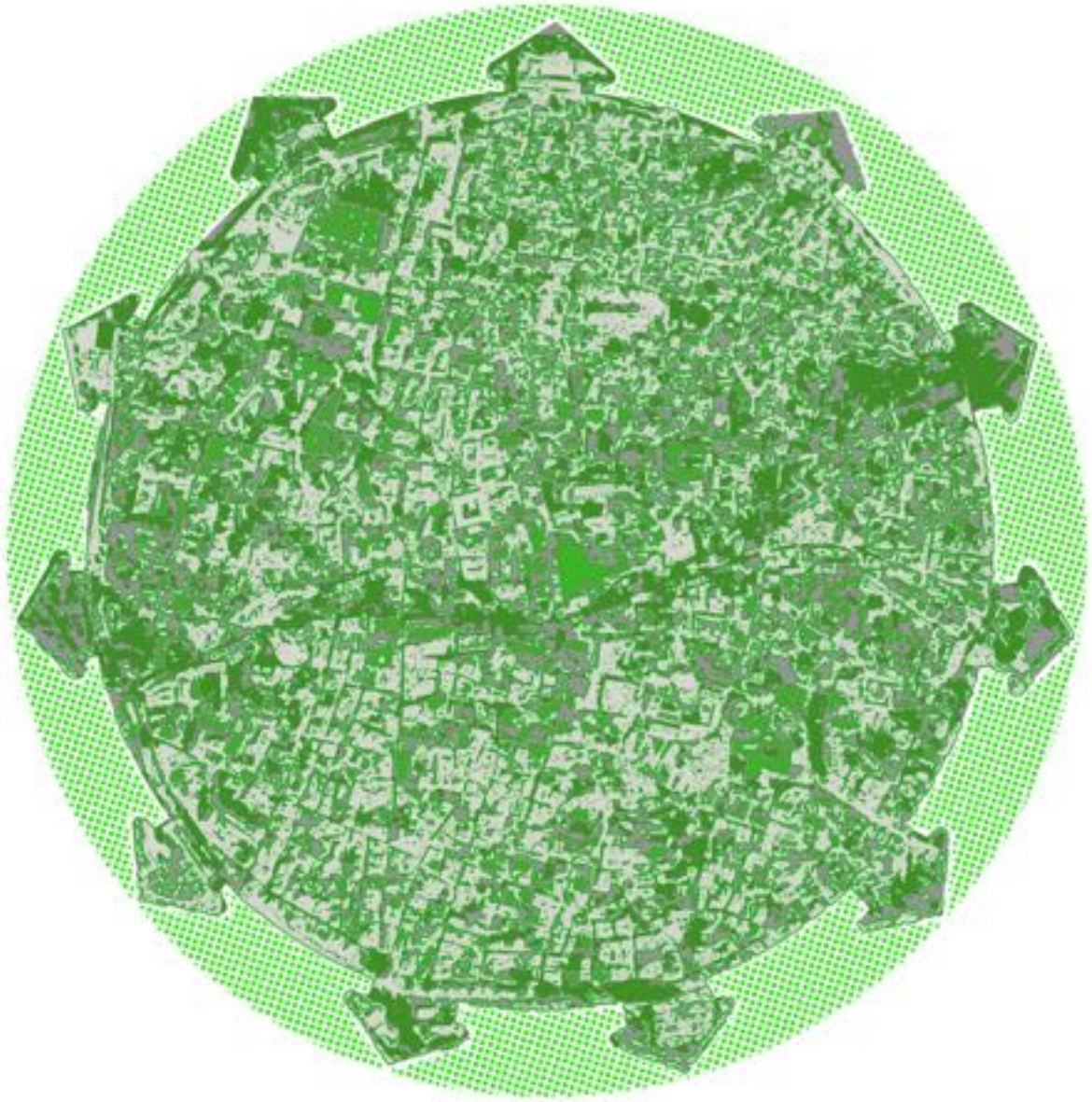
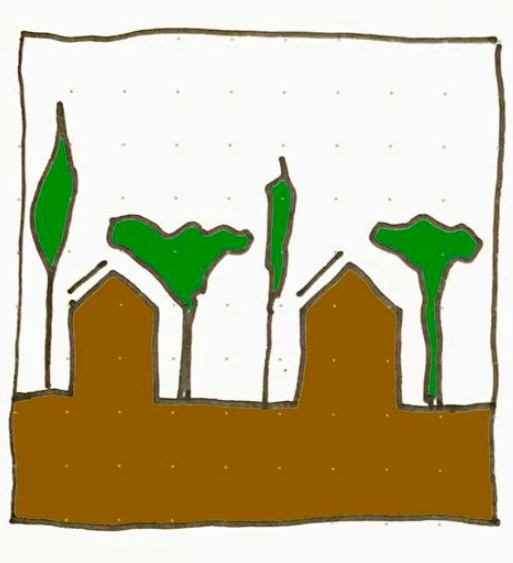
Nicosia, Cyprus. May 2019

Urban Design

Green the Bastions





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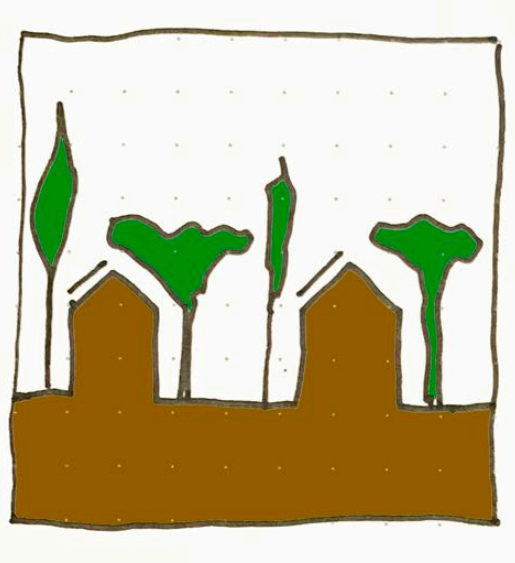
Nicosia, Cyprus. May 2019

Urban Design

City as forest

Hide the city in a forest –
Hide a forest in the city…..



City as forest

Increased intensity

Community services

Increased density

Reason to visit

CITY-zen
New urban energy
ROADSHOW

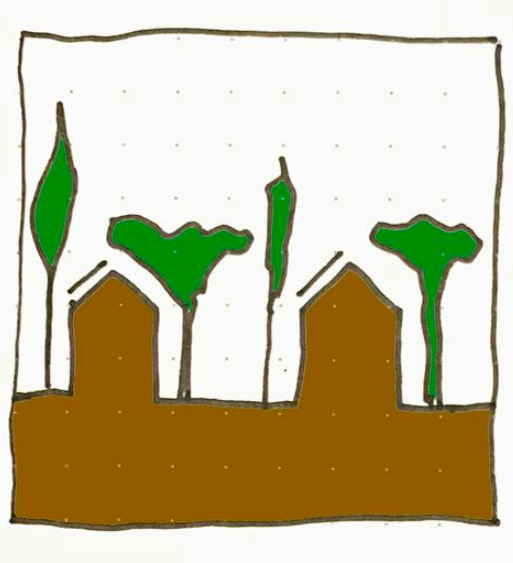
Urban Design

City as forest

Hide the city in a forest –

Hide a forest in the city…..

Greywater facades



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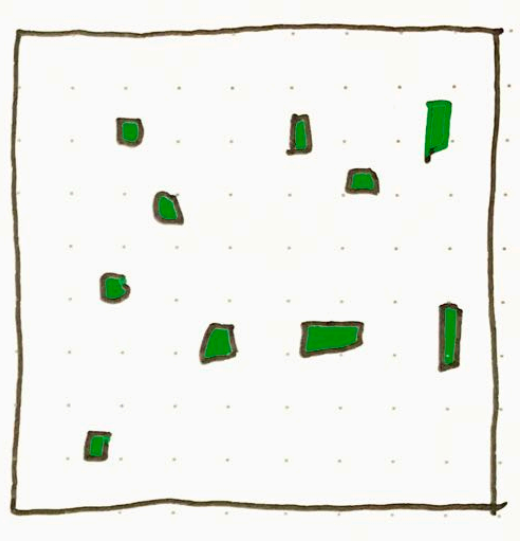
Reason to visit

CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design



Pocket parks

Re-purpose car-parks.

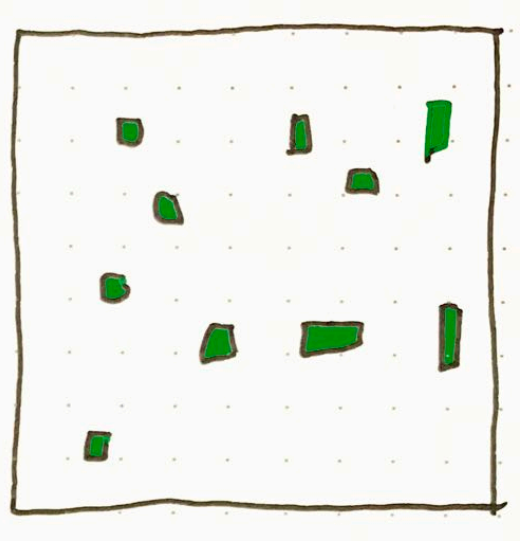
New 100m infrastructure that reduces heat island effect

CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design



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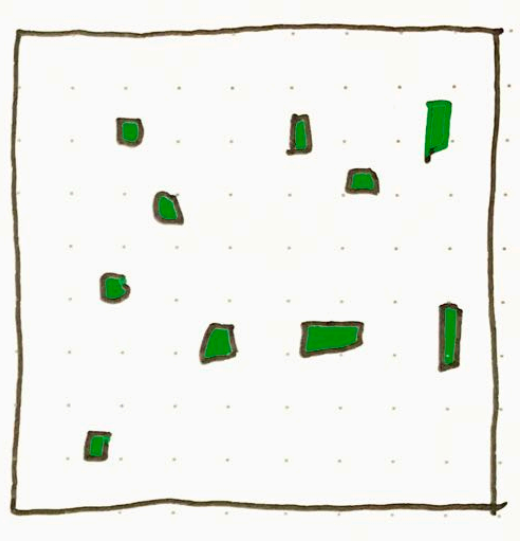
Urban Design



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New 100m infrastructure that reduces heat island effect

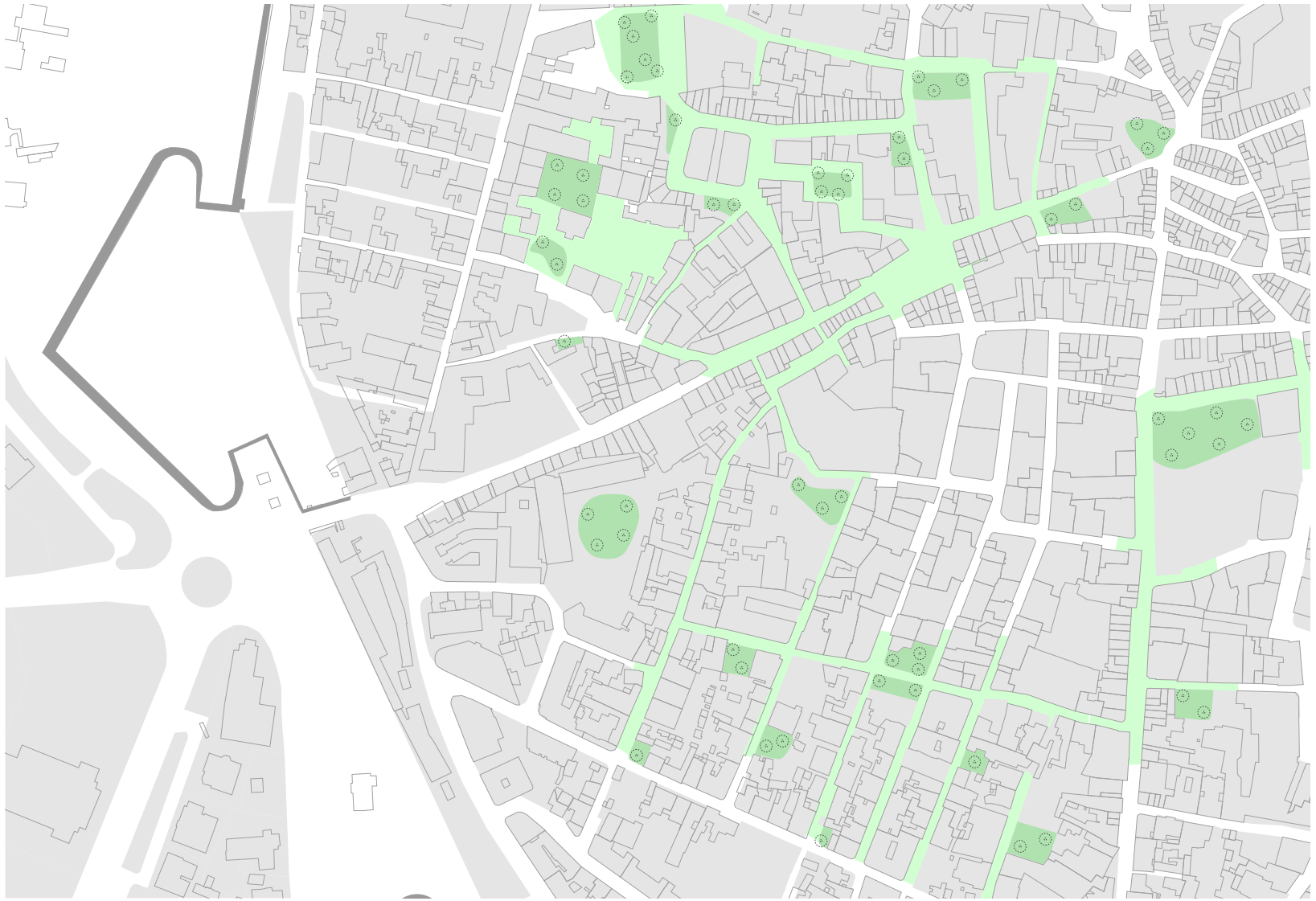
CITY-zen
New urban energy
ROADSHOW

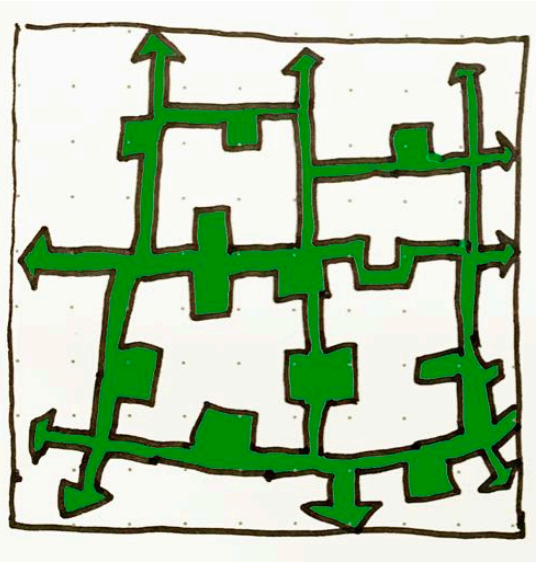
Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Green network





Green Network

Connect inner-city Pocket parks.

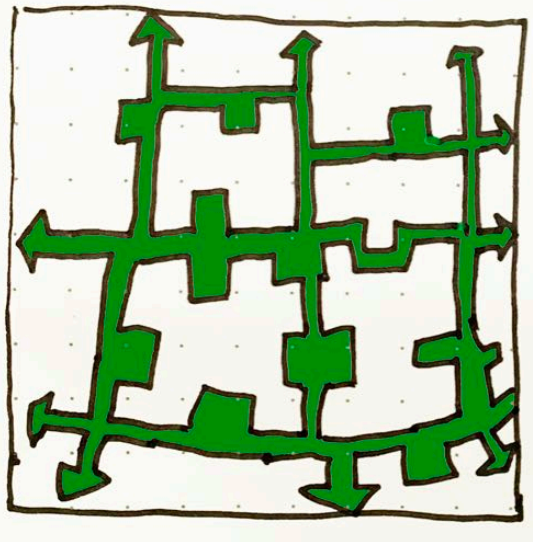
Make shaded network of places to walk

CITY-zen New urban energy ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design



Green Network

Connect inner-city Pocket parks.

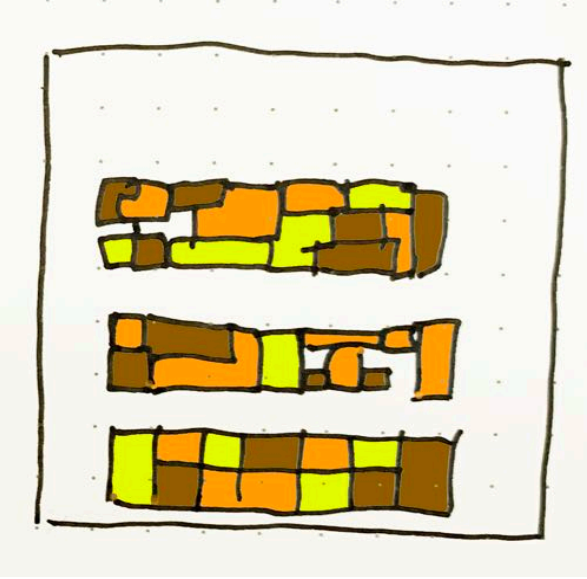
Make shaded network of places to walk

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Densification - south



Densification

Increased density

Increased intensity

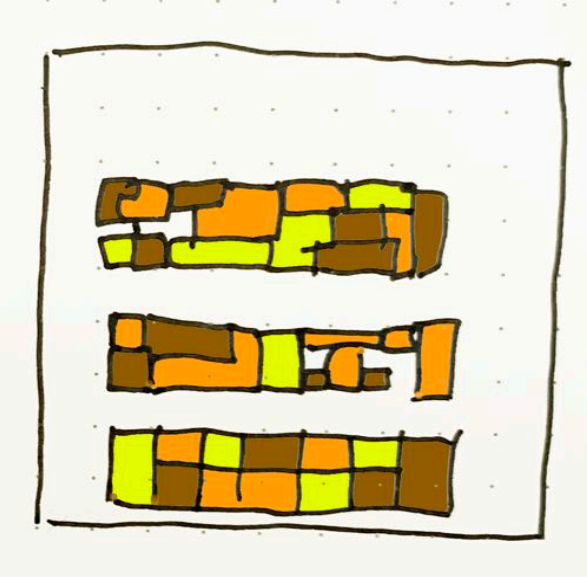
More shade

Better community services

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Urban Design

Densification + greening



Densification

Increased density

Increased intensity

More shade

Better community services

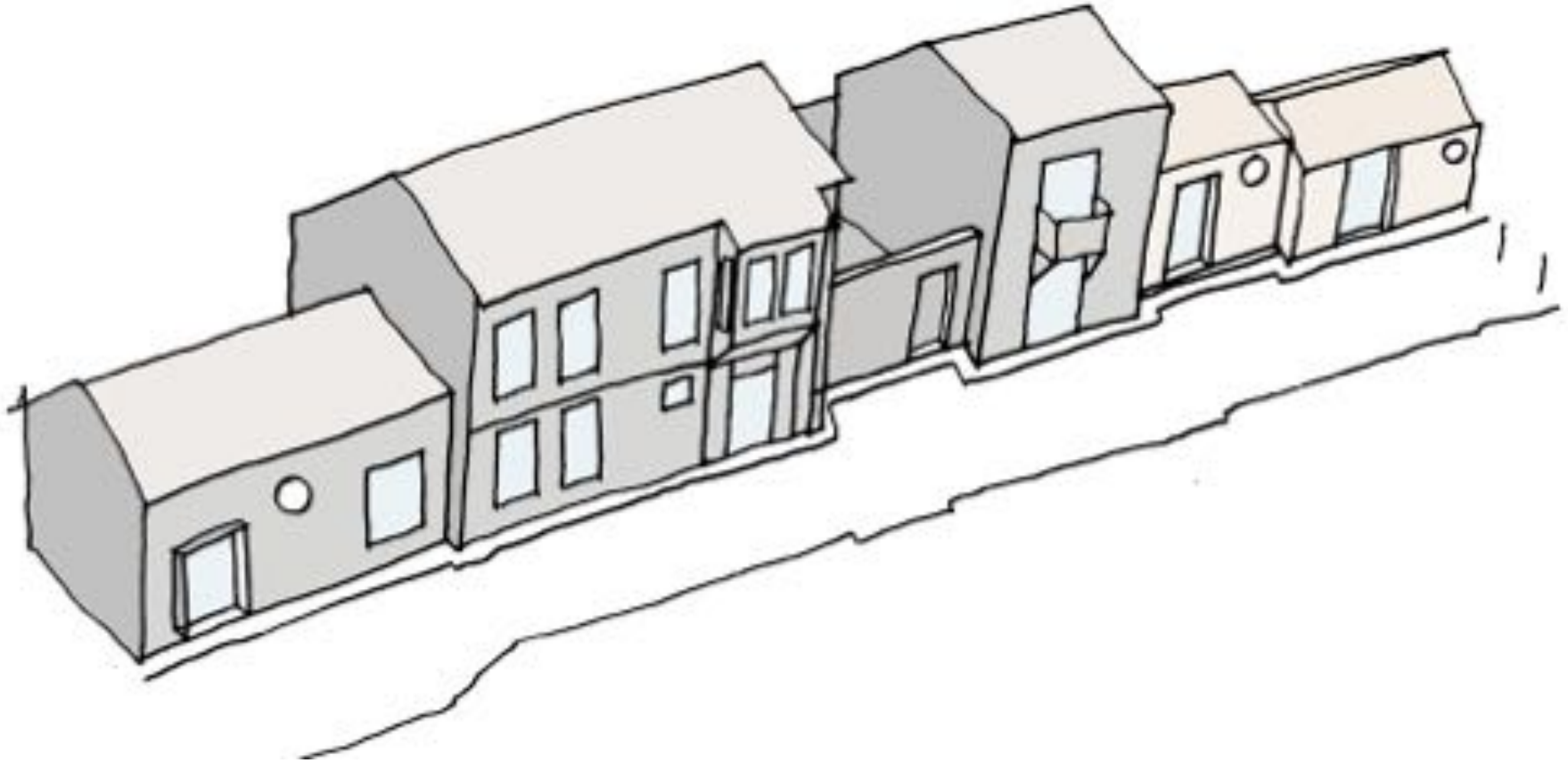
CITY-zen
New urban energy
ROADSHOW

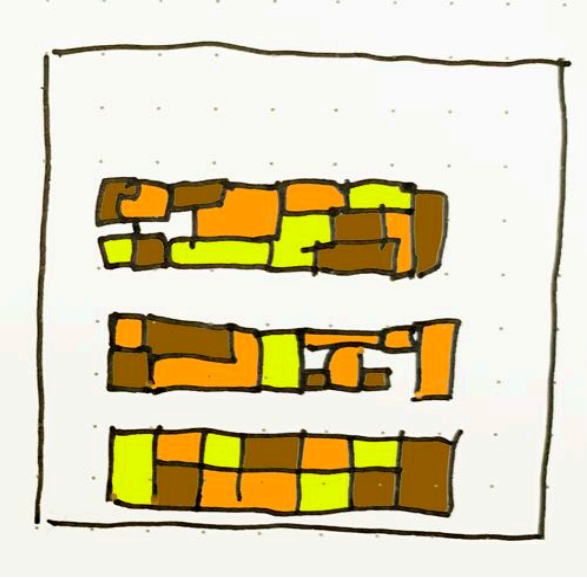
Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Densification North





Densification

- Increased density
- Increased intensity
- More shade
- Better community services

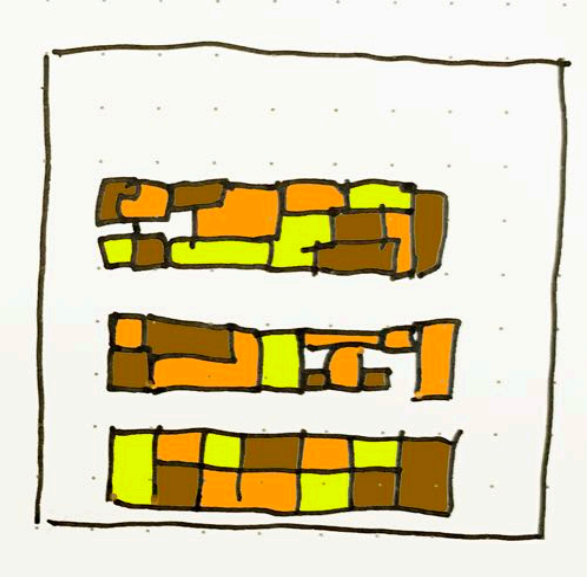
CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Densification and greening



Densification

Increased density

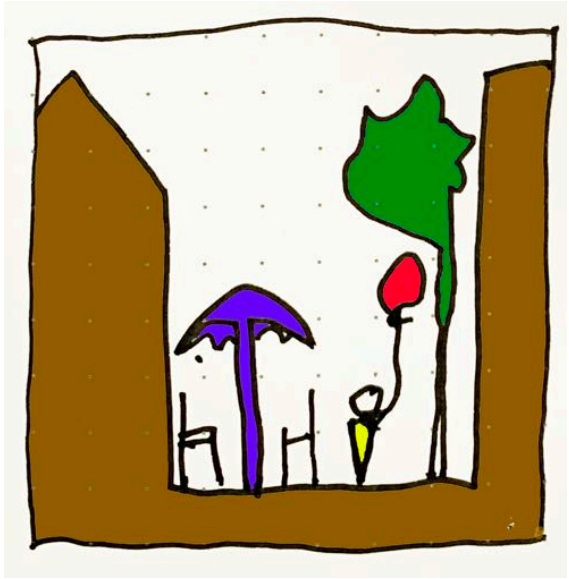
Increased intensity

More shade

Better community services

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Urban Design



Re-invent the street

Reclaim territory from the car

New community

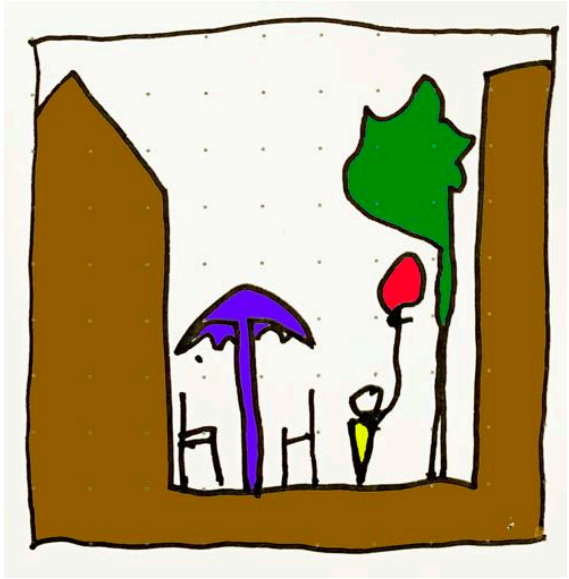
Increased intensity

CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design



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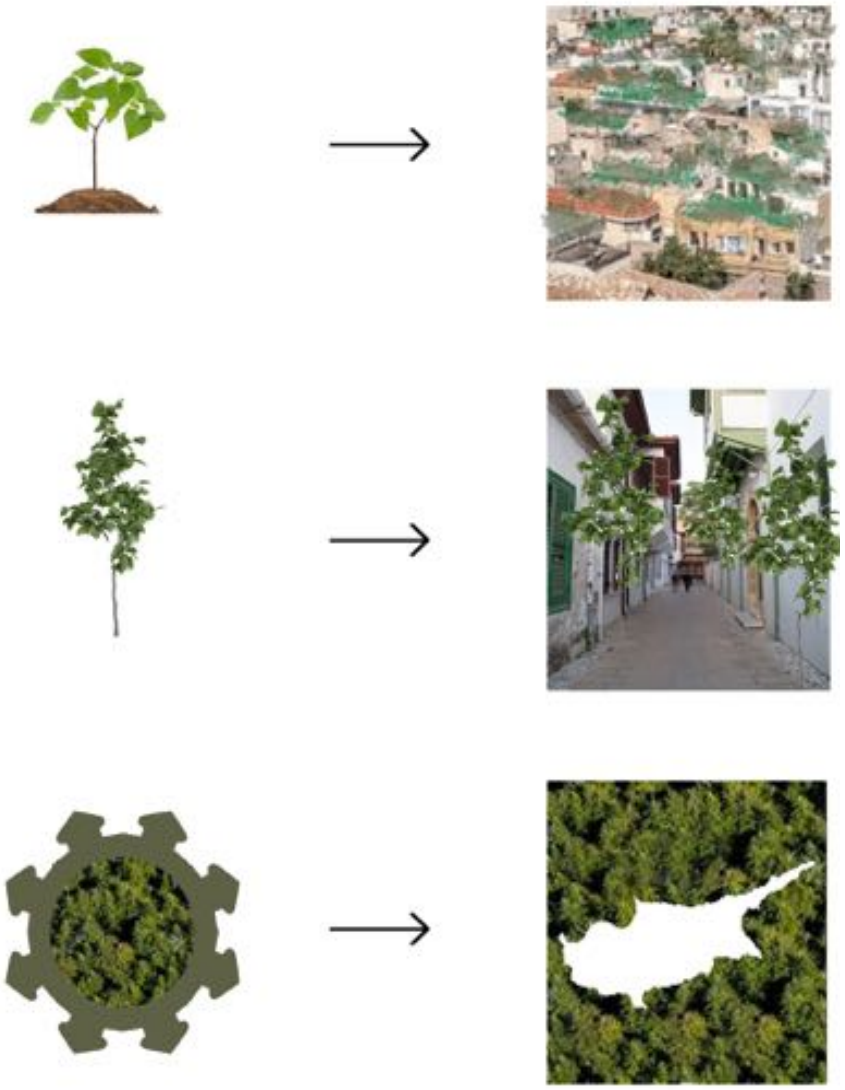
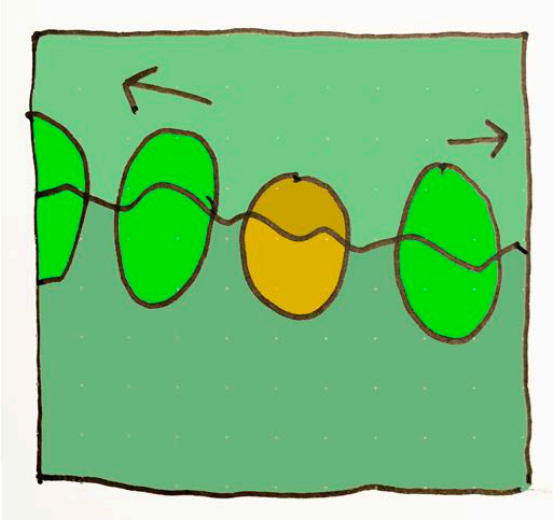
Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Climate sequestration… grow the forest in the city and plant it out……





Climate sequestration

World issue

Do your share

1.2 million trees per year for a century

100 cities……

CITY-zen New urban energy ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Mustafa Ozan

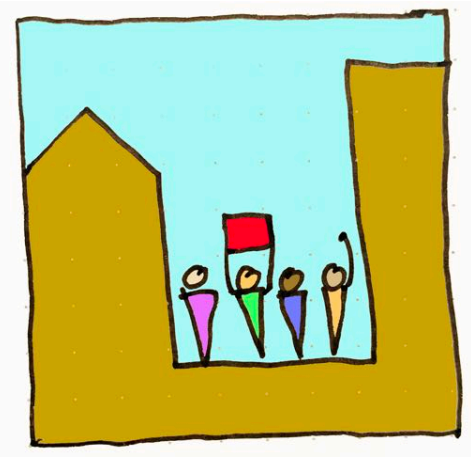
“Hi, I’m Mustafa,

I lived and worked within the walls of Nicosia all my life and run my own business creating hand crafted belts, and bags. The new co-community bazaar in the Green zone, has allowed me to connect better with more customers and especially tourists.

Since pedestrianisation and the electric car share facility I have found the city to be much safer for my children, I too feel so much healthier, and happier and I’ve found that I have met many new people and made new friends, as I no longer confine myself to my car.

The new car share at the city walls has allowed me to use different vehicles when I need them. I can now get a van when I need to collect materials and a campervan for the family trips at the weekend

I was sceptical at first but I feel the changes in the city have really improved my quality of life.”

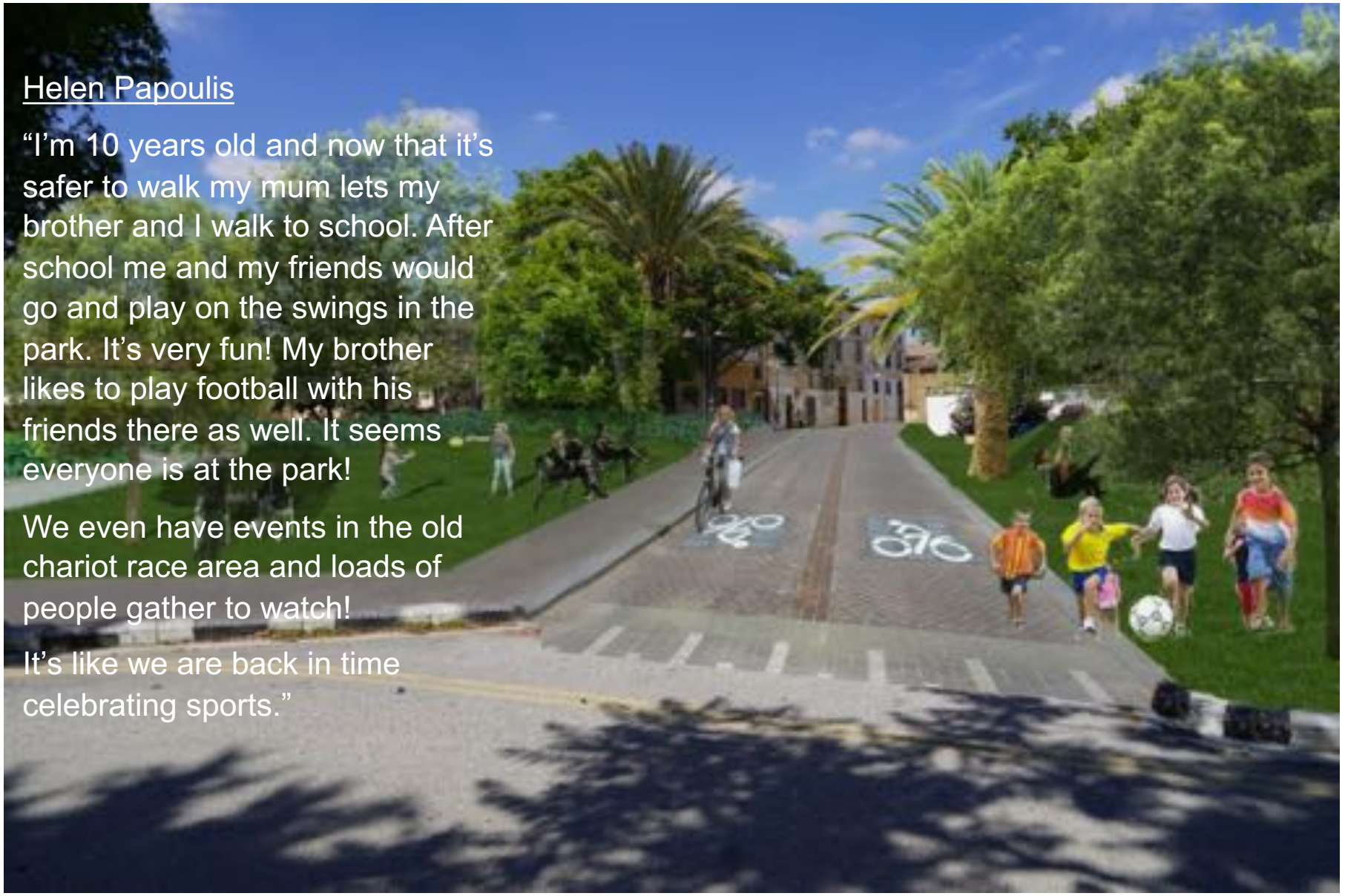


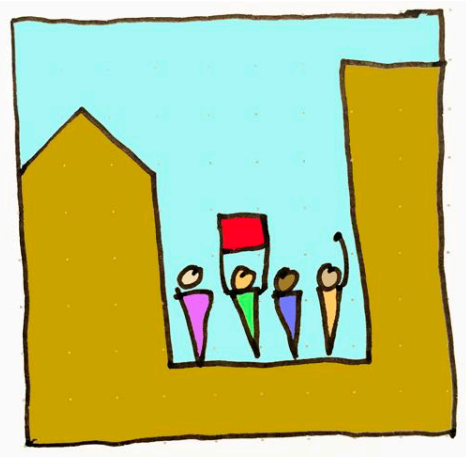
Pen picture 1

Keep it local

CITY-zen
New urban energy
ROADSHOW

Urban Design





Pen picture 2

Kids deserve a better future

CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

Ela Sari

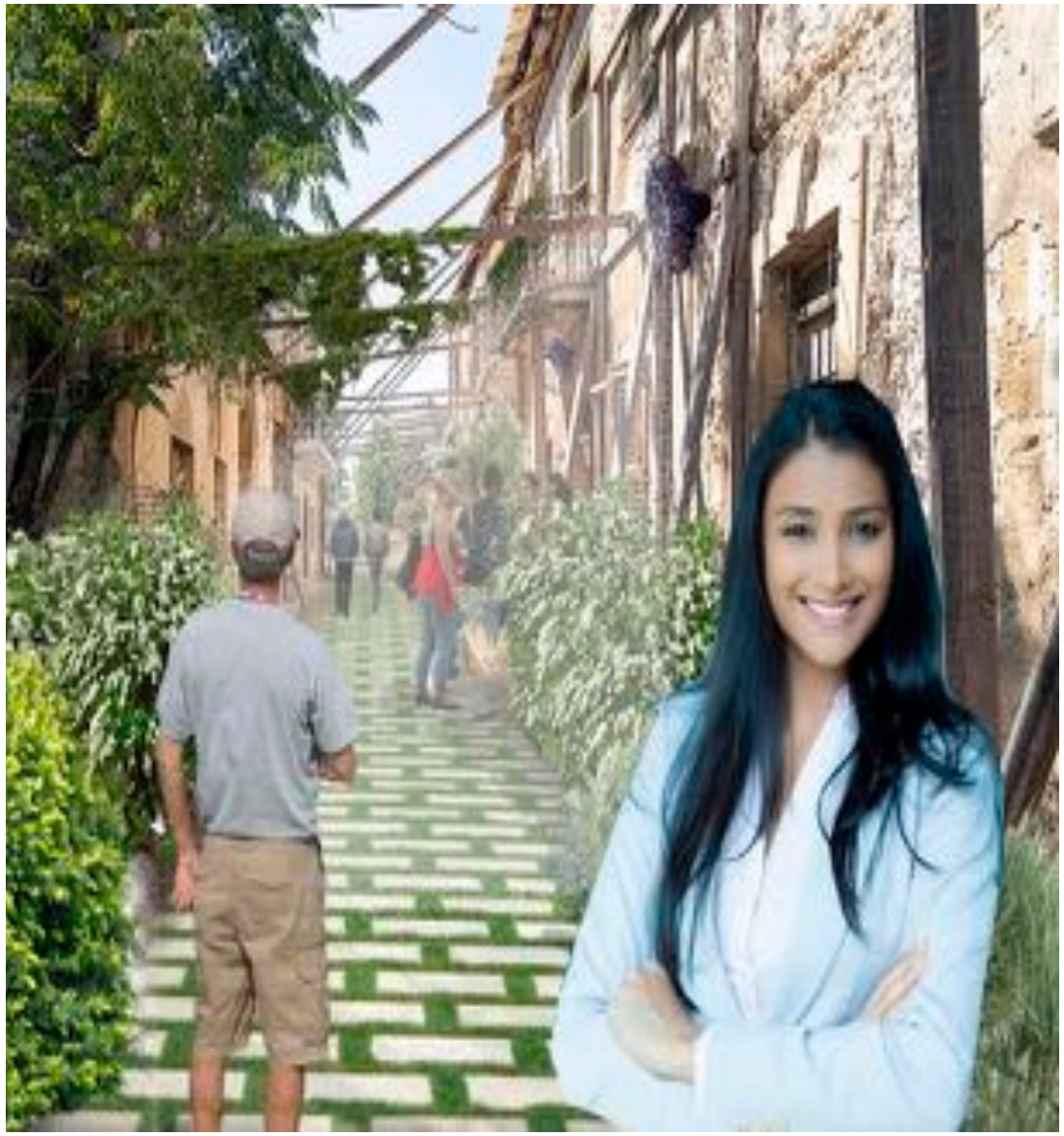
“Hello, my name is Ela,

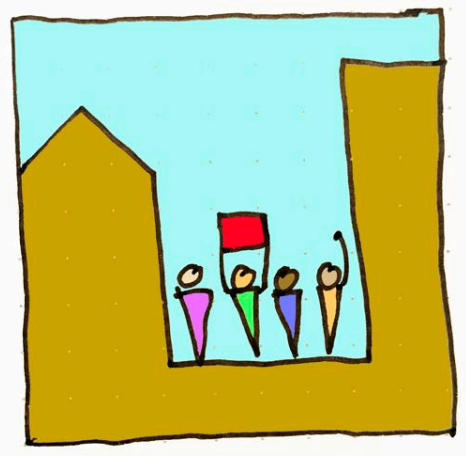
My family home is in the suburbs of Nicosia. I spend much of my time within the walls of the city as my children go to school there and I work as an architect in the walls.

I can take the kids after School to the Park. There’s more wildlife within the city walls now, and the city air also seems to be easier to breath and cleaner.

My new P.V. panels on my roof have drastically decreased our energy bills making it possible for us to now afford more meals out, and the ability to go do activities with the kids means a less stressful life. I feel the changes to Nicosia have really made mine and my children’s lives better.

I now cycle to work every day from outside the walls using the bike share and really enjoy it. We are now considering, when the kids are older, moving into the walled city to get more out of the new streets and parks.”





Pen picture 3

Help the commuter

CITY-zen
New urban energy
ROADSHOW

Urban Design

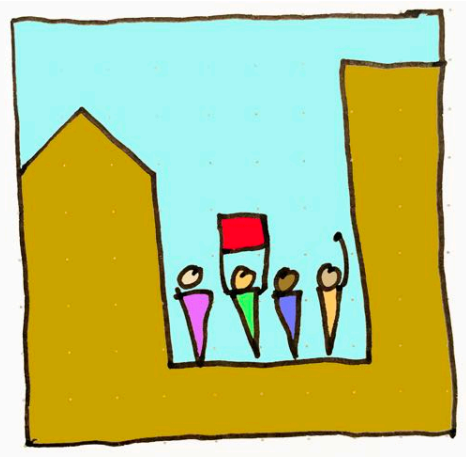
Alexandro Angelos

“I came to study from abroad at the University. I really enjoy the lifestyle and culture. I can now rent in the middle of the city and all the restored buildings make the experience very unique. There is nowhere else I would rather work!

The city has become a hub for new bands and up and coming artists. Every Friday evening there are usually performances in new public space that everyone comes to. The shared public spaces have allowed people from the north and south to mix and spend time together. This has increased trade and hand-crafted items within the walls.

I now cycle everywhere it’s a lovely way to see Nicosia and its historical features. Me and my friends have all stayed within the city to work and live after are study’s. Many more people want to live within Nicosia now and not many people are moving away to work elsewhere.

I would not move from my Nicosia now as it is as good as New York, London and Amsterdam if not better in my eyes and would recommend this city to anyone who asked.”



Pen picture 4

New entrepreneurship

CITY-zen
New urban energy
ROADSHOW

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Nicosia, Cyprus. May 2019

Urban Design

More More More More…

Urban design strategy: Prof Greg Keeffe, Queens University, Belfast.

Queens
Prof Greg Keeffe
Dr Andy Jenkins
Ms Emma Campbell
TUDelft
Sam van Hooff
UCLAN
Ms Maryam Al-Irhayim
Rainer Townend

More History

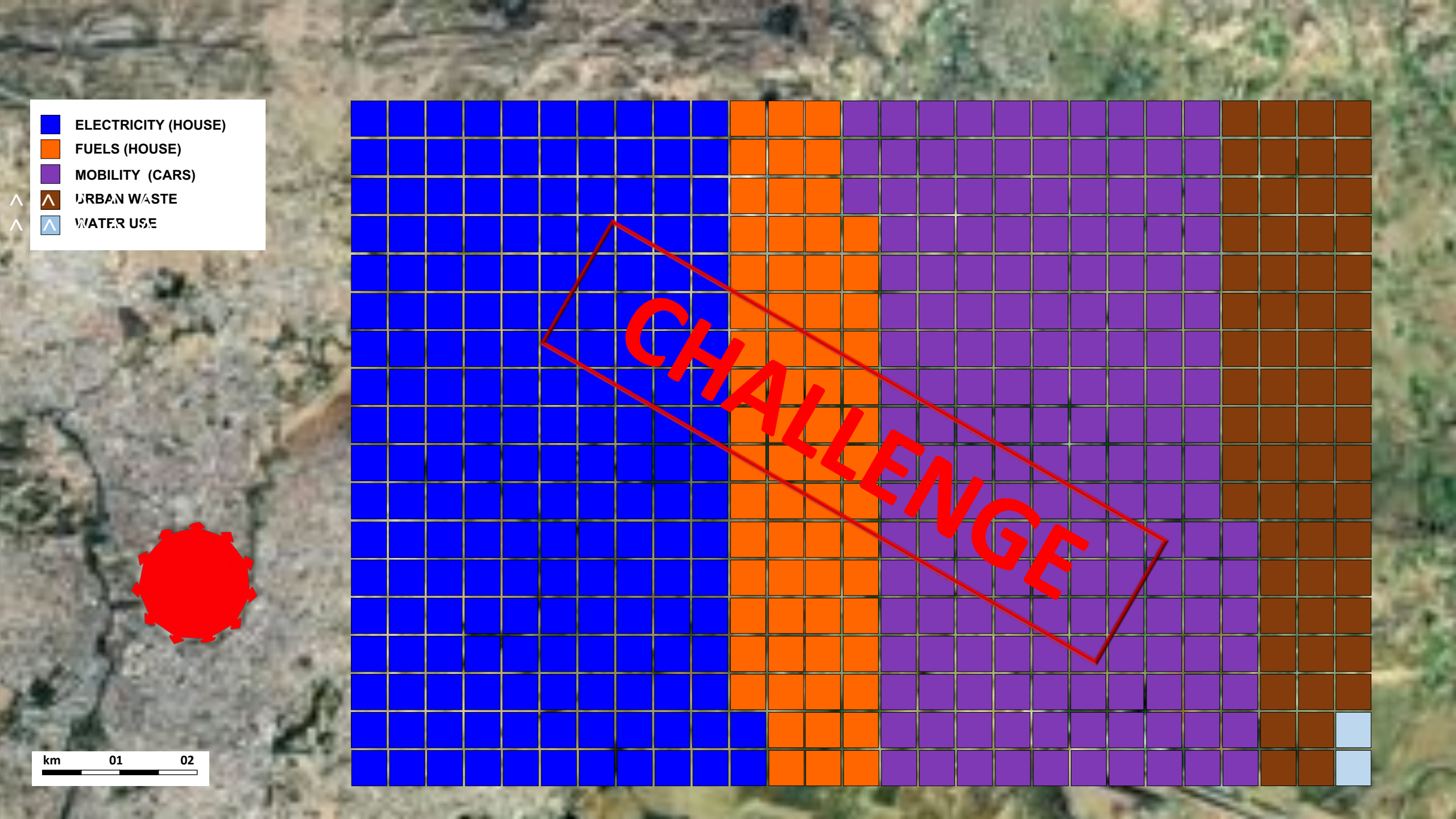
More Green

More renewables

More Fun

CITY-zen
New urban energy
ROADSHOW

Nicosia, Cyprus. May 2019


ELECTRICITY (HOUSE)
FUELS (HOUSE)
MOBILITY (CARS)
URBAN WASTE
WATER USE
CHALLENGE
km
01
02

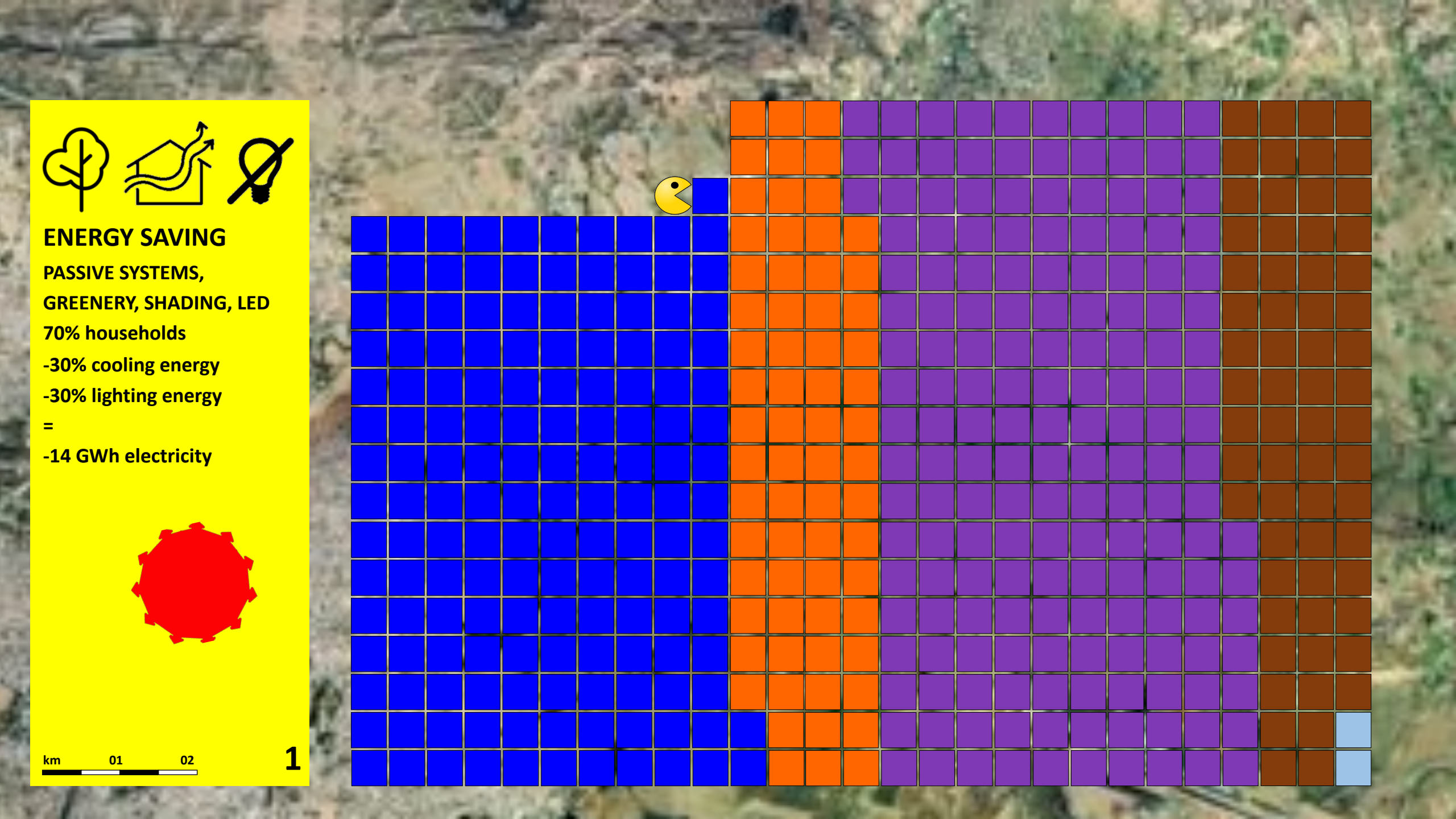
3 …

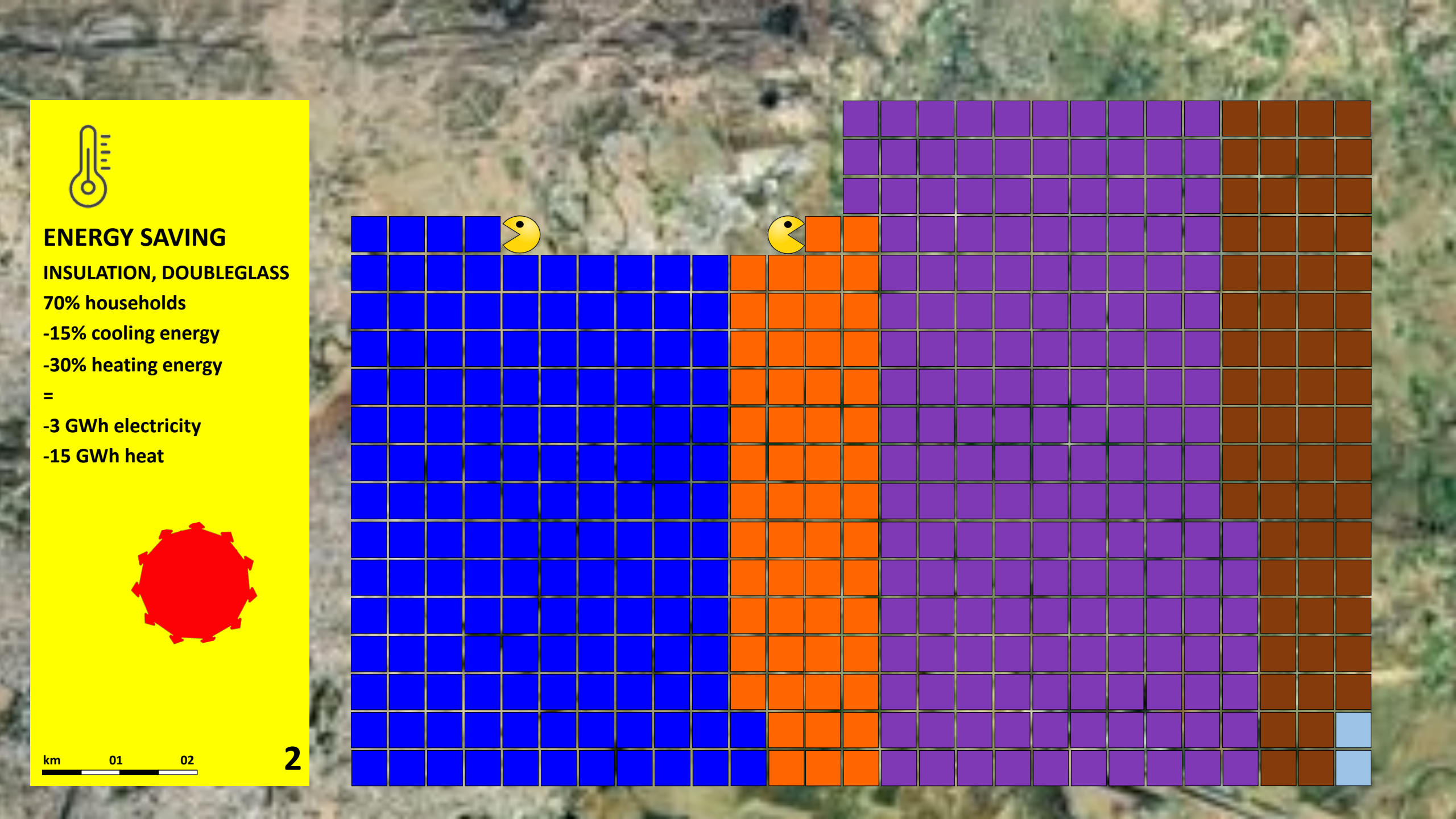
2 …

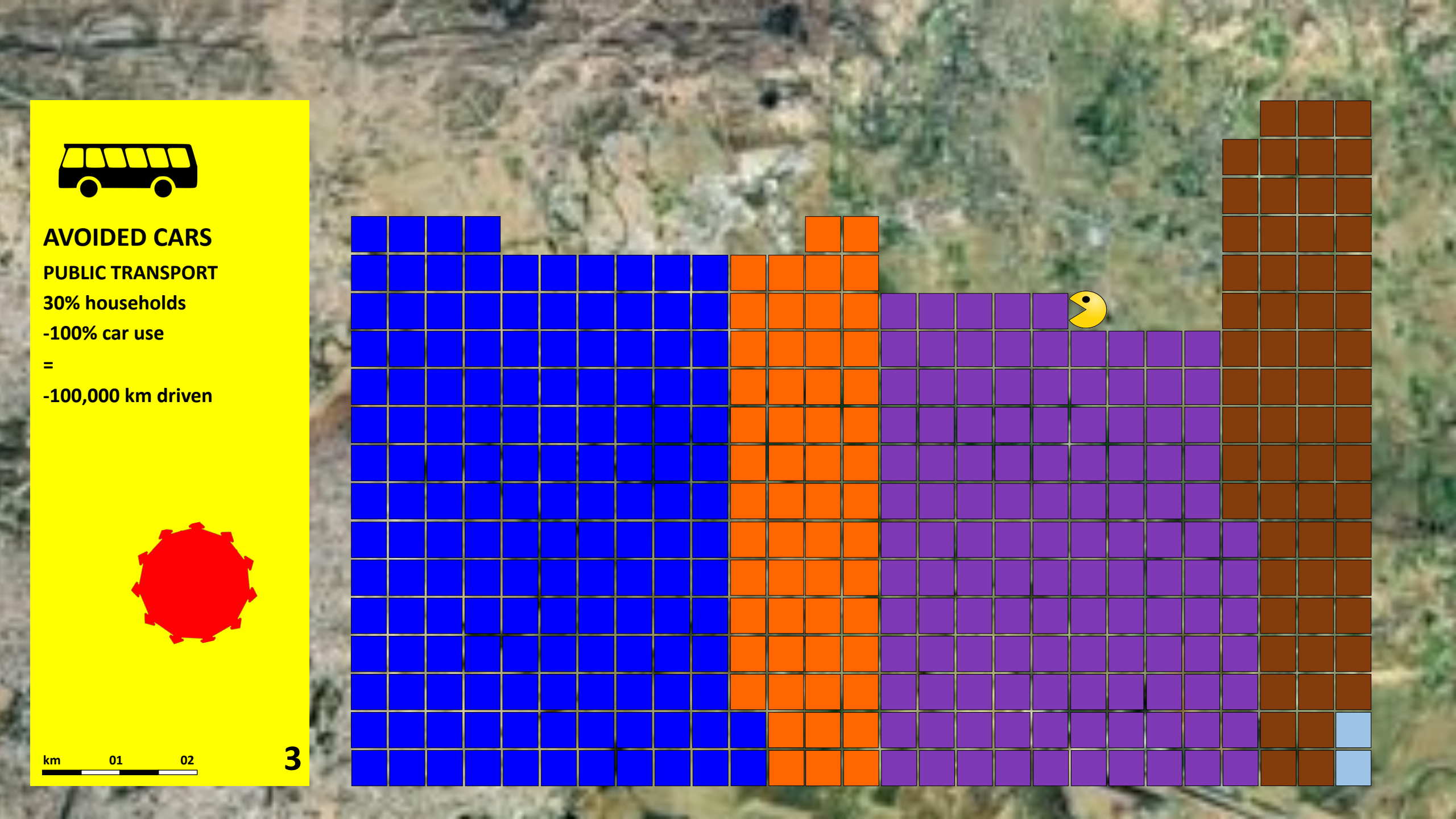
1 …

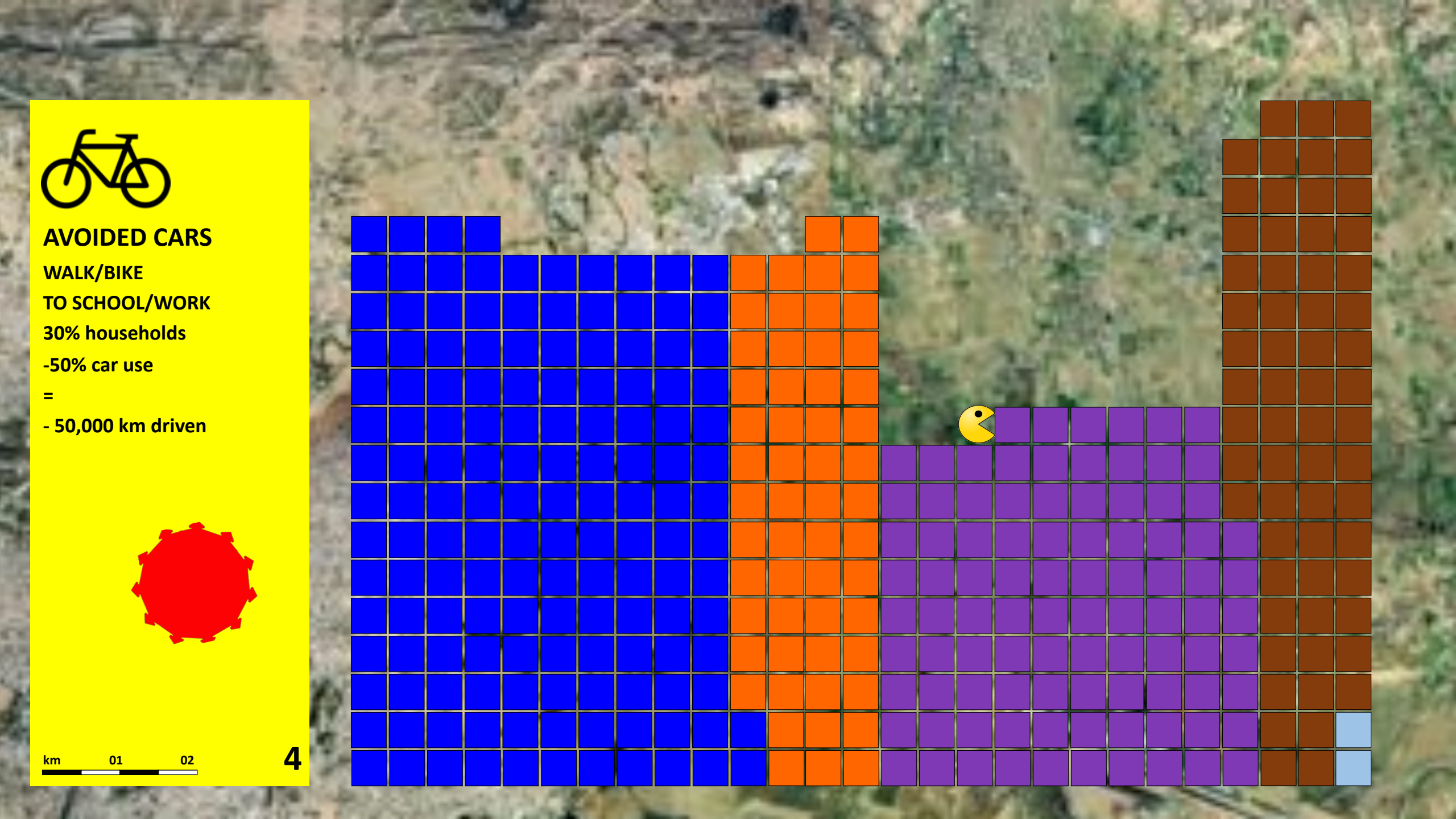
… GO!

km 01 02


ENERGY SAVING
PASSIVE SYSTEMS,
GREENERY, SHADING, LED
70% households
-30% cooling energy
-30% lighting energy
=
-14 GWh electricity
km
01
02
1


ENERGY SAVING
INSULATION, DOUBLEGLASS
70% households
-15% cooling energy
-30% heating energy
=
-3 GWh electricity
-15 GWh heat
km
01
02
2


AVOIDED CARS
PUBLIC TRANSPORT
30% households
-100% car use
=
-100,000 km driven
km
01
02
3


AVOIDED CARS
WALK/BIKE
TO SCHOOL/WORK
30% households
-50% car use
=
- 50,000 km driven
km
01
02
4

WASTE MANAGE.

WASTE REDUCTION

LESS DISPOSAL

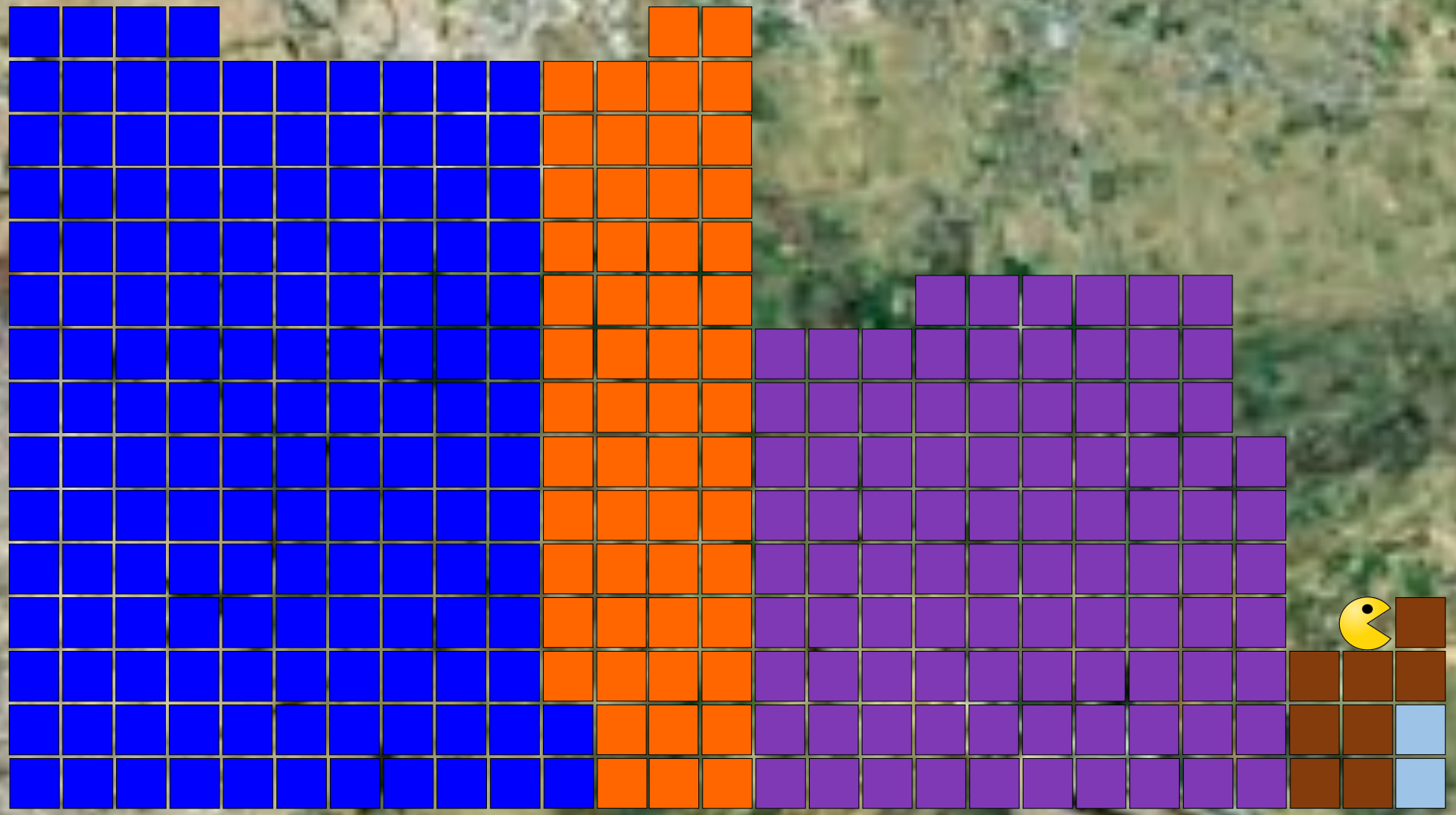
100% households

-16 kt/yr landfill (-90%)

+9 kt/yr recycled

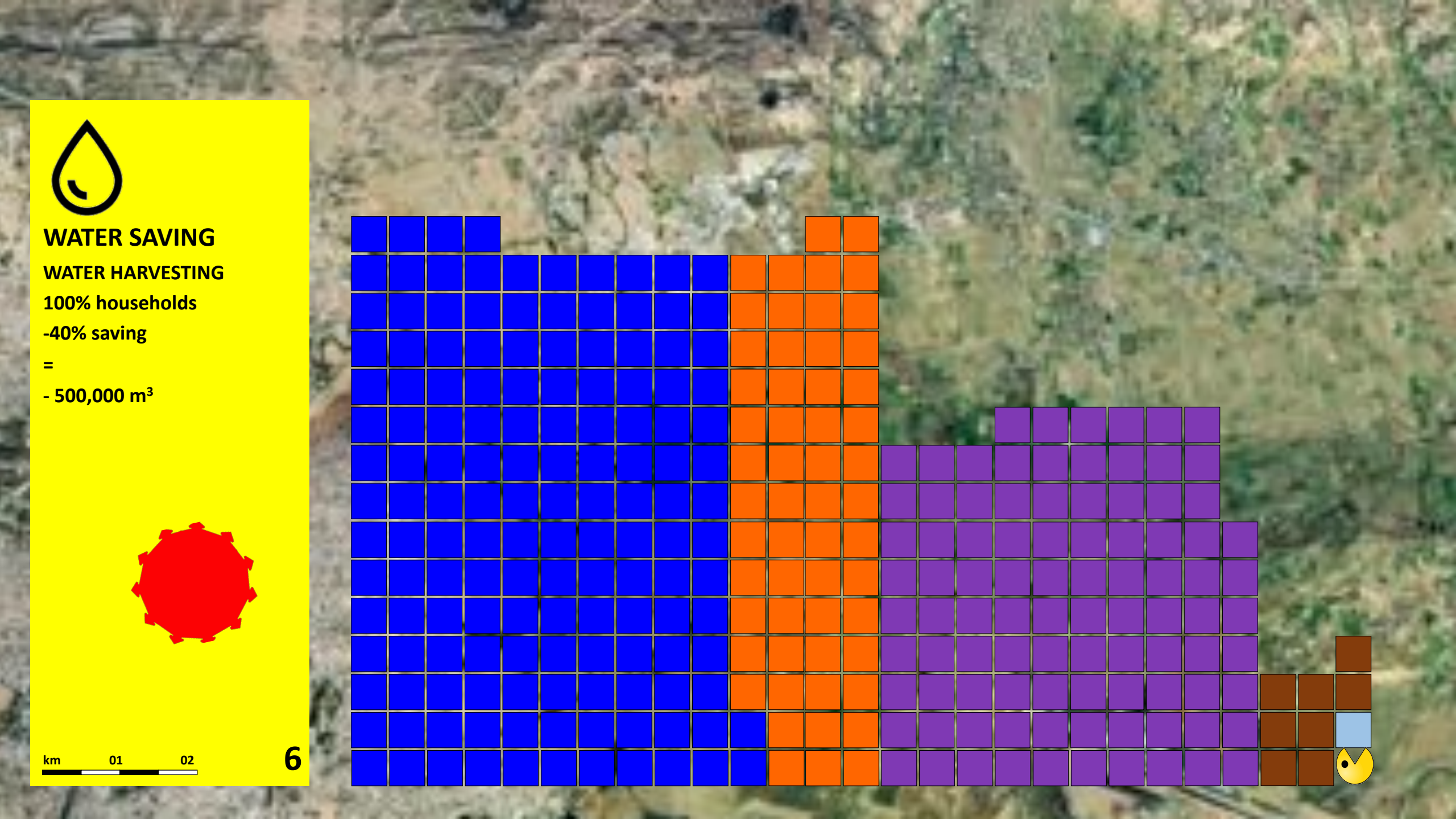
+5 kt/yr organic

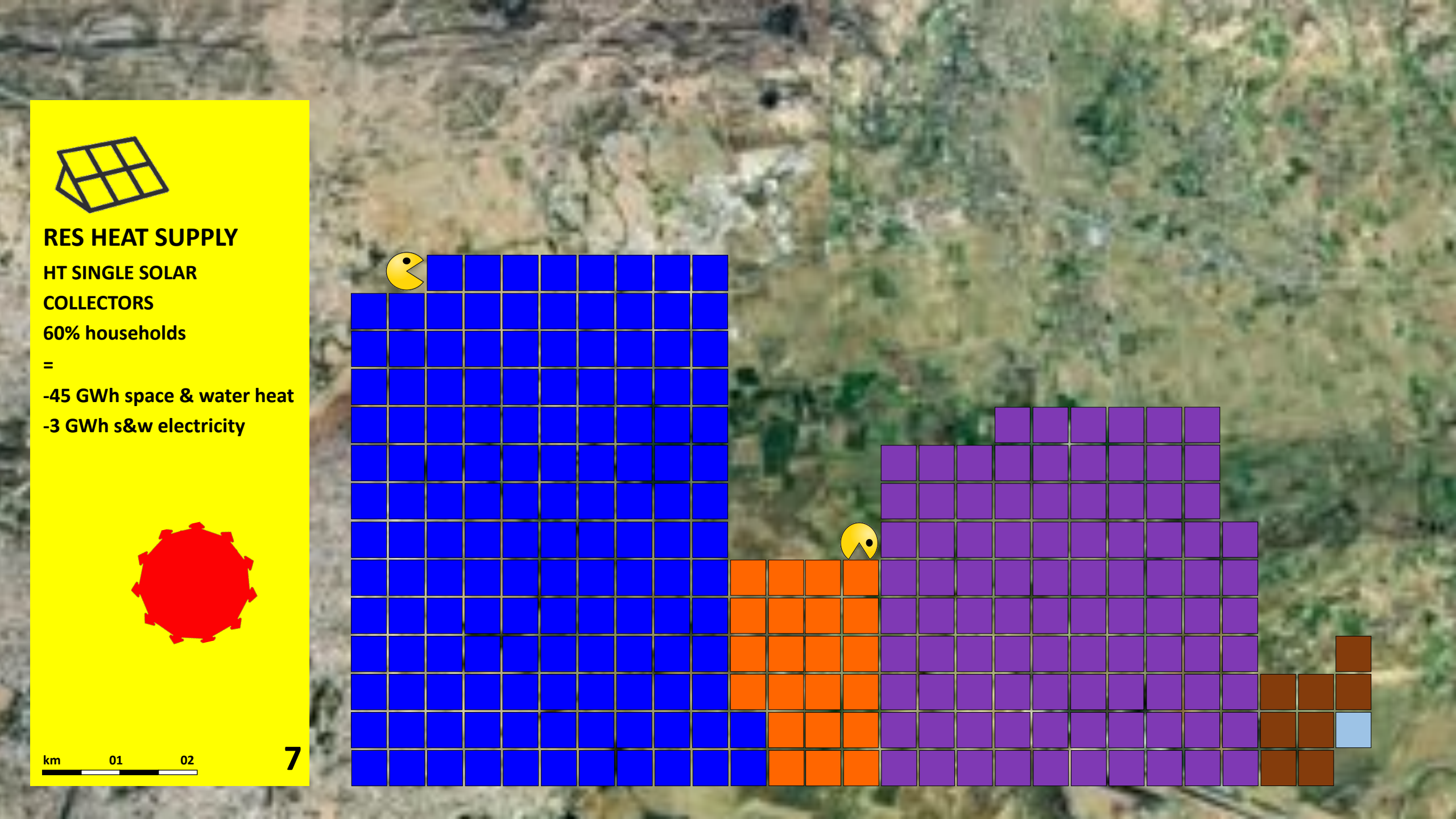
-2 kt/yr produced

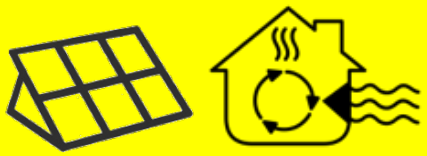


km 01 02

5


WATER SAVING
WATER HARVESTING
100% households
-40% saving
=
- 500,000 m3
km
01
02
6


RES HEAT SUPPLY
HT SINGLE SOLAR
COLLECTORS
60% households
=
-45 GWh space & water heat
-3 GWh s&w electricity
km
01
02
7



RES HEAT SUPPLY

MT SHARED SOLAR COLLECTORS + HEAT PUMPS

20% households

=

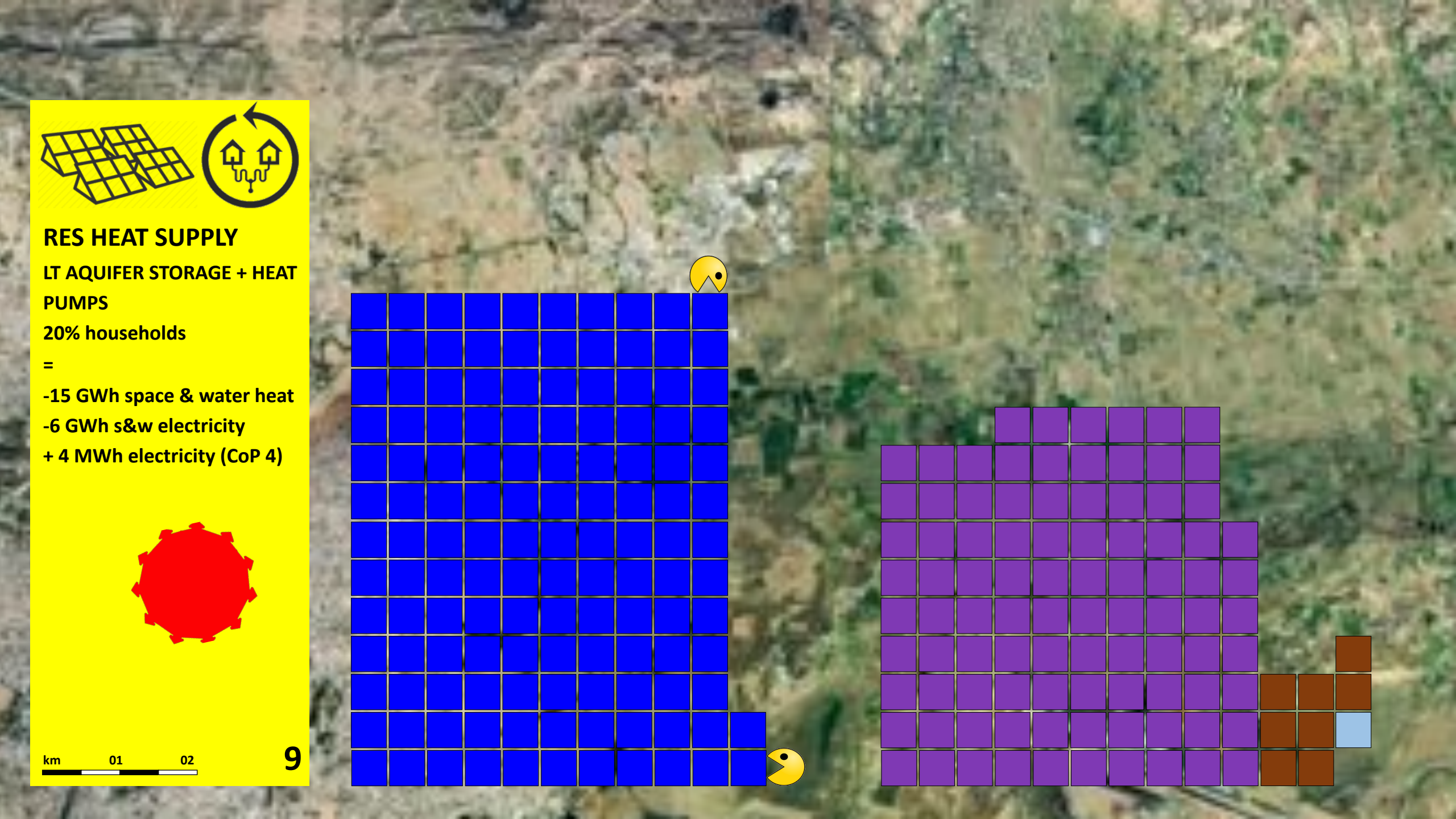
-15 GWh space & water heat

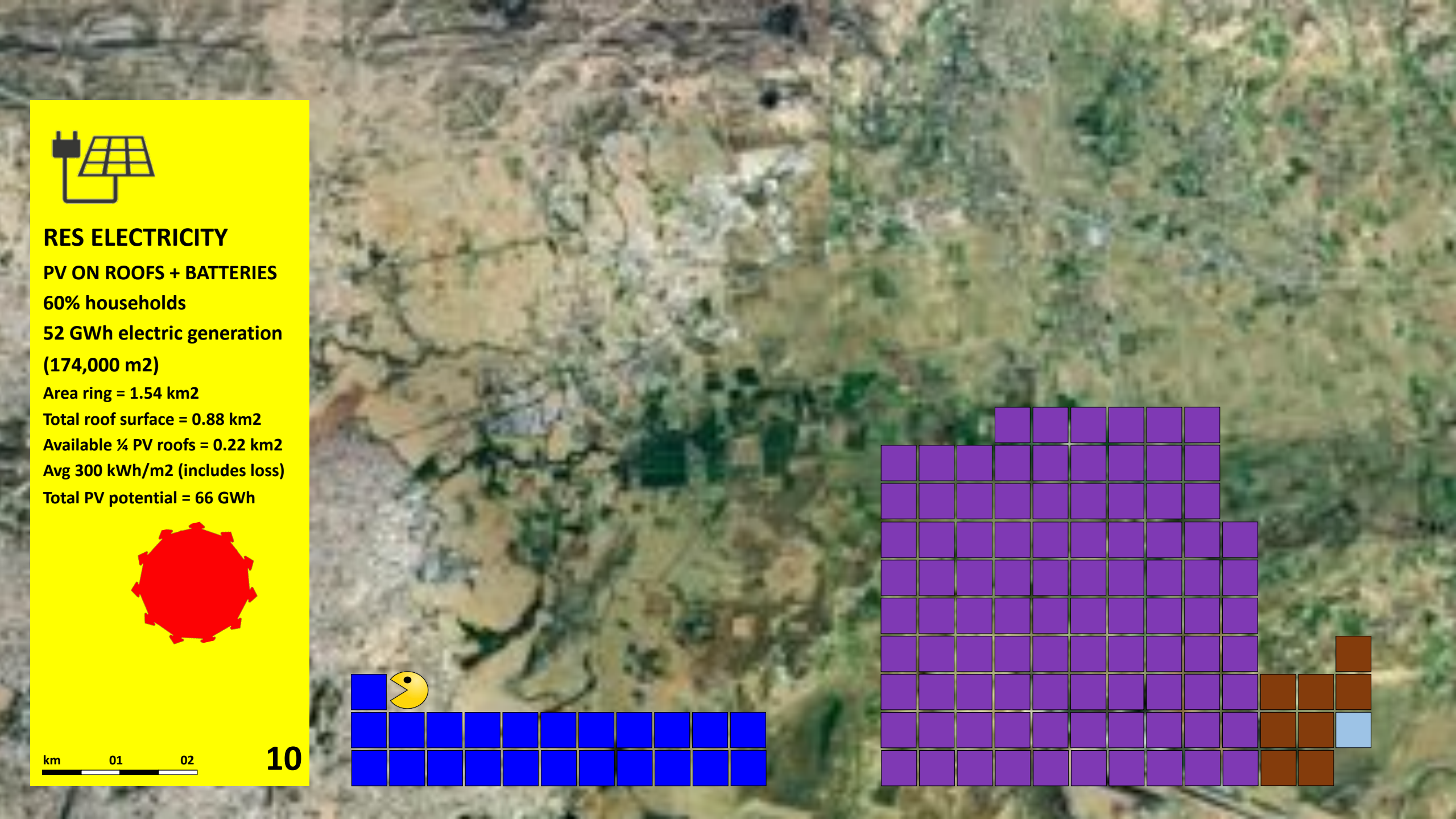
-6 GWh s&w electricity

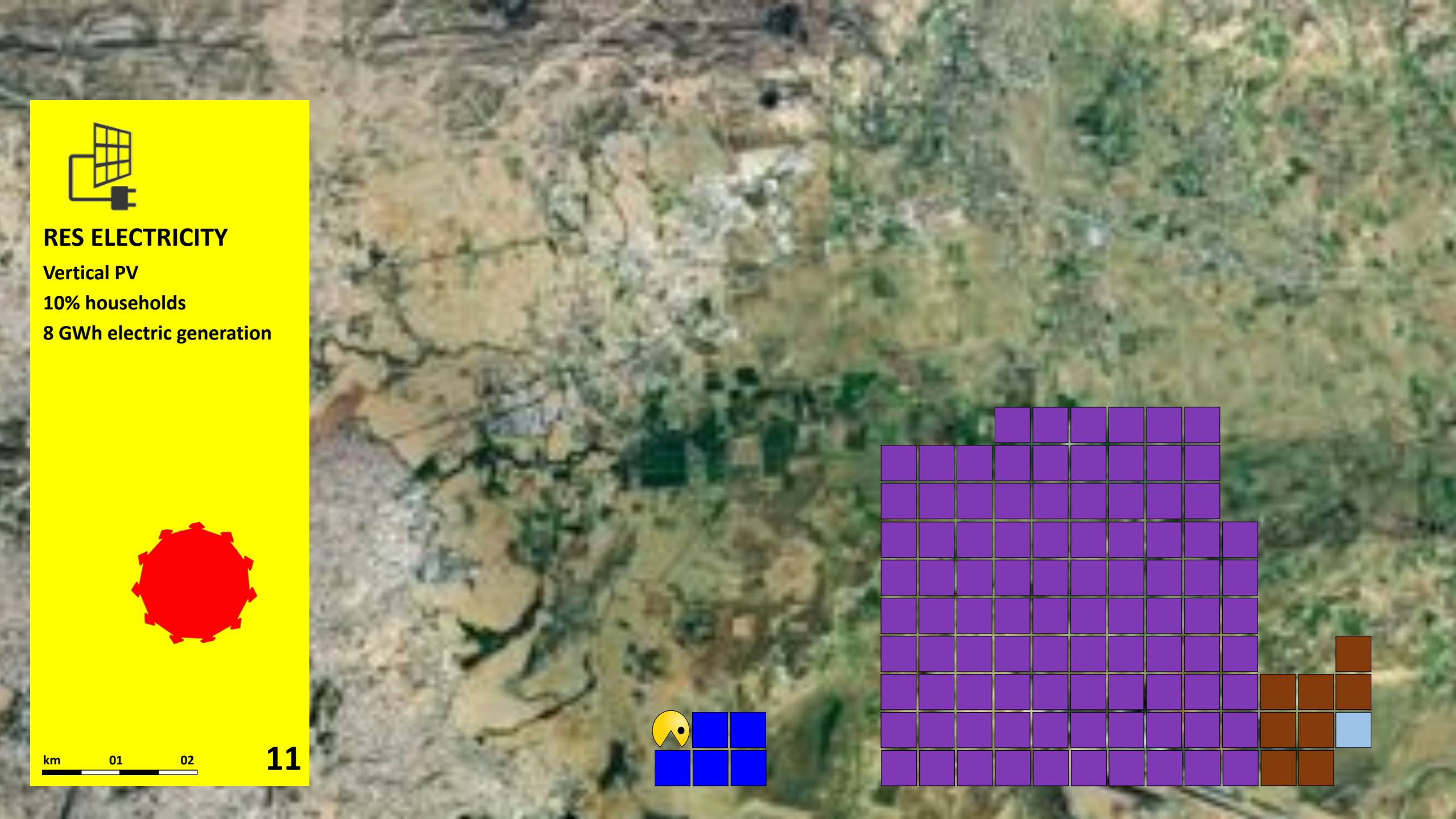
+ 4 MWh electricity (CoP 4)

km 01 02

8


RES HEAT SUPPLY
LT AQUIFER STORAGE + HEAT PUMPS
20% households
=
-15 GWh space & water heat
-6 GWh s&w electricity
+ 4 MWh electricity (CoP 4)
km
01
02
9


RES ELECTRICITY
PV ON ROOFS + BATTERIES
60% households
52 GWh electric generation
(174,000 m2)
Area ring = 1.54 km2
Total roof surface = 0.88 km2
Available ¼ PV roofs = 0.22 km2
Avg 300 kWh/m2 (includes loss)
Total PV potential = 66 GWh
km
01
02
10


RES ELECTRICITY
Vertical PV
10% households
8 GWh electric generation
km
01
02
11


TRANSITION TO
ELECTRIC MOBILITY
100% cars
32 GWh increased electriity
km
01
02
12

RES ELECTRICITY

Shared PV (canopies)

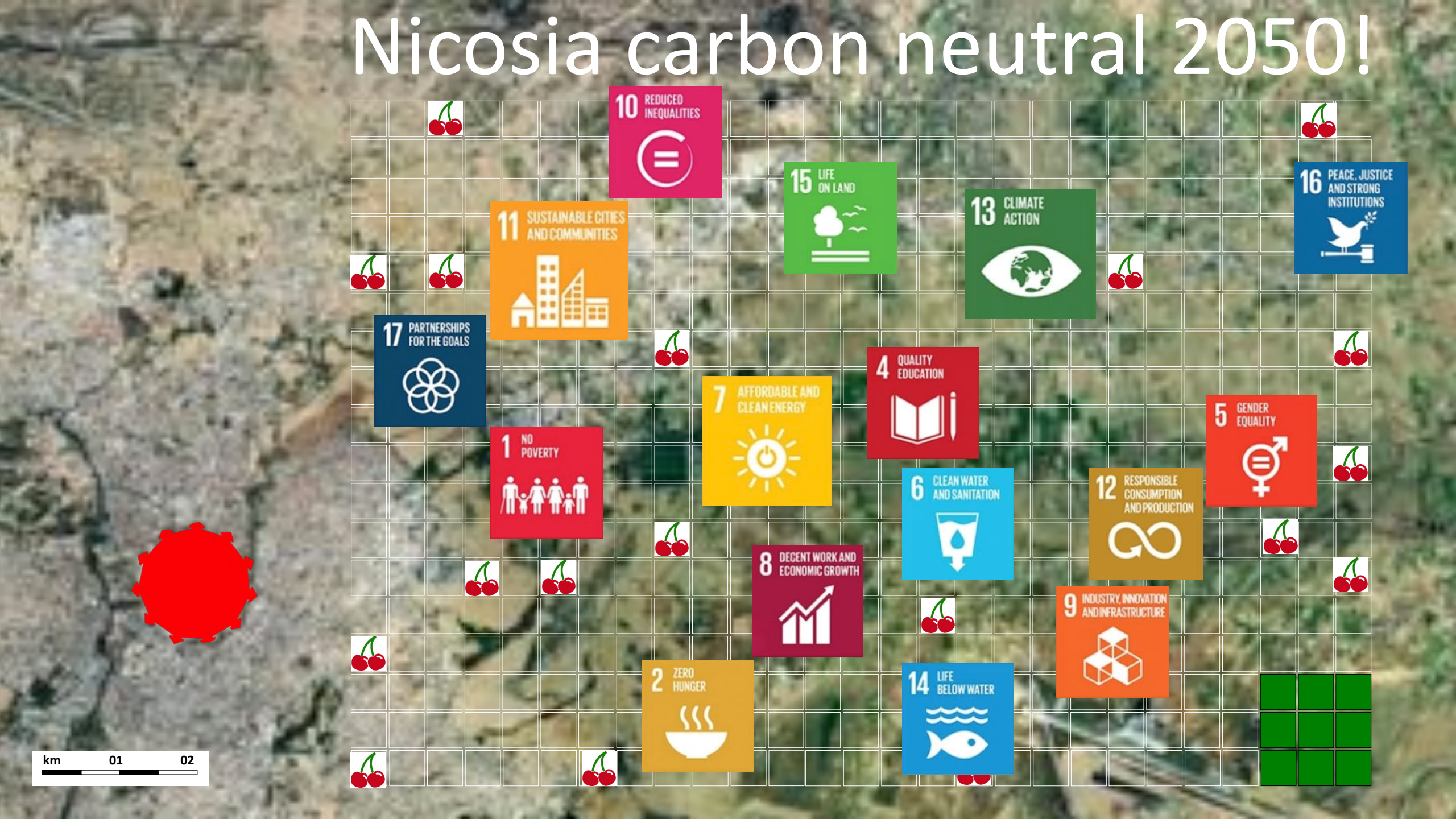
32 GWh electric generation
(107,000 m2)
e.g.
14 GWh on roofs
18 GWh on canopies

km 01 02

13


URBAN FORESTRY
CARBON UPTAKE
230 hectares forest
km
01
02
14

Nicosia carbon neutral 2050!



City-zen Nicosia Roadshow

Web: https:// www.cityzen-smartcity.eu/nl/home-nl/

@CityzenRoadshow

@CityzenRoadshow

cityzenroadshow

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This project has received funding from the European Union's Seventh Programme for research, technological development and demonstration under grant agreement No 608702

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Nicosia, Cyprus, May 2019