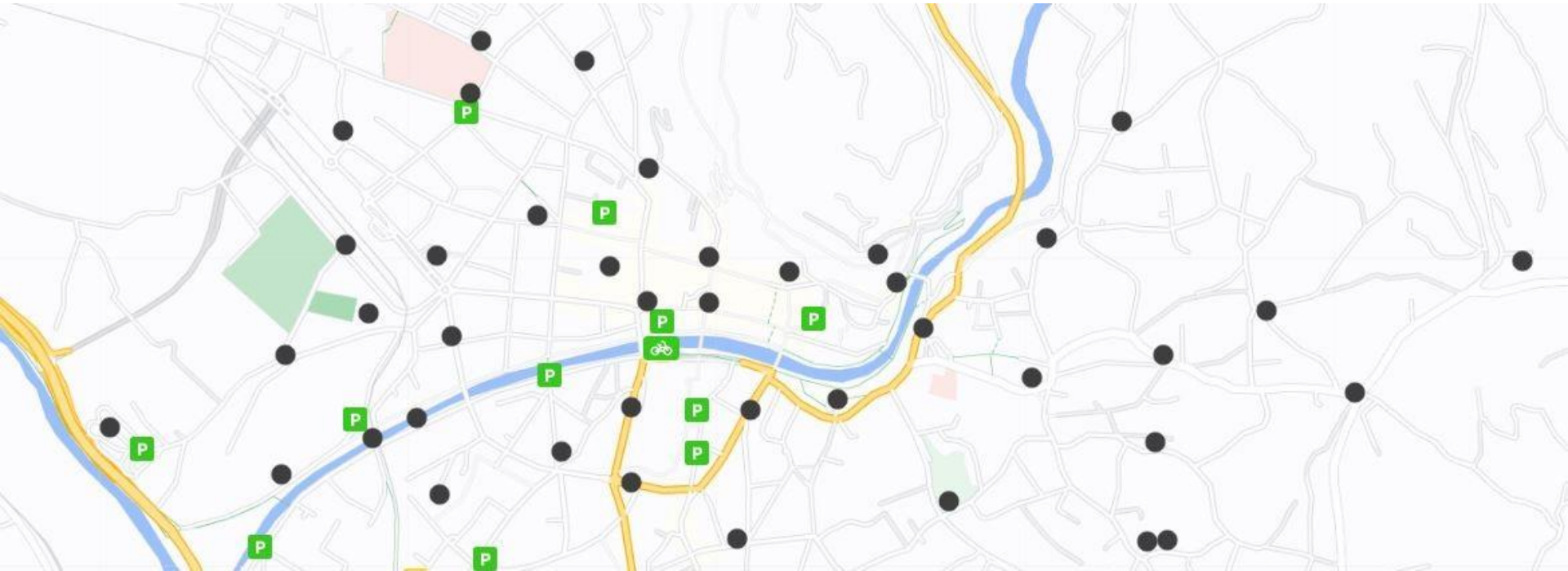




ASM Merano
Stadtwerke Meran

Per un ambiente migliore
Für eine bessere Umwelt

Stadtwerke Meran – Smart City 100% Open Source



Stefan Mutschlechner - Stadtwerke Meran



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Stadtwerke Meran

Data & Facts

Founded: 1928
Employees: 100
Revenue: over 20 millions

In-house company of the
Municipality of Meran





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WE KEEP THE CITY CLEAN



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Stadtwerke Meran

Pulizia Strade
Straßenreinigung



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Raccolta Rifiuti
Müllentsorgung





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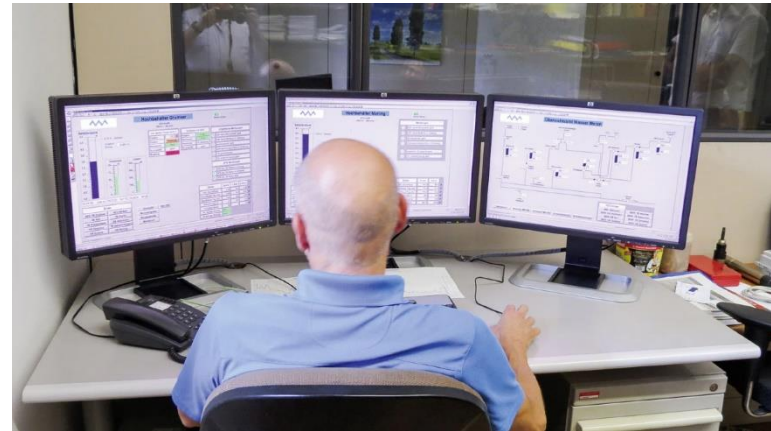
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WE SUPPLY THE CITY WITH WATER



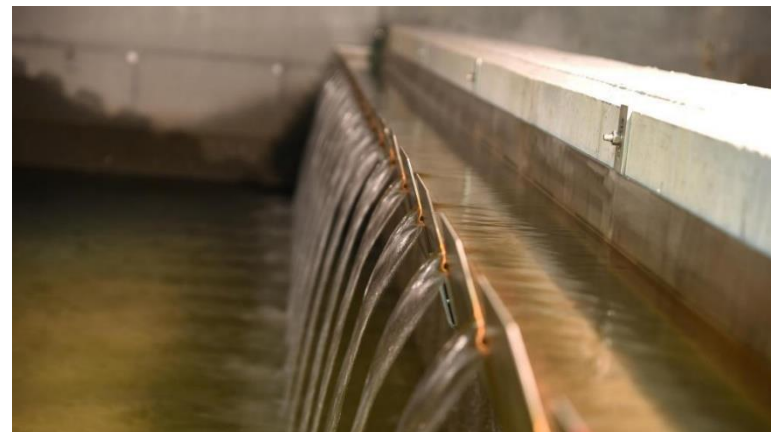
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Fornitura Acqua
Wasserversorgung



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Fognature
Abwasser





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WE ILLUMINATE THE CITY



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illuminazione Pubblica
Öffentliche Belichtung





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WE ARE TRYING TO MAKE MERANO SMARTER



Smart City

ASM Merano
Stadtwerke Meran



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Raccolta Rifiuti
Müllentsorgung



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Wasserversorgung



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Straßenreinigung



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Fognature
Abwasser



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Illuminazione Pubblica
Öffentliche Beleuchtung

- Optimization of our services
- Operation and implementation of city-owned systems (Temperature monitoring , Bike box, Traffic Counter)



OPERATIVE USE CASES

- Light: Control cabinets for public lighting 4G
- Waste: Presscontainer 4G
- Bike Box: Boxes with smart locking system 4G



- Our partner:  **TELMEKOM**
NETWORKS



USE CASES IN DEVELOPMENT

- Light: Smart Lighting
- Just Nature : Temperature, Humidity
- Traffic: Integrate Traffic Data
- Water: Smart Metering

Lorawan

Lorawan

4G

Lorawan





THE BEGINNING

The 70 public lighting control cabinets already had a remote monitoring system

At the end of 2019, we get the announcement that the communication protocol used for this system would be **switched off**.

We needed a new solution quickly in order not to go OFFLINE (150 km of roads with public lighting)



404. That's an error.

The requested URL
/badpage was not found on
this server. That's all we
know.





THE EXISTING SOLUTION

What had brought us to this situation

- Proprietary software for lighting cabinet controller and lighting platform
- The modem was soldered into the lighting control unit
- System was **not modular, and not adaptable**

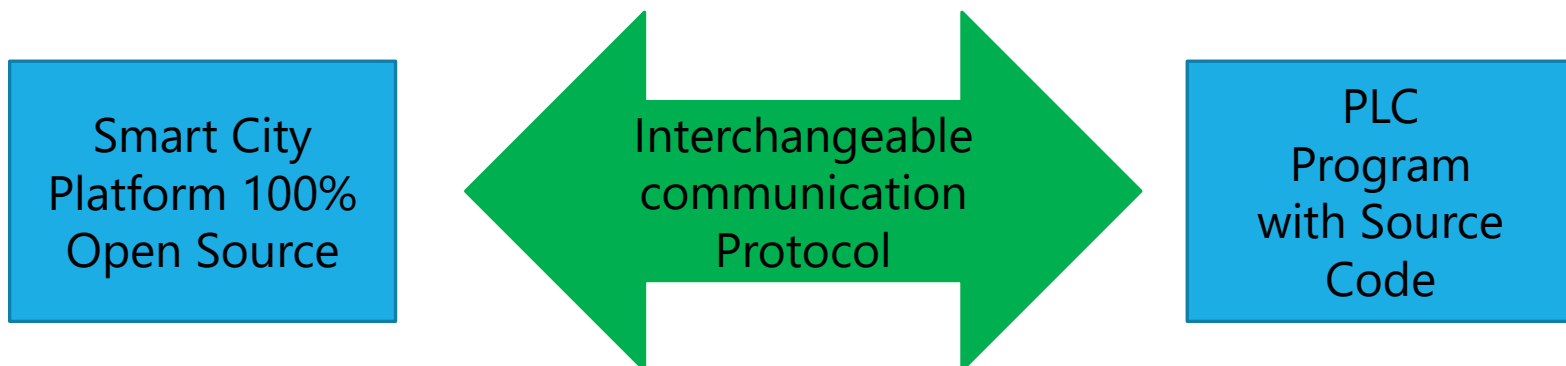




THE NEW SOLUTION

How do we avoid ever getting into such a situation again?

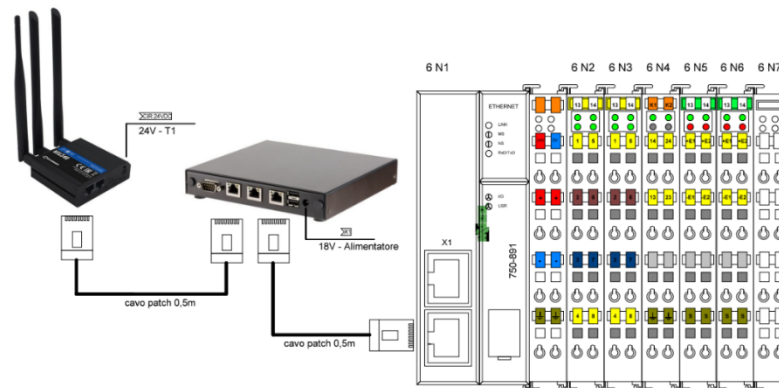
- Development of a new 100% Open Source based platform.
- The modem is connected to the PLC control via a network cable.
- Development of the PLC program for the Lighting controller.
- The system is modular, and adaptable





THE IMPLEMENTATION

- Software development for platform and PLC
- VPN network has been set up
- The cabinet controller(PLCs) were installed by public lighting team
- **Development and installation in 4 months!!!**





USE CASE LIGHT CABINETS

- Visualization of the actual line status
- Remote control on/off
- Alarm via automatic voice call
- Configuration of the switch-on time (get weather data form Open Data Hub for correct on/off time)





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USE CASE PRESSCONTAINER

- 1500 user per day
- 50% of Merano's residual waste
- 16 Presscontainer
- 10 Underfloor container





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THE BEGINNING

The maintenance electrician's contract expired at the end of 2020 and the tender came up empty.

Maintenance by public lighting team

Alerting via SMS or e-mail not suitable



THE PROBLEM

- Press Container use every 5 minutes at peak times

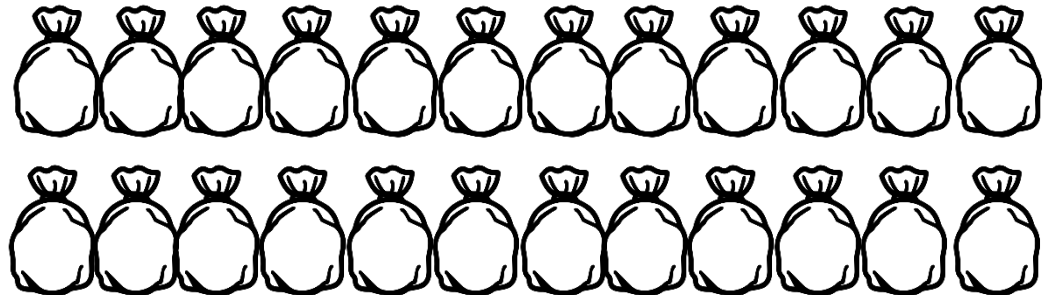
- Standstill 10 min:



- Standstill 30min:



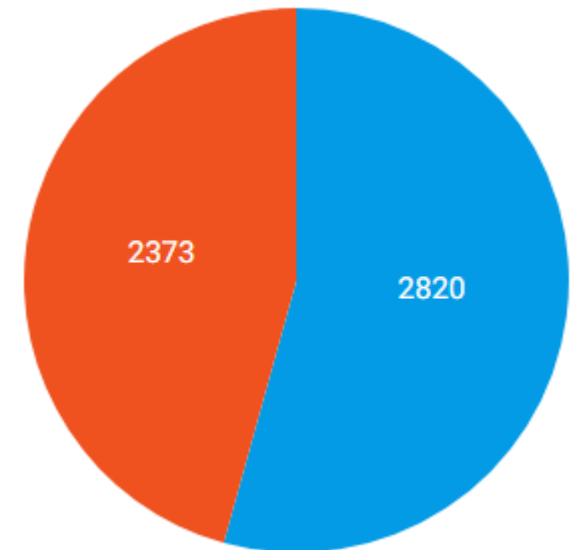
- Standstill 120 min:





THE SOLUTION

- Minimisation of downtimes
- Automatic WARMSTART- reinitialization
- In case of unsuccessful WARMSTART - alerting the employee via automatically generated voice call
- Success rate at 60%
- 2820 problems solved automatically since May 2021





THE NUMBERS

- Comparison service operations on site

2020 June July August	300 service operations
2021 June July August	100 service operations

- Comparison service costs

01.12.2019 – 01.12.2020	77.000 €
01.12.2020 – 01.12.2021	32.000 €



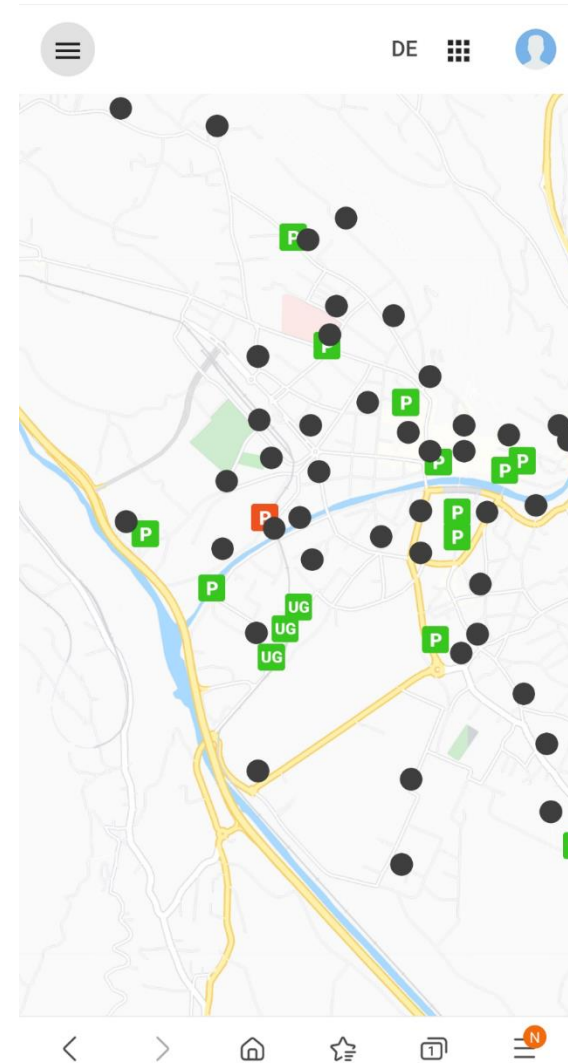
USE CASE BIKE BOX

- The bike boxes were installed within the EU project Mentor of the municipality of Merano.
- Stadtwerke Meran are responsible for maintenance
- 2 Locations
 - City Centre 12 Boxes
 - Train station M.B. 12 Boxes
- The boxes can be booked and opened via an APP



USED TECHNOLOGIES

- Python - backend
- Google Angular – frontend - desktop
- React Native – frontend - mobile
- PostgreSQL Database
- Open VPN
- Modbus TCPIP





USED TECHNOLOGIES

- Chirpstack – Lorawan Network Server
- Fiware – Snap 4 City Platform



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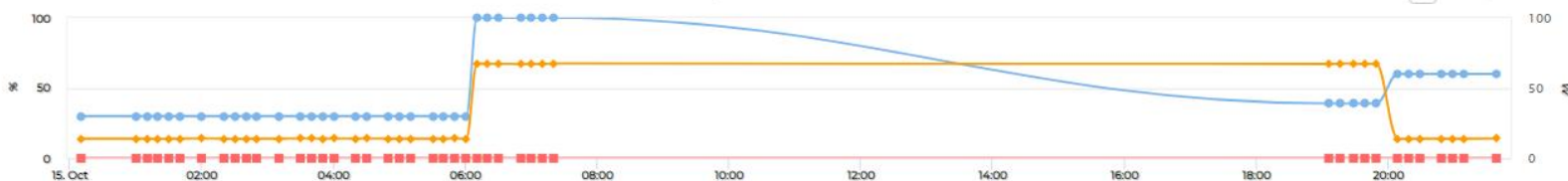
Stato Linea

Attivo

Stato Linea verso Merano Centro

Attivo

Stato Linea verso Sinigo



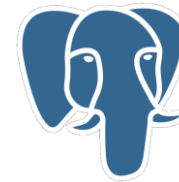


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WHY OPEN SOURCE

- Independence – no vendor lock in
- Possibility to **collaborate with other cities**
- Most smart city use cases would be **uneconomical** with license costs to pay
- For don't have a platform for every use case
- The "**codice appalto**", Italian procurement code, obligate public administrations to rotate.
- Possibility to have a internal software development team in the future





WHY OPEN SOURCE

- It's possible → Art. 68 CAD.
- Public administration can only use proprietary software if it's impossible to find an open-source solution

1-ter. Ove dalla valutazione comparativa di tipo tecnico ed economico, secondo i criteri di cui al comma 1-bis, risulti motivatamente l'impossibilità di accedere a soluzioni già disponibili all'interno della pubblica amministrazione, o a software liberi o a codici sorgente aperto, adeguati alle esigenze da soddisfare, è consentita l'acquisizione di programmi informatici di tipo proprietario mediante ricorso a licenza d'uso. La valutazione di cui al presente comma è effettuata secondo le modalità e i criteri definiti dall'AgID.



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THANK YOU FOR
YOUR ATTENTION!