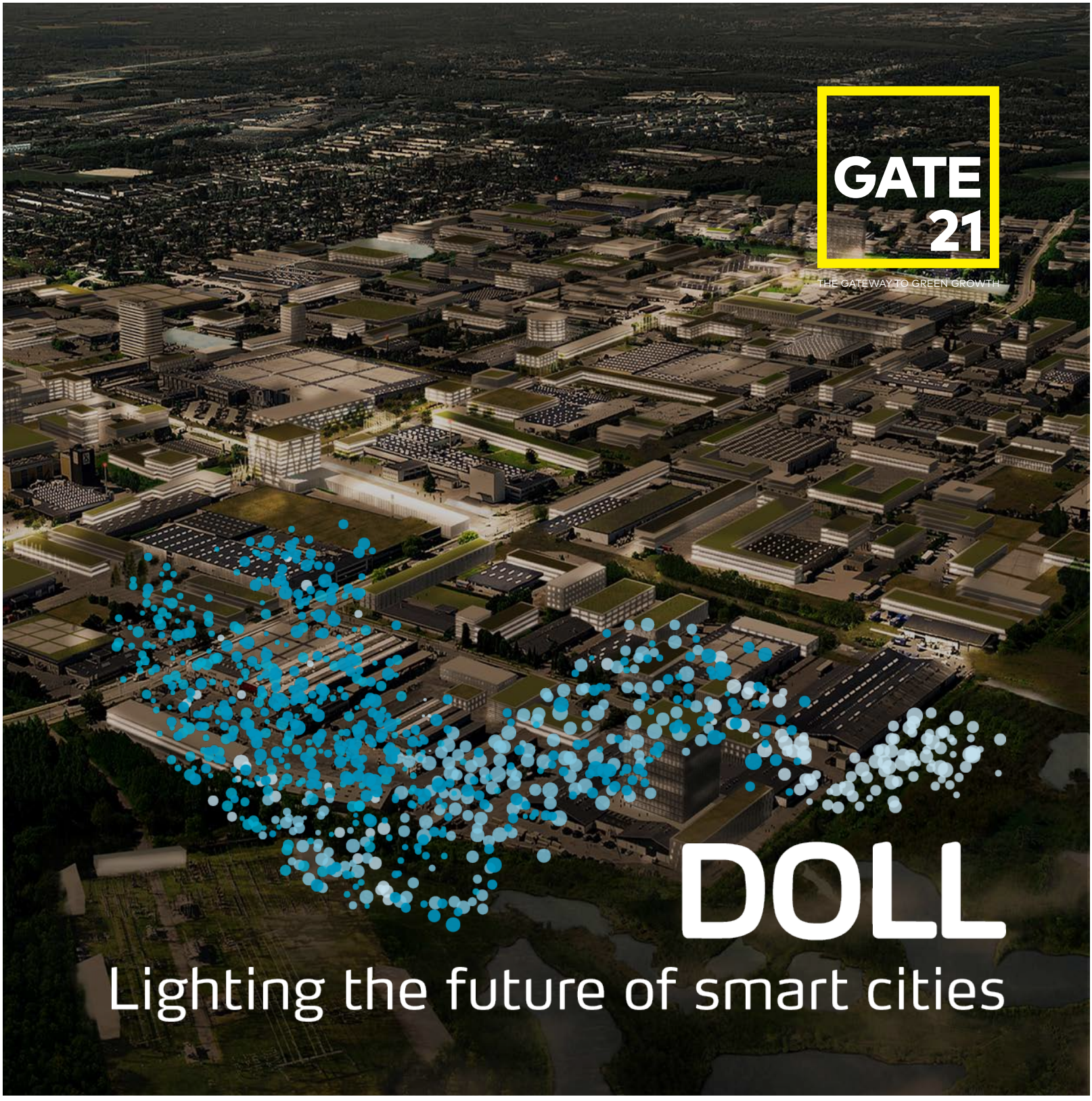
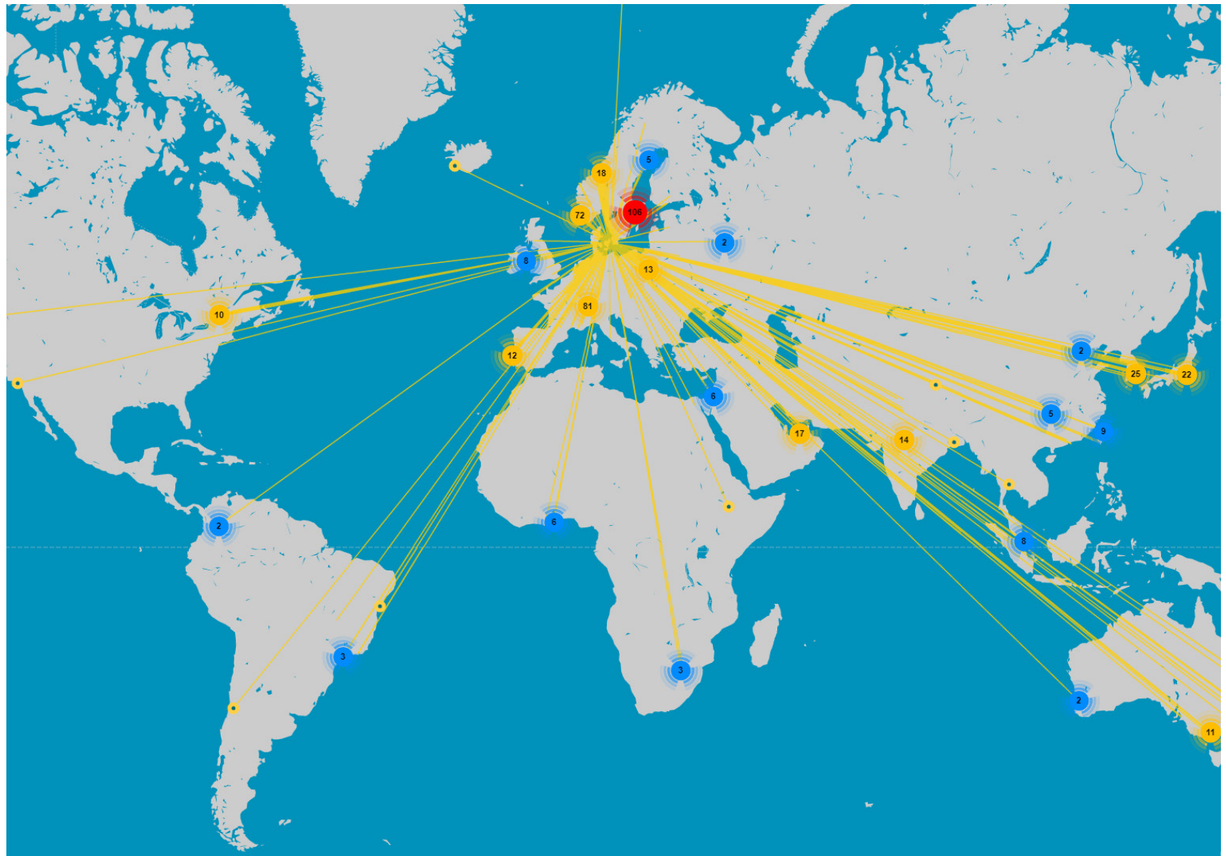

GATE
21
THE GATEWAY TO GREEN GROWTH
DOLL
Lighting the future of smart cities

Introduction

DOLL Living Lab is a leading facility of its kind in Europe, testing and demonstrating intelligent outdoor lighting systems and Smart City-technologies.

We build bridges between manufacturers, public decision makers and knowledge institutions, with a common interest in developing liveable, sustainable and resource efficient communities, through the means of technology.

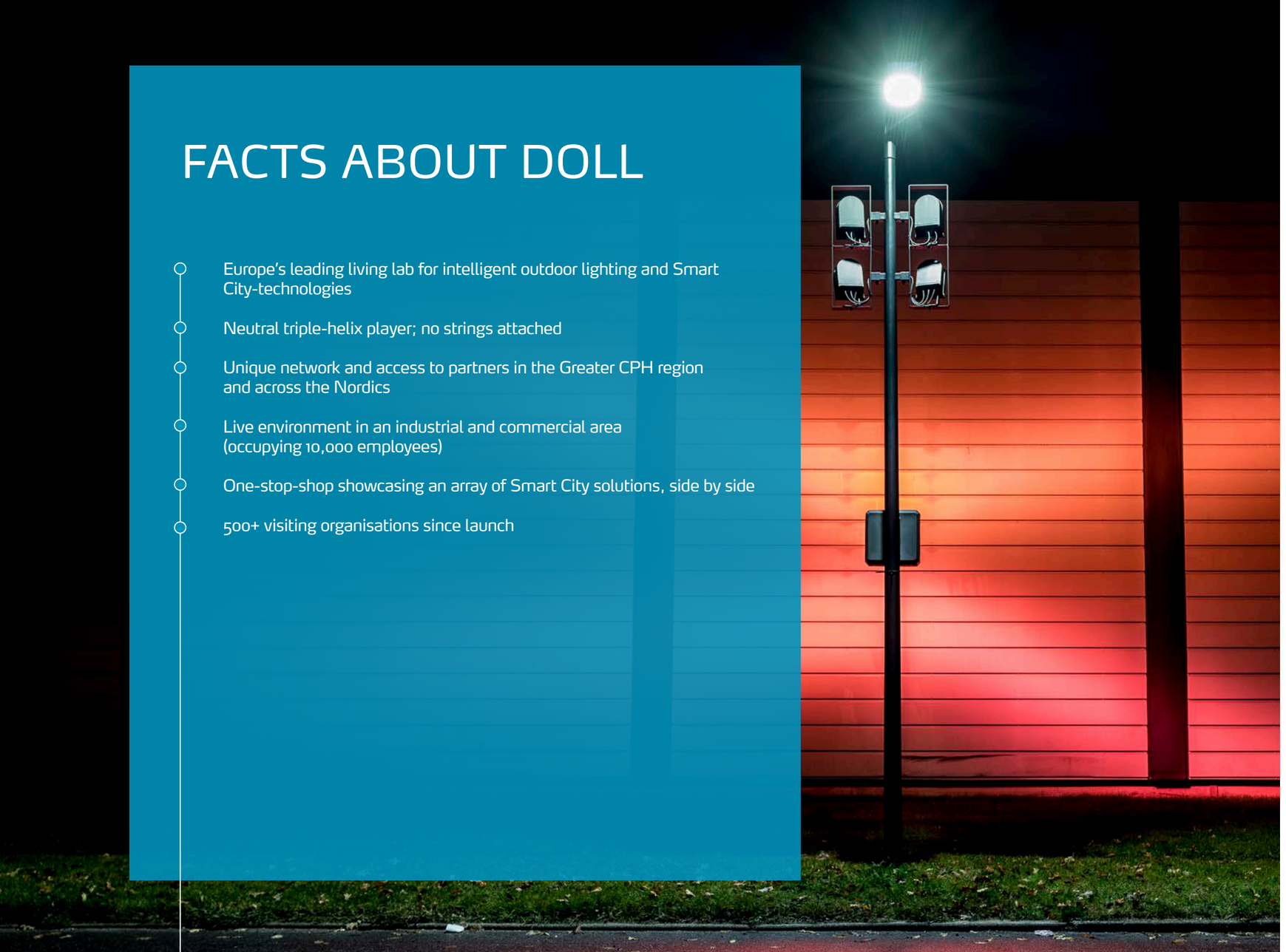
So whether you want to hear more about the latest developments in community digitization, IoT and Smart City, at our visitor centre in the heart of our living lab, or represent a company with the need to test and demonstrate your technology in a full-scale plug-and-play environment, we're ready to help.



VISITOR MAP
500 PUBLIC AND
PRIVATE ORGANISATIONS

FACTS ABOUT DOLL

- Europe's leading living lab for intelligent outdoor lighting and Smart City-technologies
- Neutral triple-helix player; no strings attached
- Unique network and access to partners in the Greater CPH region and across the Nordics
- Live environment in an industrial and commercial area (occupying 10,000 employees)
- One-stop-shop showcasing an array of Smart City solutions, side by side
- 500+ visiting organisations since launch



HOW WE WORK

DOLL is a tech-lab in the intersection of digitalisation and sustainable development, creating results through:

- Community digitisation, IoT, and Smart City
- Testing and demonstration of the latest solutions and services
- Development of eco-systems with a wide range of national and international industry players
- Matchmaking between public decision-makers (needs) and private companies (solutions)
- Addressing the needs of sustainable, liveable cities and communities

As an extension of Denmark's largest green cluster, Gate 21, DOLL is part of an organisation who develops innovative projects through triple helix partnerships, regionally, nationally and across the EU – with all project results directly supporting the global SDGs.

PRIVATE SOLUTIONS

PUBLIC CHALLENGES

FOCUS AREAS

WE WORK WITH SEVERAL SMART CITY AREAS:

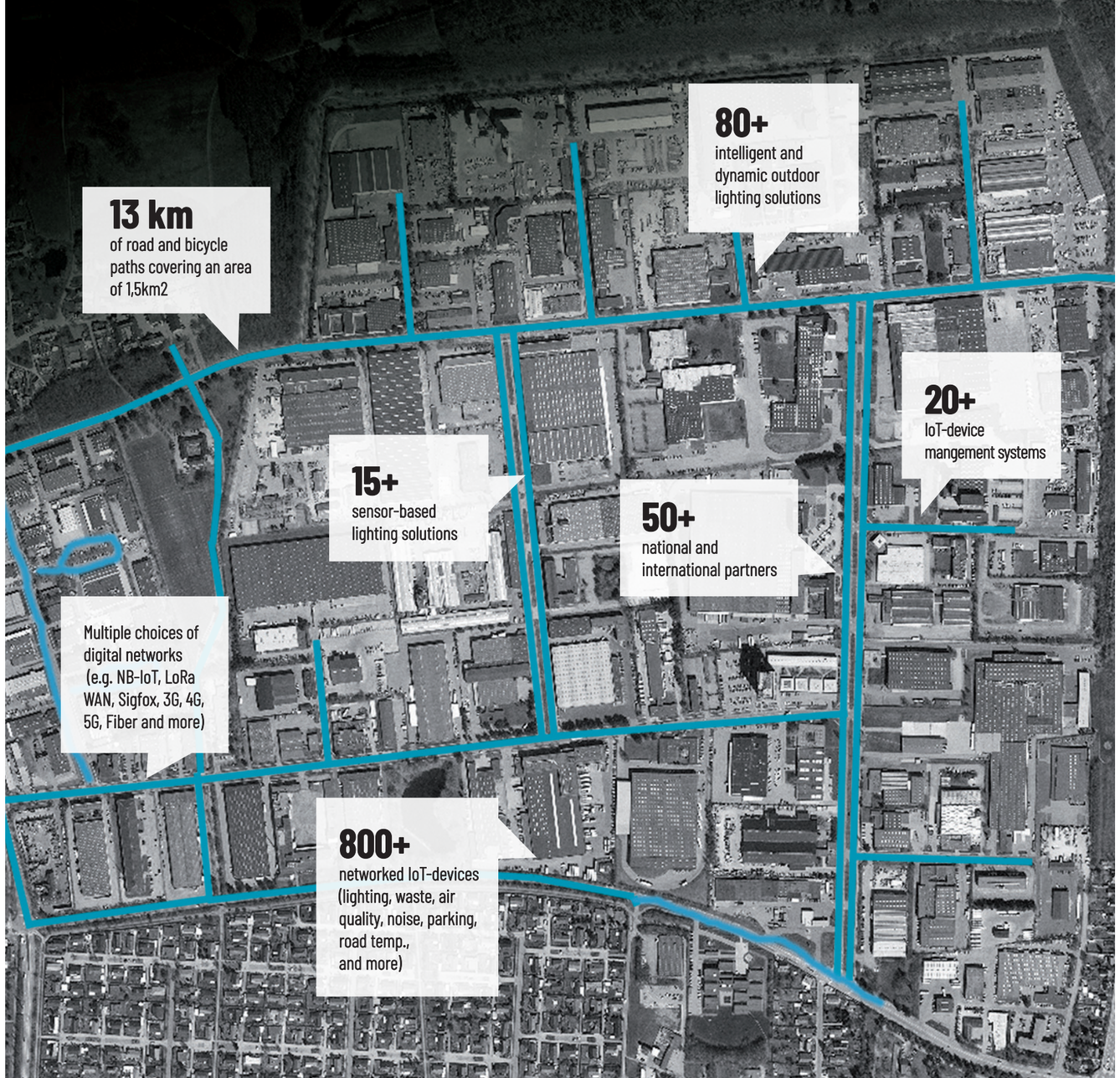
INTELLIGENT OUTDOOR LIGHTING
Lighting is considered as one of the key enablers of the Smart City, and the testing and demonstration of intelligent and dynamic LED-based outdoor lighting is therefore an essential part of DOLL Living Lab, where more than 80 solutions are tested side-by-side.

DYNAMIC TRAFFIC LIGHT
Dynamic traffic lights combine traditional traffic lights with an array of sensors and artificial intelligence to intelligently route vehicle and pedestrian traffic. Potential benefits include reduction of harmful emissions as well as saving motorist time.

SMART WASTE MANAGEMENT
In Denmark alone, approximately 11 million tons of waste are produced annually. Waste collection costs time, money and resources; therefore, at DOLL, we test digital sensor-based solutions, where collection takes place as and when needed, rather than on fixed schedules.

ENVIRONMENTAL MONITORING
At DOLL we measure precipitation, temperature, noise and particulate pollution in real time. Measuring in real time offers completely new possibilities for adapting activities to the current conditions, for example by directing traffic away from cloudy areas or adjusting snow clearance and salt distribution to match the current road temperature.

DATA INFRASTRUCTURE & DATA COMMUNICATION
Today, many of the new internet-enabled devices differ broadly in terms of network infrastructure and capabilities, so at DOLL we are testing a wide range of networking solutions, from city wi-fi to low power wide area networks and lightning fast 5G cellular networks.



TRENDS IN 2020 – NEW DEVELOPMENTS

A string of new partners joining DOLL's existing partners results in a wide variety of new installations at DOLL. Here are some examples:

DRIVERLESS BUSSES
At DOLL Living Lab we are working on how driverless collective mobility can help solve mobility and congestion challenges in urban areas.

MOTION SENSORS
There are several benefits of applying motion sensors to a system, from energy savings to city planning, combining traffic data with dynamic lighting and more – this year will see a large increase in the use of sensor-based solutions at DOLL.

SMART POLES
Smart poles take the blend of design and multi-functionality to a new level. DOLL's first new installation of this year was six smart poles, and more will follow.

TUNABLE WHITE
DOLL Living Lab is one of the first to demonstrate tunable white for outdoor lighting; single diode LED with a greater capacity for both dimming and colour-variation, which have proven beneficial for both humans and the environment.

ZAGHA SOCKETS
We see an increase in installations with Zagha – the new smart standard for sockets -starting with communication units, and now also a variety of sensors.

AIR QUALITY AND NOISE DETECTION
The installation of sensors helps to both qualify and quantify different sources of pollution, in order to introduce appropriate solutions to help reduce their impact.

BICYCLE HIGHWAY TRAFFIC MONITORING
By knowing the use of bicycle paths, services can be improved and improve the cyclists' conditions.


Albertslund Kommune
12:04
Mon. 12. Jun.
Infrastructure
Air Quality
Lighting
Waste
Parking
Water Pumps
Motion Detection
Smartbuilding
Map
Twitter
Communication
DOLL
a Photonics GreenLab
New Lighting: DOLL Living Lab

Our visit at DOLL Living Lab was very useful and informative. The presentation at the visitor center and the chance to see the technology in operation during the following tour around the area, even inspired us to plan our own mini-lab, where we will start testing different smart city solutions.

Sonja Svardal,
Municipality of Marnardal

DOLL Living Lab provides us with an opportunity to demonstrate how our products work. and how the lighting is expressed, in different outdoor urban environments, at a location shared with the wider lighting and Smart City community, and that is frequently visited by international delegations.

Henrik Hansen,
Louis Poulsen

It was very useful for us to visit DOLL Living Lab and see the possibilities on the market, both in terms of energy management and savings, but also how to use lighting as a design tool - not least in a city like ours, which experiences complete polar darkness for three months of the year

Håvard Moe,
Longyearbyen - the world's northernmost city

WORK WITH US

BECOME PART OF: EUROPE'S LARGEST TEST FIELD, SHOWROOM AND INNOVATION HUB

- A leading living lab for intelligent and dynamic outdoor lighting and other Smart City-technologies
- A one-stop-shop testing and demonstrating a vast number of solutions side-by-side
- Live environment, industrial and commercial area (10.000 employees)

GET ACCESS TO: A RICH PARTNER ECO-SYSTEM

- Eco-system of key players, incl. manufacturers (sensors, luminaires, traffic light, etc.), utility companies, network and telecom operators, data analytics and processing companies and application & system integrators
- An on-going portfolio of public-private innovation projects via our host organisation Gate 21 , the largest cluster organisation in Denmark

PLUG INTO: MAKE YOUR USE-CASE AND CONNECT IT

- Design your use-case based on any preferred digital network infrastructure (e.g. city WiFi, LoRa WAN, Sigfox, NB-IoT, 5G, and more)
- Modern and advanced power infrastructure
- No installation costs - we cover the expenses

BRING YOUR COSTUMERS: DOLL AS NEUTRAL GROUND

- Use DOLL Visitor Centre in the heart of DOLL Living Lab, with meeting and conference facilities
- Control Room: video wall, servers and management systems
- You will get full key access and booking rights
- Catering, bus service and cleaning are all part of the DOLL Visitor Centre

MAKE USE OF: THE DOLL TEAM, COMPETENCIES AND NETWORK

- Ask if we can assist or facilitate your presentation or workshop with costumers
- Ask if we can facilitate a FIELD TOUR in the living lab
- Ask if we can assist connecting you to the relevant partners
- Ask how you become part of workshops and seminars together with cities

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VISIT DOLL

VISIT DOLL LIVING LAB

We invite public decision makers and practitioners from city and government levels, as well as private organizations and Smart City-focused players in general, to visit the DOLL Living Lab and the DOLL Visitor Center.

- All visits must be booked in advance
- Guided tours and visits are customised according to requests
- All installations are placed in real outdoor environments
- Visits are charged a fee

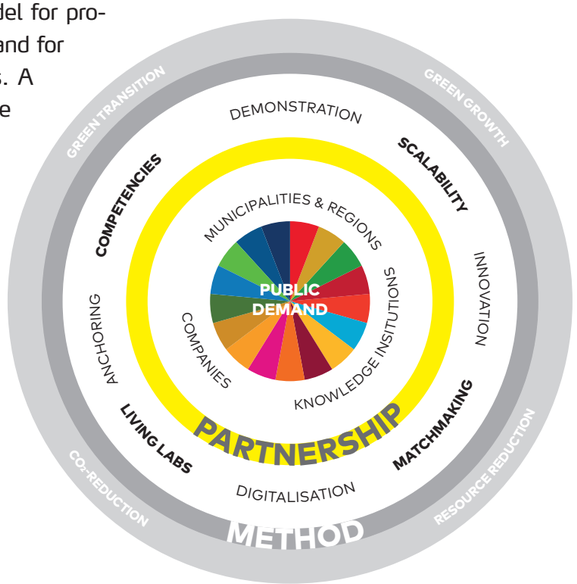
For further visit enquiries please contact:
Hedvig Spang-Hanssen at
visitor@doll-livinglab.com or +45 5354 7003

GATE 21

Gate 21 is the partnership for green transition in Denmark, bringing regions, municipalities, companies and knowledge Institutions together, to develop and demonstrate ways to a fundamental green transition of our community. Solutions are tested based on public demand, which can be scaled and spread across the whole country – for inspiration to the rest of the world.

PROJECTS FOR ACTION

At the centre of Gate 21's result-driven model for projects is the regions and municipalities' demand for new energy and resource-efficient solutions. A strong triple helix organisation encircles the core and enables the key methods applied, from Living Labs, demonstration, innovation, scaling, digitisation, anchoring, skills development and matchmaking.



FUNDING PROVIDERS:

The Capital Region of Denmark

GREEN LABS DK

REGION ZEALAND

Vækstforum Hovedstaden

Uddannelses- og Forskningsministeriet

Interreg Öresund-Kattegat-Skagerrak European Regional Development Fund

EUROPEAN UNION

CONSORTIUM PARTNERS:

City of Albertslund

GATE 21

DTU Denmark Technical University

DOLL

Lighting the future of smart cities

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