Smart City

Technology, the near future

www.inels.com/SmartCity

ELKO EP

ELKO EP employs about 330 people, exports its products to more than seventy countries, and has representatives in seventeen foreign branches. Company of the Year of the Zlín Region, Visionary of the Year, Global Exporter of the Year, Participation in the Czech TOP 100, these are just some of the awards received. Still, we are not finnished. We are constantly striving to move forward in the field of innovation and development. That's our primary concern.

Millions of relays, thousands of satisfied customers, hundreds of our own employees, twenty five years of research, development and production, seventeen foreign branches, one company. ELKO EP, innovative- a purely Czech company based in Holešov, where development, production, logistics, service and support go hand in hand. Our primary focus is on custom-built systems for hospitality, health care, smart cities and the Internet of Things.

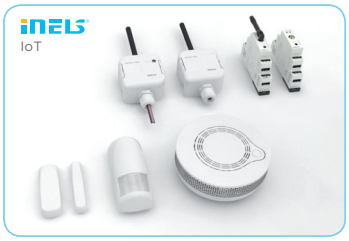
content

Product groups

Smart city

Timers / Relays

Protection monitoring relays



iNELS Air - IoT devices

Wireless electroinstallation (RF)

Wired electroinstallation (BUS)

Energy management

Wireless Retrofit Hotel (HRESK)

Hospitality Hotel (GRMS)

Building Management System (BMS)

Lighting control

Multimedia

Switches and sockets

Each of us surely remembers our childhood. At that time there were no mobile phones, the internet or computers that could for example, drive transport. Since then, not only villages, but small cities, and large cities have undergone changes that have not always changed for the better. Perhaps some of you have already said that it is no longer possible for this to develop further. But the opposite is true. More than ever before, the term Smart city is being used not only in firms, but the entire city. What about Smart cities? What does Smart Cities mean? The exact definition differs, but their common denominator is the new and beneficial practices that move the city forward.

Different technologies from digital, communication, to information are used. They streamline existing resources and look for new ones. The effort is focused on reducing energy consumption, sharing data, or relieving the environment. It is therefore an ideal place for creative environments to lure talents in the area to help make cities more attractive, more familiar and enjoyable for life. These visions and innovations are a strategic plan that not only involves the highest echelons but also its inhabitants. Cities are thus led to a sustainable economic, environmental state, but above all heightened social development


Environment
Safety
Informations
Public lighting
Smart Metering
Sustainability
Parking
Air quality
IoT
Energy savings
Electromobility
Smart buildings

Why a Smart City?

Smart City is tomorrow's place. It is the heart of revolution and innovative solutions. In order for cities to be successful, there is a need to provide not only a pleasant place to live, but also a competitive marketplace and more satisfied employees.

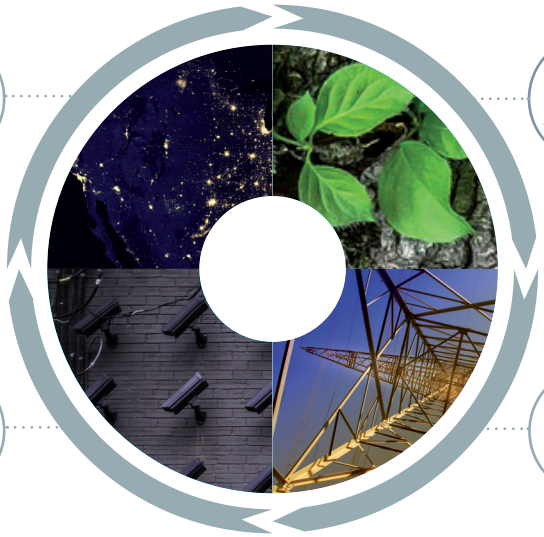
Local roads will turn into intelligent communication highways that will be able to respond to the traffic situation and avoid congestion and the delay of urban public transport. Cities are not only safe but also cost-saving.

They are great springboards for expanding other features such as air quality, emission reductions and more. This will attract new residents and prevent the outflow of people out of city centers. The „smarter" we are, the more important it is to focus on sustainable energy.

The main reasons to choose a Smart City

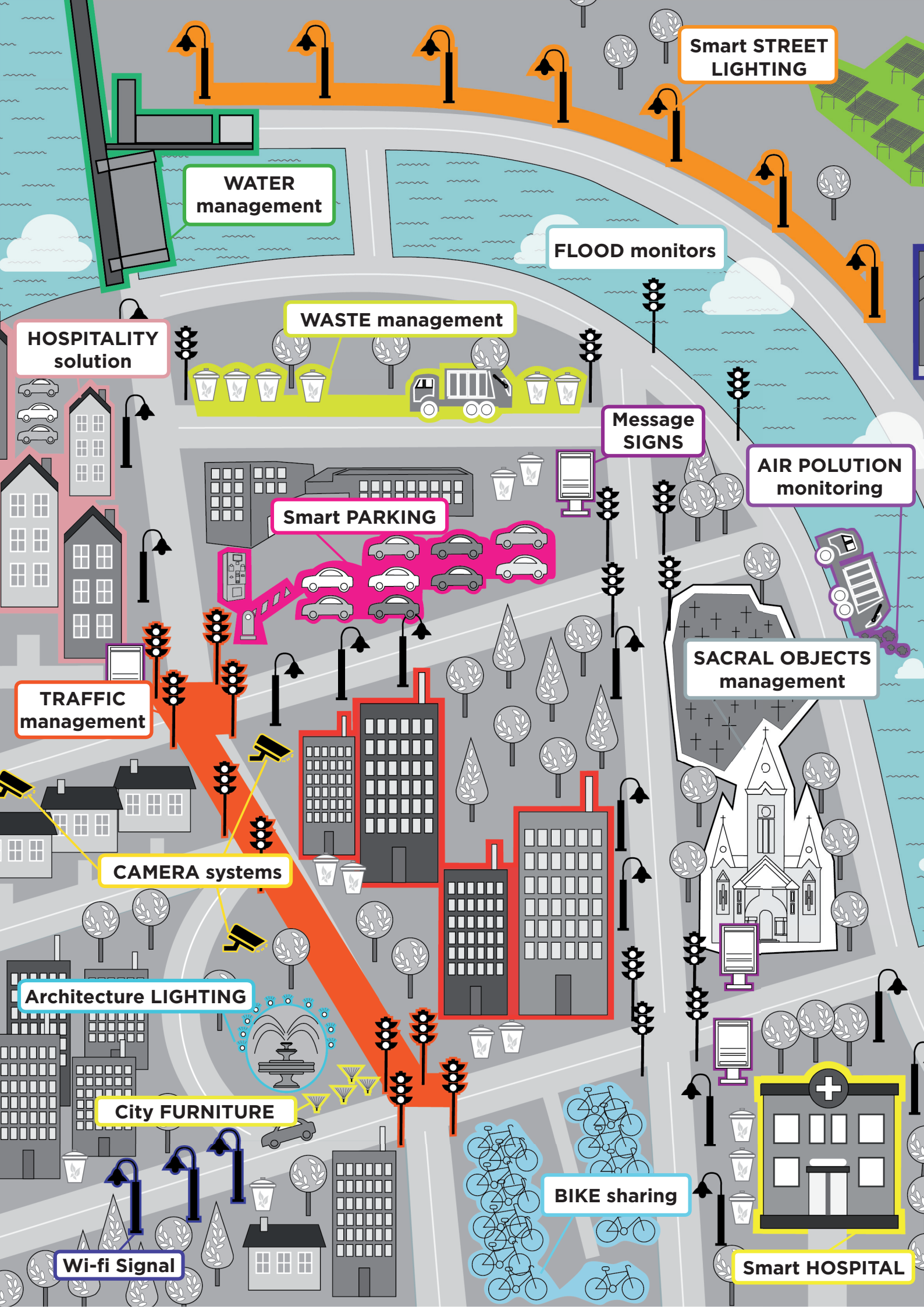
21%
Improvement in the quality of life for city's inhabitants

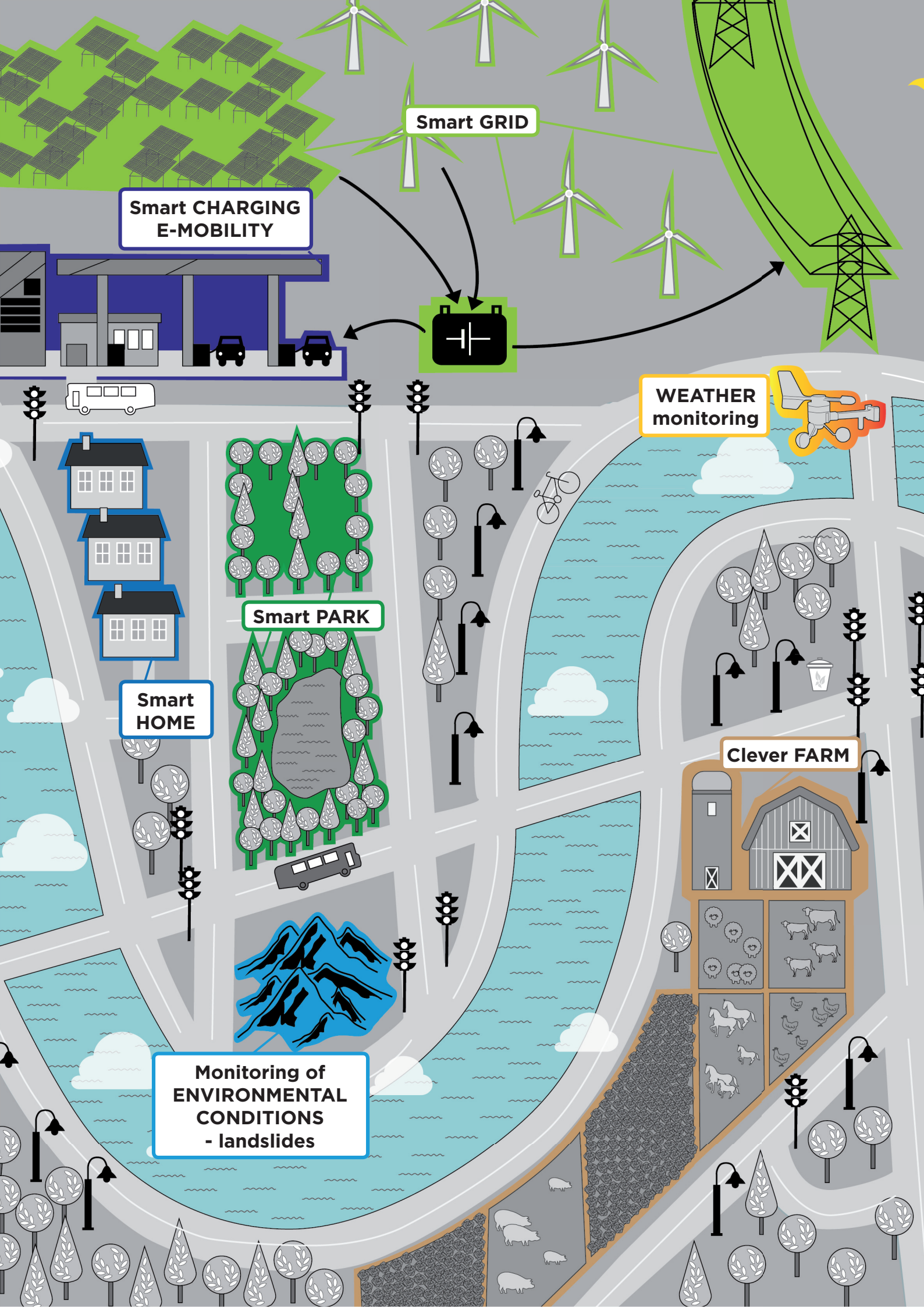
38%
Positive impact on the environment



14%
Better visibility, greater security

27%
Saving costs and resources


Smart STREET LIGHTING
WATER management
FLOOD monitors
WASTE management
HOSPITALITY solution
Message SIGNS
AIR POLUTION monitoring
Smart PARKING
SACRAL OBJECTS management
TRAFFIC management
CAMERA systems
Architecture LIGHTING
City FURNITURE
BIKE sharing
Wi-fi Signal
Smart HOSPITAL


Smart GRID
Smart CHARGING
E-MOBILITY
WEATHER
monitoring
Smart PARK
Smart
HOME
Clever FARM
Monitoring of
ENVIRONMENTAL
CONDITIONS
- landslides

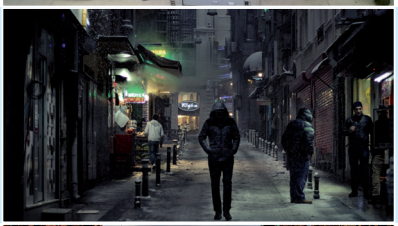
Todays' City...

CITY MANAGEMENT

Improving the quality of city life, more efficient city management. Easier to work with data, digitization, the current state of urban agendas.

TODAYS' TECHNOLOGY

Technologies are new, but incompatible with each other. It often happens that they can not be merged especially with their individual software and used as a complete unit, making it difficult to manipulate and view data, including its administration.

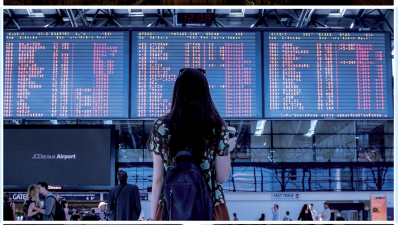


POPULATION MOTIVATION

Residents have no chance to decide on the projects that the city is preparing, let alone intervene with a helping hand, or an expression of whether this change is beneficial for them. Groups are created only to highlight the problem.

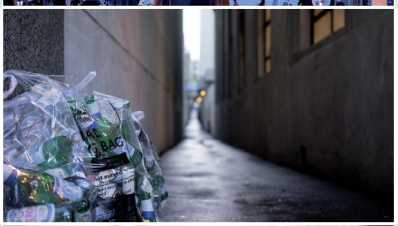
VISION AND STRATEGY

The city with the vision of a Smart city takes responsibility and plans and organizes a strategy for its construction. Along with this, it also ensures cooperation with partners. There is a competitive market and a healthy labour market.



CITY

The quality of the city is consistent with its security and technology. The city is struggling with poor security in some parts, poor transport links, poor parking and reduced transport accessibility.



ENVIRONMENT

The everyday traffic situation has an impact on the environment. In the cities we live in, there are excessively high levels of carbon dioxide and emissions in the air, as well as dust and other pollutants. People are paying for this with health problems.

ECONOMY

Lengthy waiting for grants for new projects, allowing the construction of new buildings and make them green. Energy savings - when energy demands are constantly growing - they are becoming more and more important.

DANGEROUS CITY

Tourists are not there because they know from what they have heard that the city is not safe. Increasing criminality discourages investors, and also entrepreneurs.

...Smart City

EFFICIENT AND BETTER

All the information is stored in one place and provides a comprehensive overview of the city's spending every day or month. This makes it easy to come up with new enhancements and relieve where it is needed.

CHANGING TO SMART TECHNOLOGY

The introduction of the clever smart technologies that the present day brings will make it easier not only to manage the city but make the city's inhabitants and visitors more satisfied.

BE INFORMED

Citizens create communities, motivate and allow space for self-development. They cultivate public spaces and work with the economy of sharing. An information board, a citizen portal, or an urban application provides on-line the ability to share data and information that will simplify everyday life.

DEVELOPMENT OF THE CITY FIRST

The city with the vision of an Smart city takes responsibility and plans and organizes a strategy for its construction. Along with this, it also ensures cooperation with partners. Thanks to greater technical capabilities, it can bring beneficial projects to its residents.

SMART CITY

Modern wireless networks make it easy to connect various sensors - whether parking, air quality, waste, or controlling public lighting. Resulting sensor data streamlines city management, provides greater comfort for residents and ensures safety.

CLEAN LIKE NEVER BEFORE

Reducing negative conditions in urban transport, low-emission support, planting of greenery, anti-noise and anti-dusting measures. The city becomes cleaner and more pleasant for life. There is also local production of energy.

GROWING TREND

Saving financial resources for environmentally friendly citizens. Introducing incentive programs, motivating not only tenants but also homeowners. Emphasis on energy savings by their regular measurements. Advantages and benefits resulting from the construction of smart homes and buildings.

CITIES WITH GOOD REPUTATIONS

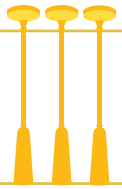
Better perception of the city image from the point of view of tourists who visit for vacation, the visibility and the traffic, easier to attract investors, the city is attractive for life. People do not leave, they move here.

Smart City

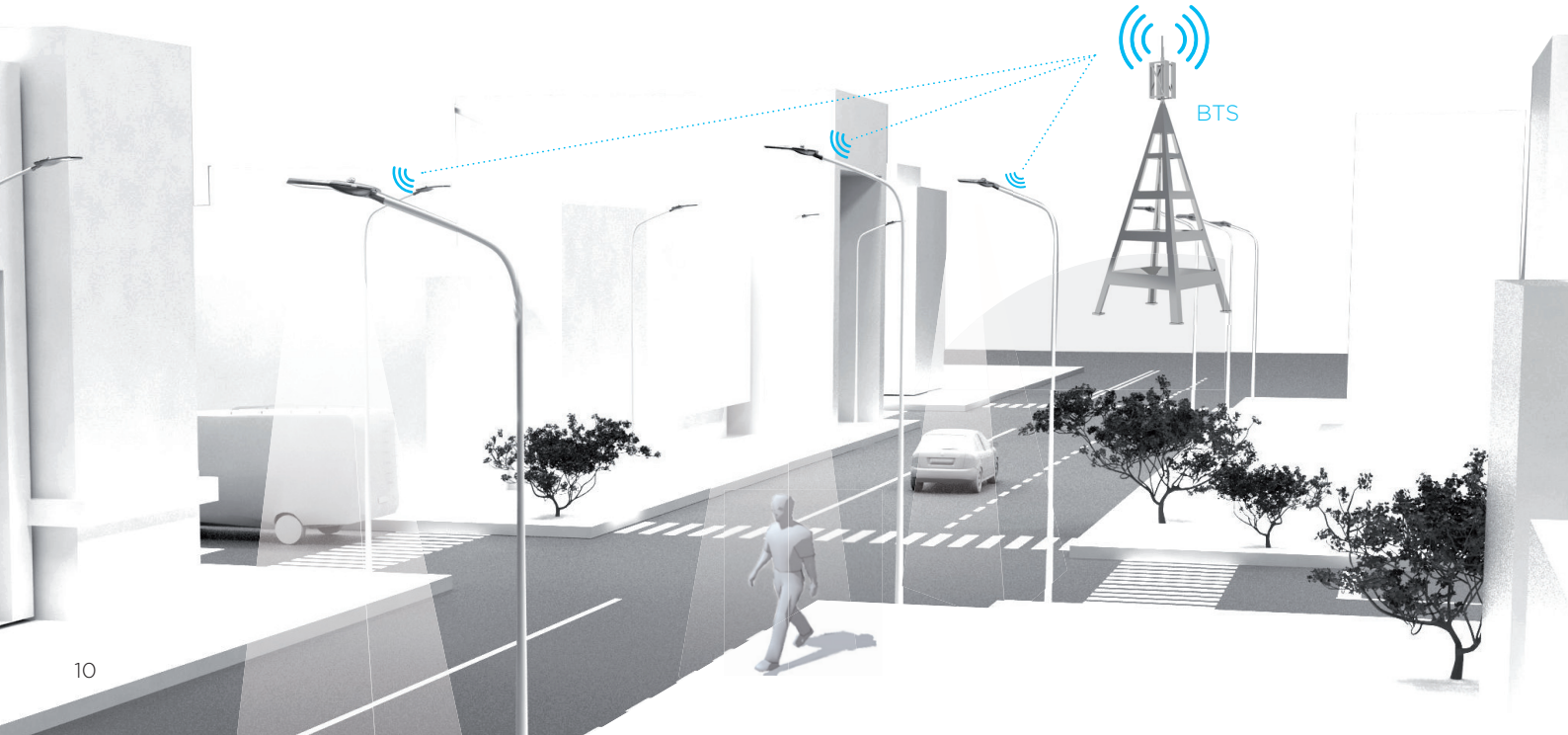
Public lighting

Modern street lighting (Smart Street Light) can almost work independently, and practically think for itself. In the event of a fault, it can inform itself about the required patch, and even incorporates fault prediction - if the light source ages and loses power. It can not only react to the ambient light level but also to the density of the current traffic on the road or in the area and accordingly adjust the intensity of the light. This reduces costs and increases security. A light source with smart LED lights is capable by itself of saving up to 60 percent of the cost in energy alone. Moreover, frequent switching or dimming does not matter.

- **LIGHTS CONTINUOUSLY**
- **WITHOUT THE OPTION TO REGULATE BRIGHTNESS**
- **ECONOMICALLY DISADVANTAGEOUS**



INTENSITY	●●●●●●●○	**ECONOMY**	●●●○○○○○
REGULATION	●○○○○○○○	**ENVIRONMENT**	●○○○○○○○



Each light is equipped with a “communication module” (either in the form of a cap in a standard socket or built-in inside the light fitting), communicating through the wireless IoT network via the Cloud to the Platform control. From here, the lights (whether individually or separately) can not only be operated, but also have scenes set up, traffic monitored, costs measured, and failures predicted.

However, a public lighting pole may not only be a “bearer of light,” but thanks to the infrastructure it may provide room for the installation of other devices - **Smart Column, page 34**

LIGHTS ONLY WHEN REQUIRED ✓

LIGHT INTENSITY BY EVENT ✓

DETECTION AND TROUBLESHOOTING ✓

INTENSITY	●●●●●●●●	**ECONOMY**	●●●●●●●●
REGULATION	●●●●●●●●	**ENVIRONMENT**	●●●●●●●●

Retrofit

Outdoor design for retrofits, placement externally on the body of the light, mast or base.

PLUG-IN

Communication module in a special box with a bayonet connector LUMAWISE/NEMA for easy installation into lights equipped with this socket.

Embedded

PCB board for direct integration into the slot of power supply (driver).

Smart City

Parking

The number of vehicles rises inexorably every year. On the other hand, the increase in parking spaces only rises slowly. Drivers must therefore solve the problem of parking. They violate traffic regulations and lose precious time. This is not just with the parking spaces around our homes, but more and more in public car parks. At least once a day almost every driver needs and cannot find a free parking space and spends an average of 80 minutes a week simply looking for one.

Solving this problem is one of the city's main priorities. Smart City provides 3 options for solutions: 1) reading / counting vehicles and displaying vacancies, 2) sensors (pucks) at parking places detecting the vehicle, or 3) a camera system that recognizes free / occupied positions. Each of the solutions has its advantages / disadvantages but in combination they are ideal.

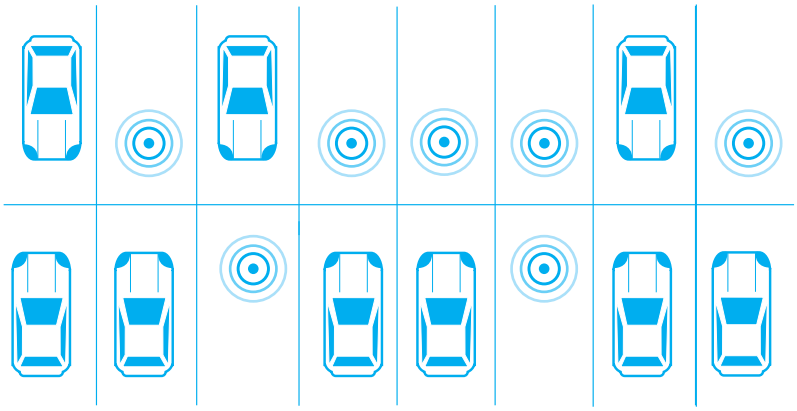
6-14 minutes
The usual time the driver spends searching for a free space in the parking lot

15%
Drivers in daily traffic are just those who are looking for a place to park

- FULL PARKING PLACES
- IMPOSSIBLE TO PARK WITHOUT BEING LOST
- TIME LOST IN SEARCHING FOR A PLACE

It's much easier to steer to the free spaces. Parking sensors embedded in the ground provide up-to-date information on the availability of parking spaces. These are displayed on the information boards.

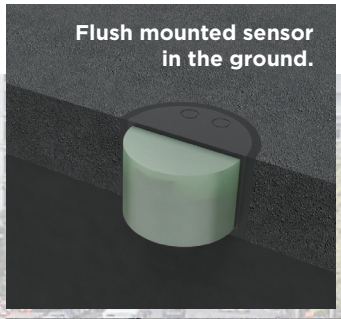
The boards give instructions to the drivers and direct them to the vacancy. The system also helps them with a simpler parking payment. Parking systems also provide valuable data for traffic management. By analyzing this data, cities are more efficient at handling or planning their construction.

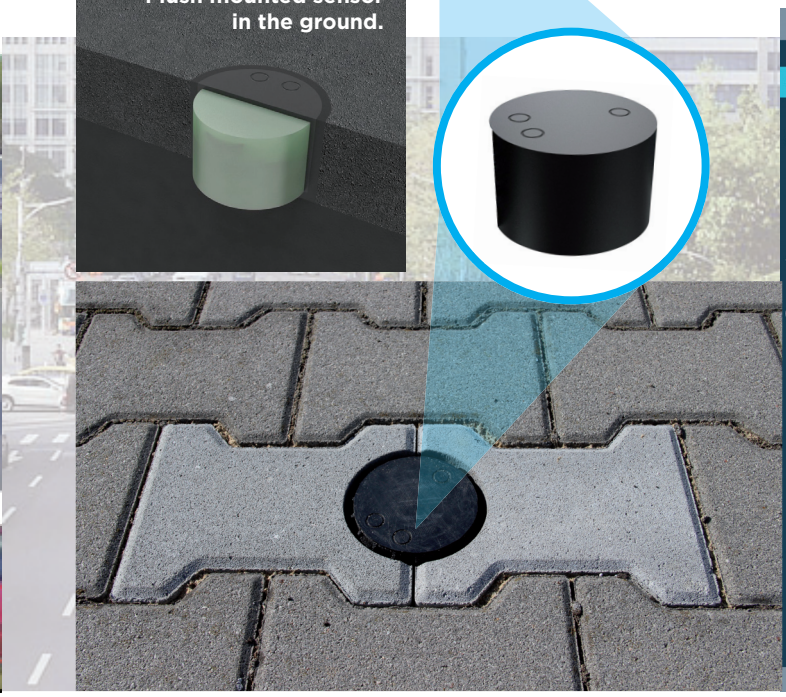


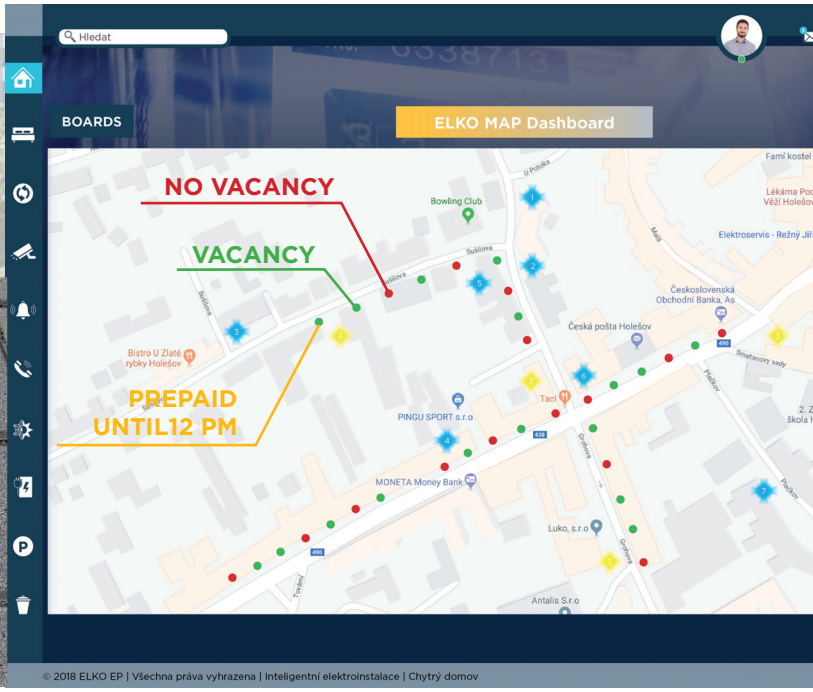
OVERVIEW OF PARKING PLACES

SYSTEM IMMEDIATELY GUIDES TO THE VACANCY

POLLUTION REDUCTION



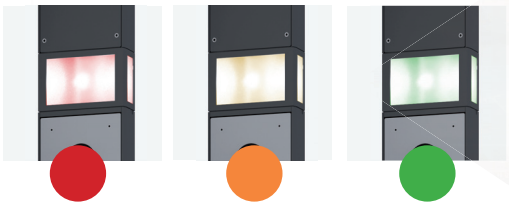




Charging

Cars, bicycles, scooters, laptops or mobile phones. With the increasing number of these devices, demand for places where they can be charged is also rising. The smart pole collects all the chargers in one place. Car, bicycle, notebook or phone can be recharged even if you are waiting for a bus or relaxing in the park. Recharging times and fees can be set directly on the display or on the phone. A non-contact card reader is also part of the pole.

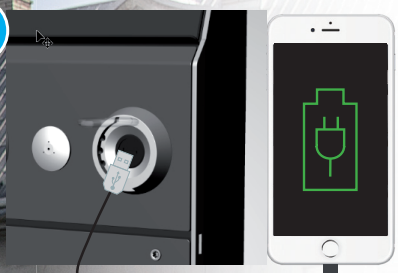
1



RGB Status signalling light

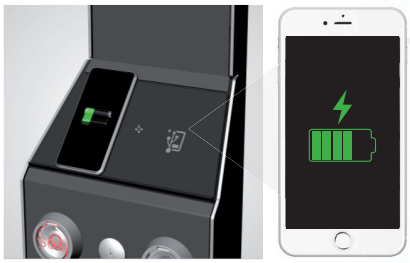
One of three colors indicates for example the charging status. availability and fault conditions.

2



USB charger

USB charger into which you connect any 5V/2A device or appliance.



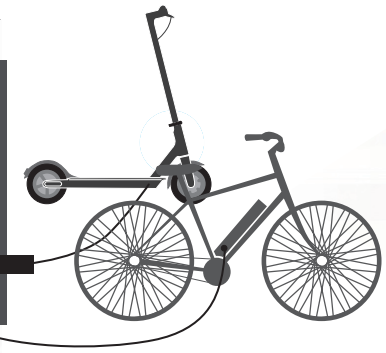
Contactless Charger

Output voltage: 5 V DC

Output power: max. 5 W (1 A)

Type of charging: Standard Qi

3



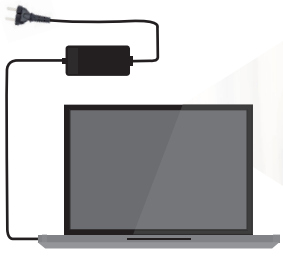
Electro bikes, scooters

Output voltage: 230VAC

Output power: 1,15 kW

Current limit: max. 5A

4



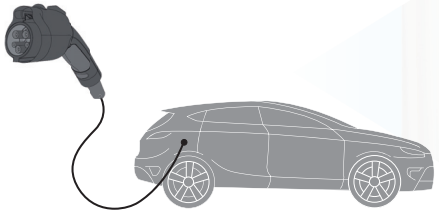
Equipment 230 V

Output voltage: 230VAC

Output power: 1,15 kW

Socket: French / Schuko type

5



Electric vehicle charge socket

Socket: Mennekes

Charging mode: AC

Output power: 22 kW (32A phase)

Socket type: EU TYP2

Safety

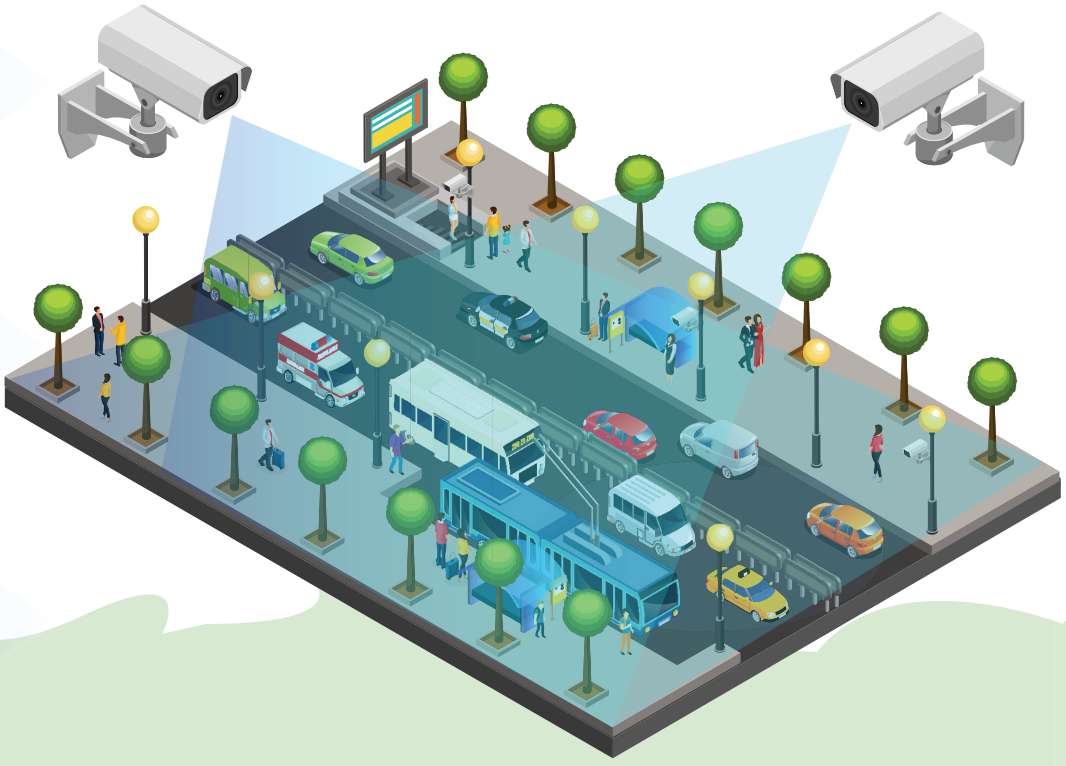
The key motivation for implementing smartcards technologies is to increase population security and protect public property. This, for example, starts with smart lighting, adjusting the level of lighting based on traffic and movement of people. Public lighting columns serve as carriers of security features: SOS buttons to help in case of emergency, street and space monitoring cameras, a two-way communication system that can communicate with the surveillance centre.

202 303 criminal activities

The amount of crimes that were registered during 2017 in the Czech Republic. Only 107,920 of them were solved and brought to a conclusion.

- HIGH CRIMINALITY
- DANGEROUS PLACES IN CITIES
- NO CAMERA OPTIONS FOR IMMEDIATE ASSISTANCE CALLS

- Eliminating crime
- Permanent surveillance
- Property protection
- Warning on time system
- Call for immediate assistance



Smart City

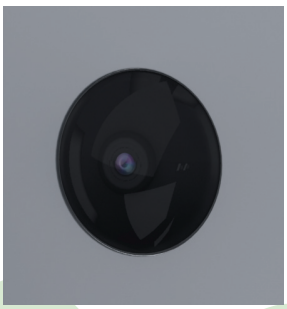
Security in cities is supported not only by public lighting, which depends on whether or not someone is passing through it or not by spontaneously lighting or dimming it. There is also a security camera system that monitors events in different parts of the city. In the event of danger, a signal is immediately sent out, which saves the rescue or defensive components time and sends out the need for assistance. As a result, criminality, damage to property and physical violence are greatly reduced. If security is threatened, summoning help is served by the SOS button that will also display a notification. Help will get you in a short time. It creates a safer, more efficient and smarter society.

Intelligent public lighting fixtures can operatively change the level of brightness according to critical situations that occur - when there is an attack or transit through the IRS components immediately set the street light to full brightness. It is also possible to monitor the size of a group of people at a given time on certain columns, to illuminate the area at a given level and thus giving vandals or intruders no rest at night.

- **REDUCED CRIMINALITY**
- **AT RISK SITES ARE IDENTIFIED AND PROTECTED**
- **CALL IF NECESSARY FOR HELP**

Camera

FullHD camera with 180° field of view, position setting, zoom, automatic recording.

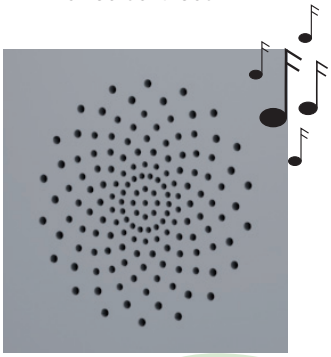


SOS button

When pressed, it sends a signal to the operator at the city's central security, who will arrange for assistance.

Intercom

Built-in microphone and speaker enables two-way communication with the operator of urban surveillance services



Smart City

Informations

Do you have inefficient communication in your town or village? Do you lack information, lack of information about current events, traffic conditions, free parking spaces, timetables and other services of your city? And if you have the information, it is often out of date or it is unnecessarily difficult to update it, especially if it is static!

Us also. Fortunately, it can be easily and quickly changed. Intelligent, functional, efficient, and easy-to-read information networks operate on the principle of smart cities. They provide you with clear, up-to-date information.

- **DIFFICULT ORIENTATION**
- **TOURISTS ARE RELIANT ON MAPS**
- **INFOPANEL NOT INSTALLED**

Timetables

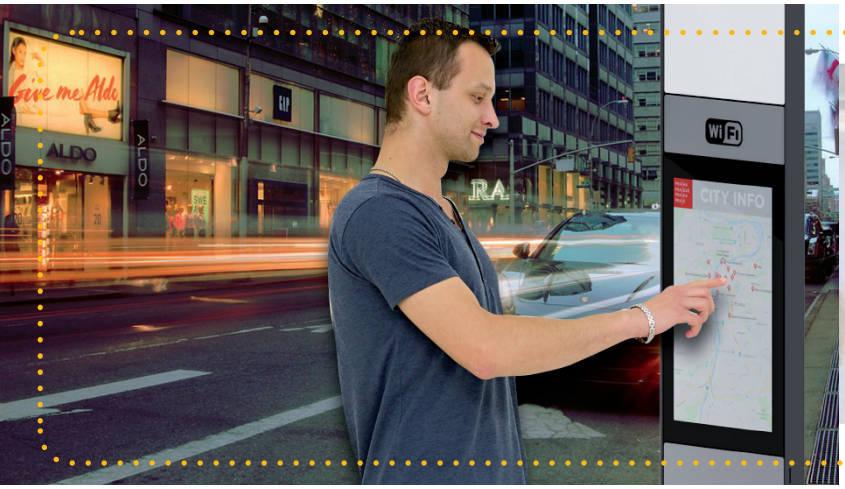
You can see information that is often unchanged - such as timetables, or information about exits or changes, on the backlit panel.

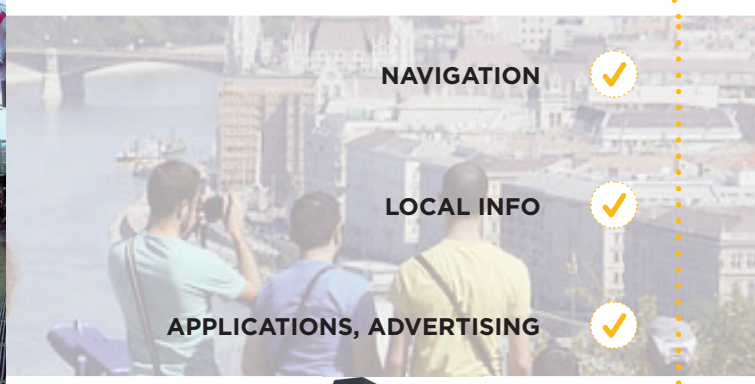
Infopanel

Printed on special film, which is positioned behind unbreakable glass provides protection from the weather.

Smart City

Getting and providing information is a basic prerequisite for every smart city. Information about current events, traffic conditions, available parking spots, timetables, exclusions, and also air quality in a given area is important information not only for citizens but also visitors to the city. They increase comfort, save time and provide protection against possible threats.
Up to now, this information has not been able to be presented in real time, and if, only partially, through public media or the Internet. It is now available on large screens, LED boards, displays, smart phones or touch panels, and for example on smart poles.
The advantage is directly displayed values from sensors, public transport data or message alerts from the city.





Touch panel

The 10-inch colour touch panel allows you to display dynamic information, such as current information on transportation, city line delays, navigation or alternative route. It uses apps to provide services that are available locally.

Renewable sources

The first renewable sources as we know them, were used many years ago. As the population grows across the whole world, landscapes began to defraud and the use of fossil fuels was hampered. And it leads to concern.

That is the reason why more than 18% of the world´s renewable sources is already renewable dating back to 2006, the desire to use these sources is the right spot to invest more money to build it.

Initial costs will soon return and will bring the benefits not only to you, but your city and it´s inhabitats too.

20% of the entire energy

should have been based on renewable sources by 2020

What can be described as the green evolution parameters?

Water energy

- Hydro Power Plants
- Pumped Water Power
- Plants Wave Energy
- Tidal Energy Water Cooling in deep lakes
- Marine Thermal Energy
- Transformation Unmanned Hydro Power Plants

Geothermal energy

- It collects the heat of the Earth itself
- There are three types of energy: dry steam, boiling water, and duel type
- Potential to produce other types of energy

Biomass

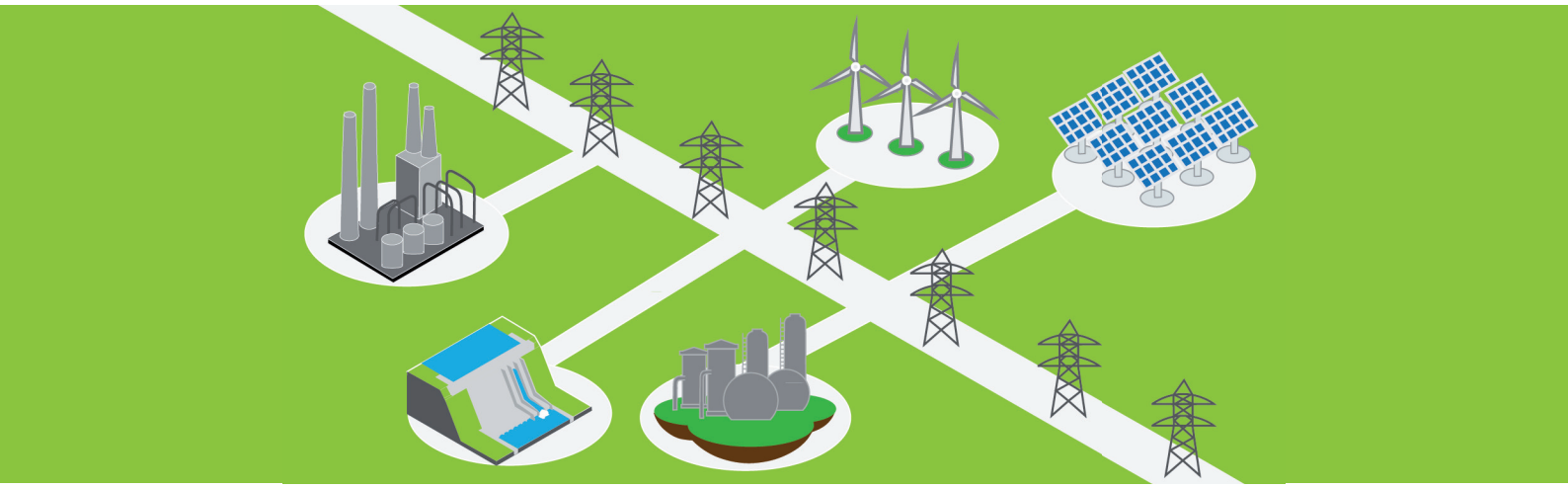
- Combustion of biomass directly from the source of photosynthesis
- Production of biofuels
- Sugar cane fuel
- Energy is taken from the chemical energy stored in it

Solar energy

- Photovoltaic cells
- Electricity produced by heating the enclosed air
- Energy is changed by means of photovoltaic cells or a solar current tower

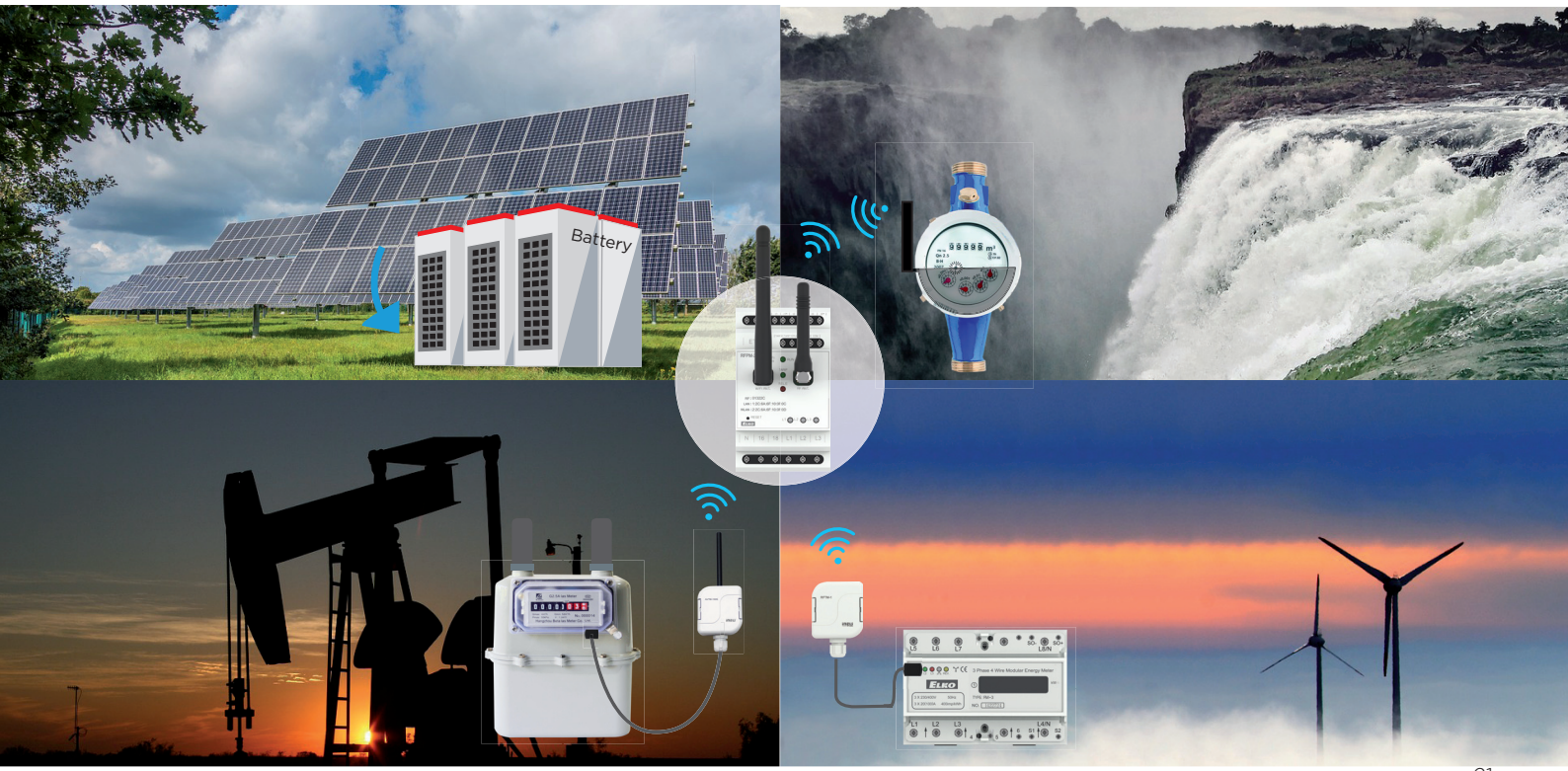
Wind energy

- Wind turbines not only on the ground but also in the water
- Do not produce greenhouse gases



Renewable sources nowadays

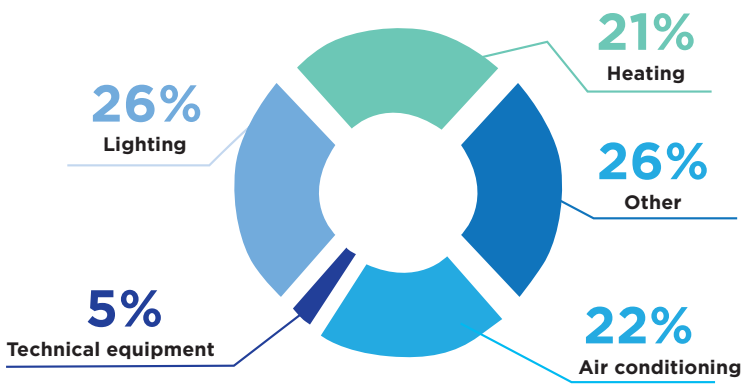
Renewable resources are an essential part of urban functioning as they are naturally renewed as they are used. Often, however, they are criticized for their instability and unreality, but the opposite is true. For example, production by photovoltaic industry has achieved a performance of more than 2000 MW. Nor is the Czech Republic an exception. Here, too, there are wind farms, towering above the country landscape, bringing clean energy. Renewable sources are also expected to grow in the future because their production does not have the effect of producing greenhouse gases and carbon dioxide.



Smart City

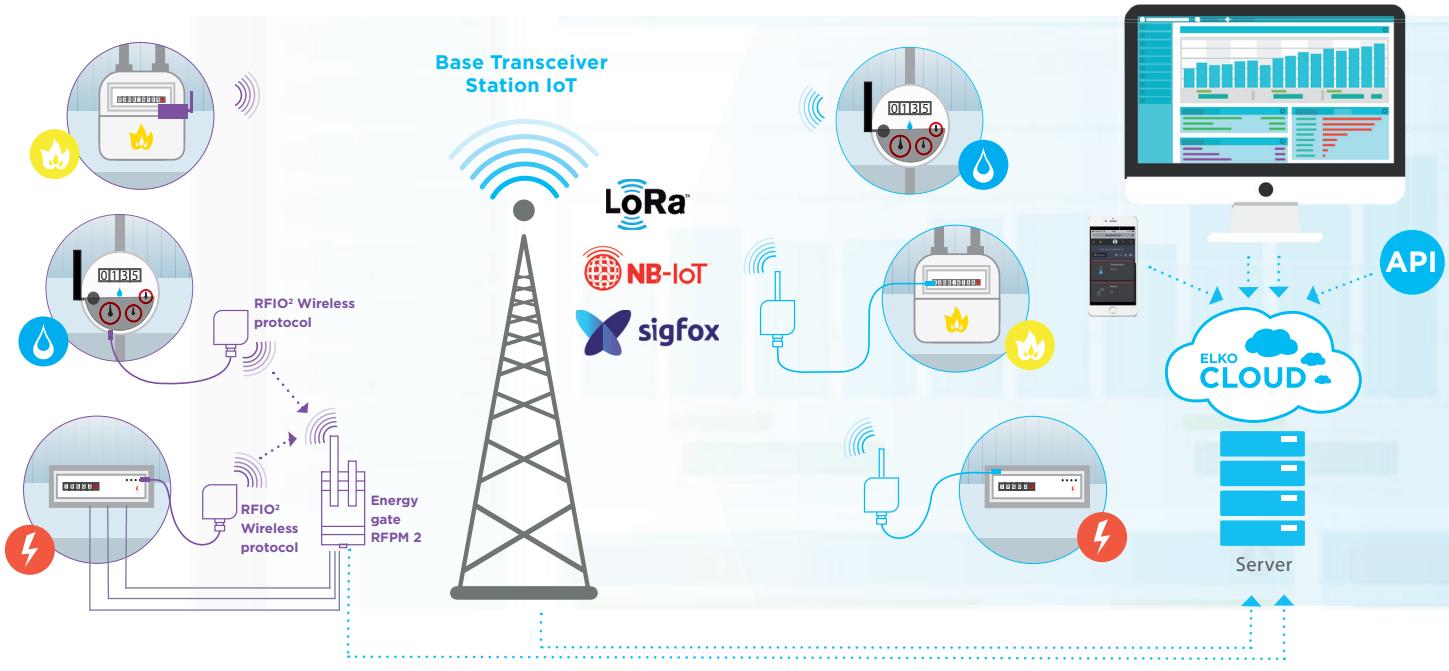
Energy Management

At times of ever-increasing energy prices, their economical use is of utmost importance. In existing buildings (no matter if they are city buildings, rental flats, or city companies), there is usually no consumption information before the sales utility itself and / or your own energy meter. The data is processed manually, the evaluation is subjective. The measures taken to save money will therefore only remain on paper.



Is the annual electricity consumption in the building.
(Source: Lutron)

- NON-COMMUNICABLE MEASUREMENTS
- MISSING TOOLS
- EVALUATION DATA IS NOT EASY PROCESSED



21%
Lighting

26%
Heating

22%
Air conditioning

is how much you can save when implementing the energy management and optimizing these areas.

Intelligent meters provide information about the measured values continuously. Thanks to wireless IoT networks, these values are instantly transmitted to the Cloud. There they undergo careful analysis that can recognize not only the fluctuation in consumption but also any change in consumer behaviour. They can either suggest saving measures or make them directly - for example by properly regulating the heating or cooling temperature, by regulating the lighting depending on the outdoor light or the occupancy of the building, correctly switching on / disconnecting the heat source, or simply alerting the administrator to the running water tap or forgotten lights left on after working hours.

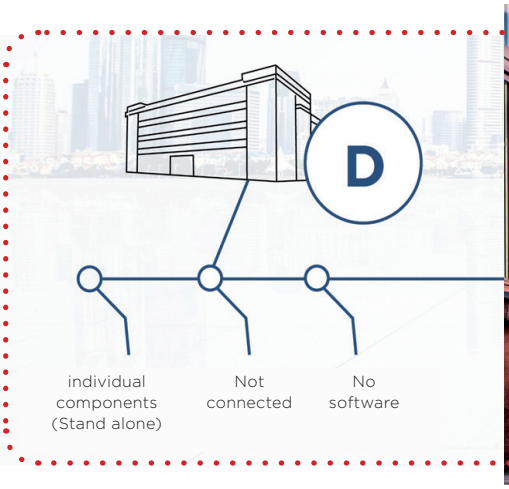
- **ONLINE SMART METER CONNECTING**
- **EFFECTIVE DATA ANALYSIS**
- **PREDICTION, OPTIMALIZATION, SAVINGS**

Smart City

Smart building

Smart buildings are today a phenomenon that can bring cost savings. By smart buildings we mean constructions that are equipped from the outset to make life as easy as possible and bring security and comfort to its inhabitants. The building management system, also known as the BMS, is a major contributor to this. The main emphasis is on energy efficiency and the environment inside the building. With the latest technology, interaction between the inhabitants and the building manager can be achieved.

It also protects you in the event of a fire. The alarm panel can turn off the ventilation systems to prevent further fire propagation. That is what the BMS is all about.



What drives our intelligent solutions for building the most?

Finance
Reduce total energy costs, increase productivity, and generate revenue.

Community
Environmental sustainability, social responsibility, brand recognition, and society,

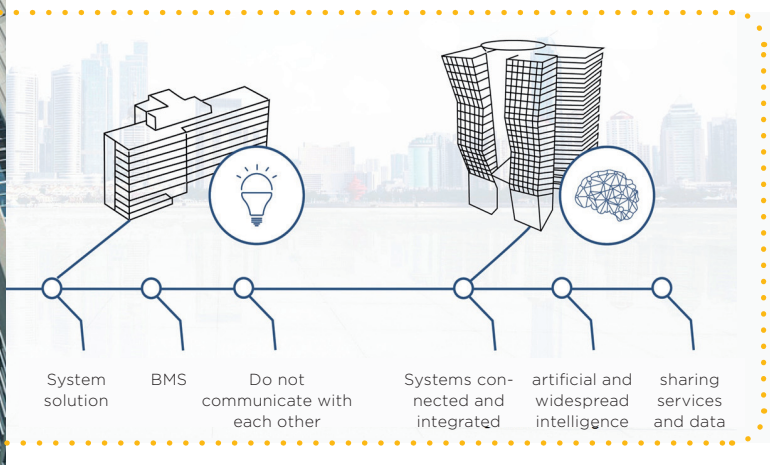
Business process
Optimize the efficiency of services, increase business intelligence.

Workforce
Greater mobility and flexibility to provide security and comfort, the balance of working life.

Buildings are also the largest contributor to global carbon emissions, accounting for about 40 percent of the country's total carbon footprint. In developing countries, commercial buildings account for almost 20 percent of the total. Commercial buildings, whether we like it or not, are still expensive for many companies and organizations. Energy plays an important role in the efficiency portfolio of buildings and it is important to reduce emissions and to promote corporate image.

80%

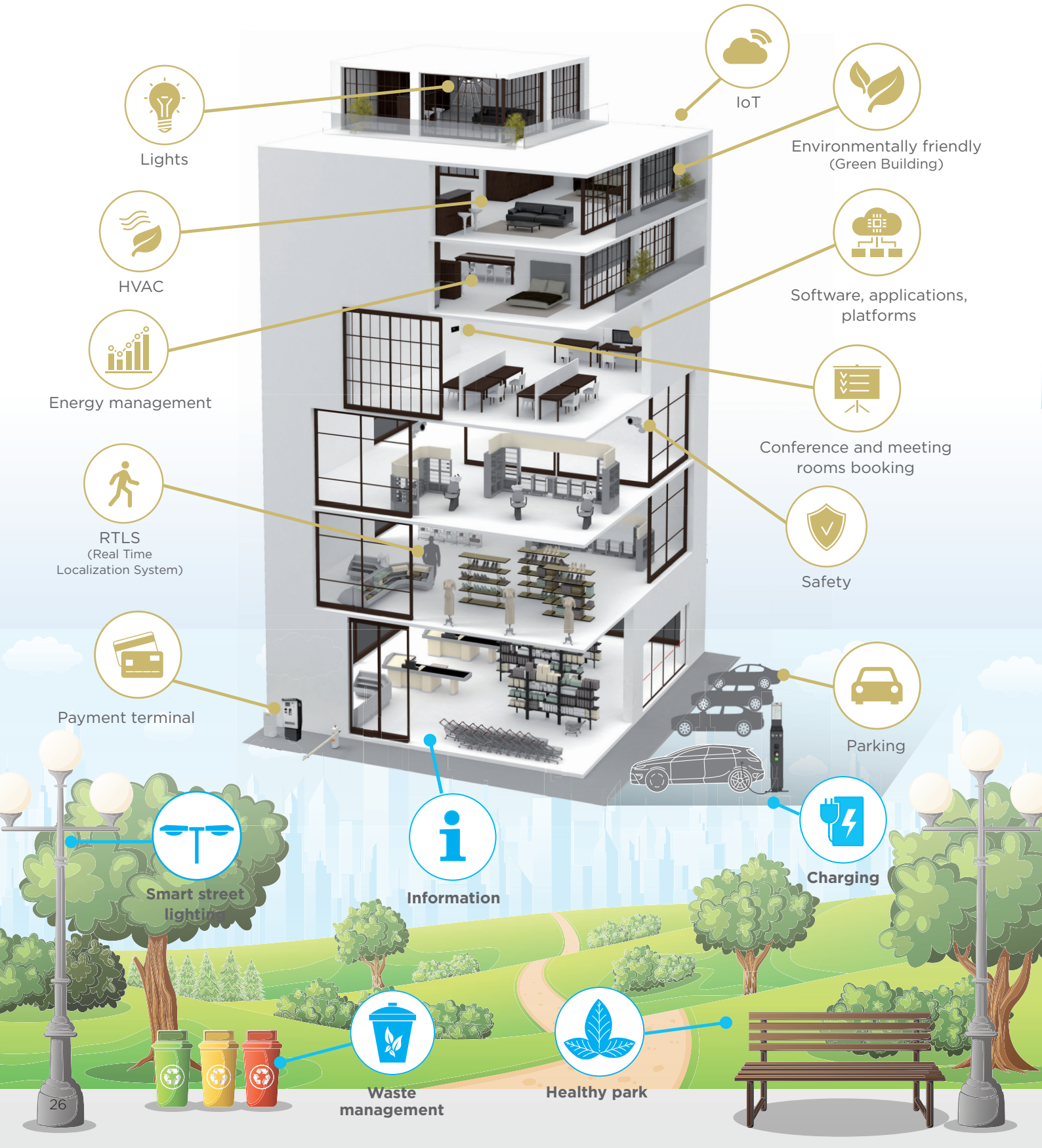
we spend so much time on average in buildings - whether at work or at home.



What is the brain of smart buildings?

BMS is a software environment in which it is possible to create mutual relations, visualize the activity of buildings technologies, collect statistical data and evaluate them. In this way you can find optimal building settings to ensure user comfort while increasing the energy performance of the building. It integrates all the technologies in the building and visualizes them for the operators and administrators.

Smart building

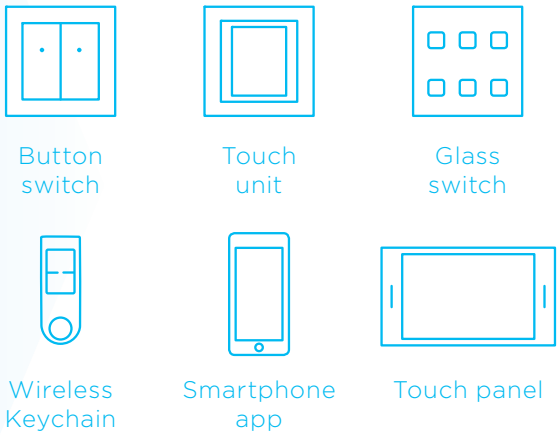


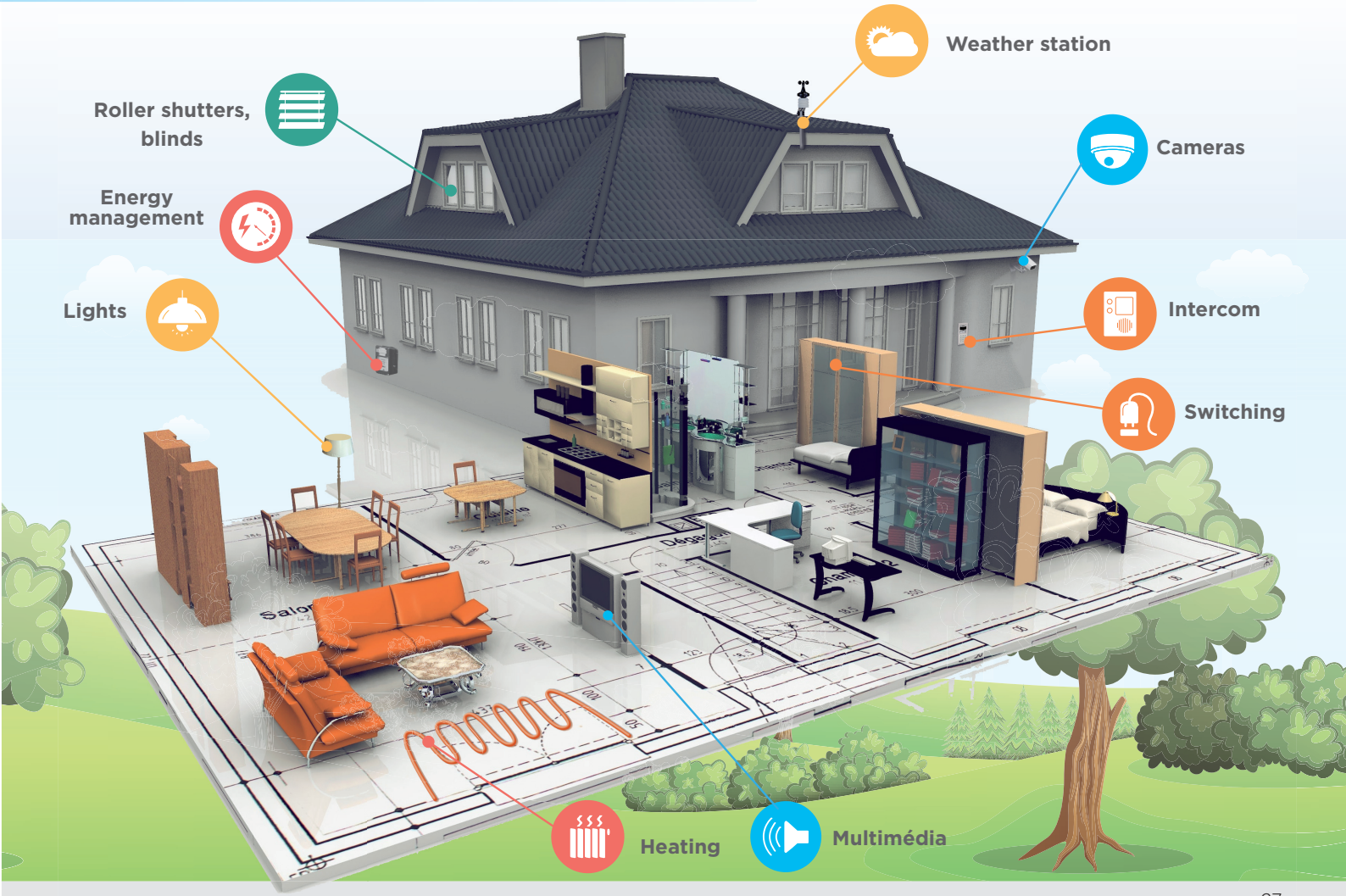
Smart home

Without realizing it, we are surrounded by a number of smart things today. Except for the touch phones we use everyday, through cars - which would not run without such things, to home appliances or modern wiring. The smart house is not only funguard completely but mainly saves, it provides comfort, safety and especially - it thinks for you!

In the spirit of this vigorous development, there is an increasing need for interconnection and integration of technologies in the house so that they understand each other and communica- tions. The smart house today is far from just lighting and heating over the phone, but the combination of all heat / cool sources so as to provide the user with the desired comfort and economic return.

How to control Smart home?





Smart City

Waste management

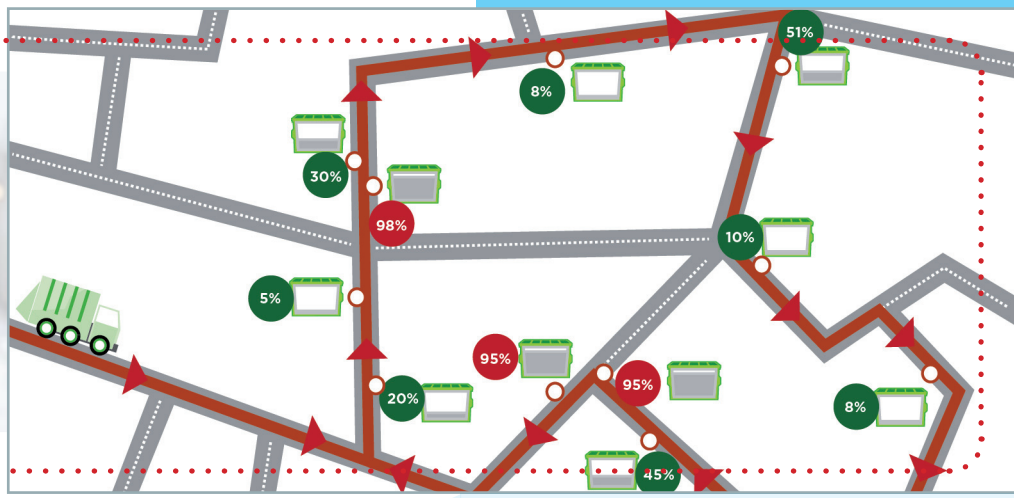
Waste production in the Czech Republic is estimated at millions of tonnes per year, which means 339 kilograms per person. With such a number, you cannot be surprised that you occasionally go down the street and you witness overcrowded garbage cans and garbage lying around everywhere. Then just around the corner, the containers can be almost empty.

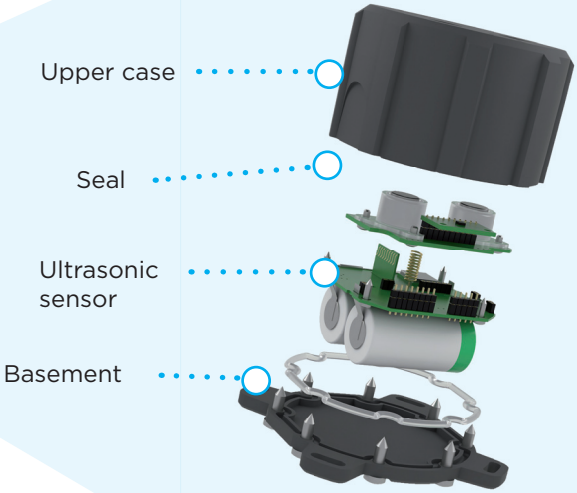
The primary idea of smart waste management is to streamline waste administration with the help of modern technologies and to directly reduce the costs of collection and disposal.

2,5 tons per citizen
is a waste production iín the Czech republic during 2016

- INEFFICIENT DISPOSAL
- ENVIRONMENT WHERE PILES OF GARBAGE LIE AROUND
- DIRTY CITY STREETS AND DIRTY CITIES

Total route length : 25 km





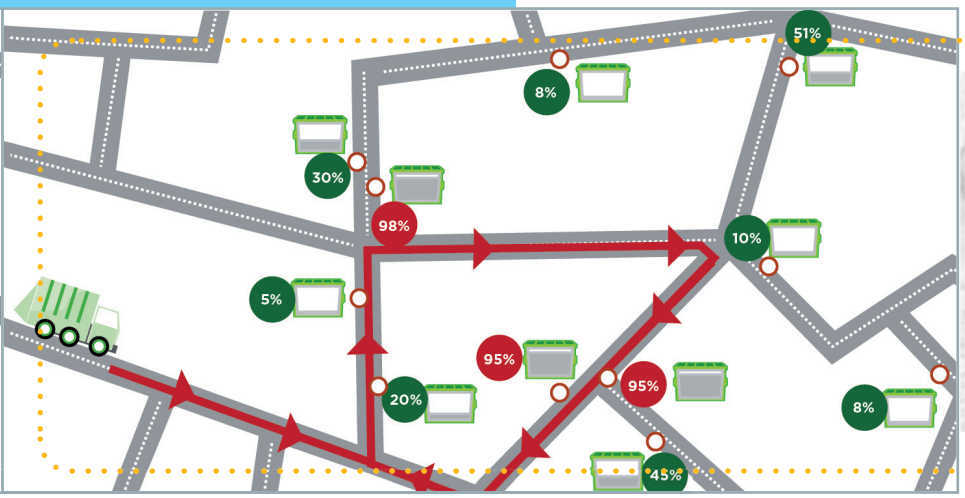
Ultrasound scans the “level” of the waste, and over the IoT wireless network it regularly transfers this information to the Cloud. Battery power allows for up to 5 years of operation, outdoor weather-resistant design allows it to rest on the lid of the container. The entire sensor is located in an anti-vandal box.

There are two ways to determine the container's completeness - by subjectively viewing and pairing with the NFC chip on a waste container - but this requires regular physical control (janitor) and automatic container fill measurement and online data delivery to the Cloud / Platform. This is able to design the conveyance service for the optimum route so that they do not have to traverse to each container. The savings on fuel and wages are not negligible.

3 955 977 tons

such waste was produced by the towns and municipalities of the Czech Republic in 2017

Total route length: 12 km



- ROUTE PLANNING WHERE NEEDED
- EASIER WASTE SORTING
- PROVISIONAL SAVINGS

The filled volume of the container can be viewed via the platform on-line, in a clear map background with color-coded icons. Built-in artificial intelligence, collection history, and current period can predict the requirement for emptying. In this way, containers of recyclable secondary raw materials (paper, glass, PET) can also be monitored.

Smart City

Smart Agriculture

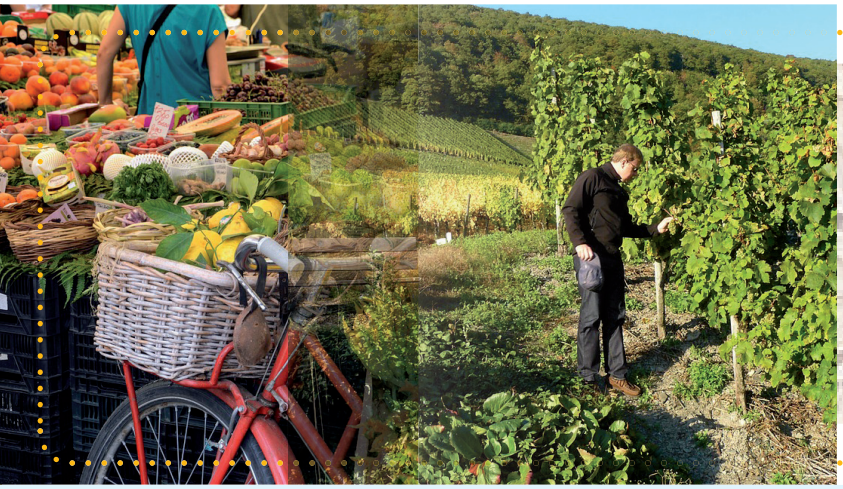
Agriculture is one of the oldest forms of livelihood of mankind. New trends and technologies can really help agriculture. Technology - not just agrochemicals or machines for harvesting crops - but measures to prevent disability or impairment of crop harvesting in real time. The weather is still the main risk factor for farmers. Weather cannot be affected, but its effects can be mitigated.

VINEYARD MECHANICS ORCHARD FIELD STABLES

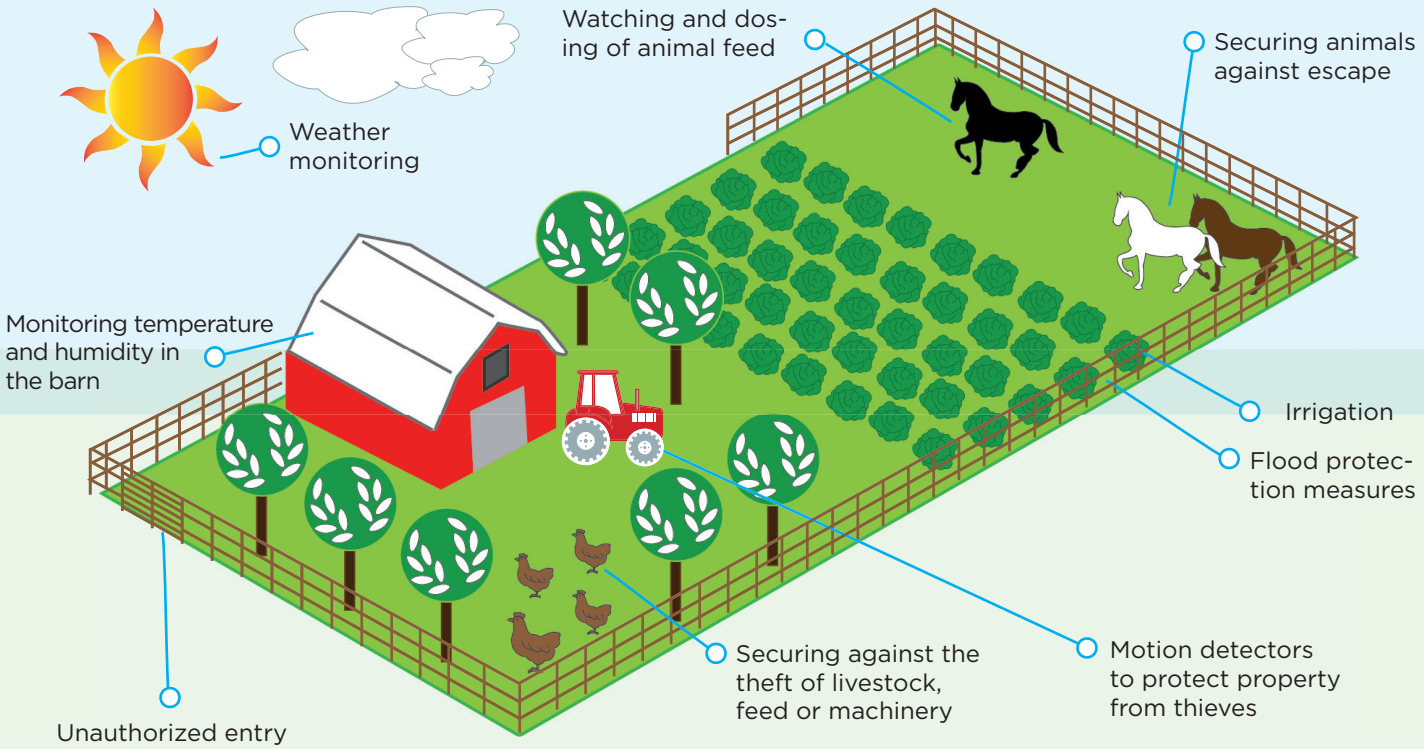
- BARREN FIELDS
- COMMON PROPERTY THEFT
- CATTLE UNSECURED AGAINST ESCAPE

New IoT networks allow the location of sensors in fields, greenhouses, forests - where there is no permanent power and communication network available. Sensors can measure values (temperature, humidity, precipitation, relative humidity) at set intervals and transfer the data to the Cloud to which the Platform is connected. It evaluates not only current sensor data but also their history. Along with the weather forecast it suggests appropriate measures to the farmer or it can directly execute them (irrigate, run ventilation, and open the window). The sensors also allow you to guard the objects themselves, farm equipment, machinery and animals.

GREENHOUSE · FORESTS · MEADOW · POULTRY FARM · BEEHOUSE



- PROTECTION OF AGRICULTURAL SOIL AGAINST FLOOD
- FARMER PROPERTY PROTECTION ANTI-THEFT
- CATTLE SAFETY



Smart City

Environment

One of the key features of Smart City is to improve the environment. These processes merge with all other Smart city points. By using modern technology inside the city, it is possible to measure air, water, light pollution and much more. Installing smart waste bins and underground containers can achieve a more efficient take-back. An important aspect is the education of people, leadership and motivation for a gentle approach. Recycling, Smart Use of Renewables, CO2 Emissions - All of this and much more can be included under the Smart Environment concept.

80%

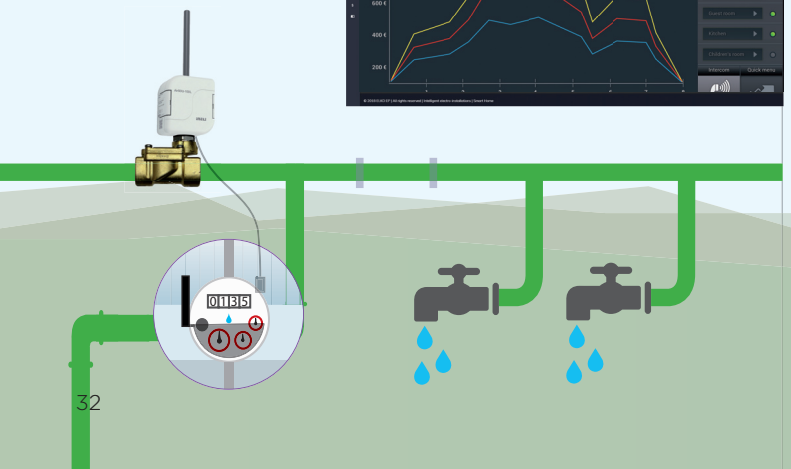
rinking water is used in agriculture, which limits the amount available to the population.

96%

Up to so many people were exposed to fine particle concentrations in values higher than the standard values determined by the World Health Organization.

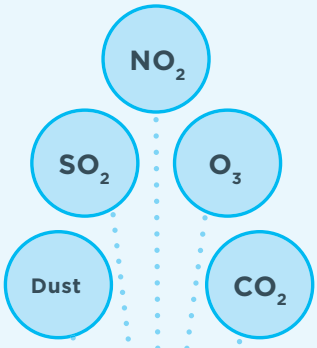
Water management

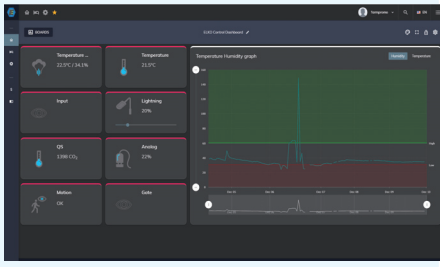
Water is the foundation of life. As the population increases, the demand for and its consumption is increasing. IoT technology helps to measure consumption, track leaks, predict flooding. The sensor continuously senses the water flow values from the water meter and transfers it to the Cloud. The platform evaluates not only consumption but can stop the main water supply if the current consumption is abnormally high or is during an inappropriate time zone (after working time).



Air quality

With the growing population (especially in large cities), the concentration of harmful gases in the air is also growing. The sources of pollution are cars, factories, incinerators, etc. IoT technology can measure and monitor most of the harmful gases. Values can be displayed on the information boards or sent directly to citizens on smart phones. Although this is only a consequence (measurement does not solve the cause, but it can greatly help), it prevents excessive inhalation of harmful substances into the human body.





CASE STUDY

Case Study

Smart pole

In every big city you will find thousands, sometimes tens of thousands of light masts under power. A dense network of public lighting masts can be used to mount sensors or security cameras. They can collect information about the numbers of people or vehicles. Reduce crime by installing security cameras. Inform people using electronic panels. Monitor and evaluate weather, air quality or noise levels. Light masts can spread Wi-Fi signals. Modern charging stations are now also found in the lighting system. The possibilities are practically unlimited.

Electric vehicle car socket

The time of electric cars is knocking on the door. Charging ahead of the long journey has never been easier than with our iNELS pole.

Wi-Fi hotspot

Connecting to the Internet becomes a public and an easily accessible property. Any Wi-Fi signal from our transmitter will flow through every smart pole.

Public address loudspeaker

Warnings, reports. With this built-in speaker you will never miss any important information.

Air quality sensor

Smart sensors are the basic means for collecting and evaluating information. This will greatly contribute to improving air quality in cities.

Motion detector

The sensor built into the body of the pole serves to detect the movement of people around you. This switches on the light only if it is really needed.

SOS button

Are you in real trouble and need help? One push of this button will tell the rescue services that something is wrong.

Communication hotspot

This device receives signals from sensors that control public lighting. Increases efficiency and cost savings.

RGB Status signalling light

The smart pole determines when it needs to be repaired. One of three colors indicates the status of the device.

Backlit infopanel

Do you want to get rid of unnecessary street signs? That's why we have a panel where you can place the name of the street on which the lamp is located.

Charging socket 230V

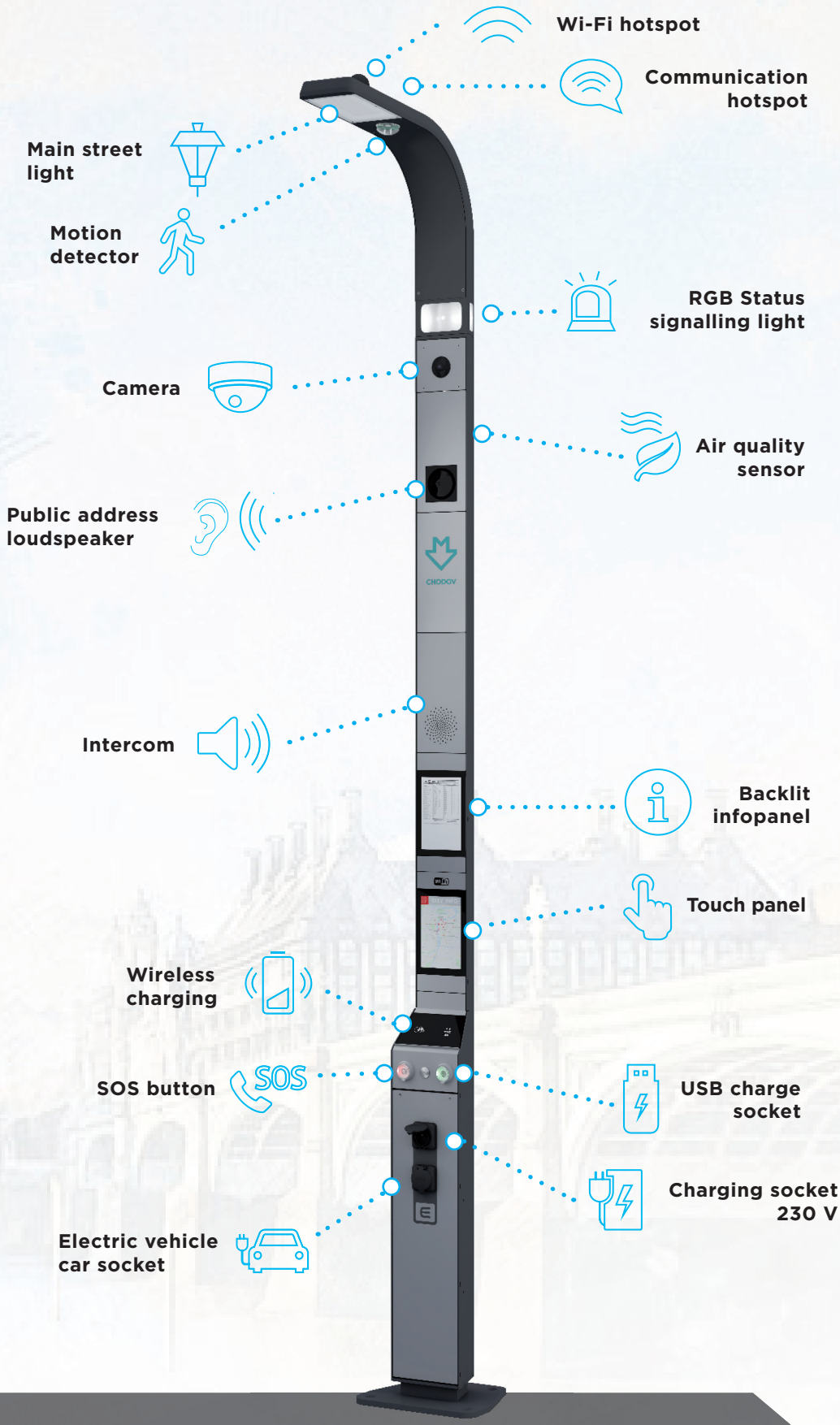
The classic socket, as we know it, for moments when you just need a good dose of electricity.

Touch panel

Touch panel to find the information you need. It includes, for example, a clear map of the city.

USB charge socket

There is also a universal USB charger to connect to any device or appliance.



Camera

The basis of security in each city is a system of security cameras that monitor the streets.

Wireless charging

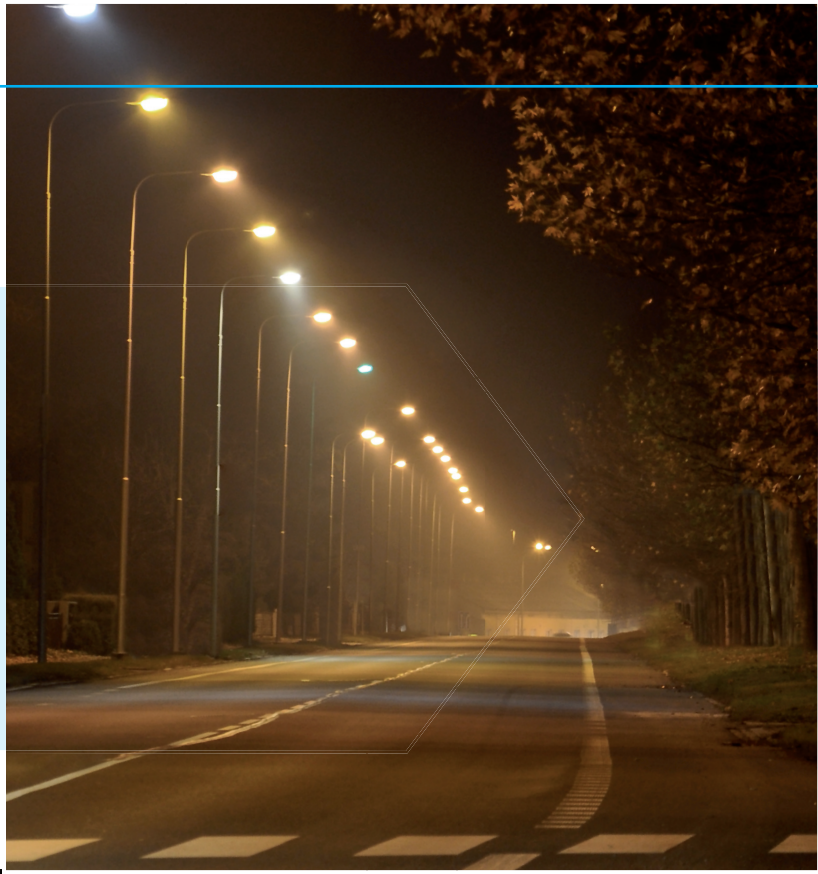
Let you charge your mobile phone while you are waiting for a bus. The wireless charger will take care of everything.

CASE STUDY

Hranice town Case study

Before

The original public lighting in this area was equipped with discharge lamps with sodium sources. This solution had a number of negative aspects, including inter alia higher electricity consumption. Not only that the sodium lamps themselves are consuming a lot of energy, the lights were also lit all night. This is often unnecessary, especially in the morning. Lighting controls were implemented using a twilight switch. The lighting circuit was switched on via the power control in the switchboard. But it was not able to respond adequately.



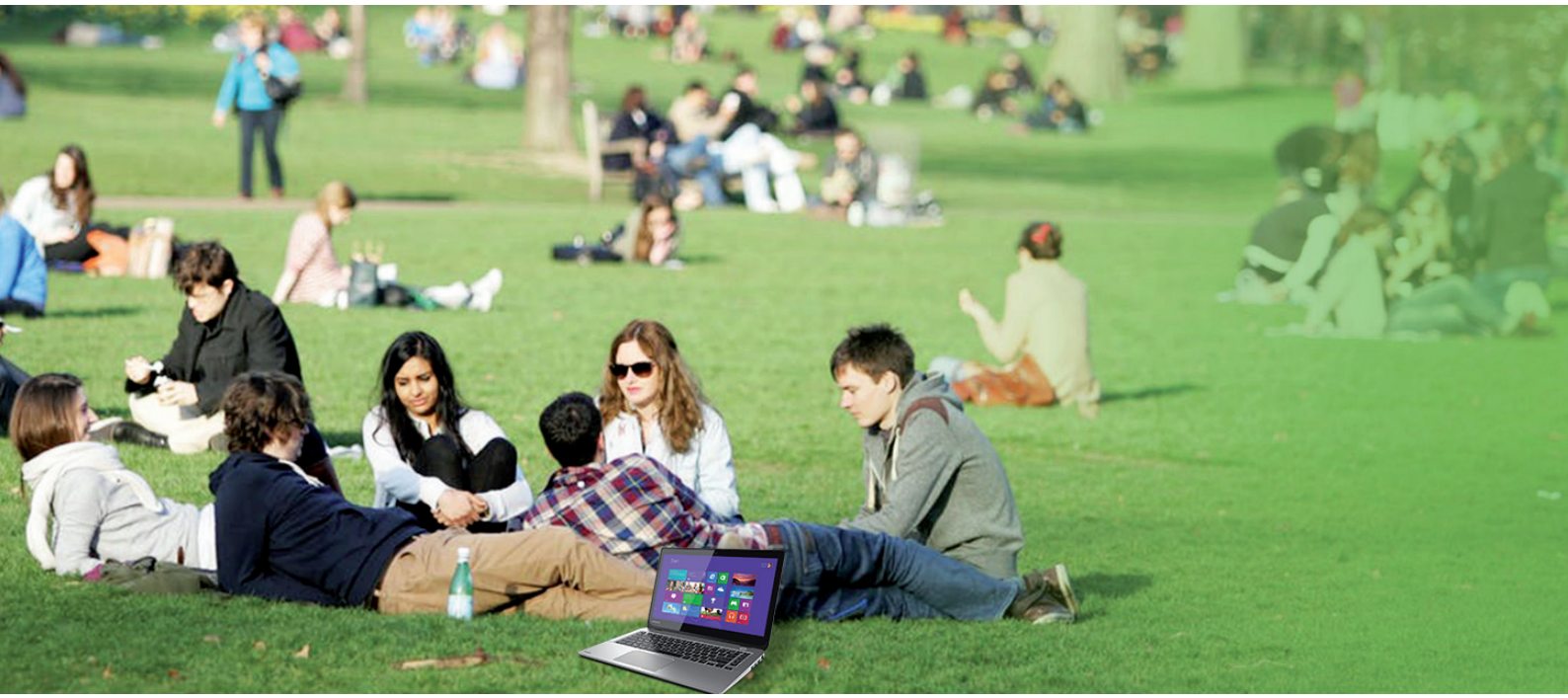
After

The new lights saves electricity by using more energy-efficient LED light sources and it is also set to reduce the lighting intensity by use of the time program. This can be changed at any time by the software that can also be set and configured. Of course the lamps are divided into groups, but you can control each lamp individually. The system is therefore highly variable, and it will recover the cost. All communication is secured by the local independent BTS station. It is conveniently positioned to ensure seamless communication with intelligent components installed directly on the smart light columns.

Municipal park

CASE STUDY

Parks are gradually coming to the foreground as places where many cultural and social events take place today. People are well aware of these events. How to make a stay more enjoyable? Technology is the key. Thanks to it, the park can make use of digital and environmental sceneries, which are readily available, promote health and, last but not least, security. You can easily recharge your mobile phone, browse the Internet, or charge your laptop through a conventional 230 V socket while sitting on the bench. You never find a full waste bin. It informs that it is full and needs emptied. As a result, parks will once again become a place to spend free time.



Wi-FI hotspot

Connecting to the Internet becomes public and easily accessible. A Wi-Fi signal will flow from every smart pole.

Wireless charging

Let your mobile phone charge while you are waiting for the bus. The wireless charger will take care of everything.

USB charging

There is also a universal USB charger to connect any device or appliance.

Socket 230 V

The classic socket, as we know it, for moments when you just need electric power.

CASE STUDY

Urban furniture

Benches, various seating and shelters have long been part of not only city parks but also public transport stops.

Parks were, in the past, a favourite spot for walks of people of different ages. In later years, they have become more synonymous with places where only dubious characters exist, and where it does not pay to go at night. Nor was there a crowd there due to the absence of new and more modern facilities. Just like waiting for a bus.

Bus stops are a similar example. Not only are they places where the vandals are busy, but it often happens that there are no bus timetables and let's face it, many of us are ignorant about printed timetables. Finally if we don't have a flashlight on our phone, we're helpless.

As in the case when we seek a specific location the **signs** are nowhere and the phone again reports an exhausted battery! At that point, there is only one thing to do, stop, ask and hope that you are not send to the opposite side of the city.

These problems can be avoided.

- **OLD EQUIPMENT**
- **PROBLEM FINDING CORRECT INFORMATION**
- **TECHNOLOGY NONE OR OBSOLETE**

Benches

Today they are mainly for a short seat because they are old, worn and not very clean. People tend to just put things down for a moment or move on.

Navigation signs

In cities, however, they are either simply not there or not very visible. Orientation itself is sometimes rather more confusing than helpful. Several parts may be missing or scorched by vandals.

Bus stop

Stops are the places where we usually stand only when it rains. Today's stops are dirty, ruined, and in general, they do not make a very good impression. But that will soon change.

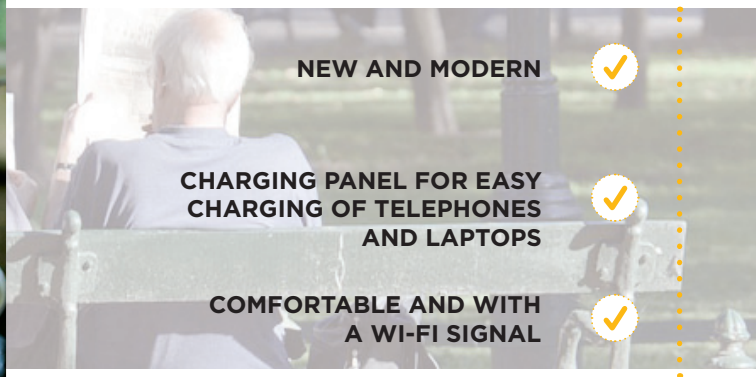
CASE STUDY

Parks will become the heart of cities where residents want to spend their free time. It will be normal to meet families with children as well as athletes or young students. The school presentations are comfortably handled there, and when they are ready for the next day, they charge their laptops.

Shorten your **waiting for a bus** by playing on your mobile phone without having to draw on your data. The Wi-Fi hotspot gives you full coverage. When the flashlight doesn't come on? It doesn't matter; you just recharge your phone.

If you do not want to wait for the bus but choose to walk in areas where so much is unknown, smart pointers will guide you safely.

Would such an idea not be tempting? Definitely and thanks to Smart city it is possible.



What are the main criteria for the creation of Smart parks?

Access
to the Smart Park is easily accessible to people of any age.

Community
uses and reflects its ecological, social and cultural environment

Health
community is at the forefront. Healthy activities are part of the population.

Safety
is an important part. It provides residents with the feeling of being in good hands.

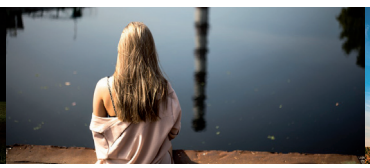
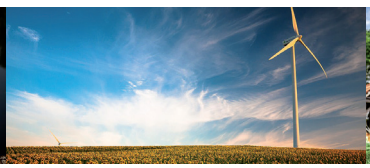



Resistance
to climate change, changing populations and countries.

Water resources
as a source that can be used repeatedly.

Energy
and how to conserve and make it clearer.

Maintenance
parks and efficient maintenance practices.


CASE STUDY

Smart Offices,
BB Centrum Prague

Intelligent Buildings are now an integral part of Smart Cities, cities that, thanks to new technologies, help save energy costs, increase the safety of their inhabitants, oversee their health, and contribute overall to improving quality of life. Global trends in this area are aimed not only at smart cities, but also on buildings where we spend 90% of our time today. This is also the case for investors and building managers, who also know how important it is to adapt the building conditions to the needs of the people in the building. Fresh air, pleasant temperature, plenty of natural light, safety, but also energy savings and environmental protection. These are the key areas to which buildings of the future must respond and some are already doing so. While in Western Europe the share of smart buildings is currently close to 50%, it is not even 10% here. But going with time is so easy.

Total energy consumption of buildings
40%

Carbon emissions today are at
36%

Reducing Energy to about
o 20%

So what's the intelligent building? First of all, it must ensure that there is mutual logic and communication between the different and diverse technologies used by the building. These are technologies for the operation of buildings such as heating, cooling, air exchange, lighting control, shading control, lifts, as well as fire and property safety. But we can also include those technologies that contribute to increasing the comfort of the building's inhabitants.

Preparation of the building before the arrival of employees

- the building is decoded at the set time and unlocked to allow cleaning
- central building lights are switched on
- automatic air and temperature control, ventilation and air conditioning are triggered automatically

Start daytime building operation

- the lights are turned on depending on the presence of people in the room
- the colour chromaticity temperature is controlled by human centric lighting
- the temperature adjustment takes place in with pre-set modes separately for each office

Reservation system

- booking of meeting rooms is done simply using a shared calendar
- controlled via Outlook, mobile or touch LCD panels placed around the room

Meeting

- the audio and video system is automatically launched when you enter the room
- setting temperature and light
- coffee for participants is ordered at the touch of a button
- technical support can be contacted easily in case of room problems

End of working hours

- lights are switched off in unused rooms
- the building switches to afternoon mode (the air conditioner switches off and adjusts the indoor temperature)

Security of offices

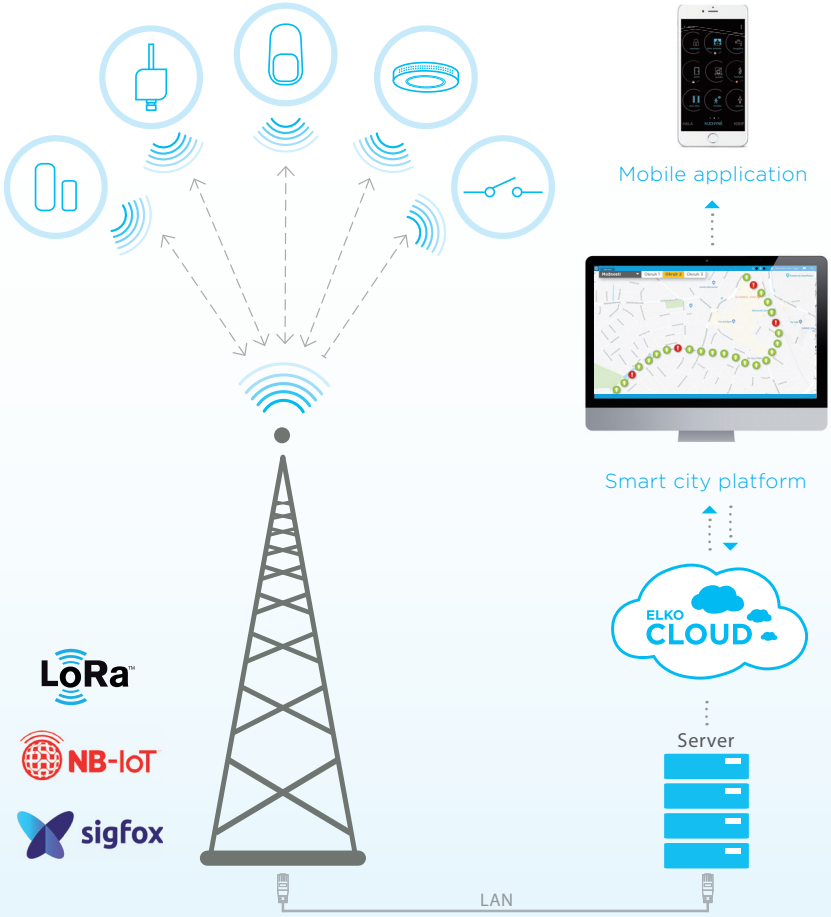
- ensure empty offices - entry only after checks
- In the case of open windows, the building manager receives a message on his mobile phone
- The temperature control is switched off

Securing the entire building

- complete locking of the building
- connection of the automation system to the central substation system
- safety is provided by the camera system together with motion detectors

These include, for example, access and booking systems, control of audio and video equipment, individual zone settings according to the needs of a particular user. If all of the above-mentioned technologies interconnect, we will create one unit in which we have already created dependencies and bonds. For example, let's link the heating and cooling system - the building simply does not allow the cooling system to activate when it's just heating up.

IoT Networks



This term includes the concept of connecting appliances, machines, sensors to an existing internet structure. This structure utilizes a specially designed network for small data transfer and low power consumption over long distances. For our concept, we use the Sigfox, LoRa and NB-IoT networks.

Data from the device is sent via the BTS to the control server from where it is sent to the ELKO Cloud network. Depending on user requirements, data may be sent to a smartphone application or integrated into the main system.

iNELS Air was designed in response to the dynamically developing networks for IoT. This technology is designed to provide full coverage, is energy-saving and has low operating costs.

	sigfox	LoRa	NB-IoT
Low purchase price	🟢	🟢	🟡
Extended battery life	🟢	🟢	🟢
Degree of coverage of areas	🟡	🔴	🟢
Wide indoor coverage	🟡	🟡	🟢
Bandwidth of 868 MHz	🟢	🟢	🔴
Two-way communication	🔴	🟢	🟢
Create your own network	🟡	🟡	🟢
Upgrade your own network	🟢	🟢	🟢
Cellular security	🟢	🟢	🟢
Roaming	🟢	🟡	🟢
Function without SIM card	🟢	🟢	🔴
Backend (B2B)	🟢	🟢	🟢
Custom Portal (B2C	🔴	🔴	🟢

Application

iNELS Smart City

System cooperation:

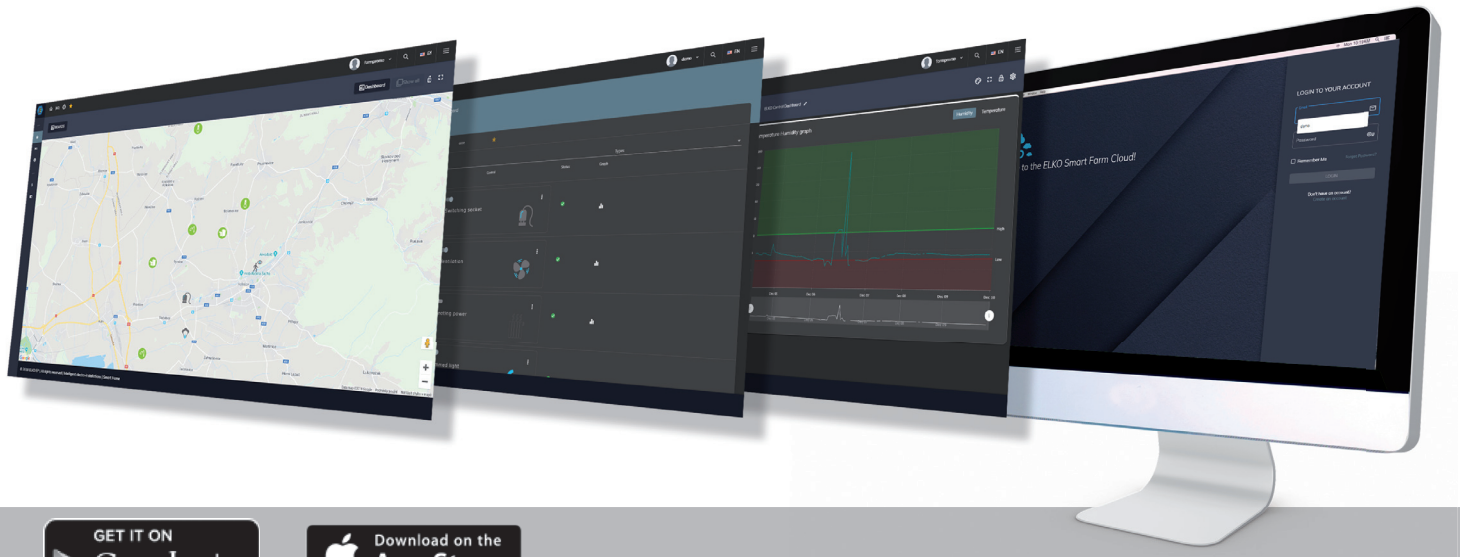
- changes informationa
- plan switching events occurrences
- emergency situations
- 3rd parties commands

Function:

- displayed on the map according to the equipment
- map view by technology
- monitoring according to operating status
- assignment to groups
- individual and group control
- smart scenarios
- graphs and statistics according to lighting, consumption, lifetime

Reporting:

- consumption reporting
- operation reporting (failure status,
- components malfunction)
- disorder reporting
- service state reporting



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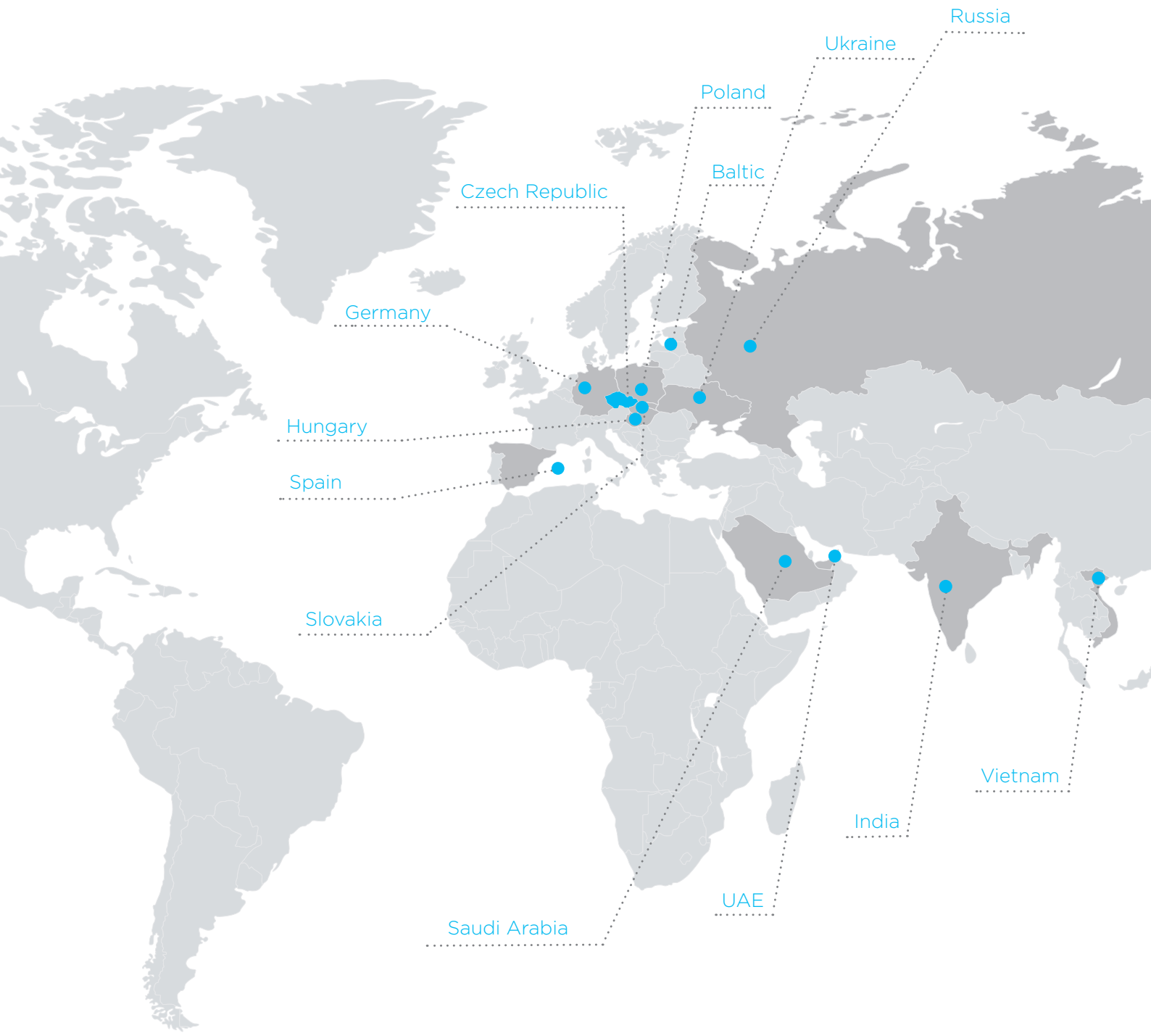
Download on the App Store

ELKO EP Holding



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