GLOBALTRONICS

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Egypt

VUKA GROUP
EXPERIENCE THE CONNECTION

Egypt’s G3-PLC Smart Meter Rollout

Deployment Insights by **Globaltronics**

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VP Technical and R&D

Project Context

Advanced Metering Infrastructure (AMI) Initiative

- Launched by EEHC: 250,000-meter AMI pilot
- Objective: Evaluate communication technologies across 5 utilities
- Technologies considered:
  - G3-PLC
  - PRIME
  - Broadband PLC
  - Cellular
- Result: Globaltronics/Sagemcom awarded deployment of:
  - ~50,000 meters in NCEDC
  - ~15,000 meters in SCEDC
  - Based on G3-PLC technology

Globaltronics Milestone in Numbers

6Mn+

Annual Production Capacity

3

Production Factories

20Mn+

Meters Installed

25Y+

Experience of R&D

15Mn+

Prepaid Meters Installed

1Bn$

Annual Transactions on GT Payment Solutions

Globaltronics:

The Leading Metering Solution Provider in MEA region

Egypt #1

Egypt #2

KSA

About the G3-Alliance

- Member-based organization
- Not-for-profit
- Objective: Standardise & Enhance the G3 communication protocol
- Operates Certification program enabling multi-vendor interoperability

G3-Alliance

Enabling the smartest grid...together

Visit us at Booth #D176

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The Five Best Benefits of G3-PLC and G3-Hybrid

1 **Cost effective**	• Uses existing powerlines for communication minimizing infrastructure and maintenance costs • No telecommunication fees
2 **Secure**	• Supports MAC-level security using AES-128 cryptographic engine
3 **Robust**	• ‘Robust’ mode for communication under noisy conditions • Self-healing mesh network and high indoor penetration
4 **Interoperable**	• International ITU standard • Certification program enabling multi-vendor implementations
5 **Future proof**	• End to end IP communication and IPv6 compliant • Designed to accept diverse application layers

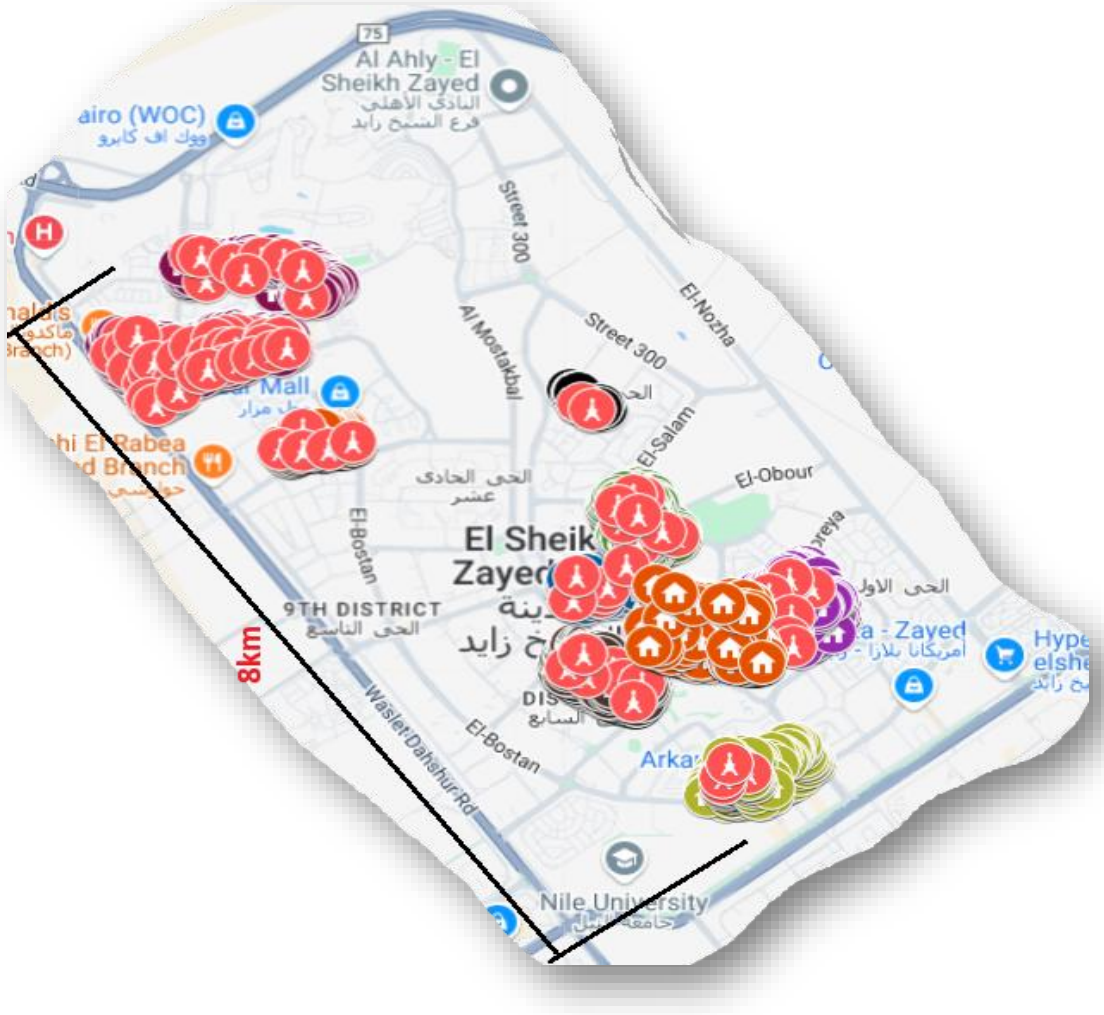
Deployment Scope & Responsibilities

Globaltronics Roles

- Engineering & site survey.
- 100% smart meter supply.
- Meters Installation, commissioning, DCU deployment.
- Creation of installation files and shipment files.
- Network topology creation.
- Integration with 3rd party MDMS.
- Share in Operation, maintenance, and training.

SCEDC Deployment Overview

Area	No. of meters	No. of DCU
Beverly Hills	2,500	35 +11
Casa Compound	1,300	9
Continental Compound	500	4
District 3	2100	14
District 7	1900	8
Dunes Compound	1700	9
Greens Compound	500	1
Jewar Compound	300	3
Karma Compound	700	10
Rawdet Zayed+ Al Mo'ez Mall	1700	6
Zayed 2000 Compound	500	4
GPRS	1300	-
Grand Total	**15,000**	**114**



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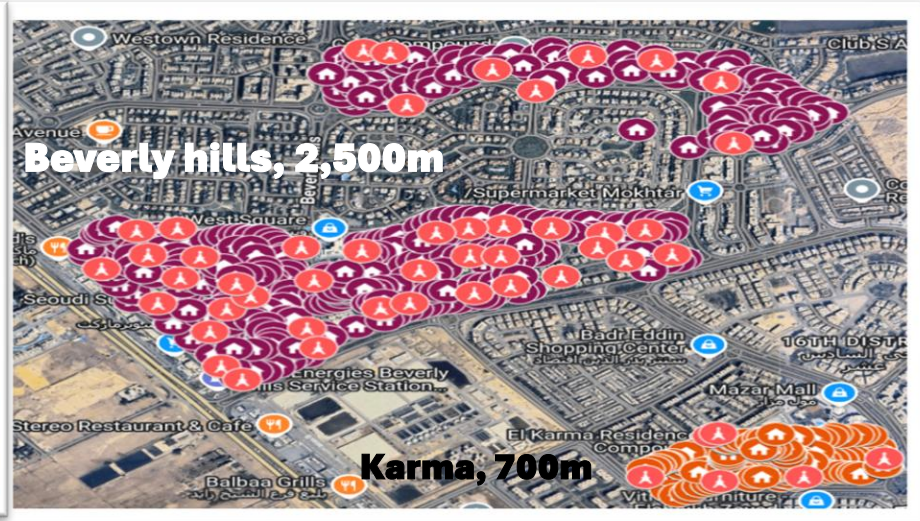

KPI Collection Performance (SCEDC)

- **Daily KPI**: 98% .
- **Weekly KPI**: 99% .
- **Monthly KPI**: 99.5% .
- High performance and consistent data collection achieved

Daily KPI

Consumption Period	Collected Meters	Commissioned Meters	KPI (%)
2021-08-28	46,113	47,043	98.023%
2021-08-27	46,137	47,039	98.082%
2021-08-26	46,185	47,031	98.201%
2021-08-25	46,192	47,021	98.237%
2021-08-24	46,234	46,914	98.551%
2021-08-23	46,121	46,899	98.341%
2021-08-22	46,187	46,896	98.488%
2021-08-21	46,202	46,894	98.524%
2021-08-20	46,184	46,893	98.488%
2021-08-19	46,161	46,891	98.443%
2021-08-18	46,200	46,885	98.539%
2021-08-17	46,267	46,881	98.69%
2021-08-16	46,242	46,879	98.641%
2021-08-15	46,247	46,871	98.669%
2021-08-14	46,260	46,869	98.701%

Monthly KPI

Consumption Period	Collected Meters	Commissioned Meters	KPI (%)
2021-08-01	46,530	46,694.663	99.647%

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Weekly KPI

Consumption Period	Collected Meters	Commissioned Meters	KPI (%)
2021-08-23	46,267	46,916.053	98.617%
2021-08-16	46,233	46,830.082	98.725%
2021-08-09	46,263	46,714.049	99.034%
2021-08-02	46,019	46,458.96	99.053%
2021-07-26	45,589	46,299.432	98.466%

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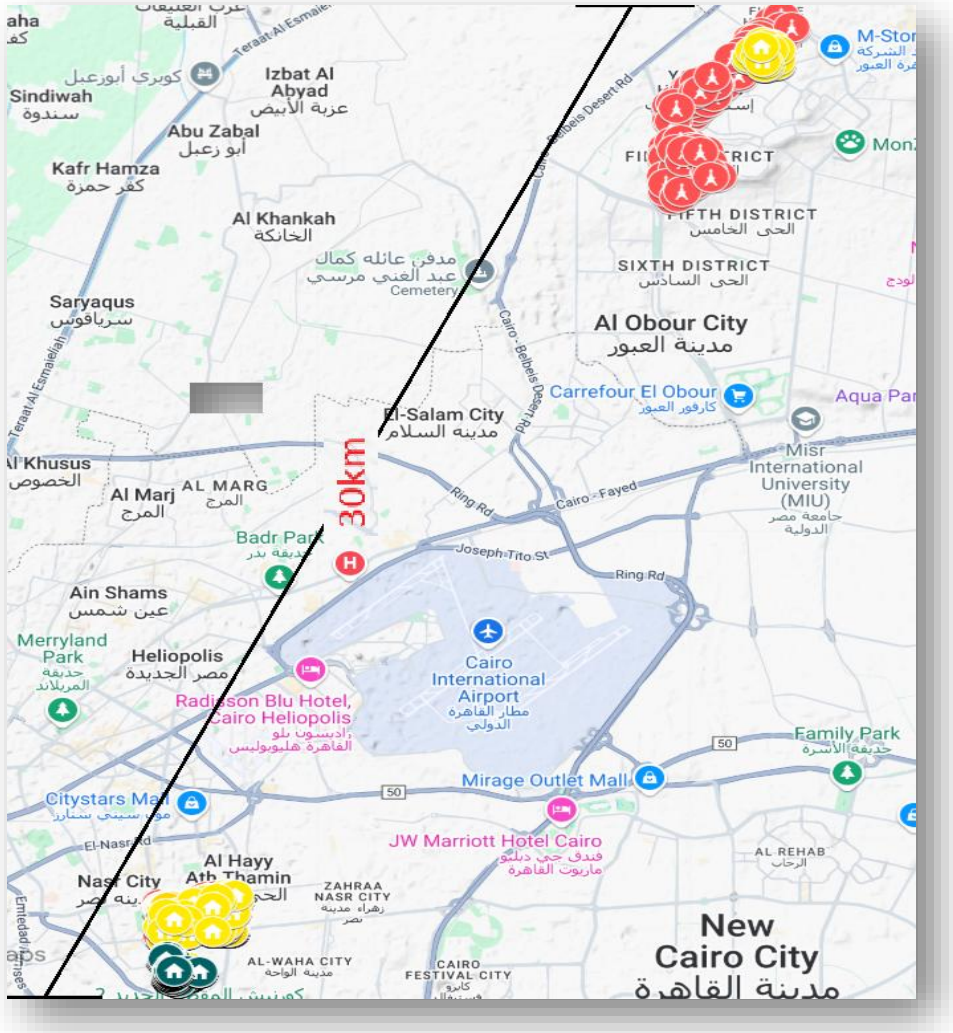
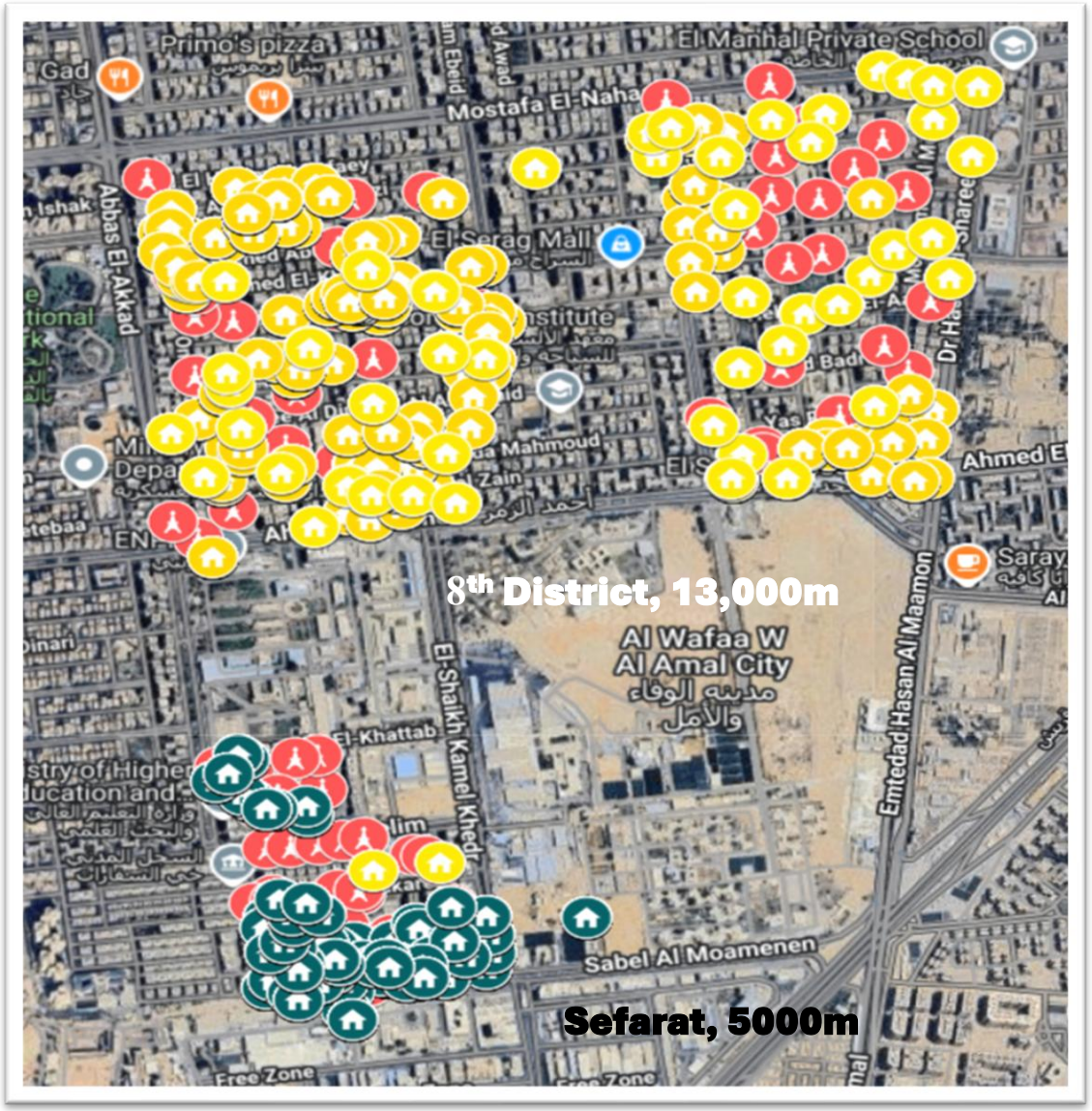
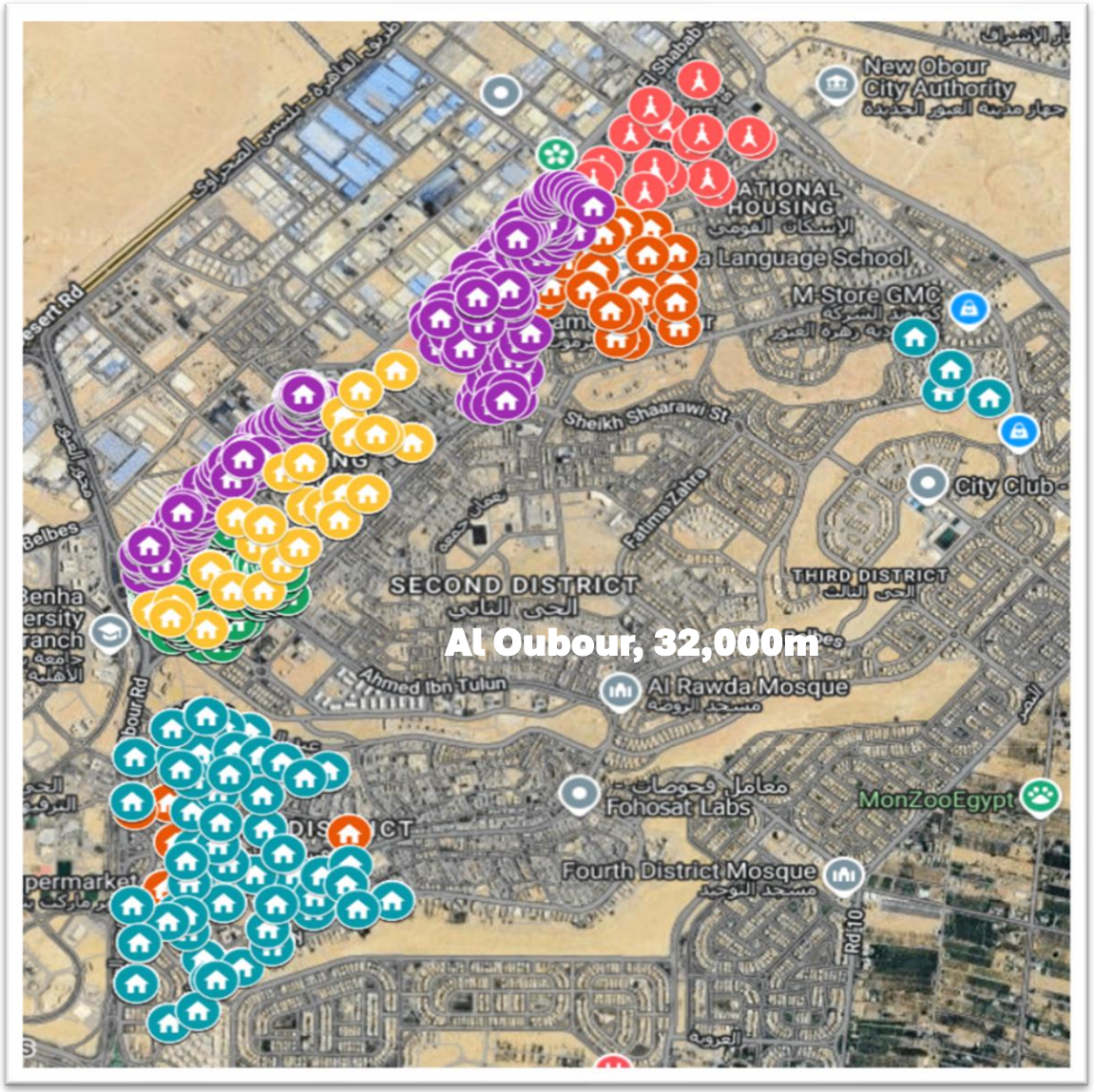
NCEDC Deployment Overview

Area	No. of meters	No. of DC
Al Oubour	32,000	142 +2
Hay Ethamen	13,000	96
Sefarate	5,000	49
Grand Total	**50,000**	**289**




8th District, 13,000m
Sefarat, 5000m
Al Wafaa W Al Amal City
مدينه الوفاء والأمل
Sabel Al Moamenen
El-Khattab
El-Shaikh Kamel Khedr
Emtedad Hasan Al Maamon
Mostafa El-Naha
El Manhal Private School
El-Serag Mall
Primo's pizza
Free Zone


Al Oubour, 32,000m
SECOND DISTRICT
الحى الثانى
THIRD DISTRICT
New Obour City Authority
M-Store GMC
City Club
Al Rawda Mosque
Fohosat Labs
MonZooEgypt
Fourth District Mosque
Sheikh Shaarawi St
Fatima Zahra
Ahmed Ibn Tulun
Rd 10

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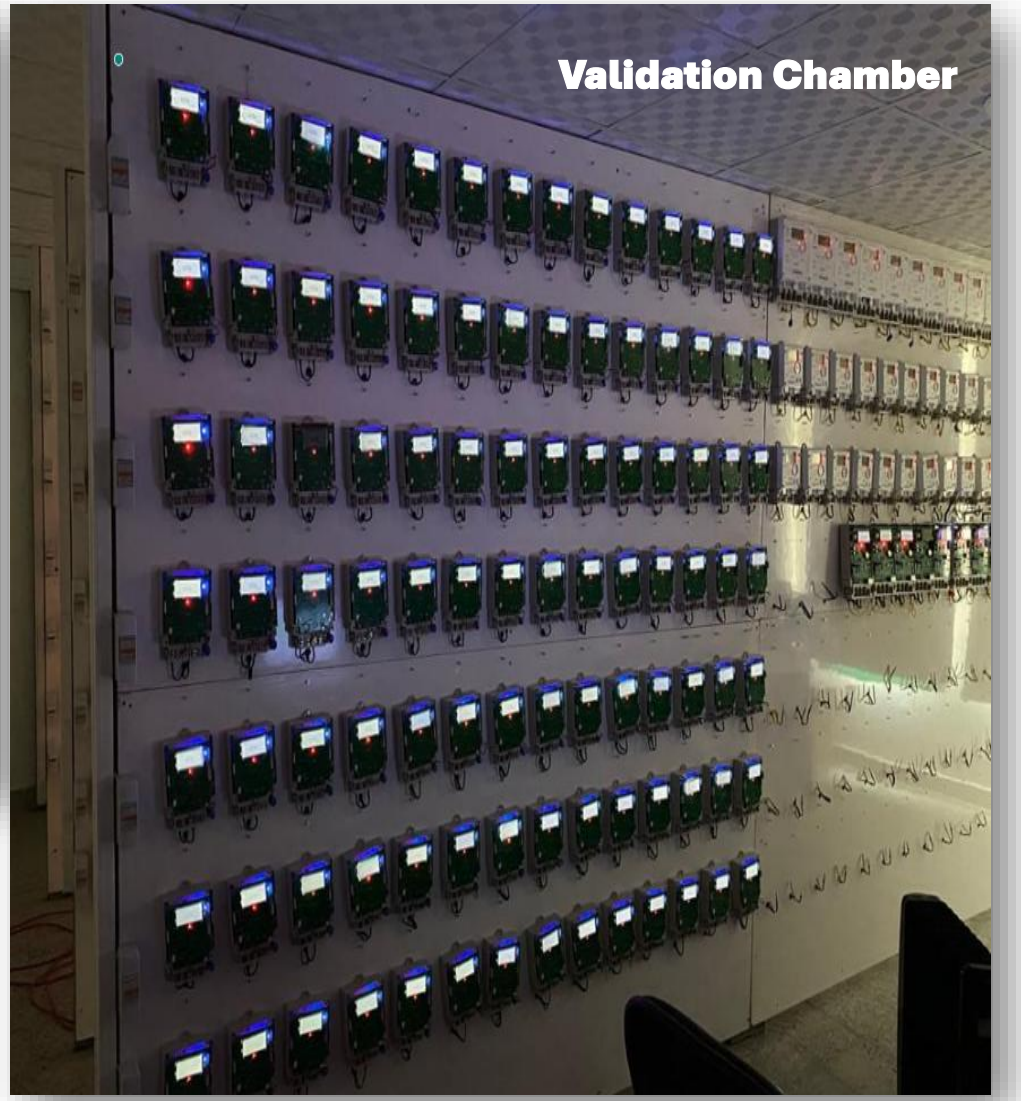
Deployed Meters

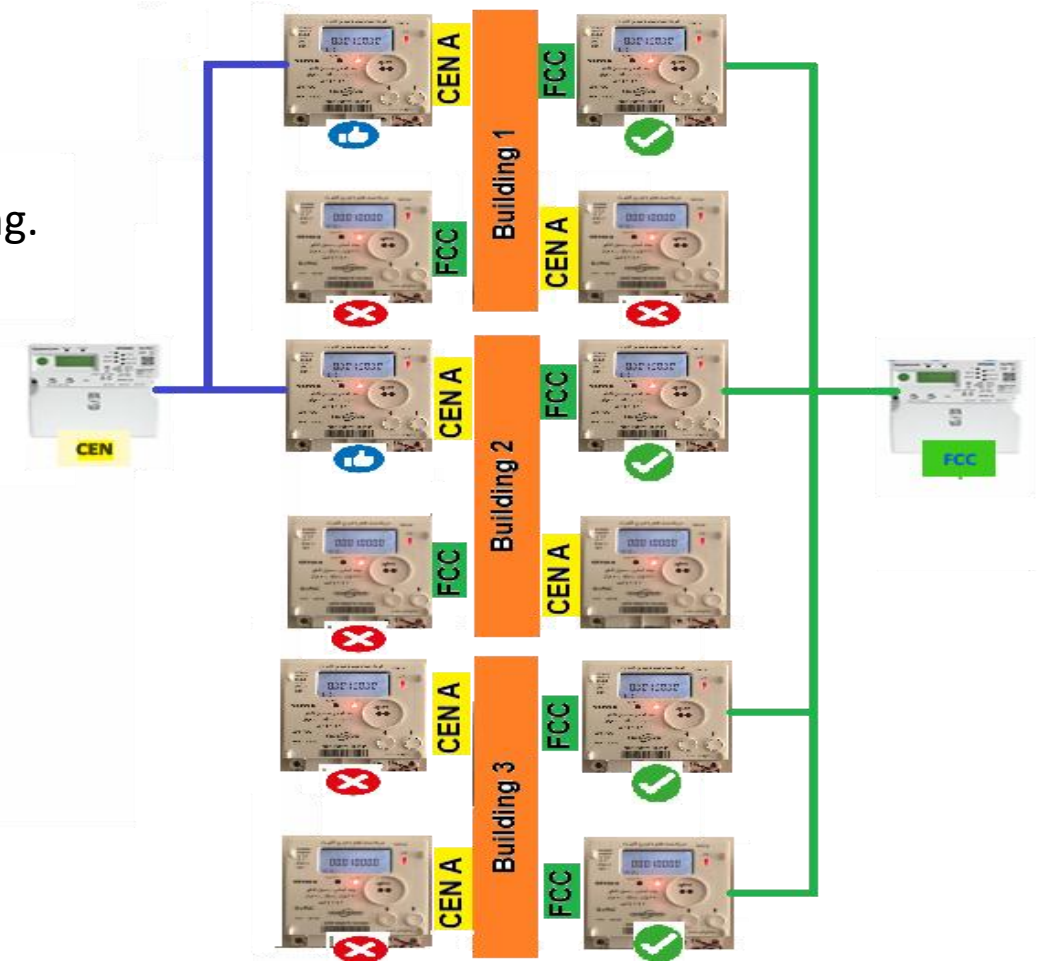


Validation Chamber

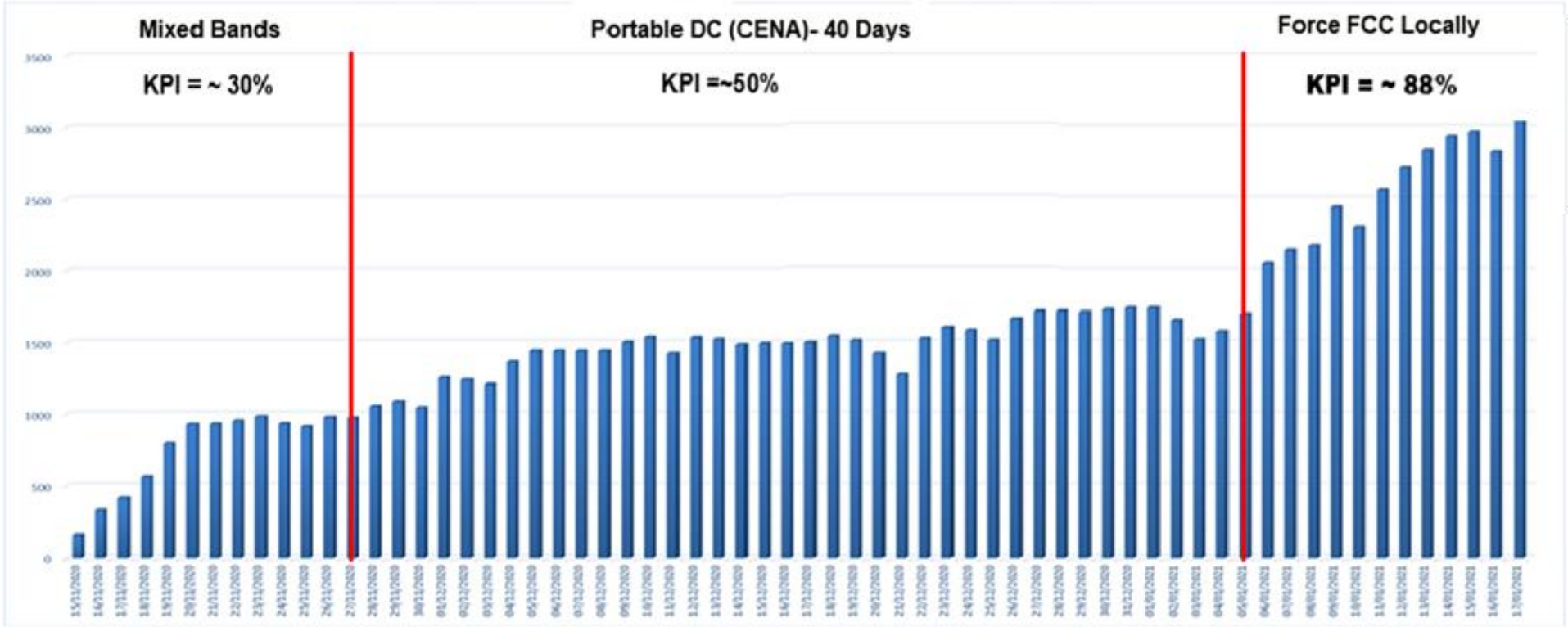
Deployment Challenges

Challenge 1: Mixed communication Protocol

- **Issue:** FCC vs Cenelec A heterogeneity.
- **Action:** Portable DCs (40 days), manual FCC switching.
- **Result:** Improved KPI dramatically.
- **Recommendation**:
  - Install DCUs prior to meters.
  - G3-Alliance to develop dynamic band switching



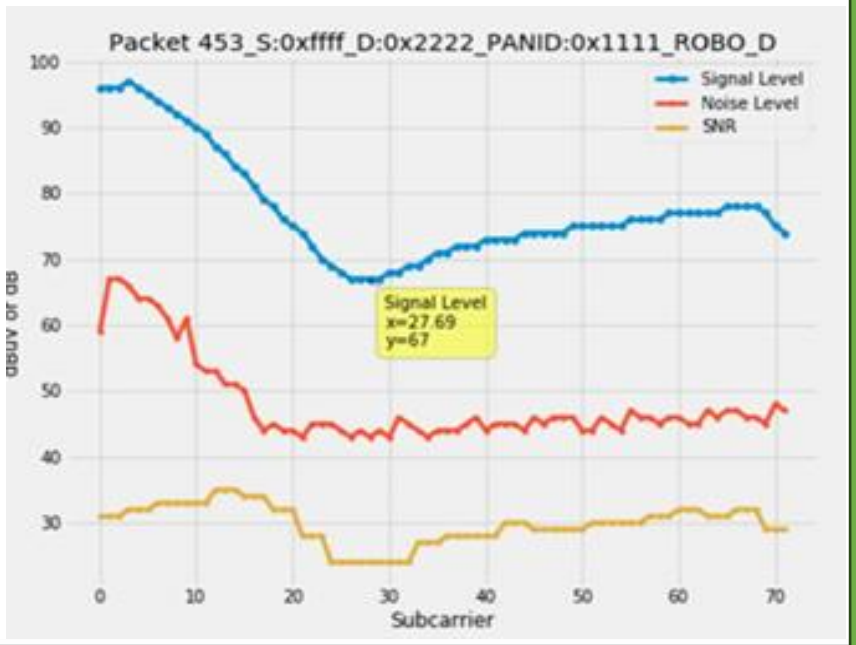
- FCC switching enhance the KPI significantly.
- Using portable DC enhance the performance but not sufficient and need very long time.
- manual Switching enhance the KPI dramatically in very short time.



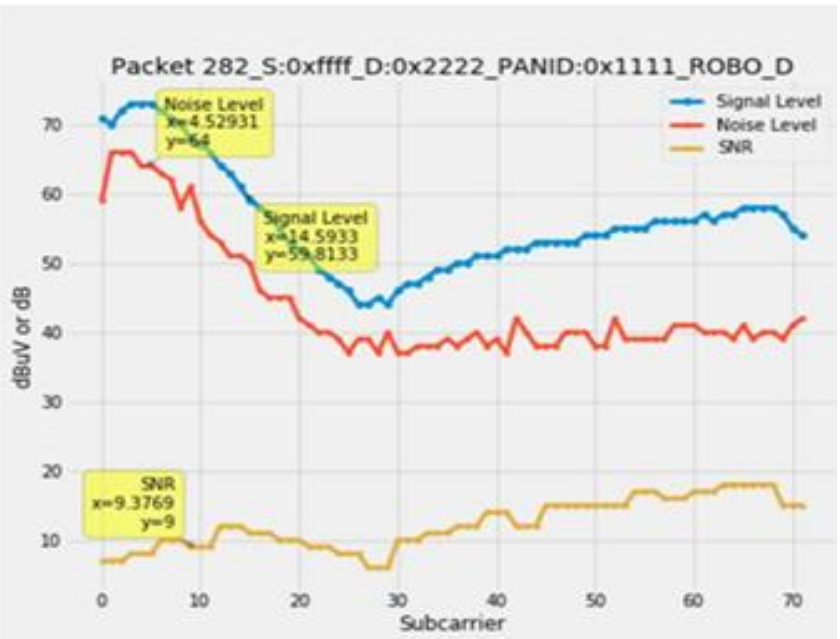
Challenge 2- Signal attenuation by MCB

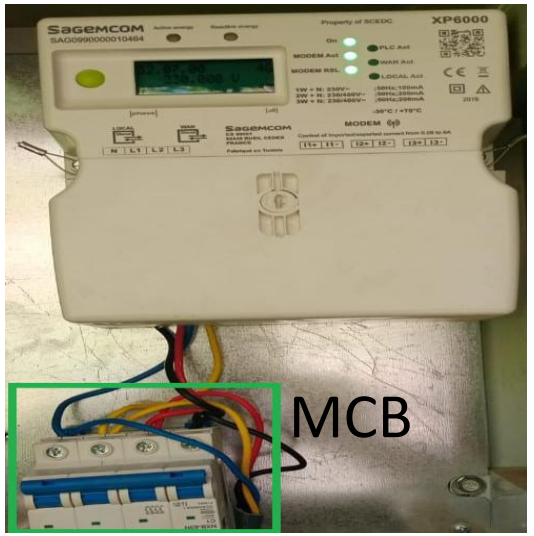
- **Issue**:
  - 20 dB signal drop caused by miniature circuit breaker (MCB).
  - Total noise level in NCEDC network is about 60 dBuv but it is OK.

PLC signal Entering MCB



PLC signal Exiting MCB

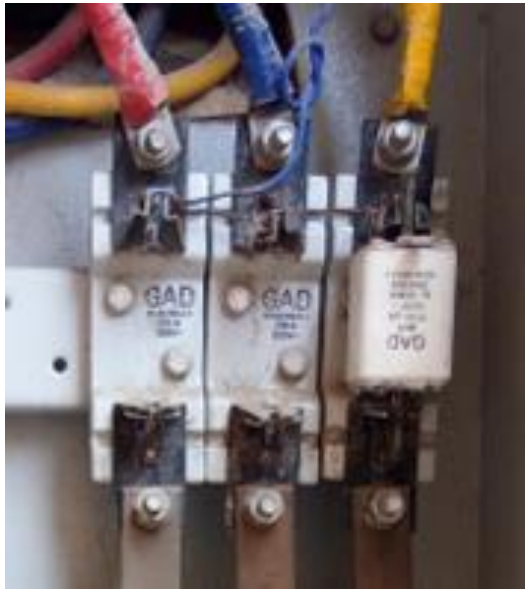


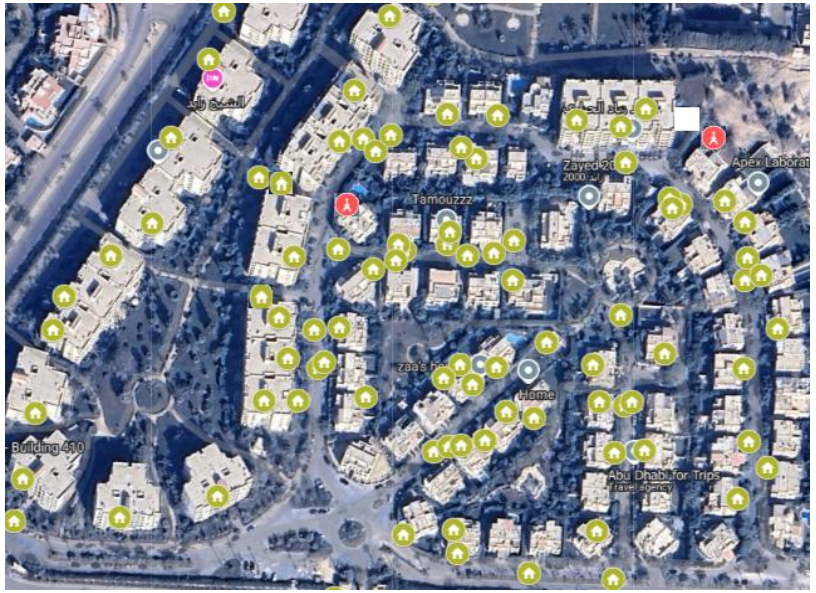


- **Fix**: MCB replacement improved KPI from ~75% to >90%
- 6 DCs not yet installed.
- We achieved entire meter read after installing the 6 DCU.

Challenge 3- Distribution network issues

- **Issue**:
  - Dual Power Source
  - Network is constructed to form a star topology.
  - End-User switch off the meter.
  - Missing the injection line.





Key Lessons & Recommendations

- FCC outperforms Cenelec A in Egypt
- Mixed band usage reduces network efficiency
  - ✓ G3-Alliance should provide the dynamic band switching.
- G3-PLC network performance can be dropped when customer turned off the meters, also injection line missing in some places.
  - ✓Recommend hybrid G3-PLC approach for Egypt's grid.
- Stronger coordination between stakeholders critical.
- Local system tuning essential to success

Special thanks to EEHC, SCEDC, NCEDC.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