City-zen Nicosia Roadshow
May 8-15

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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.
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.
FUN-SHOP - TALK (DUTCH EMBASSY/RESIDENCE)

Embassy of the Kingdom of the Netherlands

- Sustainability event at the residence of the Dutch Ambassador
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.
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**
Climate: temperatures and precipitation

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

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU
Climate: solar intensity

Solar ‘best of Europe’

Source: University of Cyprus
Climate: wind characteristics

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

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU
Energy characteristics: **final energy demand**

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

Source: Cyprus Energy Agency

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU
Energy characteristics: **energy mix**

![Energy mix chart](image)

The island syndrome!
(Cf. Menorca)

Source: Eurostat

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019
Environmental footprint: **waste**

80% of waste goes to the landfill
## Environmental footprint: **biocapacity**

<table>
<thead>
<tr>
<th>COUNTRIES WITH BIOCAPACITY RESERVE</th>
<th>COUNTRIES WITH BIOCAPACITY DEFICIT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PERCENTAGE THAT BIOCAPACITY EXCEEDS ECOLOGICAL FOOTPRINT</strong></td>
<td><strong>PERCENTAGE THAT ECOLOGICAL FOOTPRINT EXCEEDS BIOCAPACITY</strong></td>
</tr>
<tr>
<td>French Guiana 3,860%</td>
<td>Singapore 10,000%</td>
</tr>
<tr>
<td>Guyana 2,490%</td>
<td>Bermuda 5,280%</td>
</tr>
<tr>
<td>Suriname 2,310%</td>
<td>Réunion 2,860%</td>
</tr>
<tr>
<td>Gabon 818%</td>
<td>Barbados 2,020%</td>
</tr>
<tr>
<td>Congo 772%</td>
<td>Cayman Islands 1,790%</td>
</tr>
<tr>
<td>Central African Republic 569%</td>
<td>United Arab Emirates 1,730%</td>
</tr>
<tr>
<td>Bolivia 428%</td>
<td>Israel 1,670%</td>
</tr>
<tr>
<td>Uruguay 288%</td>
<td>Bahrain 1,550%</td>
</tr>
<tr>
<td>Congo, Democratic Republic of 256%</td>
<td>Saudi Arabia 1,330%</td>
</tr>
<tr>
<td>Paraguay 220%</td>
<td>Cyprus 1,300%</td>
</tr>
<tr>
<td>Eritrea 220%</td>
<td>Qatar 1,220%</td>
</tr>
</tbody>
</table>

**Analysis:** Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019
Environmental footprint: **biocapacity**

**CYPRUS (1964)**

- **Biocapacity per person**: 0.8 gha
- **Ecological Footprint per person**: 1.9 gha

\[
\text{Ecological Footprint per person} = \text{Biocapacity per person} + \text{RESERVE(+) / DEFICIT(-)}
\]

- **Biocapacity RESERVE(+) / DEFICIT(-)**: -1.1 gha

**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.
Environmental footprint: **biocapacity**

### CYPRUS (2008)

<table>
<thead>
<tr>
<th>Biocapacity per person</th>
<th>0.3 gha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecological Footprint per person</td>
<td>5.6 gha</td>
</tr>
<tr>
<td>BIOCAPACITY RESERVE(+) / DEFICIT(-)</td>
<td>-5.3 gha</td>
</tr>
</tbody>
</table>

**GDP PER PERSON** $32,652
**POPULATION** 1,081,563

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**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.

**Analysis:** Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019
Environmental footprint: biocapacity

**CYPRUS (2014)**

- **Biocapacity per person:** 0.3 gha
- **Ecological Footprint per person:** 3.4 gha
- **Biocapacity Reserve (+) / Deficit (-):** -3.1 gha

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

**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.

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019
Environmental footprint: **biocapacity**

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

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU

Nicosia, Cyprus, May 2019
The car as a constituent of non-places
The car as a constituent of non-places
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
Not only a matter of tapping into the massive PV potential...
Old Nicosia is the more sustainable place
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
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
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
Nicosia, Cyprus, May 2019

Analysis: Prof Han Vandevyvere, EnergyVille / NTNU
(2019) The answer is... YES!
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
<table>
<thead>
<tr>
<th>Category</th>
<th>CO₂-eq (kt)</th>
<th>Contribution (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity</td>
<td>3197</td>
<td>37.0%</td>
</tr>
<tr>
<td>Houses</td>
<td>570</td>
<td>6.6%</td>
</tr>
<tr>
<td>Transport</td>
<td>1889</td>
<td>21.9%</td>
</tr>
<tr>
<td>Industry</td>
<td>1901</td>
<td>22.0%</td>
</tr>
<tr>
<td>Agriculture</td>
<td>559</td>
<td>6.5%</td>
</tr>
<tr>
<td>Waste</td>
<td>466</td>
<td>5.4%</td>
</tr>
<tr>
<td>Water</td>
<td>49</td>
<td>0.6%</td>
</tr>
<tr>
<td>Carbon Uptake</td>
<td>-168</td>
<td>1.9%</td>
</tr>
</tbody>
</table>

**Total CO₂-eq (kt): 8631**

**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
Cyprus area = 9251 km²

CF Cyprus (south) = 6394 km² forestland
CF Cyprus (total) = 8860 km² forestland
## Household profiling in Cyprus

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>CO₂ eq</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Electricity:</strong></td>
<td>1150 space cooling&lt;br&gt;640 space heating&lt;br&gt;380 water heating&lt;br&gt;550 cooking&lt;br&gt;3780 appliances &amp; light</td>
<td>4625</td>
<td>37%</td>
</tr>
<tr>
<td><strong>Fuel mix:</strong></td>
<td>5330 space heating&lt;br&gt;370 water heating&lt;br&gt;1300 cooking</td>
<td>1703</td>
<td>14%</td>
</tr>
<tr>
<td><strong>Mobility:</strong></td>
<td>16000 km/yr car&lt;br&gt;1.63 car/house</td>
<td>4383</td>
<td>35%</td>
</tr>
<tr>
<td><strong>Waste:</strong></td>
<td>79% landfilled&lt;br&gt;9% organic&lt;br&gt;12% recycled</td>
<td>1608</td>
<td>13%</td>
</tr>
<tr>
<td><strong>Water:</strong></td>
<td></td>
<td>55</td>
<td>0.4%</td>
</tr>
</tbody>
</table>

**Total CO₂ eq:** 12.37 t

**Household 2009:**

- Energy: 6500 kWh /yr
- Fuel mix: 7000 kWh /yr
- Mobility: 26000 km /yr
- Waste: 1700 kg /house yr
- Water: 94 m3 /house yr

**Household 2009:**

- 4625 kg CO₂ eq
- 1703 kg CO₂ eq
- 4383 kg CO₂ eq
- 1608 kg CO₂ eq
- 55 kg CO₂ eq

**Household 2009:***


**Analysis:** Dr Riccardo Pulselli, INDACO2 / Università di Siena

**Nicosia, Cyprus, May 2019**
Carbon Footprint per household

6.93 t CO₂eq/yr household


Household
2.7 citizens
12.37 t CO₂ eq
0.92 ha
Virtual forestland

1.5 fields

Analysis: Dr Riccardo Pulselli, INDACO2 / Università di Siena

Nicosia, Cyprus, May 2019
Population 35,000
Households 13,258
Analysis: Dr Riccardo Pulselli, INDACO2 / Università di Siena, Nicosia, Cyprus, May 2019

CF 164,000 t CO₂eq
Forest 12,152 ha area
Ring 153 ha area
CF 164,000 t CO₂ eq
Forest 12,152 ha area
Ring 153 ha area
What about food?

CF 164,000 t CO₂ eq
Forest 12,152 ha area
Ring 153 ha area
What about food?

ADD CF 44,000 t CO₂eq
Forest 3280 ha area
Ring 153 ha area
\times 21

+27%
What about food?

ADD CF 67,000 t CO₂eq
Forest 4982 ha area
Ring 153 ha area
× 32
What about food?

ADD CF 26,000 t CO₂ eq
Forest 1944 ha area
Ring 153 ha area
× 12
Analysis

Dr Riccardo Pulselli, INDACO2 / Università di Siena

Nicosia, Cyprus, May 2019

km

01

02

CF 164,000 t CO₂eq
Forest 12,152 ha area

Ring 153 ha area

CHALLENGE
Nicosia Energy Strategy

- Prof. Andy van den Dobbelsteen – TU Delft, The Netherlands
- Dr. Riccardo Pulselli – INDACO2 / Università 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
A vision on the sustainable city
Nicosia, City of the Sun

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

Nicosia, Cyprus, May 2019
Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology
Nicosia, Doughnut Economy

[Diagram showing the Doughnut Economy concept: the safe and just space for humanity, the social foundation, overshoot, and shortfall.]

[after Raworth, 2017]

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

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

- Solar City
- Circular City
- Decentral City
- Connected City

Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology
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.
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
Strategy for the communal energy system

Ring network for energy mains
Branches into the city
Energy storage in the batteries

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

Nicosia, Cyprus, May 2019
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

Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology
From bastion battery to bastion battery
Bastion heat and cold storage

Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology
Bastion heat and cold storage

Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology
Hydro-power water tower look-out

Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology
Bioclimatic principles for Nicosia

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

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

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

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

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

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

Nicosia, Cyprus, May 2019
Nicosia, Cyprus, May 2019

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

Tropical roof
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

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

Nicosia, Cyprus, May 2019
Flat roofs in our area: potential for solar panels

Energy strategy: Prof Andy van den Dobbelsteen, Delft University of Technology
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 CO₂ emissions**

They are involved in energy

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

**6 years!**
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

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

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

Division

Not the biggest.....

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

Nicosia, Cyprus. May 2019
Problems

Car usage
Bigger…
Heat island
Climate change
Sustainability
Problems

People unfriendly space
Car dominated...

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

Heritage at risk

The possibilities are endless……

Urban Design

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

No obvious centre public space in the city
Urban Design

Problems compounded by

Suburban growth
Urban Design

Key Premise

Change space – change behavior – save planet

Network issues

N-S
Urban Design

Key Premise

Change space – change behavior – save planet

Network issues

E-W
Urban Design

Key issues

Change space – change behavior – save planet

Get people out of the car.... 2000 deaths a year from circulatory problems....
History to heritage

How do we unlock resilience and keep all histories......
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!!
Urban Design

Green zone analysis

Green zone
Geographically immense
Spatially invisible
Green zone analysis

Green zone

Geographically immense

Spatially invisible

Urban Design

Greenzone
Urban Design

Zoning the Greenzone

Peacemeal Green-zone

Green zone
To complex to remove wholly
So do in bits.....
Benefit each side

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

Nicosia, Cyprus. May 2019
Create a shared Centre

New centre
One new gate
Neutral space
Co-developed
Urban Design

Create a centre. Green Line changes. Airline pass

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

Nicosia, Cyprus. May 2019
Urban Design
Create a centre. Green Line changes

The Bazaar
New centre
One new gate
Neutral space
Co-developed
Urban Design

Create a centre.  Green Line changes

The Bazaar

New centre
One new gate
Neutral space
Co-developed

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

Green line moves Central zone. Ledra Street westwards.

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

Nicosia, Cyprus. May 2019
Urban Design

Green line moves Central zone. Ledra Street westwards.

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

Green line moves
New streets, New square.

New shared centre
New streets
Shared heritage
Urban Design

Green line moves

New street

New shared centre

New streets

Global/Local infrastructure

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

Nicosia, Cyprus. May 2019
Urban Design

Green line moves

New Sports place.

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

Nicosia, Cyprus. May 2019
Urban Design

Green line moves

New Sports place.

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

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

New green park

- Sports
- Cycle routes
- Tree nursery
- Climate protection

Nicosia, Cyprus. May 2019
Car removal

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

Urban Design

Remove the car from the centre
Use the Bastions and moat as a park

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

Nicosia, Cyprus. May 2019
Car removal

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

Car removal inside the ring

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

Nicosia, Cyprus. May 2019
Car removal inside the ring
Creates people space
The Bastion Park

Increased green
New infrastructure
Energy/mobility/social
Tourist/heritage enabling

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

The Bastion park

Increased green
New infrastructure
Energy/mobility/social
Tourist/heritage enabling

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

The Bastion Park

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

Nicosia, Cyprus. May 2019
City as forest

Hide the city in a forest

Hide a forest in the city.....

Increased intensity

Community services

Increased density

Reason to visit
Urban Design

Green the city

City as forest

Increased intensity
Community services
Increased density
Reason to visit

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

Nicosia, Cyprus. May 2019
City as forest

Increased intensity
Community services
Increased density
Reason to visit

Green the Bastions

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

City as forest

Hide the city in a forest –
Hide a forest in the city.....
City as forest

Hide the city in a forest –

Hide a forest in the city.....

Greywater facades
Pocket parks

Re-purpose car-parks.

New 100m infrastructure that reduces heat island effect

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

Re-purpose car-parks.

New 100m infrastructure that reduces heat island effect.
Urban Design

Pocket parks

Re-purpose car-parks.

New 100m infrastructure that reduces heat island effect

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

Nicosia, Cyprus. May 2019
Green Network

Connect inner-city Pocket parks.

Make shaded network of places to walk

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

Densification - south

Increased density
Increased intensity
More shade
Better community services

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

Densification + greening

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

Densification North

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

Nicosia, Cyprus. May 2019

Densification

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

CITY-zen
New urban energy
ROADSHOW
Densification and greening

Urban Design

Increased density
Increased intensity
More shade
Better community services

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

Nicosia, Cyprus. May 2019
Urban Design

Re-invent the street

Nicosia, Cyprus. May 2019

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

Reclaim territory from the car

New community

Increased intensity
Re-invent the street

Nicosia, Cyprus. May 2019

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

Reclaim territory from the car

New community

Increased intensity
Urban Design

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

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

1.2 million trees per year for a century

100 cities......
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.”
Helen Papoulis

“I’m 10 years old and now that it’s safer to walk my mum lets my brother and I walk to school. After school me and my friends would go and play on the swings in the park. It’s very fun! My brother likes to play football with his friends there as well. It seems everyone is at the park! We even have events in the old chariot race area and loads of people gather to watch! It’s like we are back in time celebrating sports.”
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.”
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 it not better in my eyes and would recommend this city to anyone who asked.”

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

More More More More...

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

**INSULATION, DOUBLEGLASS**

70% households

- 15% cooling energy
- 30% heating energy

= 3 GWh electricity
- 15 GWh heat
AVOIDED CARS
PUBLIC TRANSPORT
30% households
-100% car use
=
-100,000 km driven
AVOIDED CARS

WALK/BIKE TO SCHOOL/WORK
30% households
-50% car use
= - 50,000 km driven
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
WATER SAVING
WATER HARVESTING
100% households
-40% saving
=
-500,000 m³
RES HEAT SUPPLY

HT SINGLE SOLAR COLLECTORS
60% households

= 

-45 GWh space & water heat
-3 GWh s&w electricity
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)
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)
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
RES ELECTRICITY
Vertical PV
10% households
8 GWh electric generation
TRANSITION TO ELECTRIC MOBILITY
100% cars
32 GWh increased electricity
RES ELECTRICITY
Shared PV (canopies)
32 GWh electric generation
(107,000 m²)
e.g.
14 GWh on roofs
18 GWh on canopies
URBAN FORESTRY
CARBON UPTAKE

230 hectares forest
Nicosia carbon neutral 2050!
City-zen Nicosia Roadshow

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

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