



المركز الوطني للطاقة
National Energy Center

Leading cities With Smart Solutions

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Smart Cities Development Manager
National Energy Center
November, 2021



What is a Smart City?

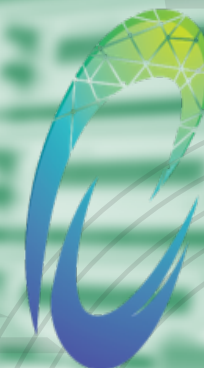


Why Smart Cities for Oman

1. Improve quality of life
2. Develop innovative solutions to city challenges
3. Cut cost & increase revenue
4. Achieve sustainability
5. Enhance international reputation



NATIONAL ENERGY CENTRE NEC



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National Energy Center



NEC – Our Story

NEC Services

NEC Moving up the value chain

Existing projects and Partners



NEC – Our Story

NEC About us..

“National Energy Centre (NEC) is a semi-government company established with a mission to develop complex technical systems featured with new technologies and innovation to serve various sectors in Oman & GCC ”

Vision..

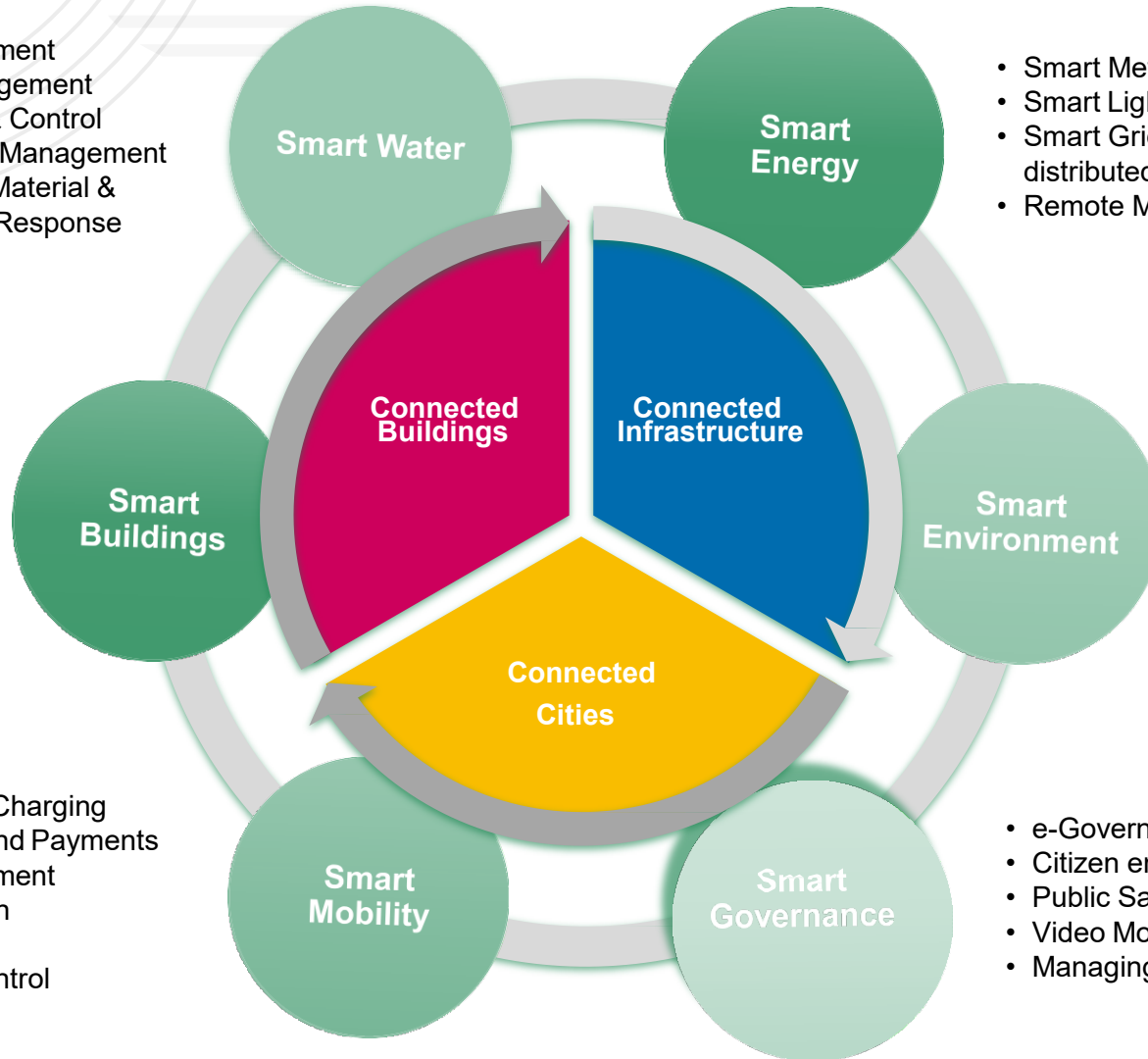
“National Energy Centre (NEC) wants to be a leading smart platform and solution providing company by 2022 in Oman, providing reliable Profitable and sustainable solutions to transform the energy Utilities and related Industries

WE INNOVATE TECHNOLOGY.....



NEC Business Model

- Water Treatment
- Water Management
- Monitoring & Control
- Wastewater Management
- Hazardous Material & Emergency Response



- Smart Meters, AMI
- Smart Lighting
- Smart Grid, micro grid and distributed generation
- Remote Monitoring & Control

- Building Automation
- HVAC Controls
- Smart Lighting
- Video Surveillance
- Access Controls

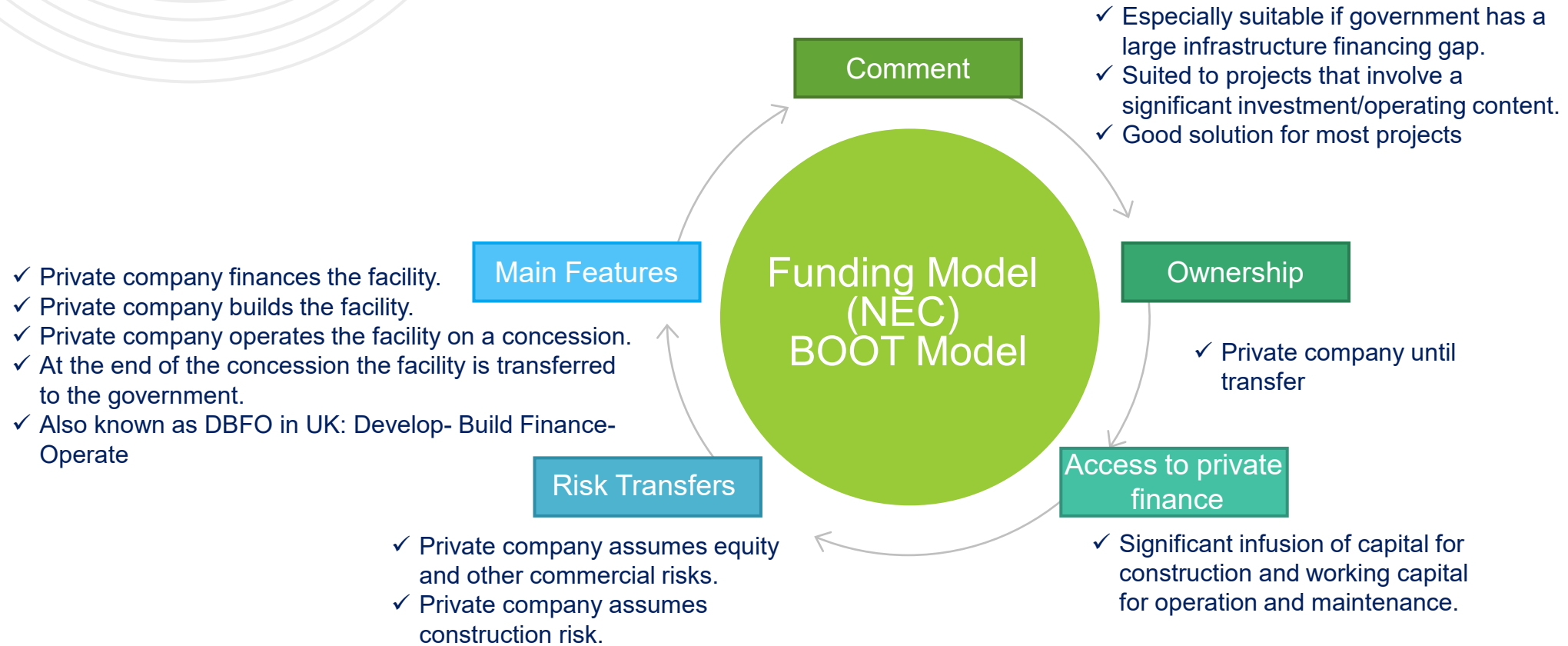
- Solid Waste Management
- Water Waste
- Air Quality Management
- Green Buildings
- Green Energy

- Electric Vehicle Charging
- Smart Parking and Payments
- Parking Enforcement
- Vehicle Detection
- Connected Cars
- Smart Traffic Control

- e-Governance
- Citizen engagement
- Public Safety
- Video Monitoring
- Managing supply-demand policy

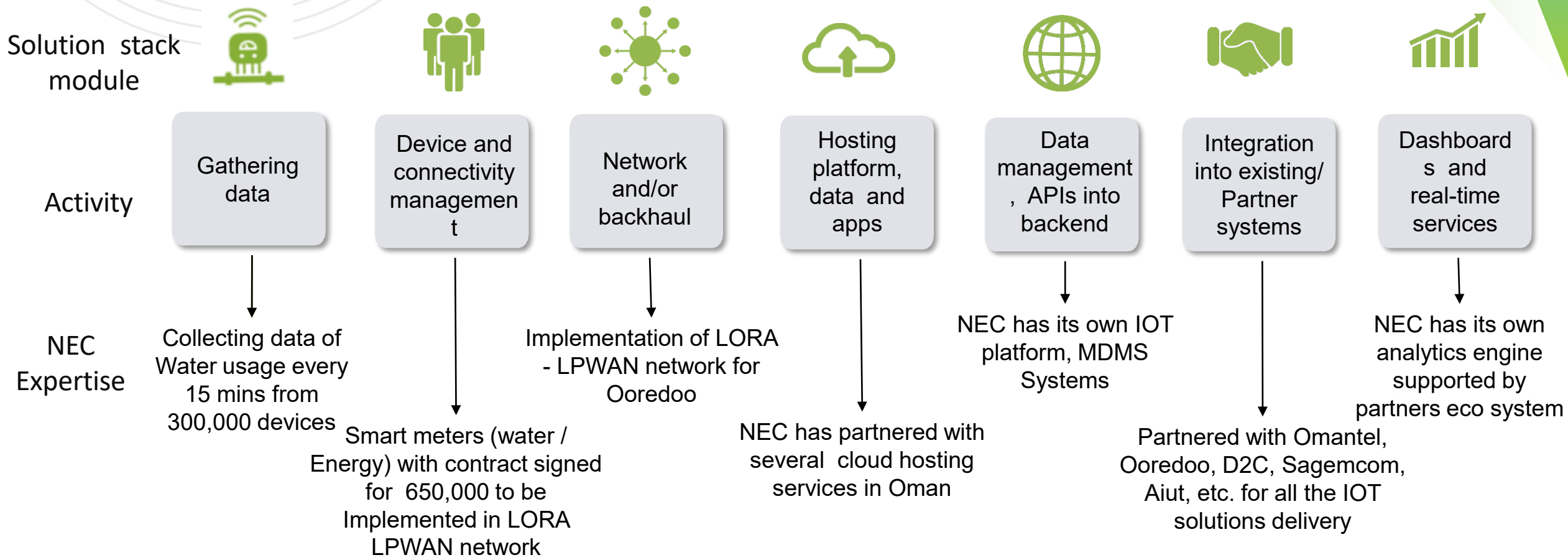


Funding Model – Build Operate Transfer (BOOT)



NEC – Smart Transformation Journey

E2E Solution or Prime/ Aggregator Role



Live Dash board for clients access on the KPI's - Installations



MMR vs AMR



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Advantage of AMI

Accuracy



- Manual Lack of effective and accurate meter reading.
- AMR more effective and give accurate meter reading.

Information



- Manual lack of information in the Billing system database.
- AMR more effective and full information in Billing system database.

Reading



- Manual Reading available only once in a month.
- AMR Daily per hour reading available , Daily , Weekly billing.

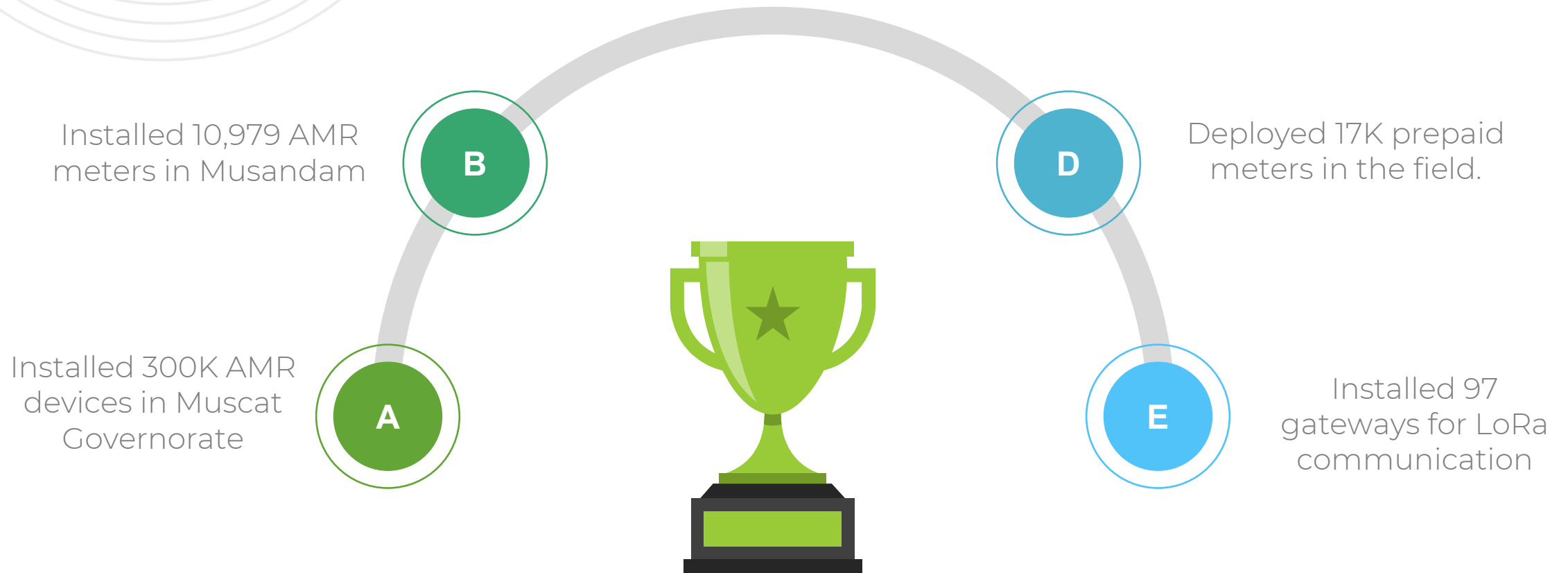
Billing



- Manual Billing and collection delays, Billing errors.
- AMR Accurate billing without positive and negative adjustments

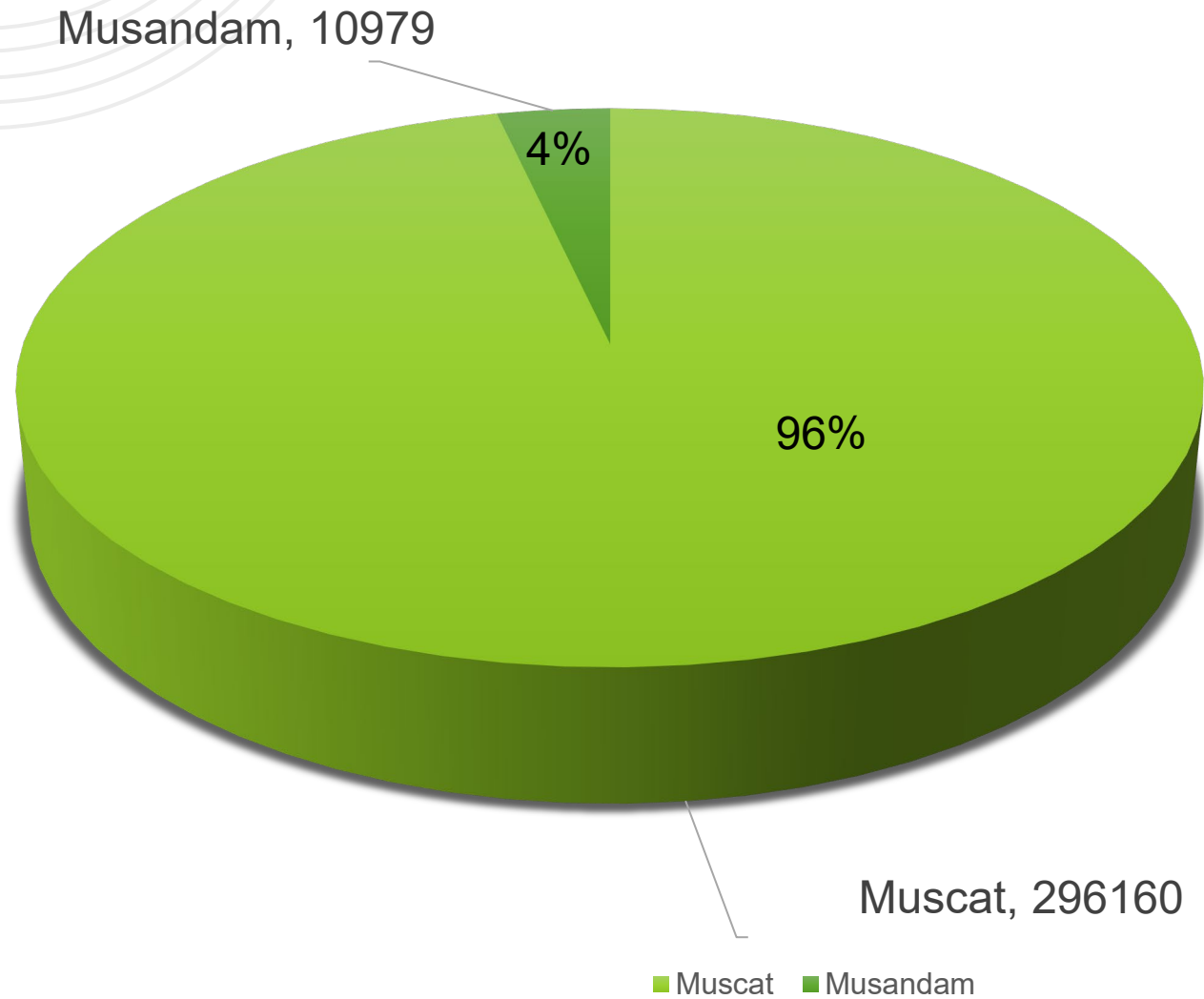


AMR Achievement

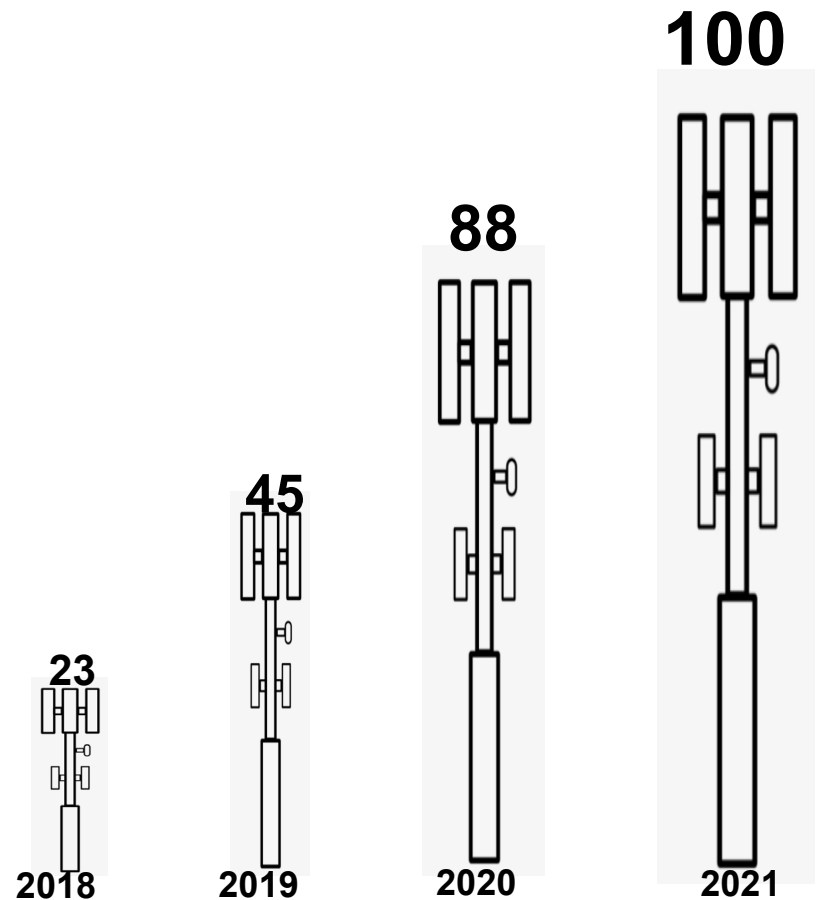
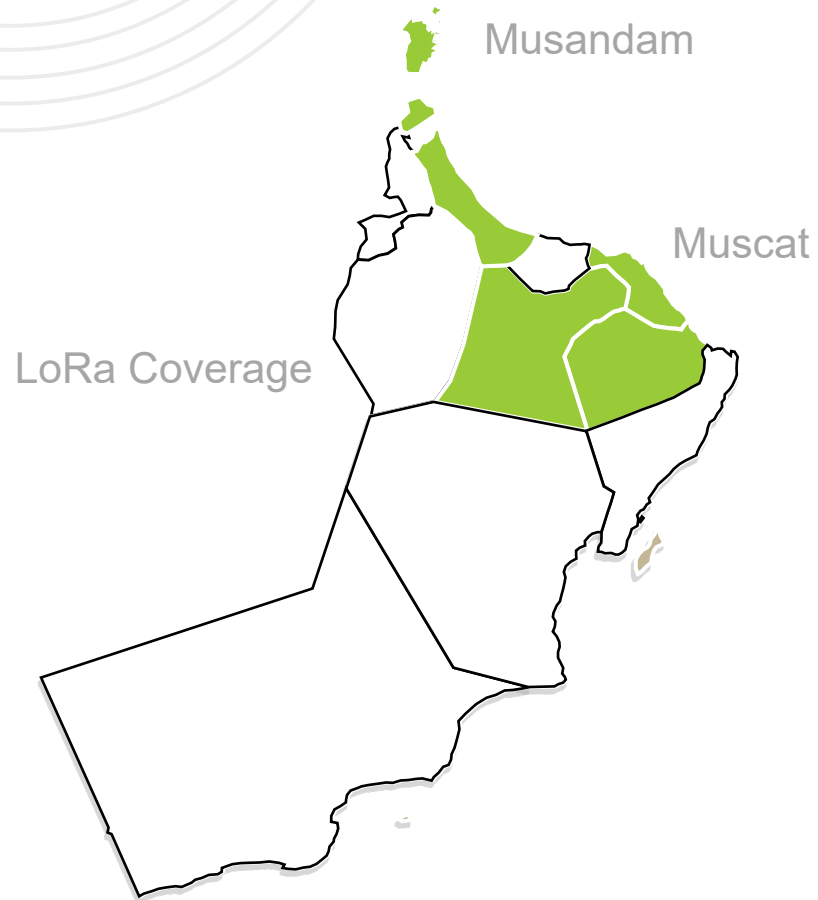


AMR Achievement

AMR METERS IN Oman: 307139



AMR Achievement



Number of LoRa Gateways

WE lead Innovation



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Collaboration

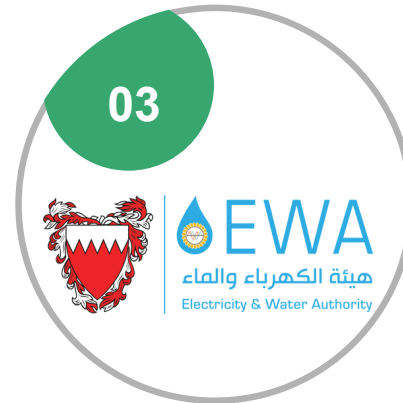
MOU with MTCIT



MOC with PDO



MOA with the
Electricity and
Water Authority in
Bahrain



MOC with Madayn





Agreement with the Electricity and Water Authority in the Kingdom of Bahrain To supply smart water meters in Bahrain



Agreement objective

- Provide the required broadband Internet of Things
- Ultrasonic smart meters with different sizes of postpaid and prepaid
- Building a large-scale IoT using other IoT device and solution providers that manage LoRaWAN

14, July 2021



Areas of Mutual cooperation

- Smart Utilities

AGREEMENT WITH THE ELECTRICITY AND WATER AUTHORITY IN THE KINGDOM OF BAHRAIN

COOPERATION AGREEMENT BETWEEN MINISTRY OF TRANSPORT, COMMUNICATION AND IT AND NEC



Cooperation agreement between The Ministry of Transport, Communications and IT and the National Energy Center To implement IoT and Smart city solutions



Agreement objective

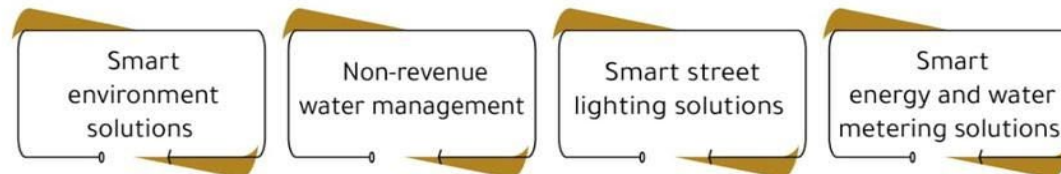
- To implement IoT and Smart city solutions
- Long bi-lateral cooperation that will encourage knowledge transfer across government, business and academia.



Areas of Mutual cooperation

- Smart Utilities
- Smart infrastructure solutions
- Smart environment solutions

Examples of smart cities concepts to be implemented



@MTC@OMAN

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Memorandum of Collaboration (MoC) with PDO

To implementation of a Smart City pilot
project in PDO's Ras Al Hamra residential



Agreement objective

- Smart water metering
- Smart energy metering
- Smart street lighting
- Smart irrigation



Areas of Mutual cooperation

- Smart Utilities
- Smart infrastructure solutions
- Smart environment solutions

16, September 2021



MEMORANDUM OF COLLABORATION (MOC) WITH PDO

MEMORANDUM OF COLLABORATION (MOC) WITH MADAYN



Memorandum of Collaboration (MoC) With Knowledge Oasis Muscat, To provide IoT solutions for Knowledge Oasis Muscat and transform it into a smart city



Agreement objective

- Smart street lighting
- Parking management system
- Smart irrigation
- Smart urban water management
- Access control
- Building management system



Areas of Mutual cooperation

- Smart security system
- City management system
- Smart environment solutions
- Smart facilities management system

17, October 2021

OUR SMART SOLUTIONS



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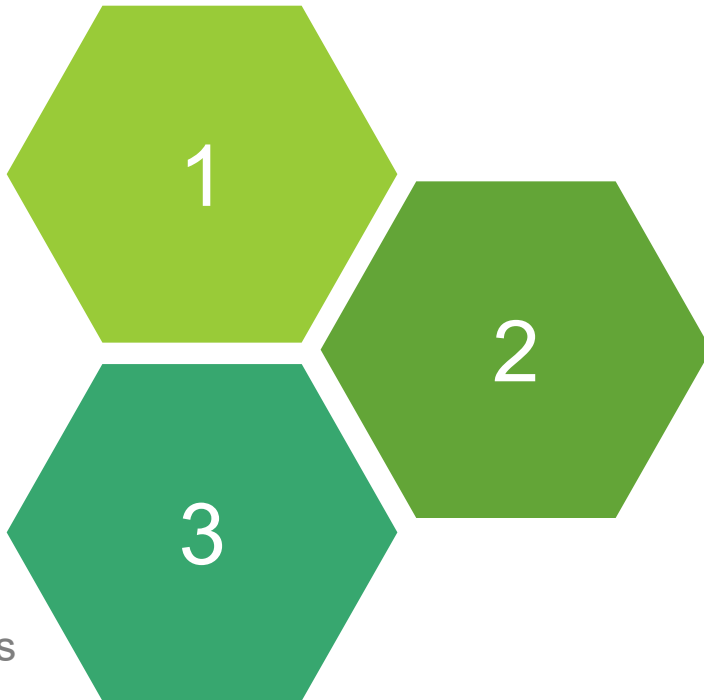
Non-Revenue Water- Ansab area



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National Energy Center

Non-Revenue Water- Ansab area

PAW & NEC conducted a pilot exercise for Non-Revenue Water in Al-Ansab area.



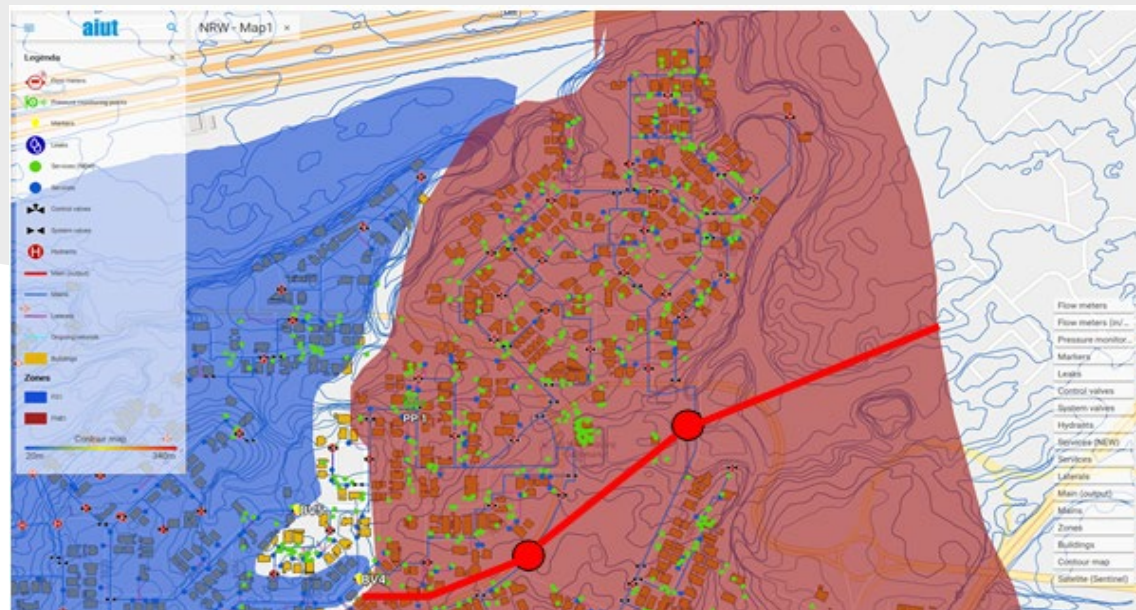
Water Lost per day was estimated to be of the volume of 1.35 million gallons.

The estimated annual savings after locating the underground leaks is to the tune of over 2.5 million USD

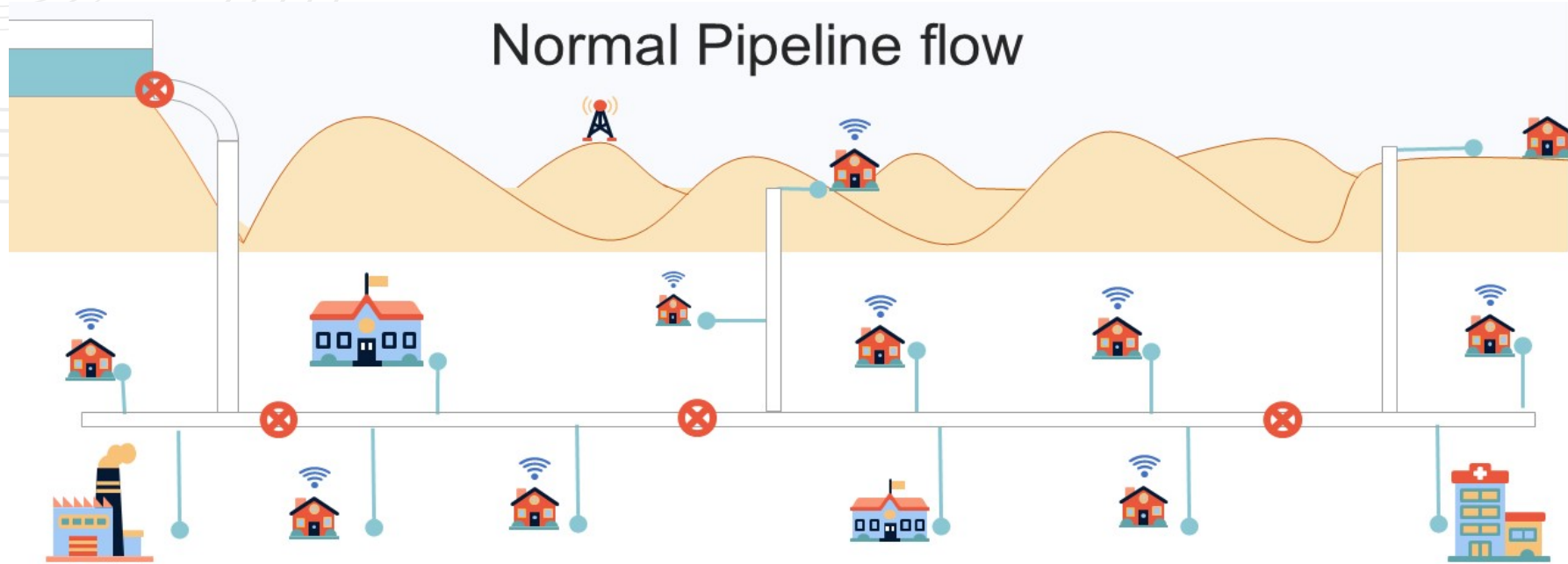
Non-Revenue Water- Ansab area

Based on received data we selected subzones for limitation of deep investigation areas and efforts prioritization.

Closing is required to be done for 3h in night time to reduce impact on area citizens and compare with night flow.



Non-Revenue Water- Ansab area



Reservoir



Valve



Getaway (LoRa)



Main pipeline



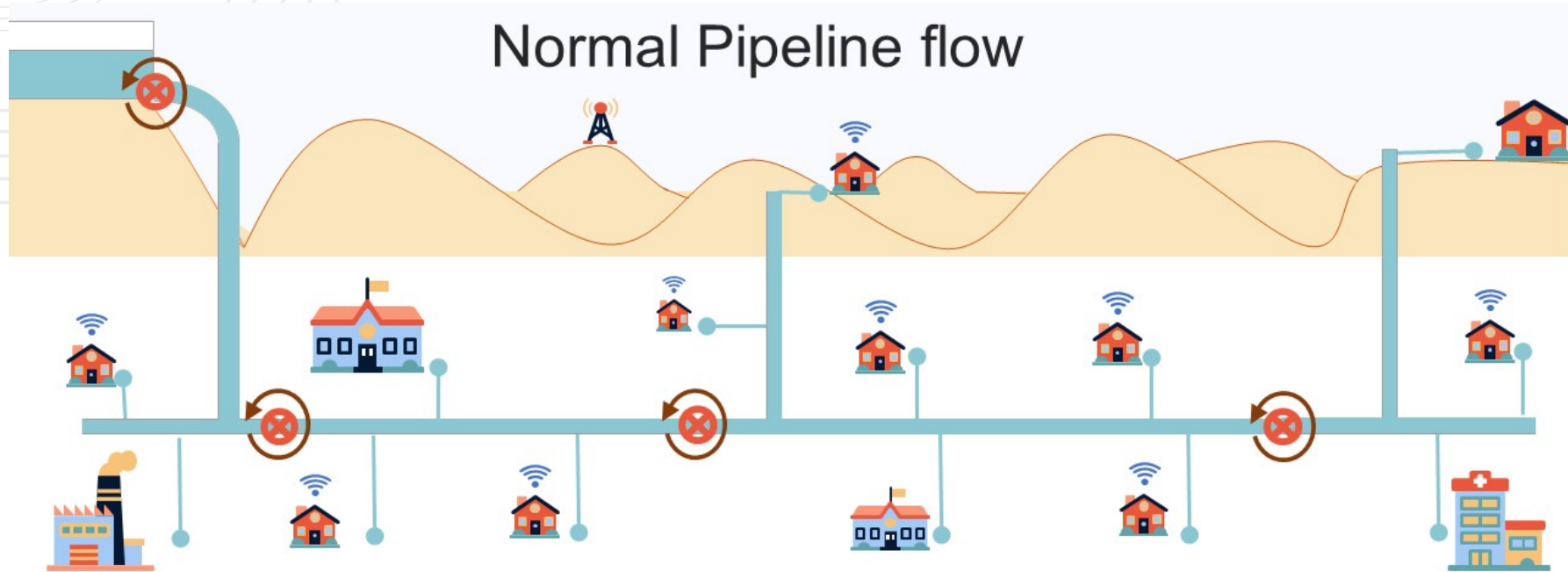
Pipe to the house



House with smart meters



Non-Revenue Water- Ansab area



Reservoir



Valve



Getaway (LoRa)



Main pipeline



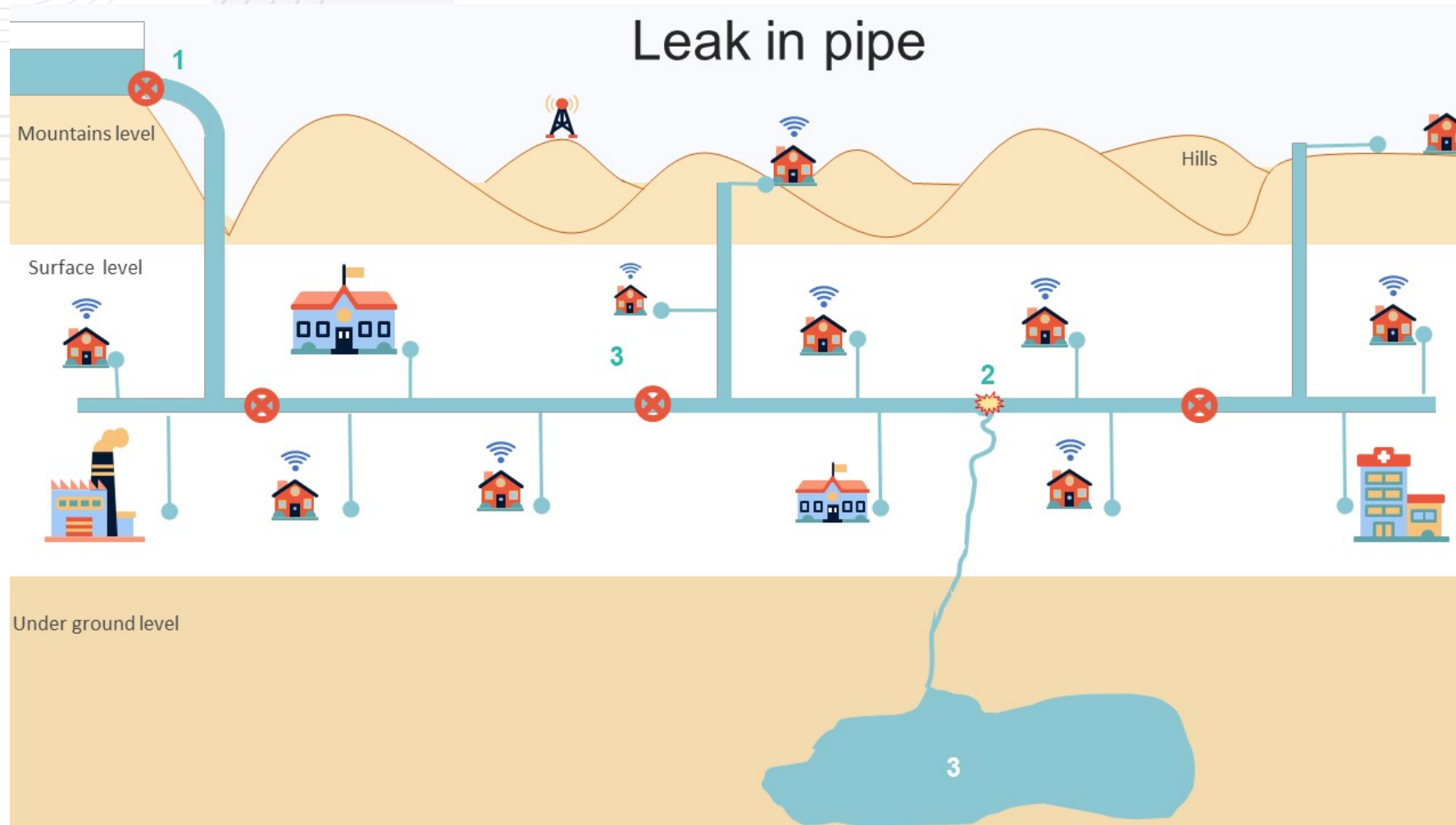
Pipe to the house



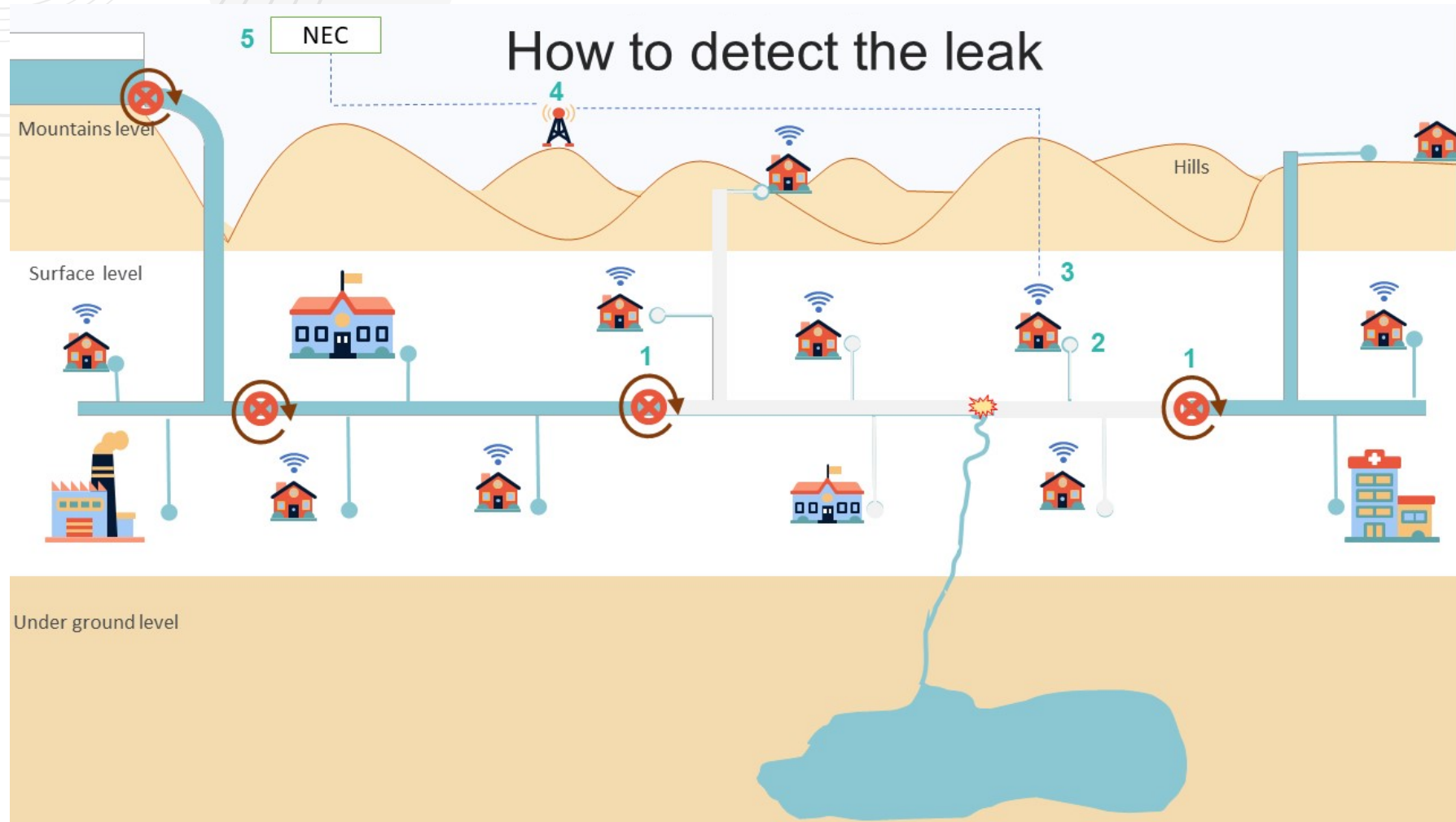
House with smart meters



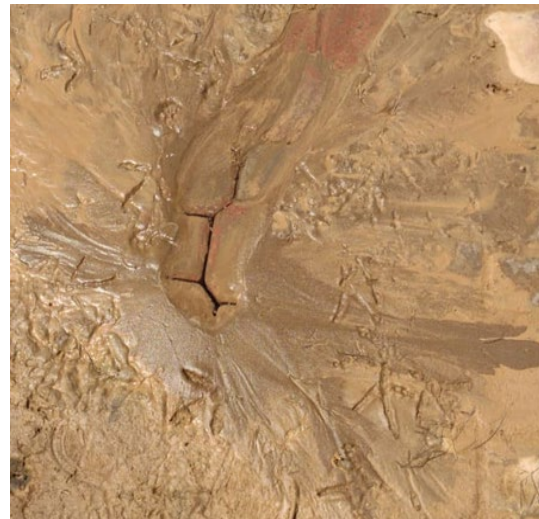
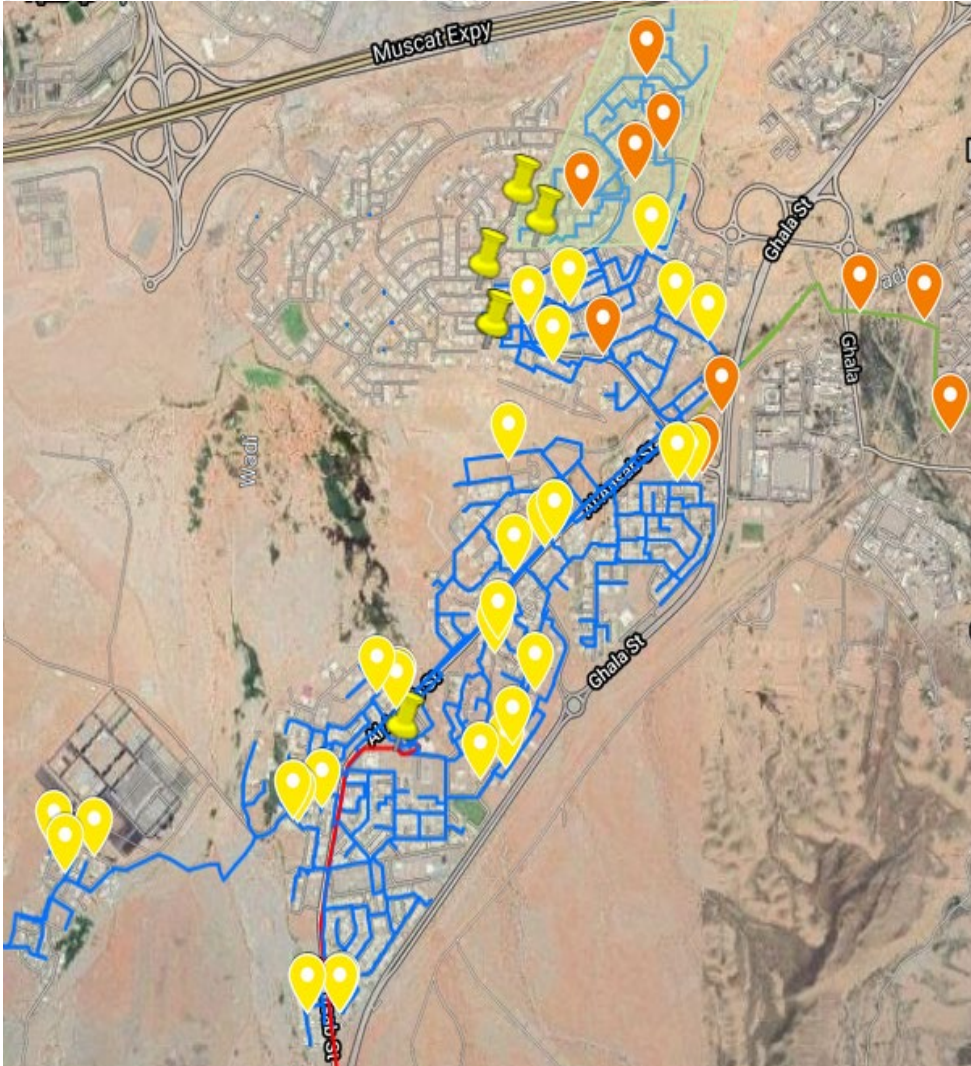
Non-Revenue Water- Ansab area



Non-Revenue Water- Ansab area



Non-Revenue Water- Ansab area

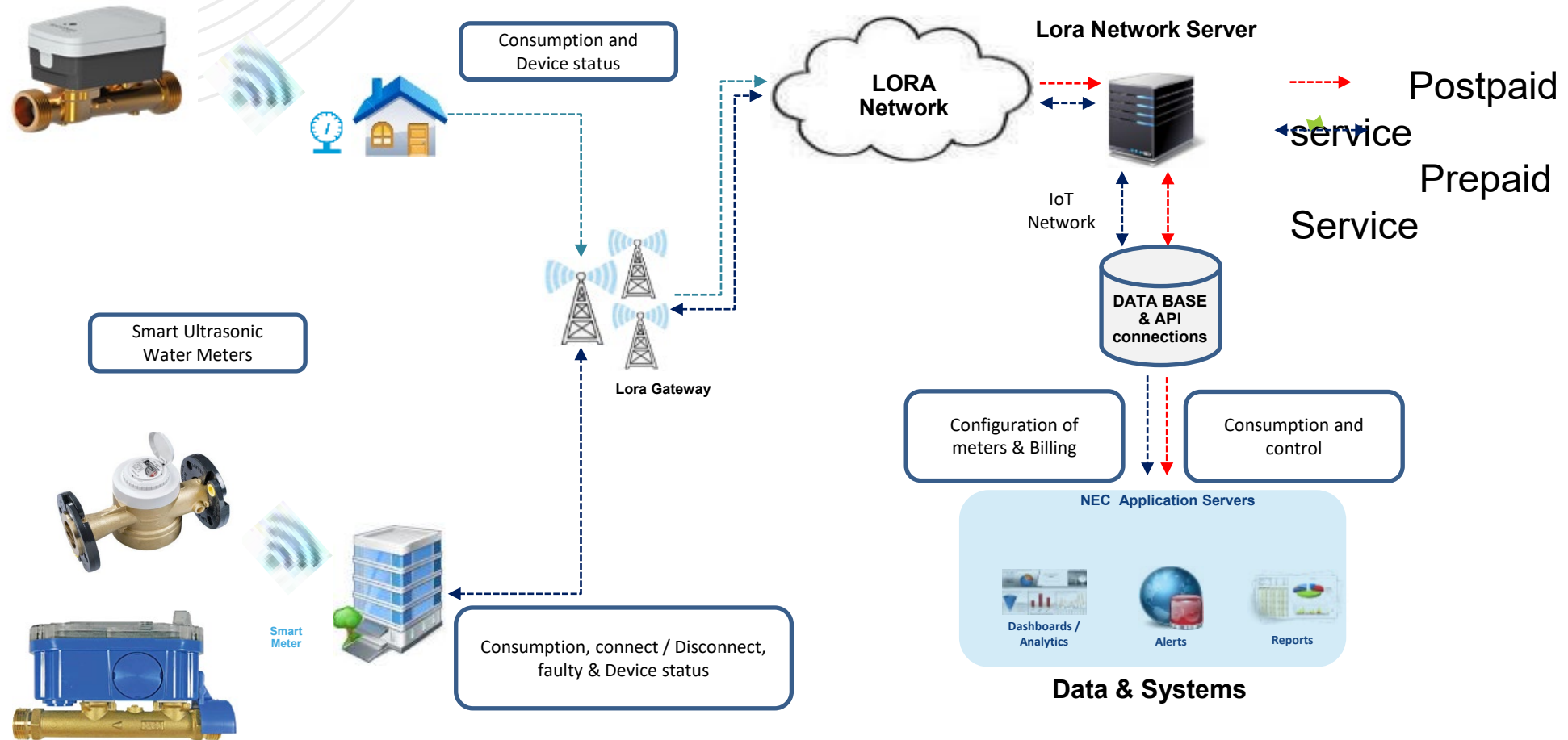


Leaks found by team on DMA area

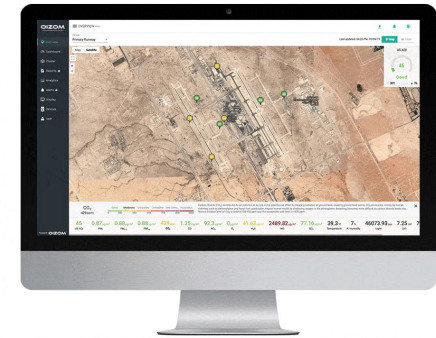
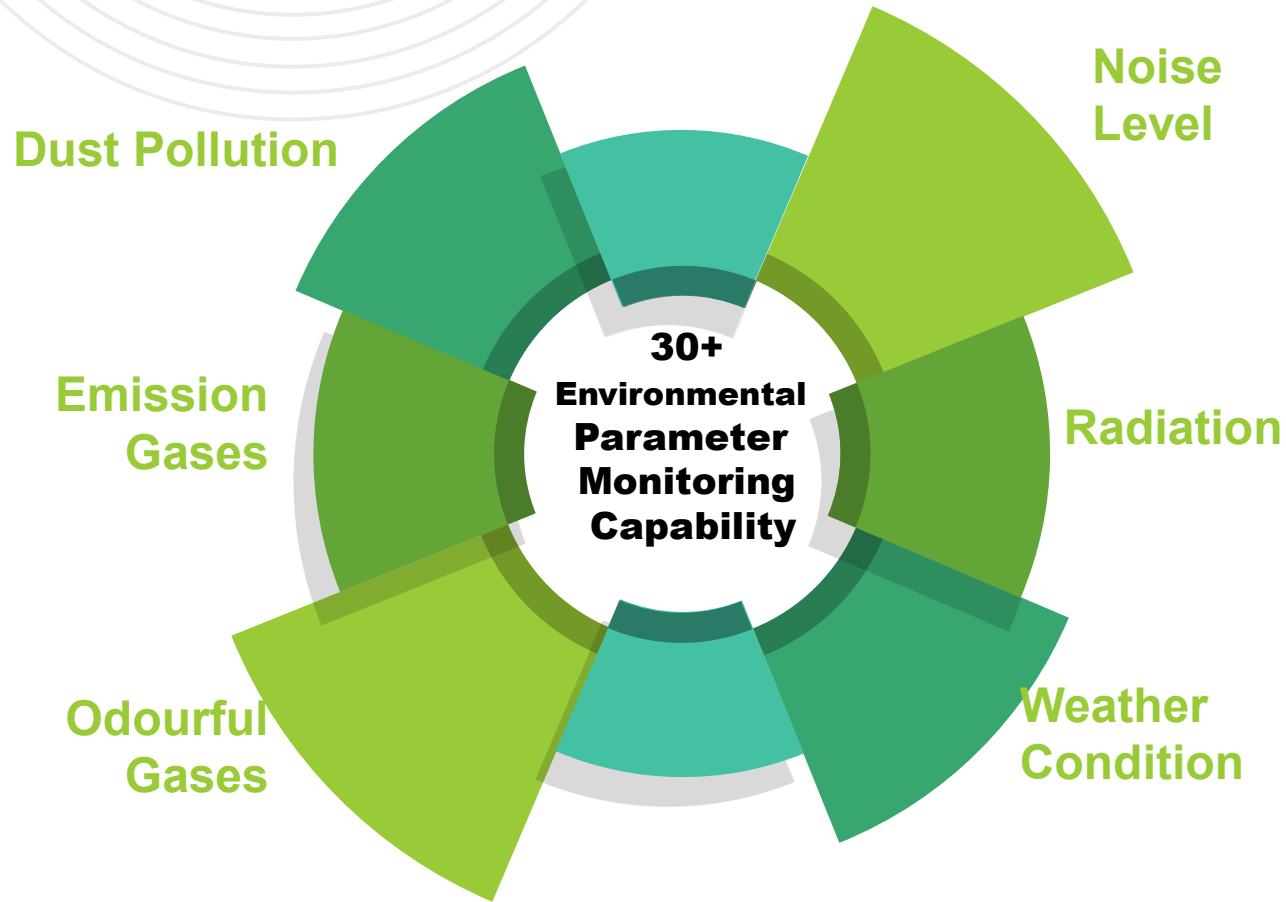
NEC provided interactive map with location and pictures attached to every issue found in FNB1 area



Smart Water Solutions



Smart environment monitoring solution



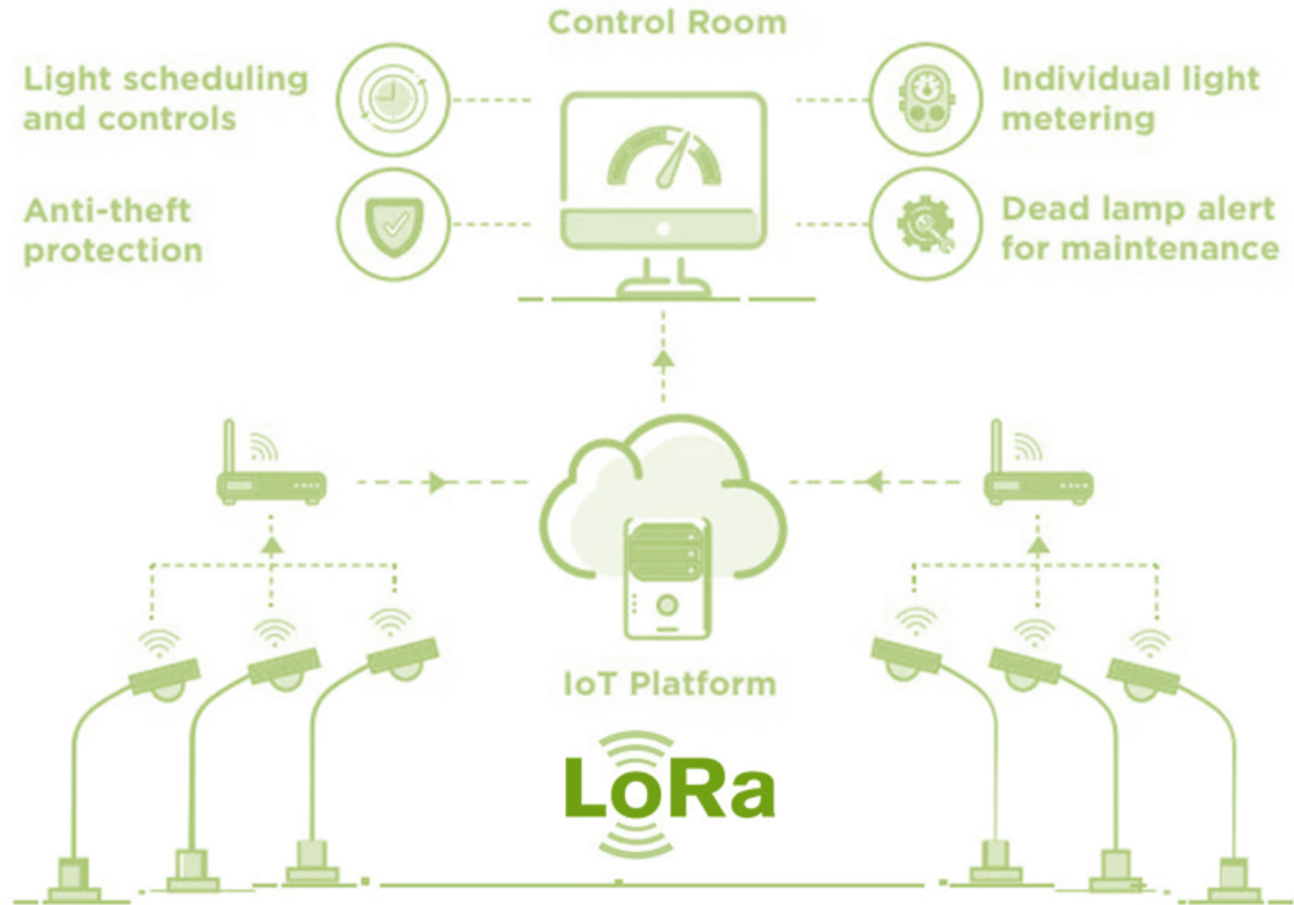
- Actionable Alerts
- Industrial Automation
- Insightful Reports
- LED Display / TV / Web
- Predictive Analytics
- Mobile App



Smart Lighting

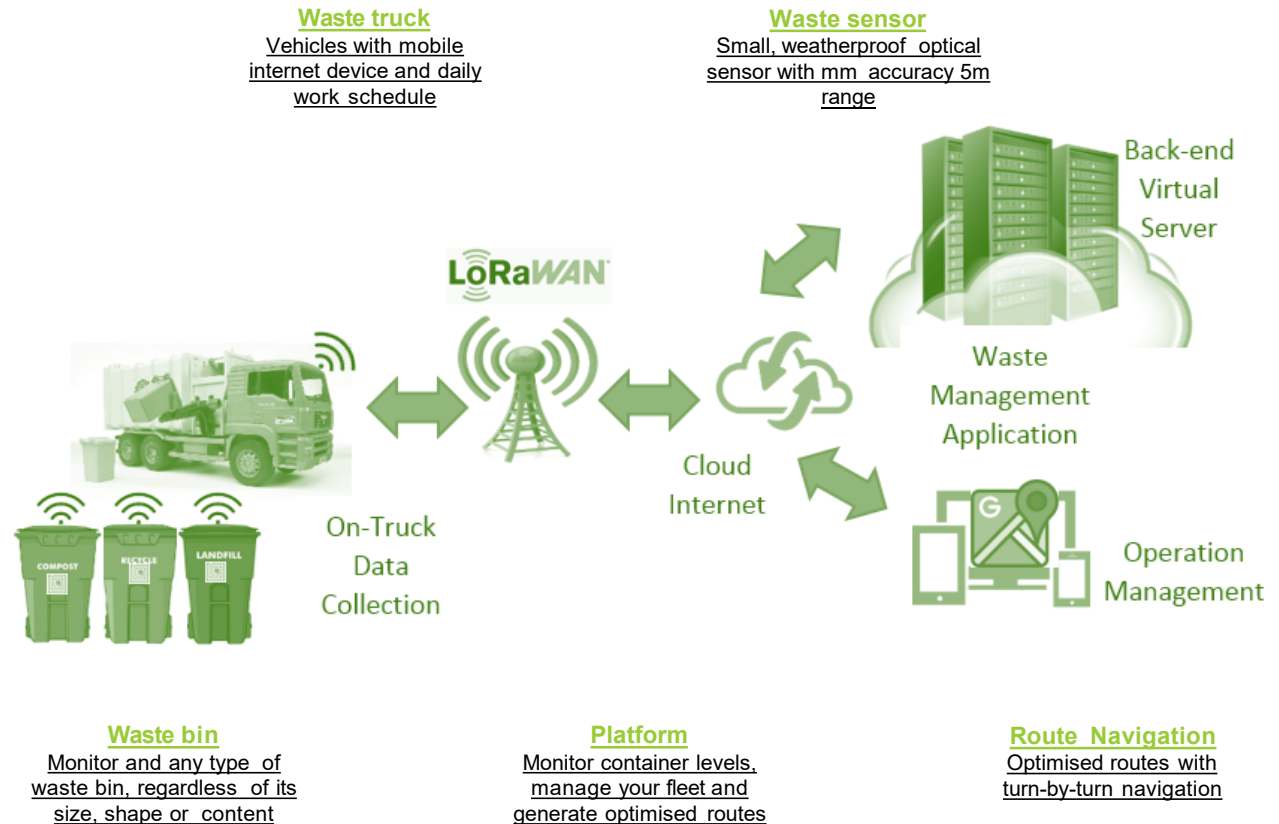
The Benefits:

- ✓ Vendor agnostic and interoperable
- ✓ Saves money for the community
- ✓ Increases lighting service quality
- ✓ More sustainable cities and cleaner environment
- ✓ Improves maintenance efficiency



Smart Waste Bin Management

- ✓ Intelligent Waste Bin monitoring solution
- ✓ optimize collection, operations and maximize the use of valuable resources
- ✓ Wireless Ultrasonic Level Sensors for containers
- ✓ Logs continuous data from sensor, provides a war room view of operations and generates optimized routes
- ✓ Alerts on container level, Handling of containers

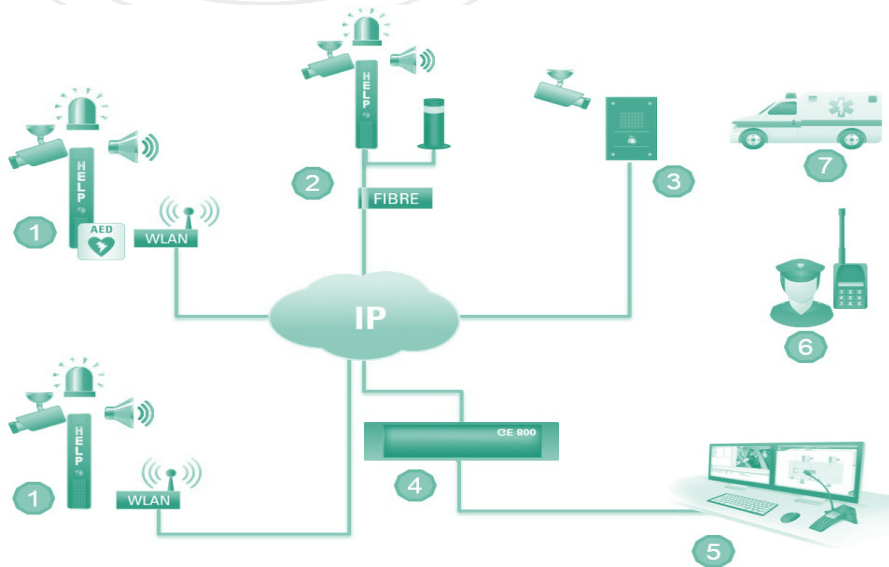


Use Case – Smart Irrigation



- ✓ Wireless battery operated valve
- ✓ Extreme range propagation even buried below ground surface
- ✓ Battery Operated with ultra-low consumption
- ✓ 7+ years autonomy
- ✓ Watering schedulers
- ✓ Fraud resistant with tamper proof
- ✓ Soil moisture sensor input(wired), 2X Dry contacts
- ✓ Web interface, Mobile app (android & IOS)

Safety & Security



Web application

- ✓ Interfaces to third-party systems
- ✓ video surveillance
- ✓ Real-time analyses

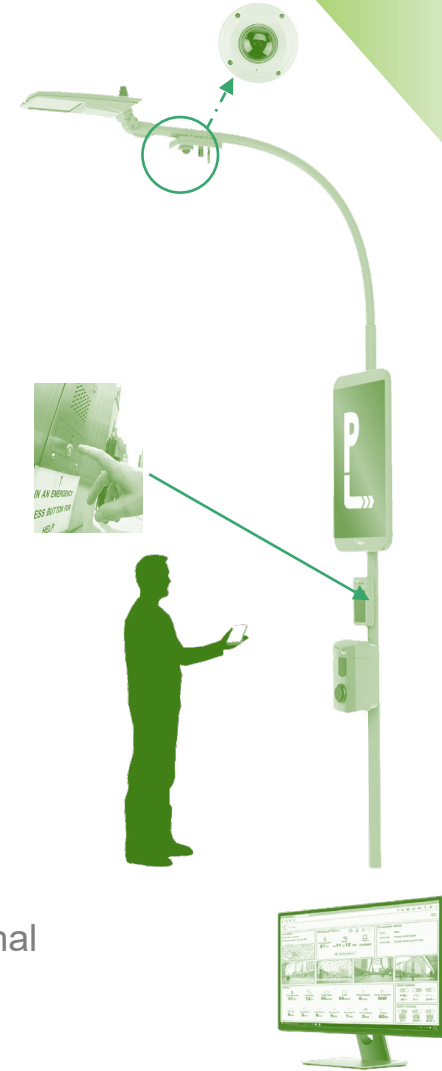
Smart Public Pole

IP Security Camera 360°

- ✓ IP67 weatherproof industrial grade camera
- ✓ Wide angle
- ✓ Polycarbonate construction
- ✓ Remote controlled

Emergency call station

- ✓ Vandal-resistant design
- ✓ Call buttons and hands free communication
- ✓ Continuous link and function checks
- ✓ Extension modules for additional functions



Command & control Centre



Smart parking

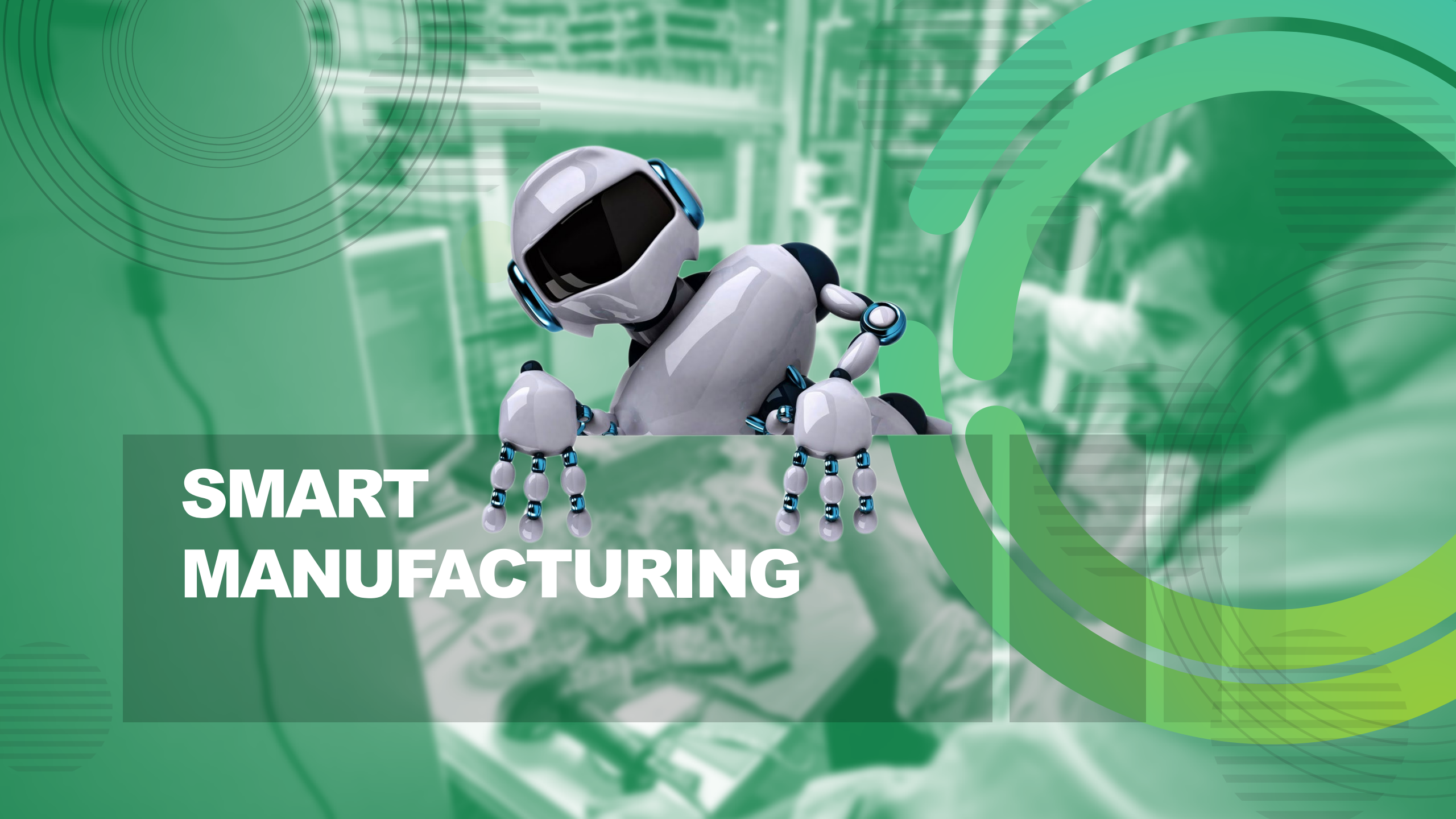
Security and monitoring

- ✓ Parking at ban of staying, driving in opposite direction
- ✓ Suspicious behavior of people around, car robbery
- ✓ Navigation directly to free parking space, navigation directly to car
- ✓ Car speed, exceeding the speed limits

The operator statistics

1. Number of vehicles parked
2. Average time of parking
3. Overtime details of the vehicles
4. Monitoring of parking space occupation





SMART MANUFACTURING

ECTRON

Smart Factory

Robots

Smart Meters

Water
Energy
Gas



Investment

4 million OMR
25 Omanis Trained

Location

Industrial Rusayl

Internet of Things Devices Factory

Aims to locally manufacture smart meters and expand their use

Water

Energy

Gas

Current status: limited use of smart meters

In the future: installment and approval of using smart meters for water, electricity and gas

Implementing agency:
National Energy Center (NEC)

Investment:
OMR 4 million

Number of jobs:
30 by 2021, 1st phase

Factory location:
Al Rusayl Industrial City

Importance:

- Reducing the cost of using conventional meters
- Providing accurate data on consumption
- Monitoring, reducing and locating leakages
- Adjusting user consumption

The National Energy Center (NEC) has successfully implemented 2 pilot projects

Musandam Governorate:
Installment of +10K electricity smart meters project (2016)

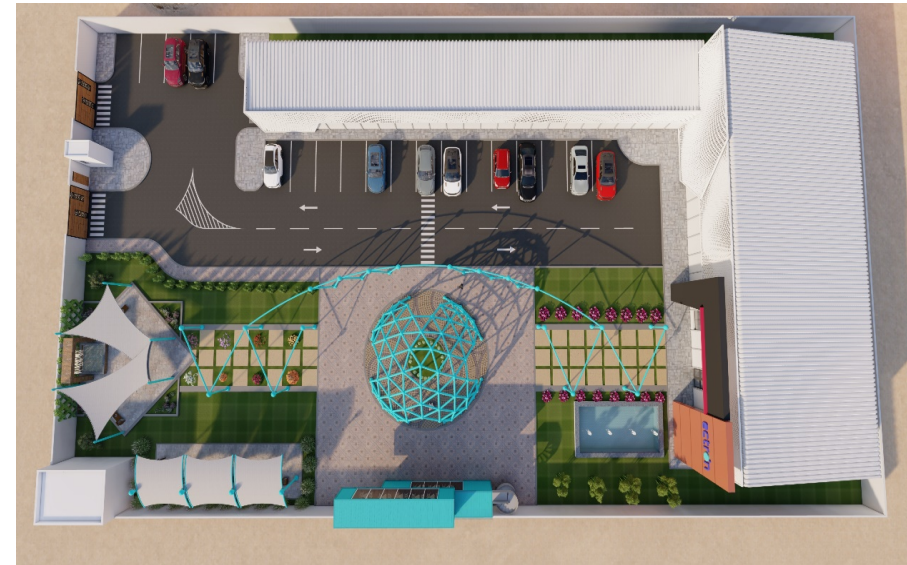
Muscat Governorate:
Installment of +300K water smart meters project (2019)

Factory Building- Rusail



WAREHOUSING

- NEC has a central warehousing of 1,750 cum, in Rusayl Industrial Estate, which accommodates more than 150,000 units of energy meters.
- The warehouse complies to the required industrial norms.



Our Champions

❑ Recruited 25 young Omanis

❑ IOT and Robots



Be Smart and Innovative

<https://www.linkedin.com/in/lailaahadhrami/>

<https://twitter.com/Lailazam>

www.nec-com.oman