

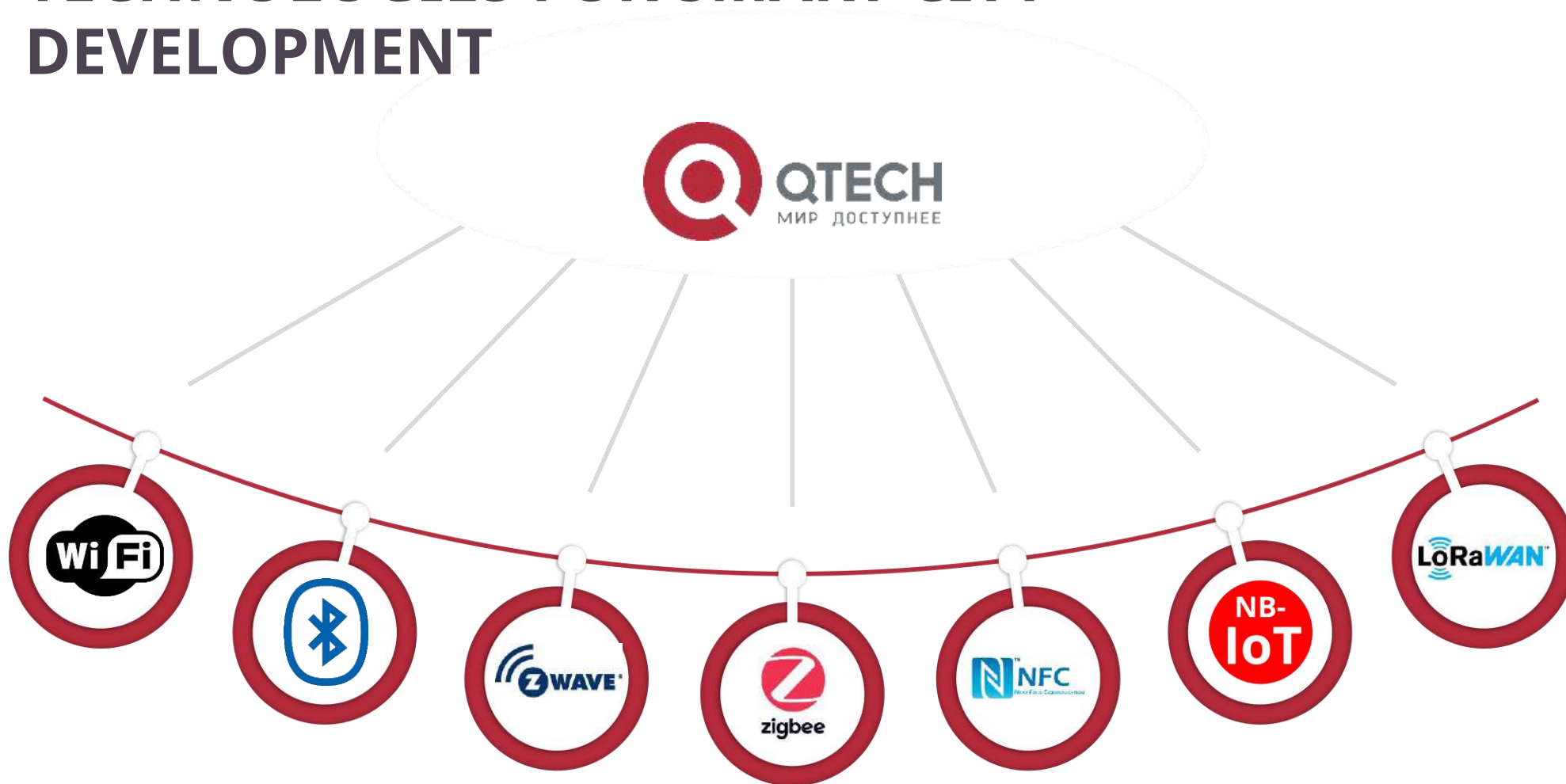


RUSSIAN DEVELOPER AND MANUFACTURER OF
TELECOMMUNICATIONS AND IT EQUIPMENT

QTECH AREAS FOR "SMART CITY"



APPLICABLE WIRELESS TECHNOLOGIES FOR SMART CITY DEVELOPMENT



BENEFITS OF LoRaWAN TECHNOLOGY

Low power consumption up to 10 years of device operation from AA battery

System scalability- number 10 times more plug-ins per station than other wireless systems

long range
up to 15 km in open areas and 1 to 3 in urban environments

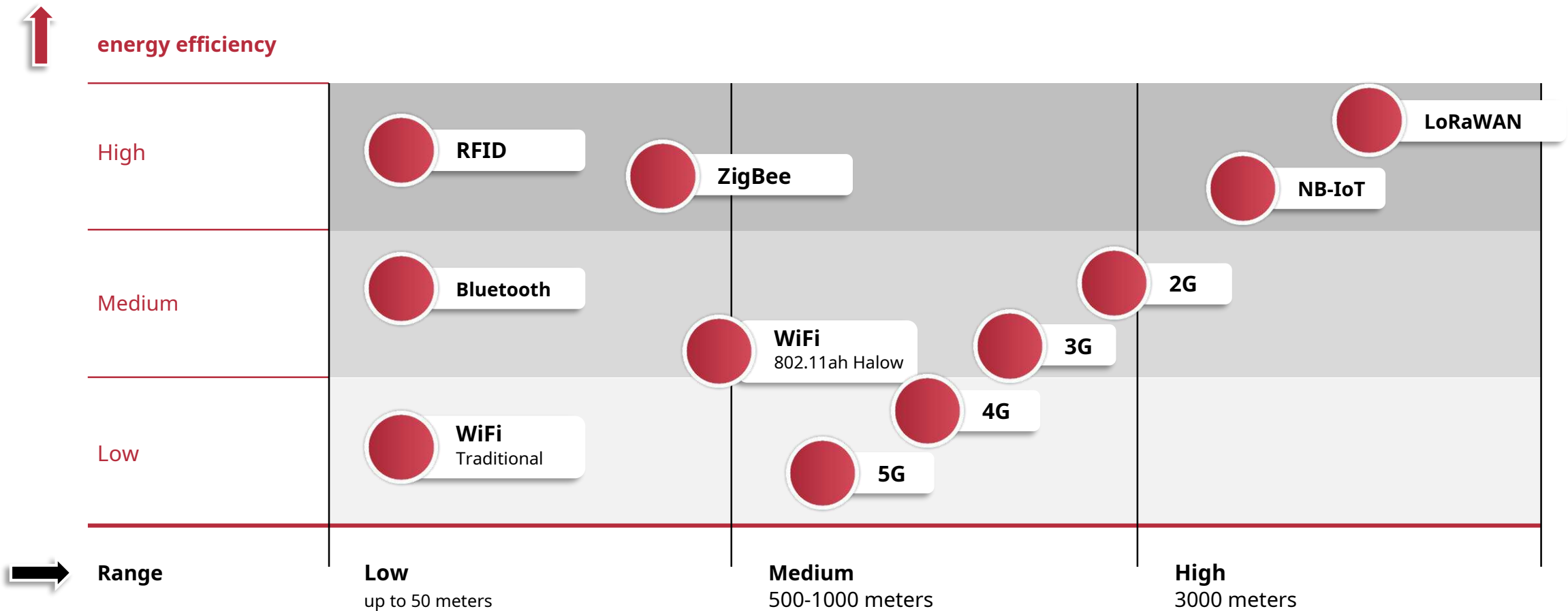
Comprehensive Security and built-in identification and authentication



open standard
(unlicensed frequencies, 868 MHz)

High penetrating ability
in urban areas

WIRELESS COMPARISON TECHNOLOGIES



DEVICE CLASSES

LoRaWAN

Class A

- Devices with self-powered
- Sending and receiving data (performed in a special time window)

BUT

Class B

- Self powered devices
- Data transfer carried out in special time window
- Data reception carried out according to given schedule

B

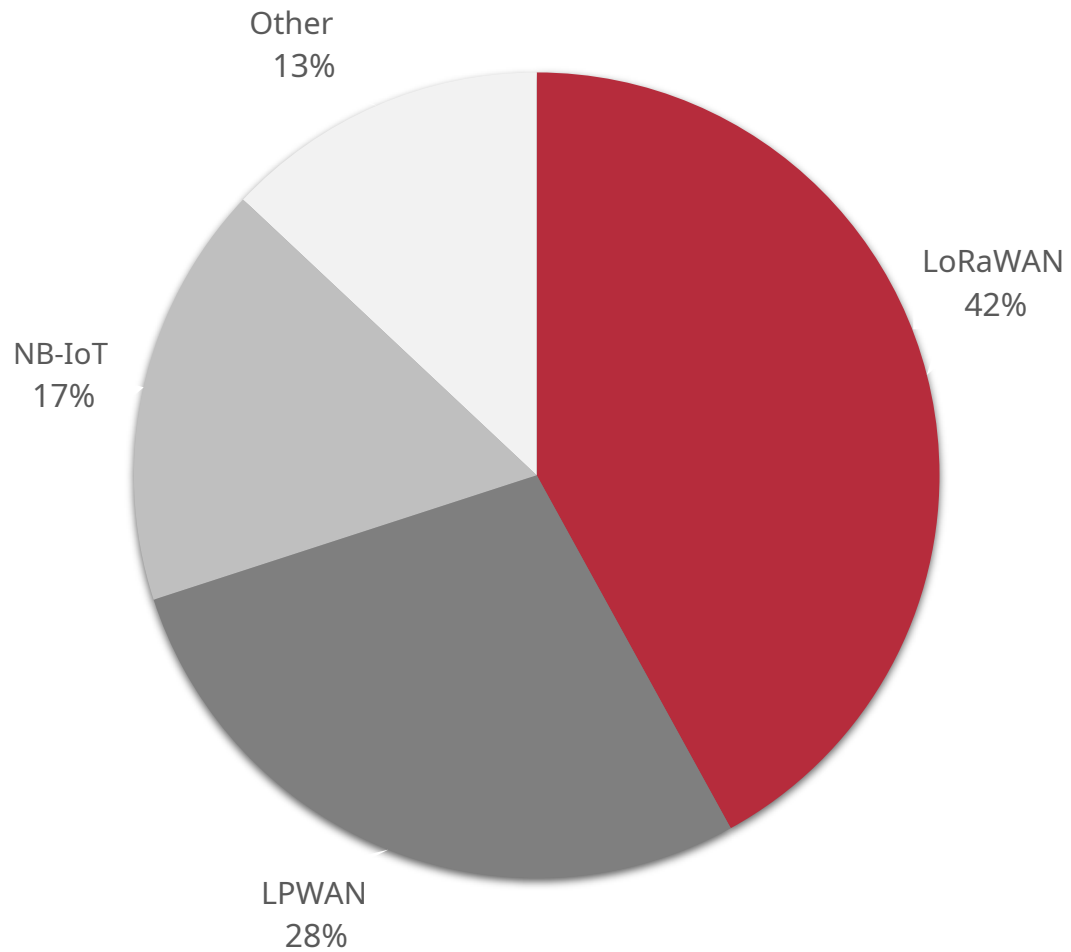
Class C

- Devices with constant external power supply
- Transmission and reception of data is carried out according to the given schedule

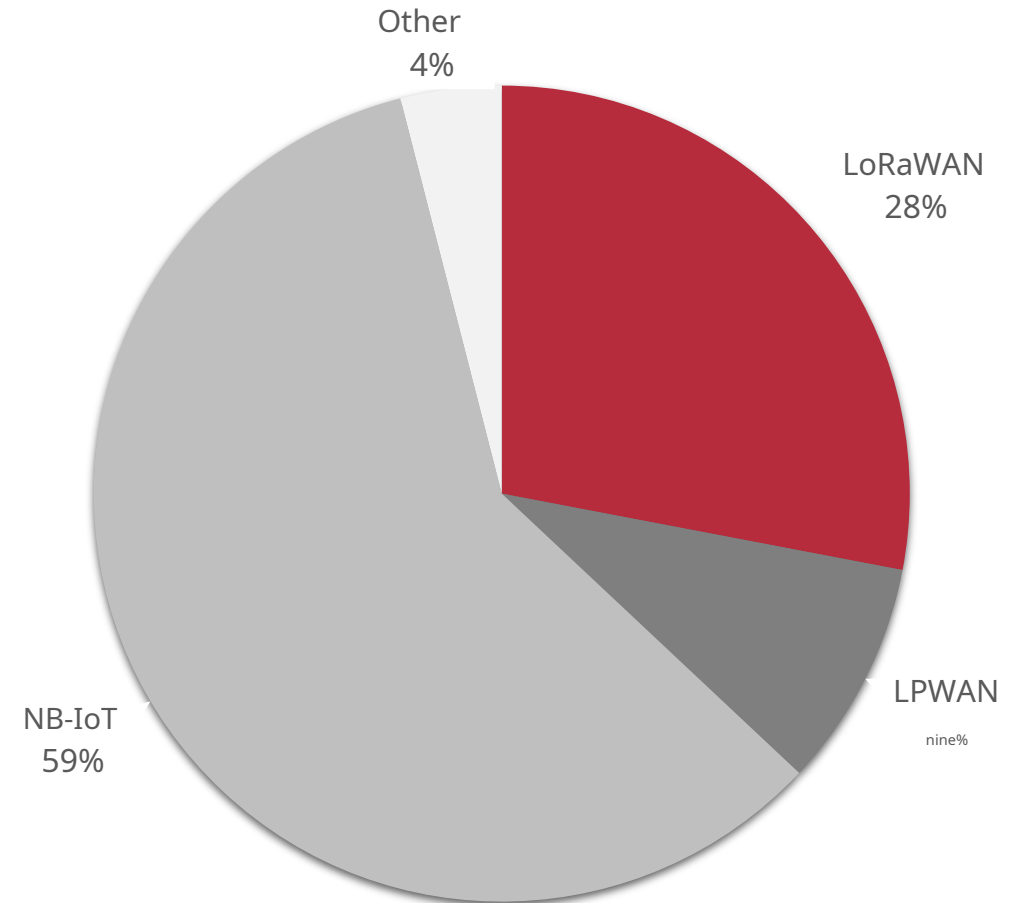
C

EUROPEAN IoT MARKET SHARE

for 2020



for 2025



REALIZED IoT PROJECTS



USA

The LoRaWAN network has been built. Implemented projects: Housing and communal services - meters for water, electricity, heat. Pittsburgh International Airport signed an agreement to equip the new terminal. MSW control sensors. Lighting control system.

Mexico

Cattle monitoring sensors (location, state).

Bulgaria

The LoRaWAN network has been built. Completed projects: Housing and communal services - water and electricity meters.

France

The LoRaWAN network has been built. Implemented projects: Determining the location of the tool during construction and repair work.

Germany

The LoRaWAN network has been built. Implemented projects: Housing and communal services - meters for water, electricity, heat.

Netherlands

The LoRaWAN network has been built. Completed projects: MSW control sensors. Housing and communal services - meters for water, electricity, heat.

Finland

Cattle control sensors (location, status).

Belgium

Automate the collection, management and analysis of household fuel consumption data.

Estonia

The LoRaWAN network has been built. Completed projects: smoke detectors, security sensors for private houses.

Lithuania

The LoRaWAN network has been built. Completed projects: Housing and communal services - meters for water, electricity, heat.

Slovenia

The largest cement plant installed electricity meters and saves 10% of electricity.

Russia

The LoRaWAN network has been built. Completed projects: MSW control sensors. Street lighting control. Housing and communal services - meters for water, electricity, heat.

Kazakhstan

The LoRaWAN network has been built. Implemented projects: Housing and communal services - meters for water, electricity, heat. A smart city Akkol has been built.

India

The LoRaWAN network has been built. Completed projects: MSW control sensors. Street lighting control. Housing and communal services - meters for water, electricity, heat.

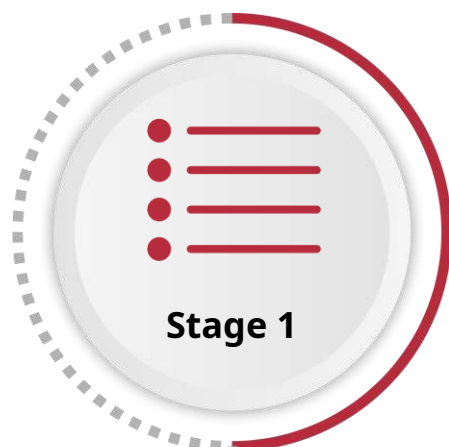
Vietnam

Monitoring the supply and energy management of the industrial area.

Lebanon

The Ministry of Telecommunications and Ogero Telecom deployed a nationwide IoT network. Soil and water temperature, air humidity, soil moisture, ultraviolet level.

STAGES OF DEVELOPMENT OF SYSTEMS USING WIRELESS TECHNOLOGIES



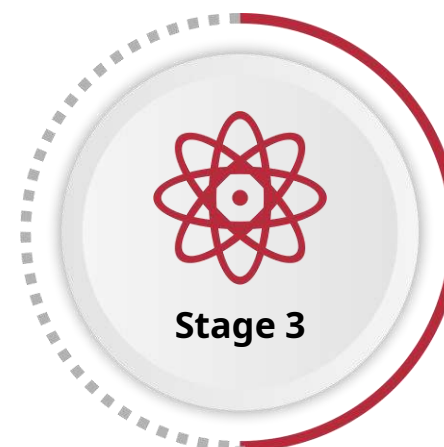
Data collection

- Collection process information and target measurement testimony
- Data conversion
- Structural data distribution



Data analysis

Automatic analytics of received data and building on it recommendations for further project operation



Artificial intelligence

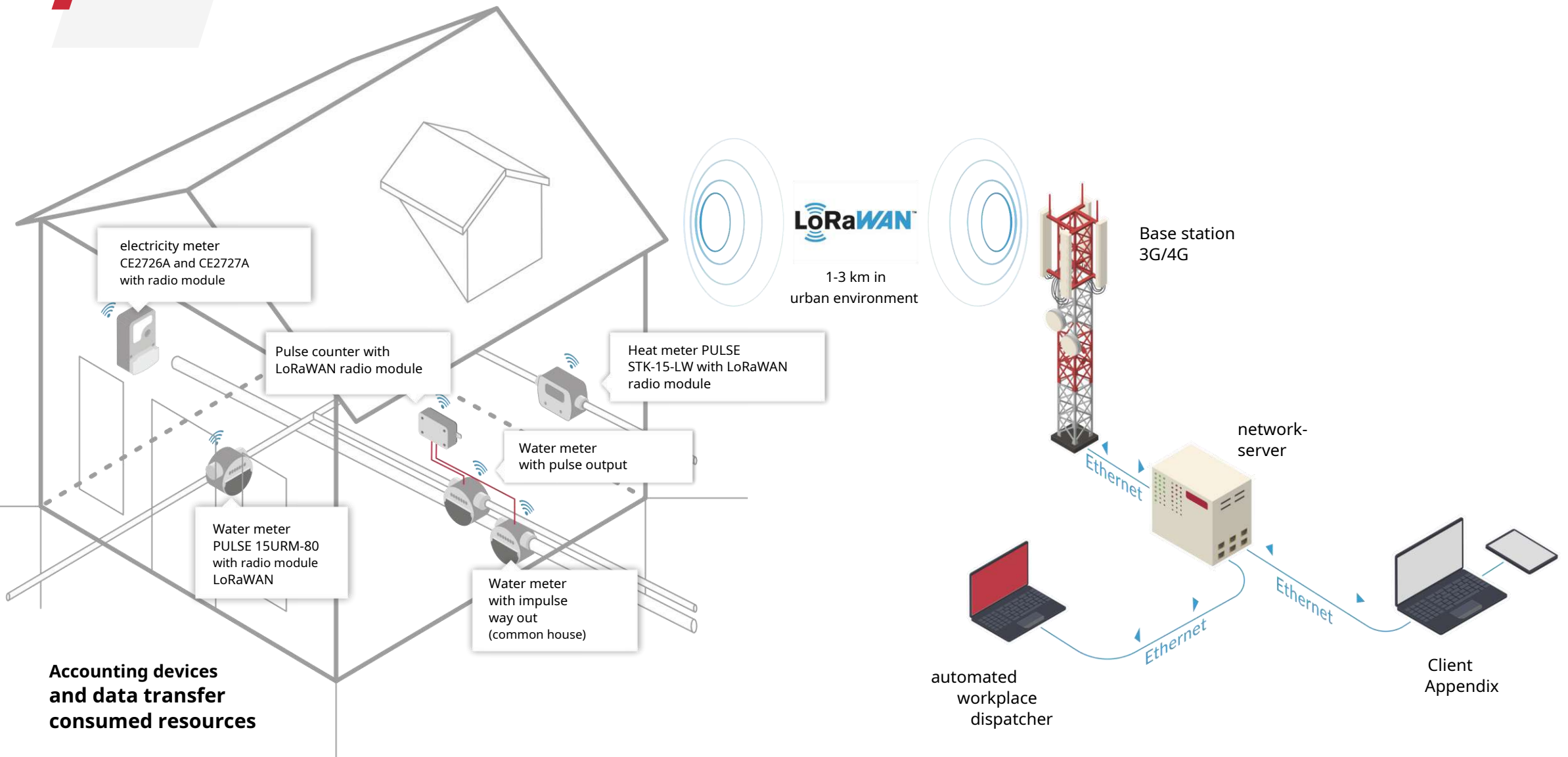
100% automatic general modeling information picture with the help of the obtained data without participation human

SCOPE OF LoRaWAN



/"SMART G OROD"

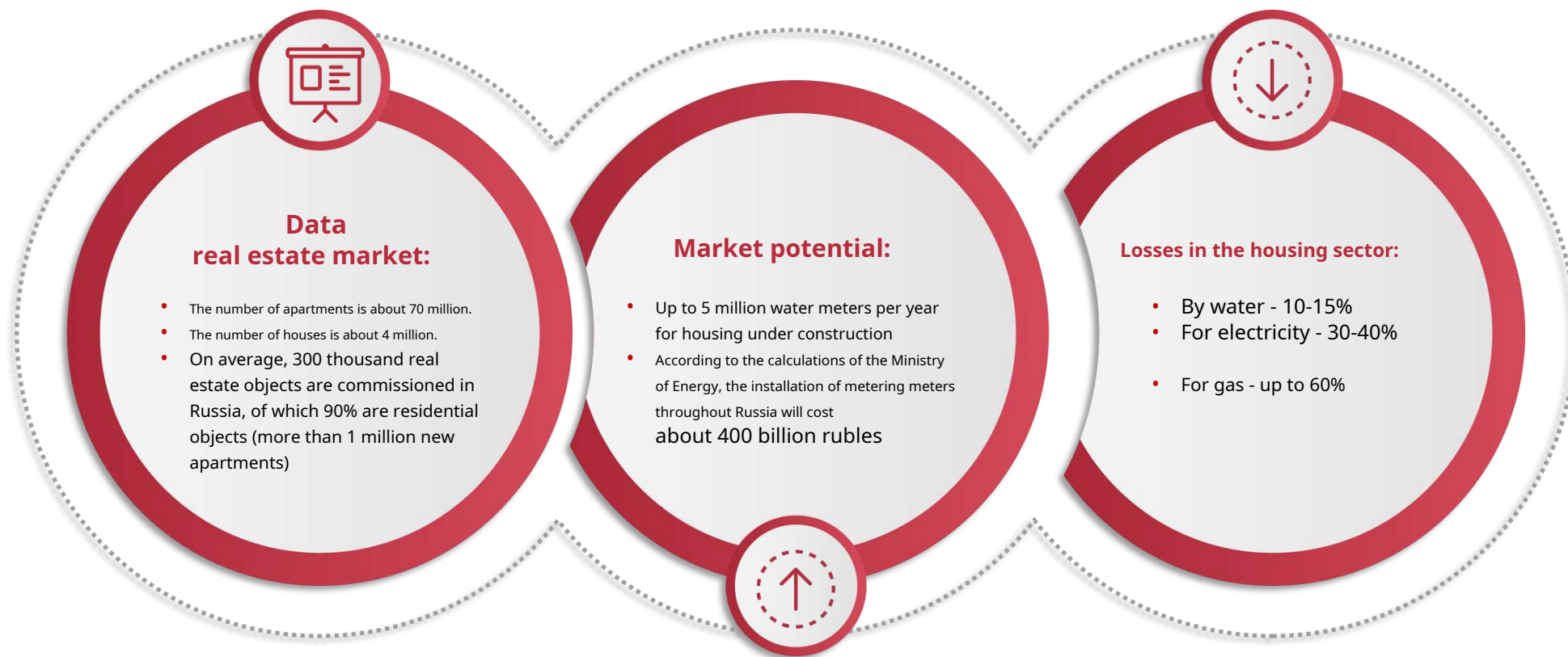
SOLUTION DIAGRAM FOR Utilities



SOLUTION ADVANTAGES

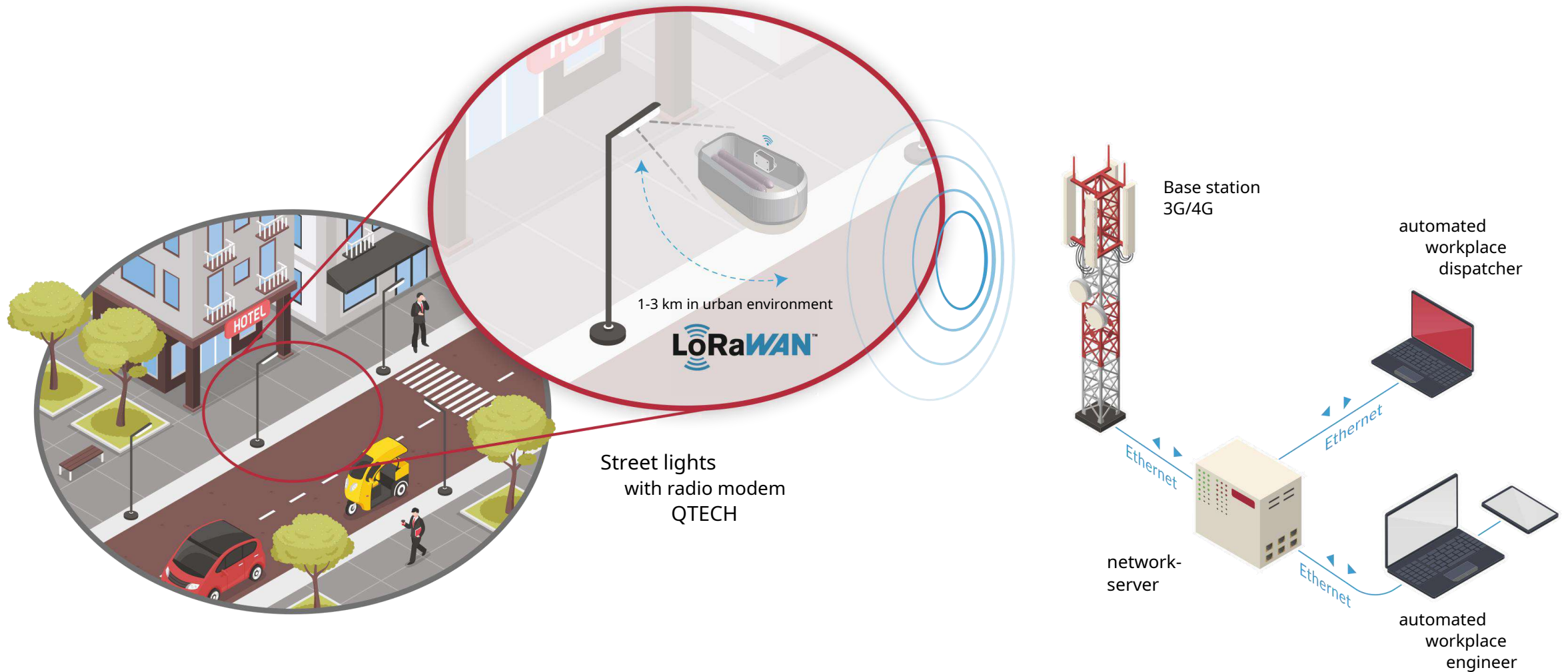


ANALYTICAL DATA OF THE UTILITIES MARKET AT THE END OF 2019



Installing accounting meters will help reduce the loss of resources and pay for their implementation in a short time!

STREET LIGHTING SOLUTION DIAGRAM



SOLUTION ADVANTAGES



SECURITY / BENEFITS / CONVENIENCE / DIGITALIZATION



COST DATA BEFORE AND AFTER SYSTEM UPGRADE STREET LIGHTING

Cost data before system implementation lighting control (city population 88 000 inhabitants):

- Estimated power consumption up to upgrades per year kWh - 5 447 266
- Estimated cost electricity up to modernization per year, rub. - 36 769 048



Average time payback of the project 5 years, taking into account the attraction investment

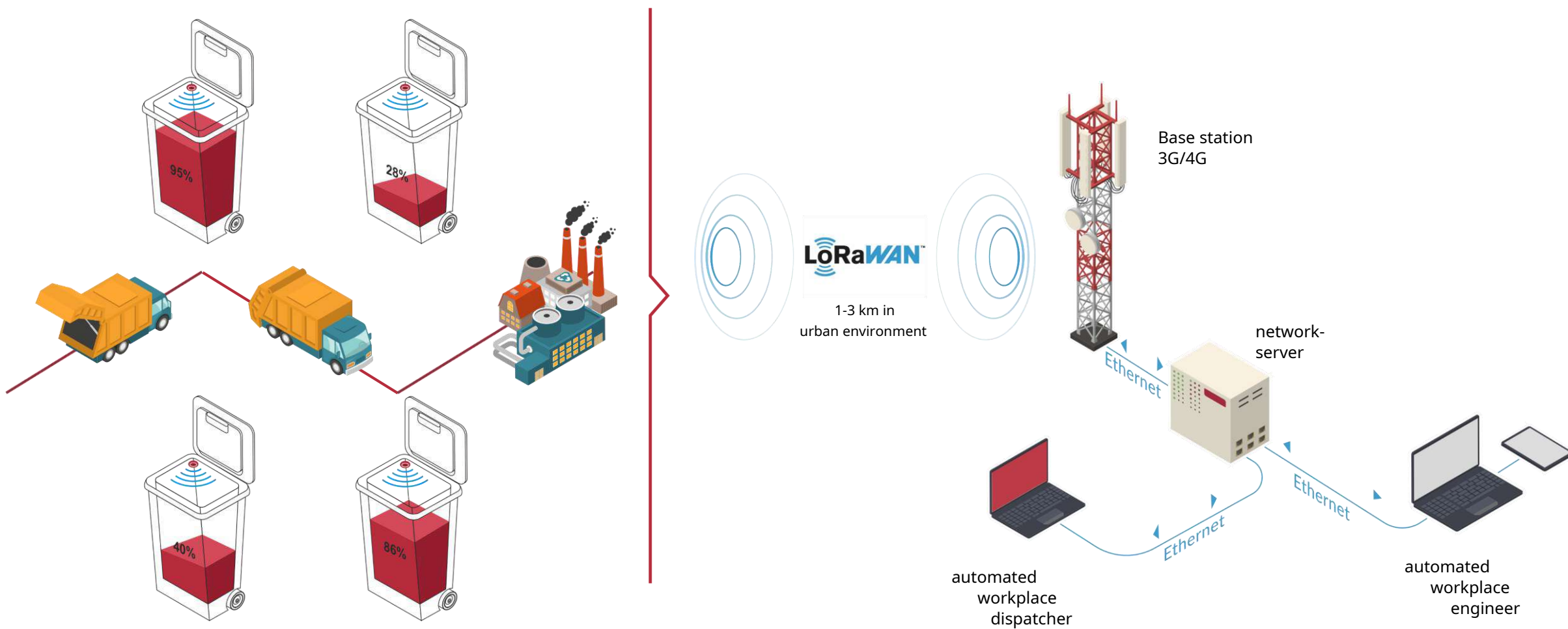
Cost data after system implementation lighting control:

- Estimated consumed power after upgrades per year kWh - 1 234 625
- Estimated cost electricity after upgrades per year (no more), rub. - 8 333 719

After modernization cost reduction is **77%**

CONTROL SOLUTION DIAGRAM

FILLING PERFORMANCE OF MSW CONTAINERS



SOLUTION ADVANTAGES



income increase
companies at the expense
timely
MSW fence.

01



Control
occupancy
and time
emptying.

02



automated
MSW control

03



Control
fires
and movement.

04



Decrease
costs for
garbage removal

05

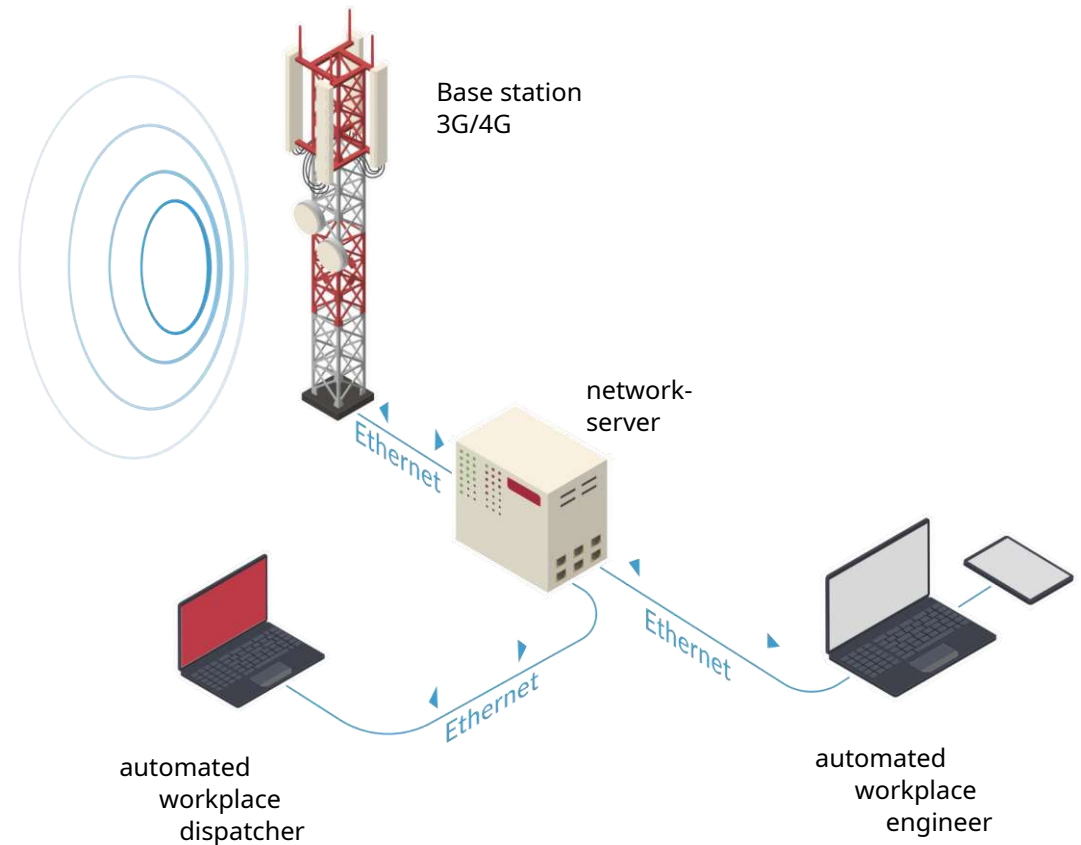
OPTIMIZATION / CONTROL / AUTOMATION / DIGITALIZATION

CONTROL SOLUTION DIAGRAM SEWER OPENING LUKOV

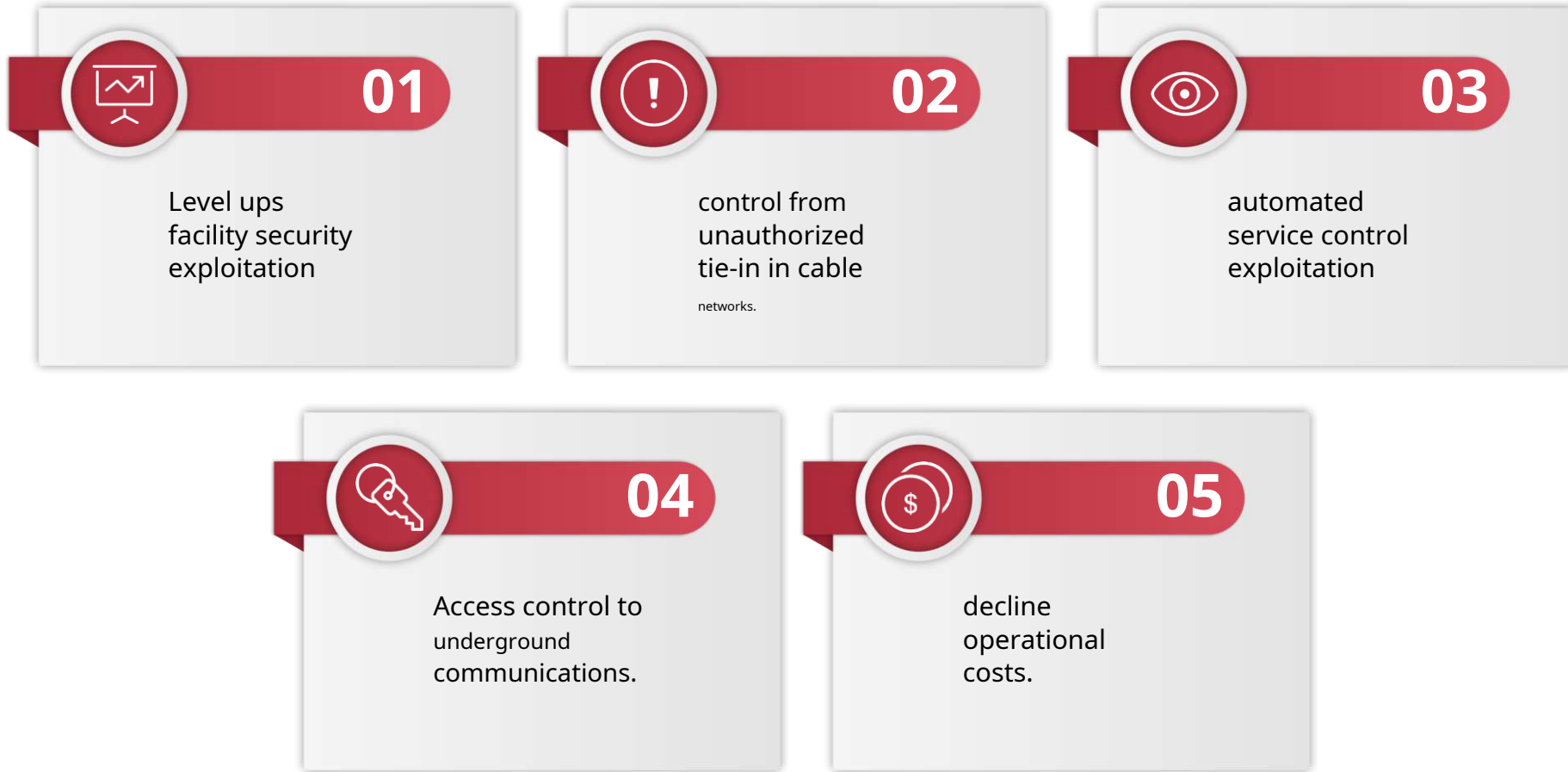


LoRaWAN™

1-3 km in urban
environment

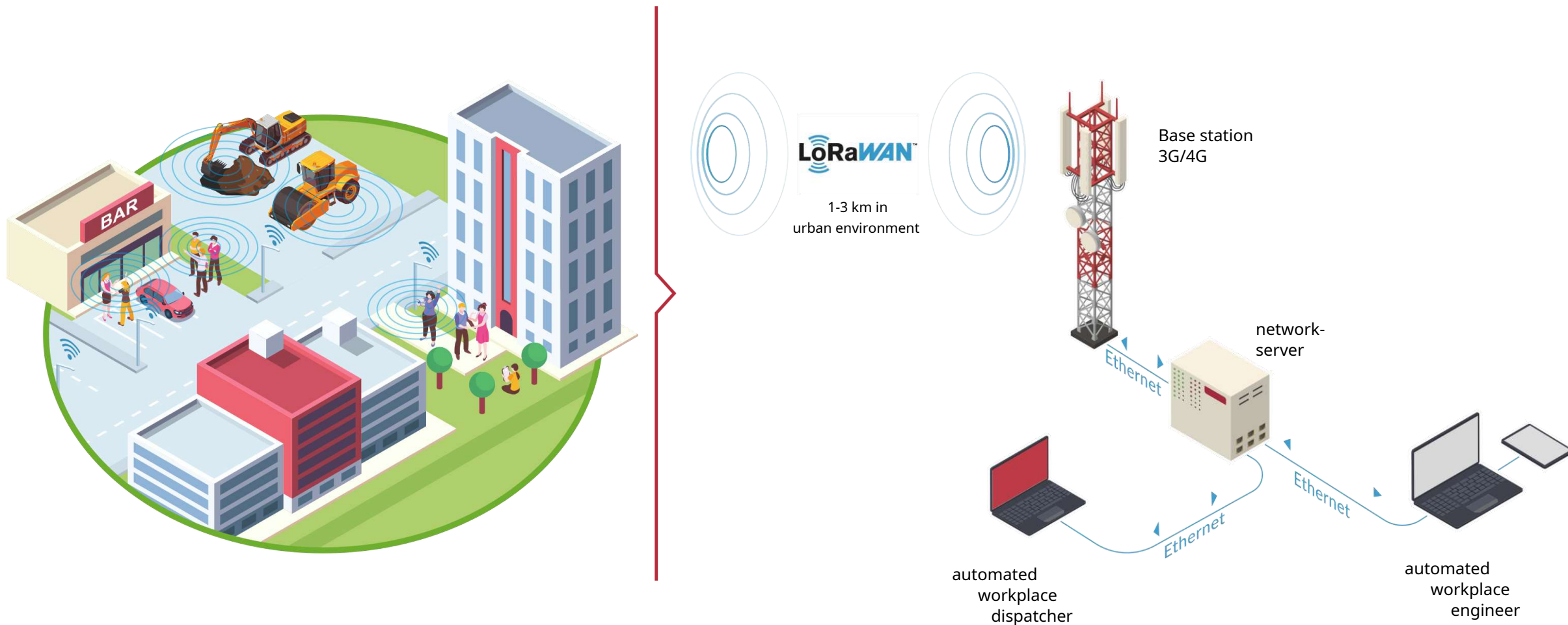


SOLUTION ADVANTAGES

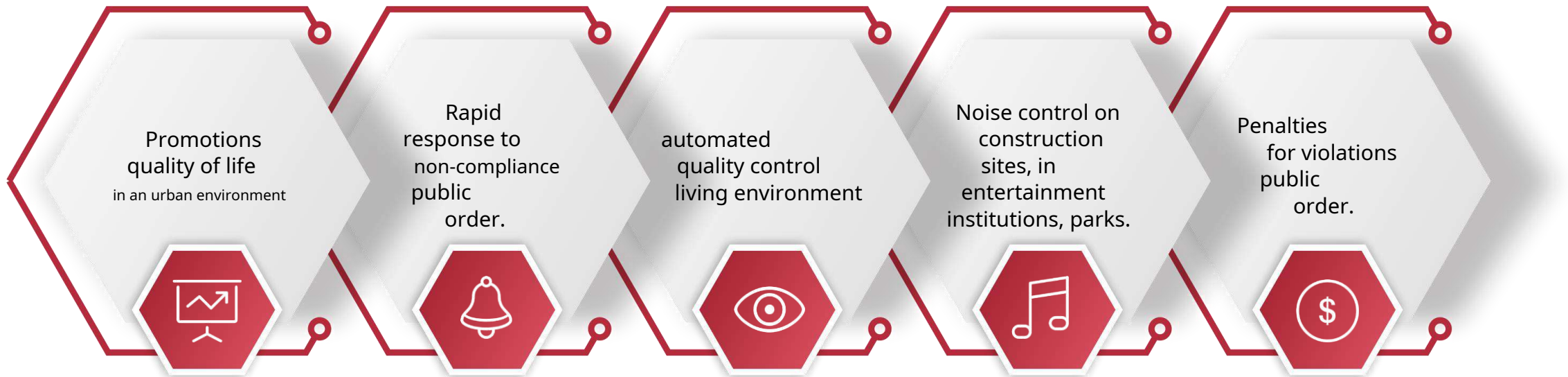


OPTIMIZATION / CONTROL / AUTOMATION / DIGITALIZATION

SOLUTION DIAGRAM FOR NOISE CONTROL IN URBAN ENVIRONMENT



SOLUTION ADVANTAGES



OPTIMIZATION / CONTROL / AUTOMATION / DIGITALIZATION

SOLUTION SCHEME. MOBILE BUTTON FOR ORGANIZING DIFFERENT CASES

Manager call
department in a hypermarket



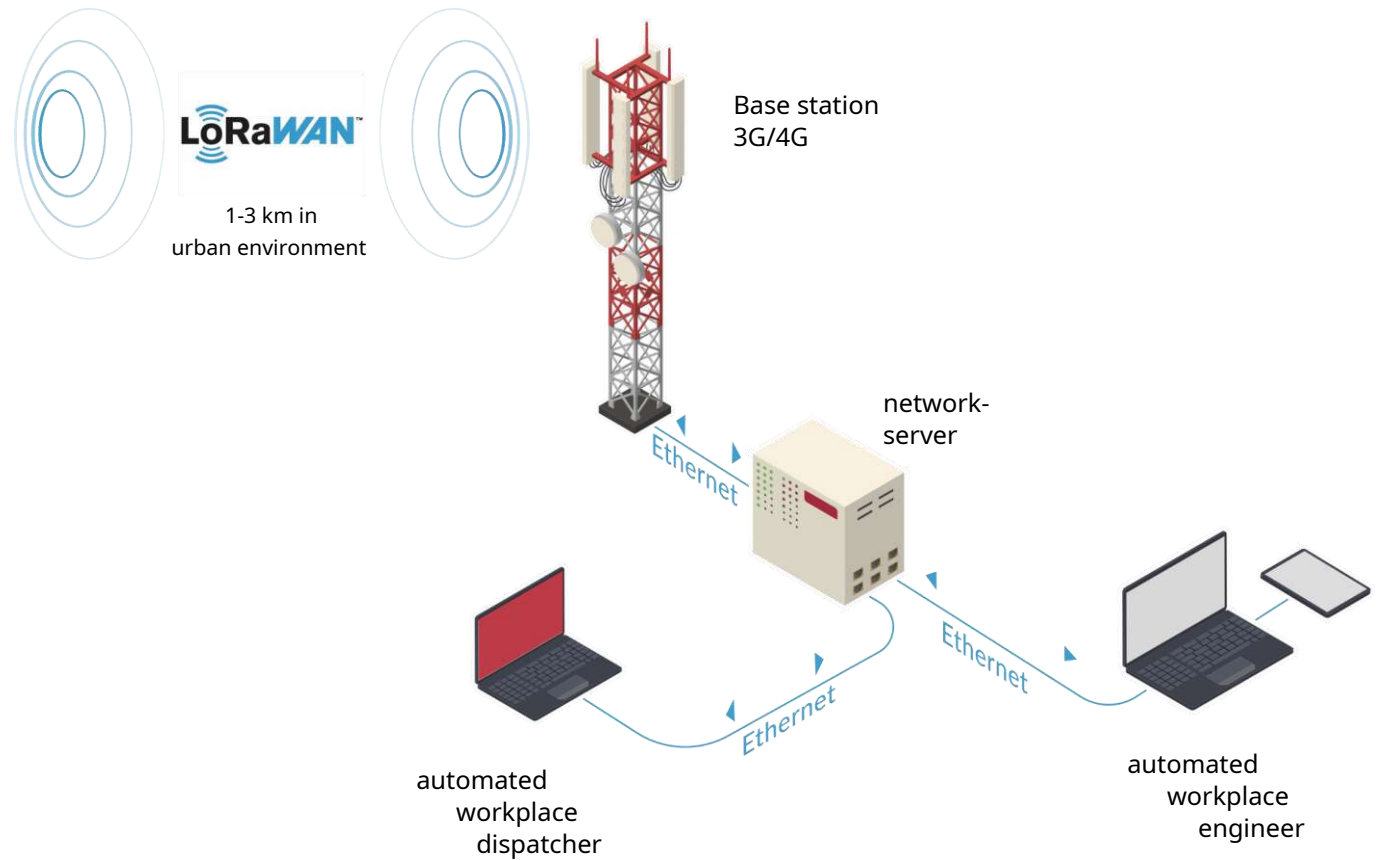
Calling the chief cashier
for cash withdrawal



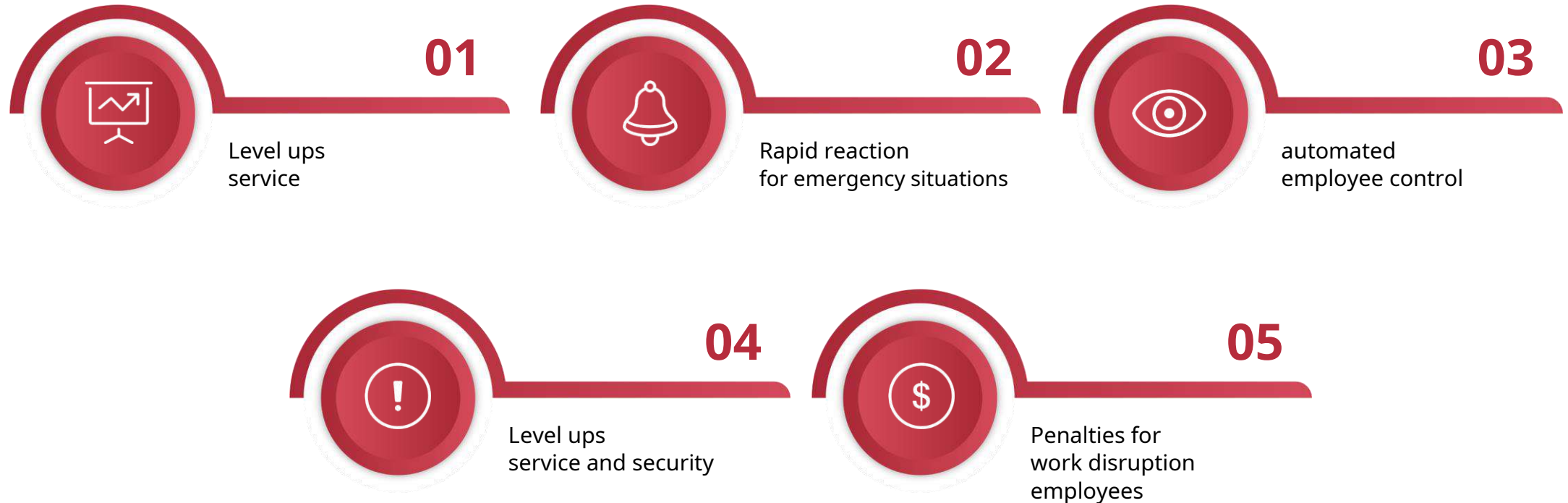
Panic button for
security call



call button
nurses

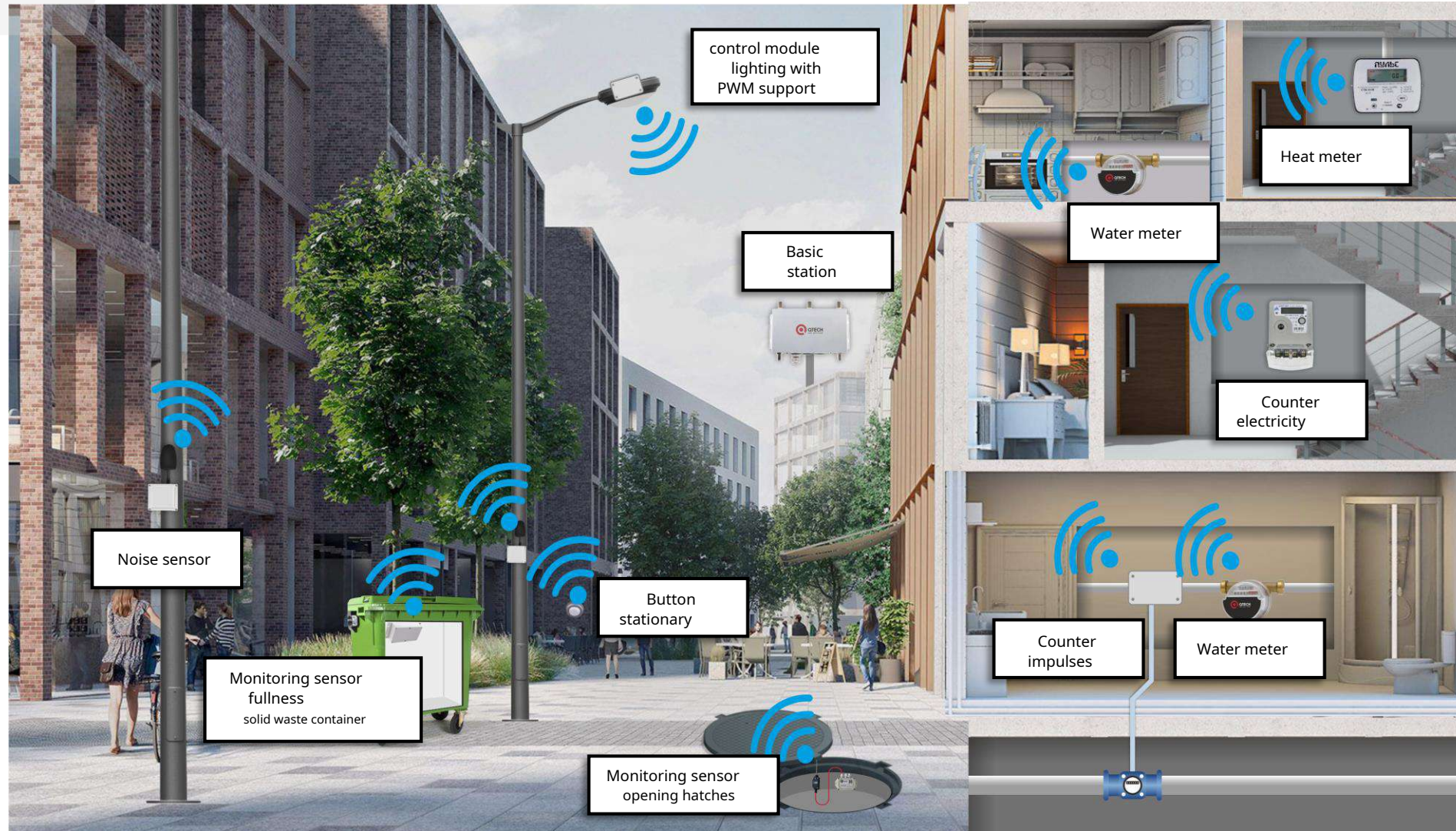


SOLUTION ADVANTAGES



OPTIMIZATION / CONTROL / AUTOMATION / DIGITALIZATION

SMART CITY. GENERAL OUTLINE OF SOLUTIONS



SOLUTION ADVANTAGES



Simplification
many
processes



Energy efficiency
activity and
saving
used
resources



Automation
forged
control
city



Raise
comfort and
standard of living



Decrease
cash register
gap



Raise
security

SECURITY / BENEFITS / CONVENIENCE / DIGITALIZATION

EQUIPPED VANIE

BASE STATIONS



QSH-ECP500M

- The equipment complies with the LoRaWAN 1.1 standard
- Support for class A, B and C devices
- Built-in GPS
- Built-in Ethernet and 3G/4G modems
- Mounting on a beam/mast
- Degree of protection of the housing IP66

GPS

IP66

RU864

3G/4G

ELECTRICITY METER



CE2726A/CE2727A with QTECH modules

- Frequency plan RU864
- Class C device
- OTAA activation method
- Multi-tariff accounting (up to 4 tariffs)
- Built-in power limit relay
- Sensitivity: up to -138dBm

RU864

Class
FROM

- 138
dBm

WATER METER



Pulse 15U with QTECH modules

- Frequency plan RU864
- Class A device
- Battery life up to 7 years
- Built-in magnet detection sensor
- Built-in tamper sensor
- Activation of the device for transmission over the LoRaWAN radio network is performed by presenting a magnet

RU864

Class
BUT



HEAT METER



Pulse STK15 with QTECH modules

- Frequency plan RU864
- Class A device
- Battery life up to 7 years
- Built-in 2 dBi omnidirectional antenna
- Built-in tamper sensor
- How to activate OTAA or ABP
- Protection class IP64
- Activation of the device for transmission over the LoRaWAN radio network is performed by presenting a magnet

RU864

Class
BUT

2dBm

PULSE COUNTER



Pulse counter QSH-C500-P4

- Frequency plan RU864
- Class A device
- Battery life up to 8 years
- 4 universal inputs (impulse or security)
- Removable battery ER14505
- Degree of protection of the housing IP65

RU864

Class
BUT

IP65

LoRaWAN TEMPERATURE SENSOR WITH EXTERNAL MEASUREMENT



QSH-C500-P4T

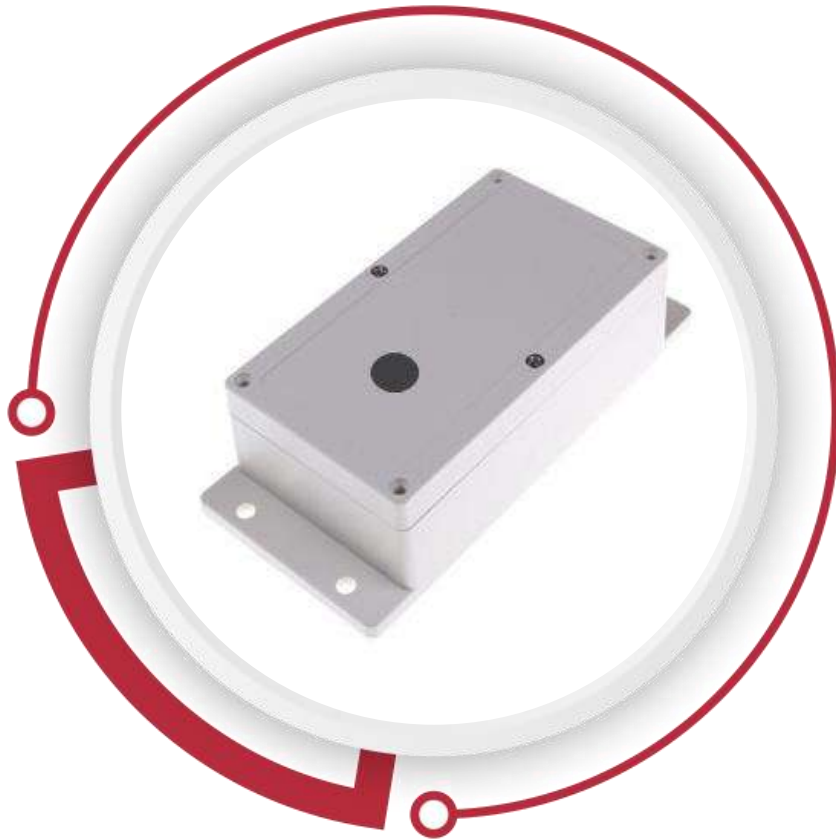
- Frequency plan RU864
- Class A device
- Built-in 2 dbi antenna
- Degree of protection of the housing IP65
- Measuring temperature range -55...+100

RU864

Class
BUT

IP65

SENSOR FOR MONITORING THE FULLNESS OF THE CONTAINER



QSH-GS500

- Frequency plan RU864
- Class A device
- Degree of protection of the housing IP65
- Built-in 2 dbi antenna
- Built-in rangefinder
- Built-in accelerometer
- Built-in GPS/GLONASS
- temperature sensor

RU864

Class
BUT

IP65

HATCH OPENING MONITORING SENSOR



QSH-MH500S

- Frequency plan RU864
- Class A device
- Degree of protection of the housing IP65
- Built-in 2 dbi antenna
- 4 channels for connecting intrusion sensors (dry contacts)
- Built-in battery
- 2 channels for connecting temperature sensors
- Temperature regime: -40 +70

RU864

Class
BUT

IP65

PWM LIGHTING CONTROL MODULE



QSH-SL500

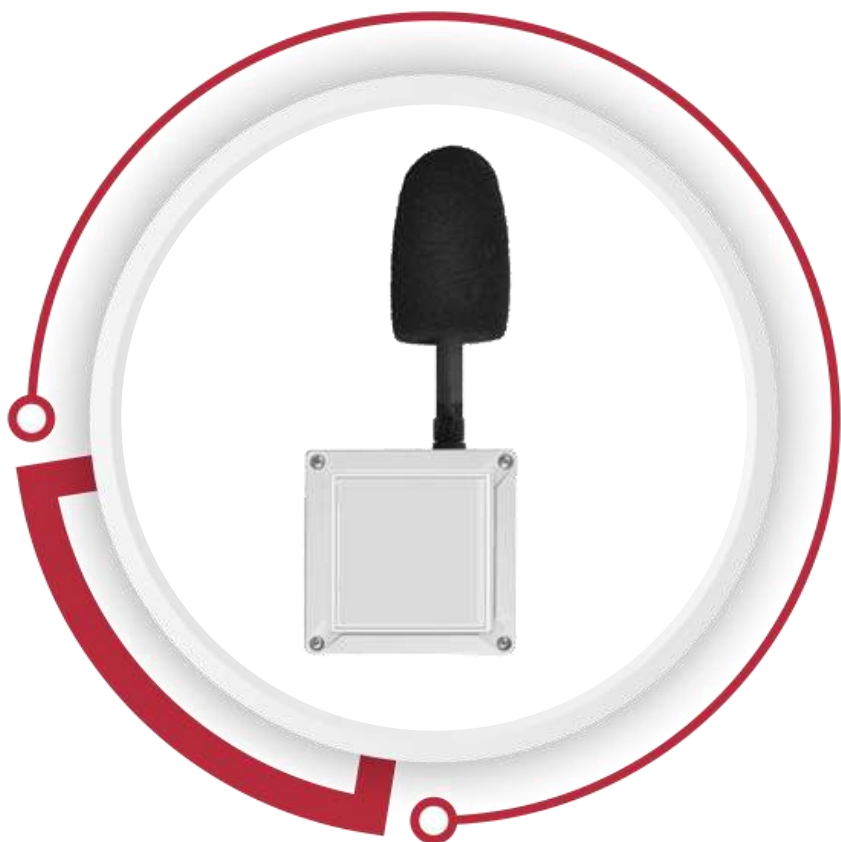
- Frequency plan RU864
- Class C device
- Degree of protection of the housing IP65
- Built-in 2 dbi antenna
- 2 x PWM outputs
- 2 x inputs for monitoring the state of the driver
- Built-in accelerometer

RU864

Class
C

IP65

STATIONARY NOISE SENSOR



QSH-NS500

- Frequency plan RU864
- Class A device
- Degree of protection of the housing IP65
- Built-in 2 dbi antenna
- Omnidirectional microphone
- Sound pressure measurement range from 30 to 120 dB
- Sensitivity ± 3 dB
- Sound level sampling frequency 1, 5, 10, 15, 30 min
- Alarm message (when the specified parameters are exceeded)

RU864

Class
A

IP65

STATIONARY BUTTON



QSH-SB500S

- Frequency plan RU864
- Class A device
- Battery life 1 year
- OTAA activation method
- Support for up to 4 types of pressing (scripts)
- Light and sound indication
- Sensitivity: up to -138dBm

RU864

Class
A

- 138
dBm

MOBILE BUTTON



QSH-SB500M

- Frequency plan RU864
- Class A device
- Battery life 1 year
- OTAA activation method
- Support for up to 4 types of pressing (scripts)
- Light indication

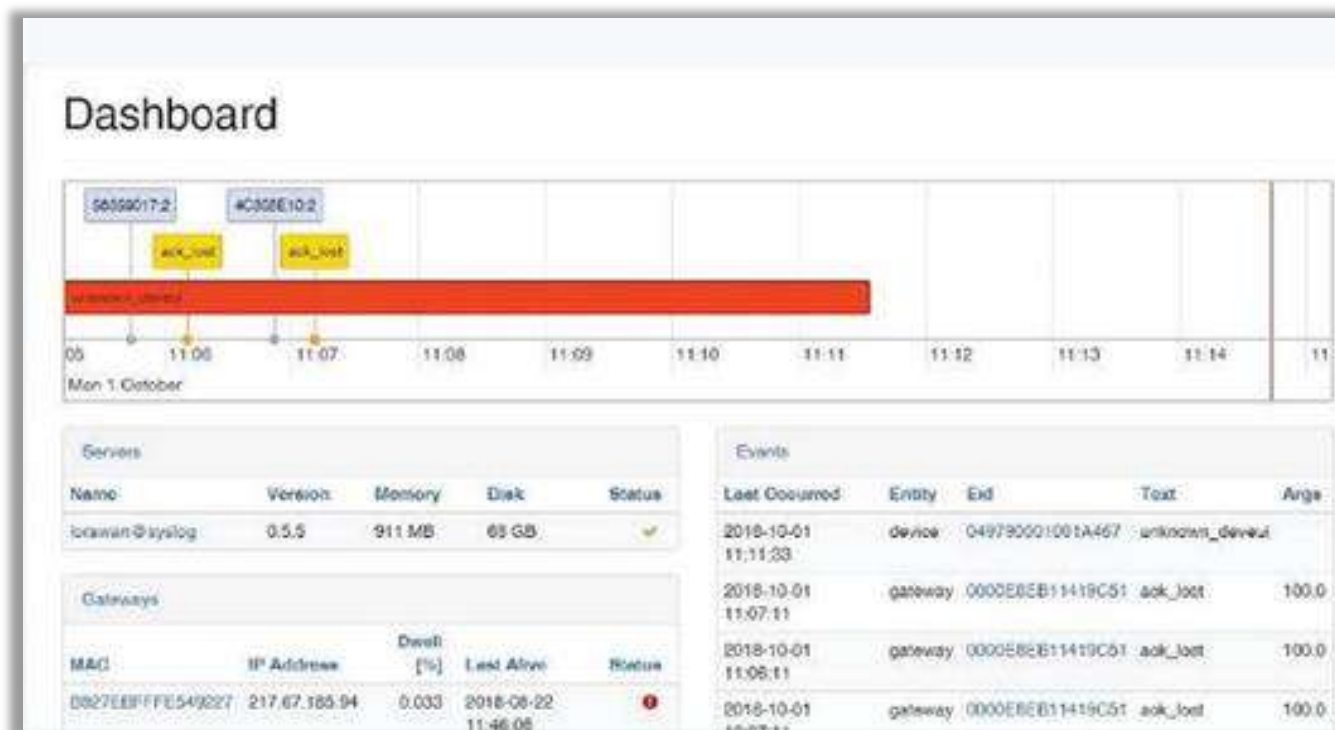
RU864

**Class
A**

**PROGRAM MUCH
PROVIDE ENIE**

TELEMETRY

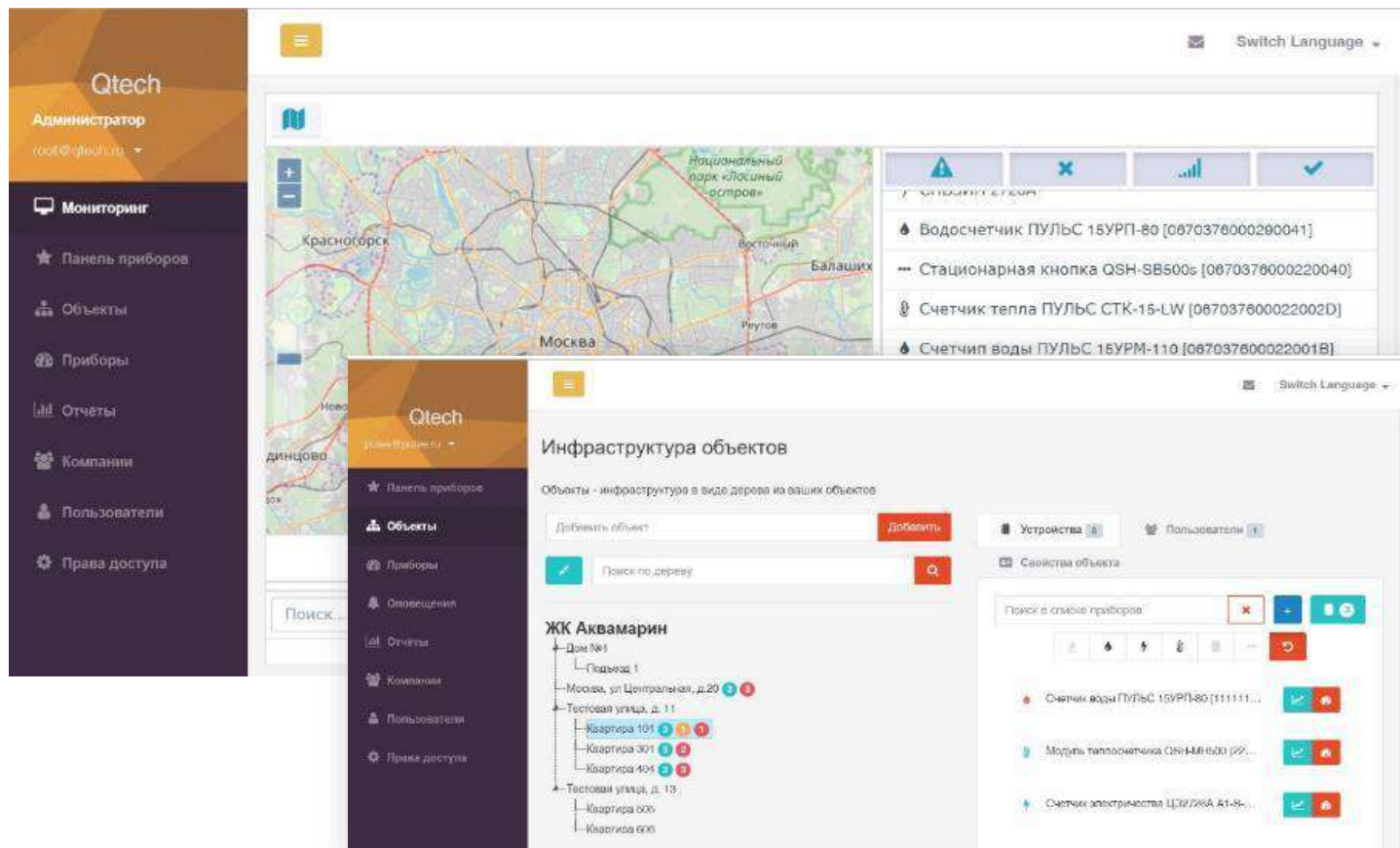




Advantages:

- Ability to build LoRaWAN networks on a scale: quarter, district, city
- Support for any LoRaWAN end devices
- Terminal support class A and C devices

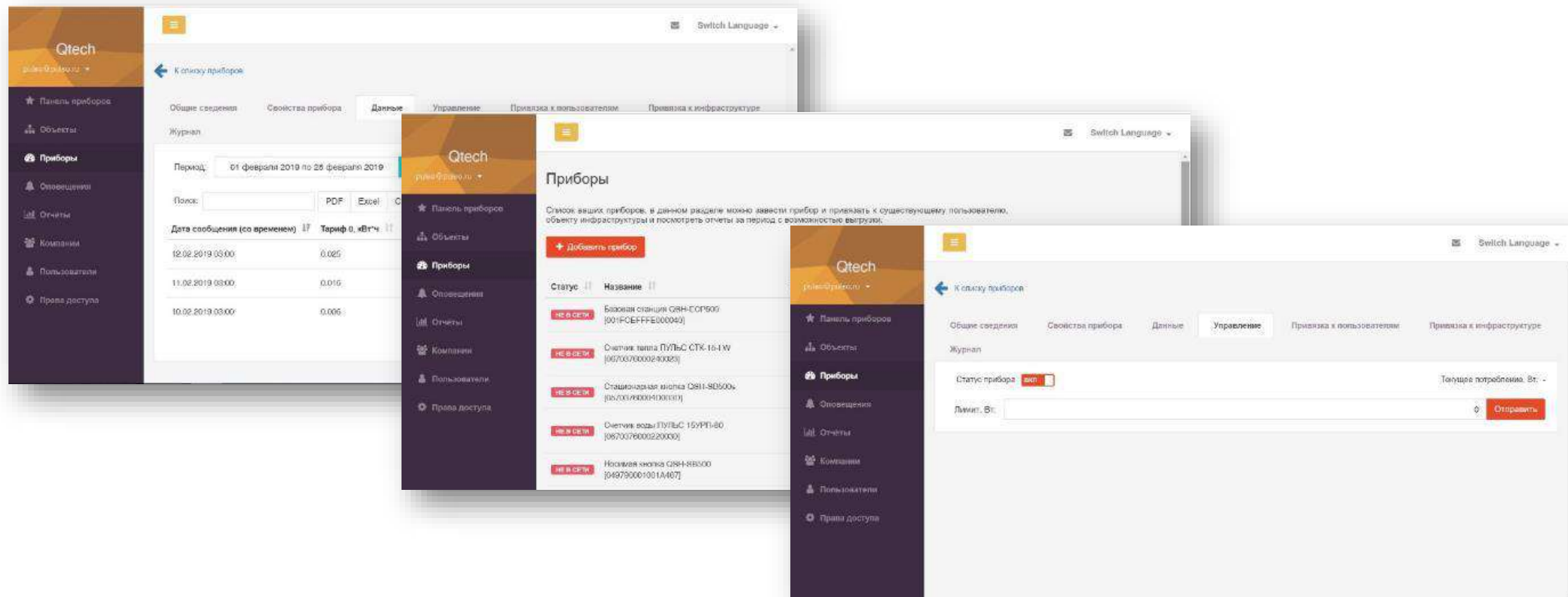
ARM DISPATCHER SOFTWARE



Advantages:

- Displaying readings in on-line mode
- Display devices on the map
- Reports in different configurations
- Integration with 1C
- SMS and PUSH notifications
- Verification date notification

DEVICE CONFIGURATION VIA SOFTWARE



NOTIFICATION

Настройка устройства

Калибровка

Правила тревожных сообщений

Журналирование

Статус Ошибка	Значение сравнения	уровень журнала
x_axis	Не активно	Предупреждение
y_axis		
z_axis		
Температура, °C		
Питание, мВ		

УВЕДОМЛЕНИЯ

☒ Включить уведомление

Текст уведомления

Не активно! Устройство ID 893498354543

☒ Внешнее уведомление

Тип уведомления

SMS

Контакт

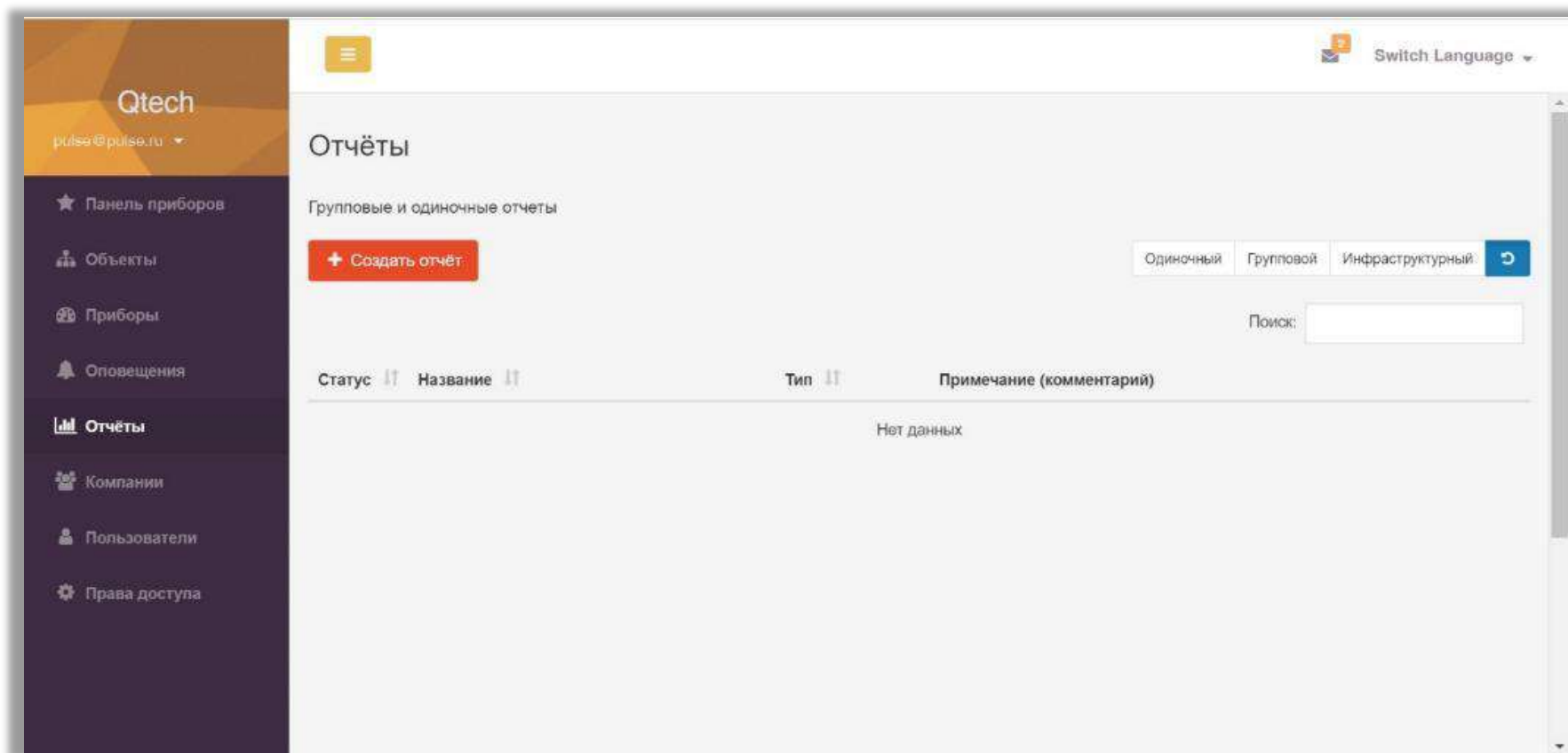
8924654456,8999456654

Очистить

Подтвердить

Отмена

REPORTS



The screenshot shows the 'Отчёты' (Reports) section of the Qtech application. The left sidebar contains a navigation menu with items: 'Панель приборов', 'Объекты', 'Приборы', 'Оповещения', 'Отчёты' (highlighted), 'Компании', 'Пользователи', and 'Права доступа'. The main content area has a header with the Qtech logo and user email 'pulso@pulso.ru'. Below the header, the title 'Отчёты' is followed by the subtitle 'Групповые и одиночные отчеты'. A red button '+ Создать отчёт' is on the left, and filter buttons 'Одиночный', 'Групповой', and 'Инфраструктурный' are on the right. A search bar labeled 'Поиск:' is also present. Below these is a table with columns: 'Статус', 'Название', 'Тип', and 'Примечание (комментарий)'. The table currently displays 'Нет данных' (No data).

Qtech
pulso@pulso.ru

Отчёты
Групповые и одиночные отчеты

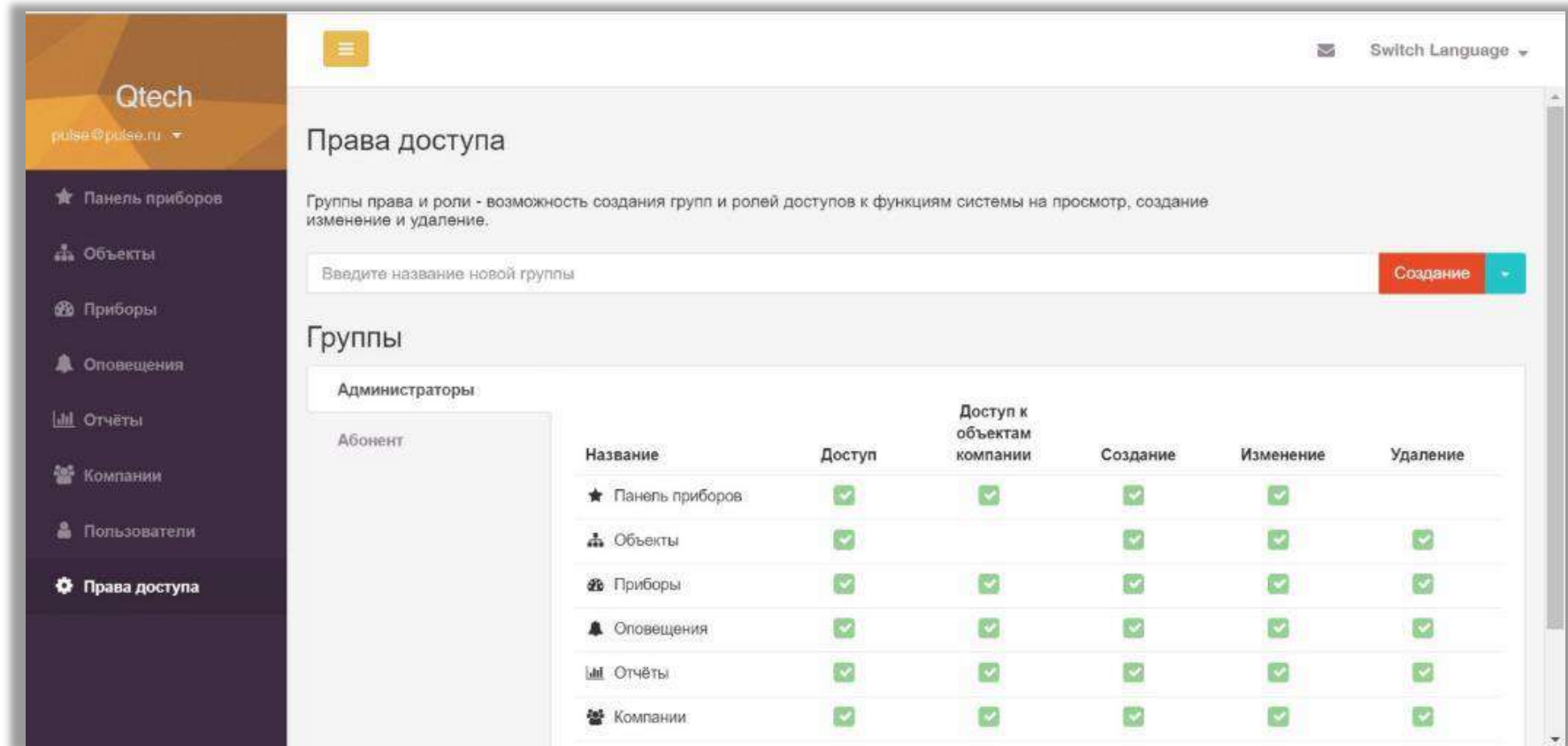
+ Создать отчёт

Одиночный Групповой Инфраструктурный

Поиск:

Статус	Название	Тип	Примечание (комментарий)
Нет данных			

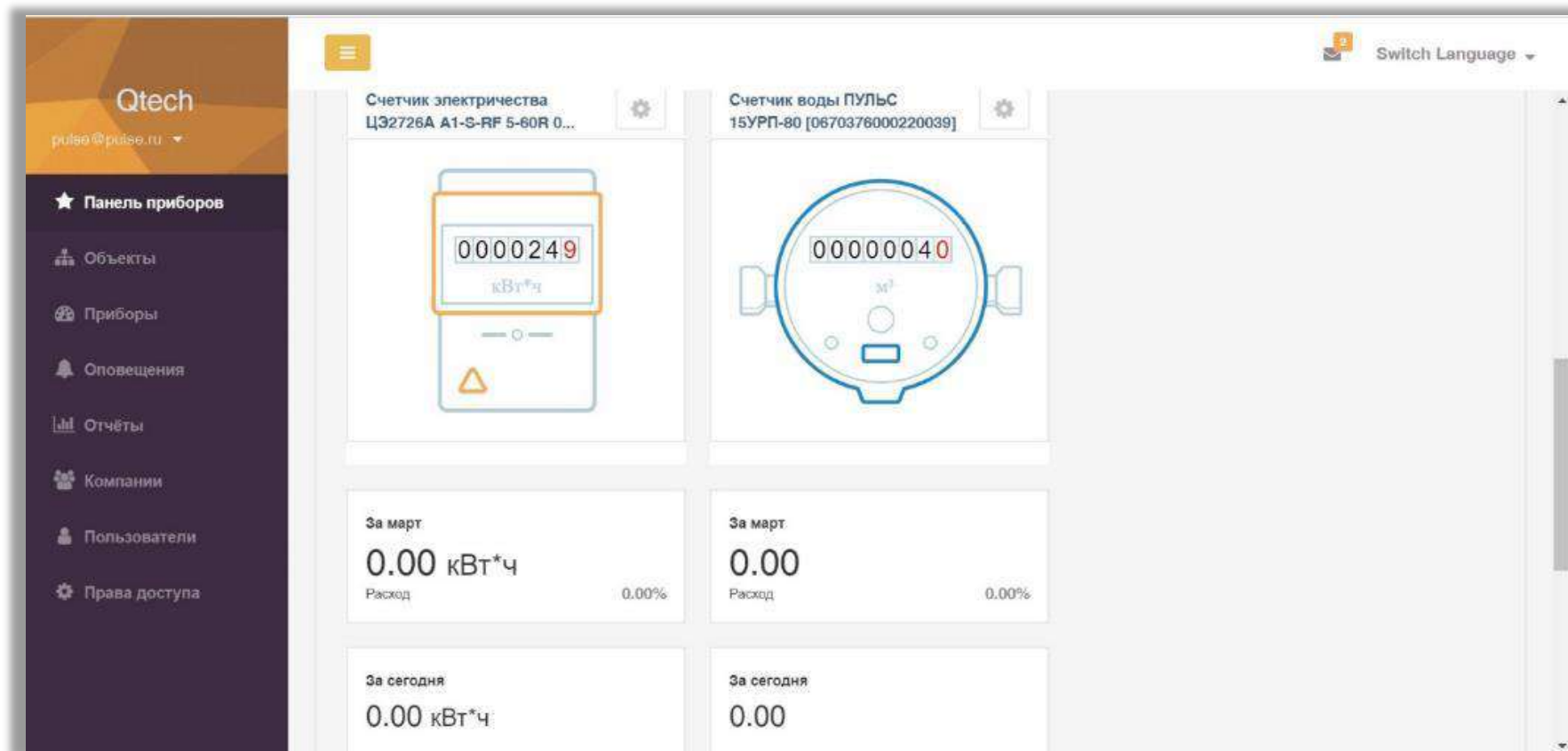
ACCESS RIGHTS



The screenshot displays the 'Права доступа' (Access Rights) section of the Qtech application. The left sidebar contains a navigation menu with items: 'Панель приборов', 'Объекты', 'Приборы', 'Оповещения', 'Отчёты', 'Компании', 'Пользователи', and 'Права доступа' (highlighted). The main content area has a header with the Qtech logo and user email 'pulse@pulse.ru'. Below the header, the title 'Права доступа' is followed by a description: 'Группы права и роли - возможность создания групп и ролей доступов к функциям системы на просмотр, создание изменение и удаление.' A form with a text input 'Введите название новой группы' and a 'Создание' button is present. Below this, the 'Группы' (Groups) section shows a table of access rights for two groups: 'Администраторы' and 'Абонент'.

Название	Доступ	Доступ к объектам компании	Создание	Изменение	Удаление
★ Панель приборов	✓	✓	✓	✓	
👤 Объекты	✓		✓	✓	✓
🔧 Приборы	✓	✓	✓	✓	✓
🔔 Оповещения	✓	✓	✓	✓	✓
📊 Отчёты	✓	✓	✓	✓	✓
🏢 Компании	✓	✓	✓	✓	✓

SOFTWARE "PERSONAL OFFICE" USER"



SOFTWARE "PERSONAL OFFICE" USER"

Advantages:



Consumption control
resources



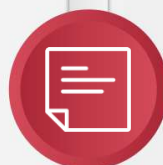
Notification
about anxieties



Reports on
consumption



reminder about
upcoming verification
metering devices



general information
from UK (news
ribbon)

PWE INVITE TO COOPERATION

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✉ ebrahimi@qtech.ir