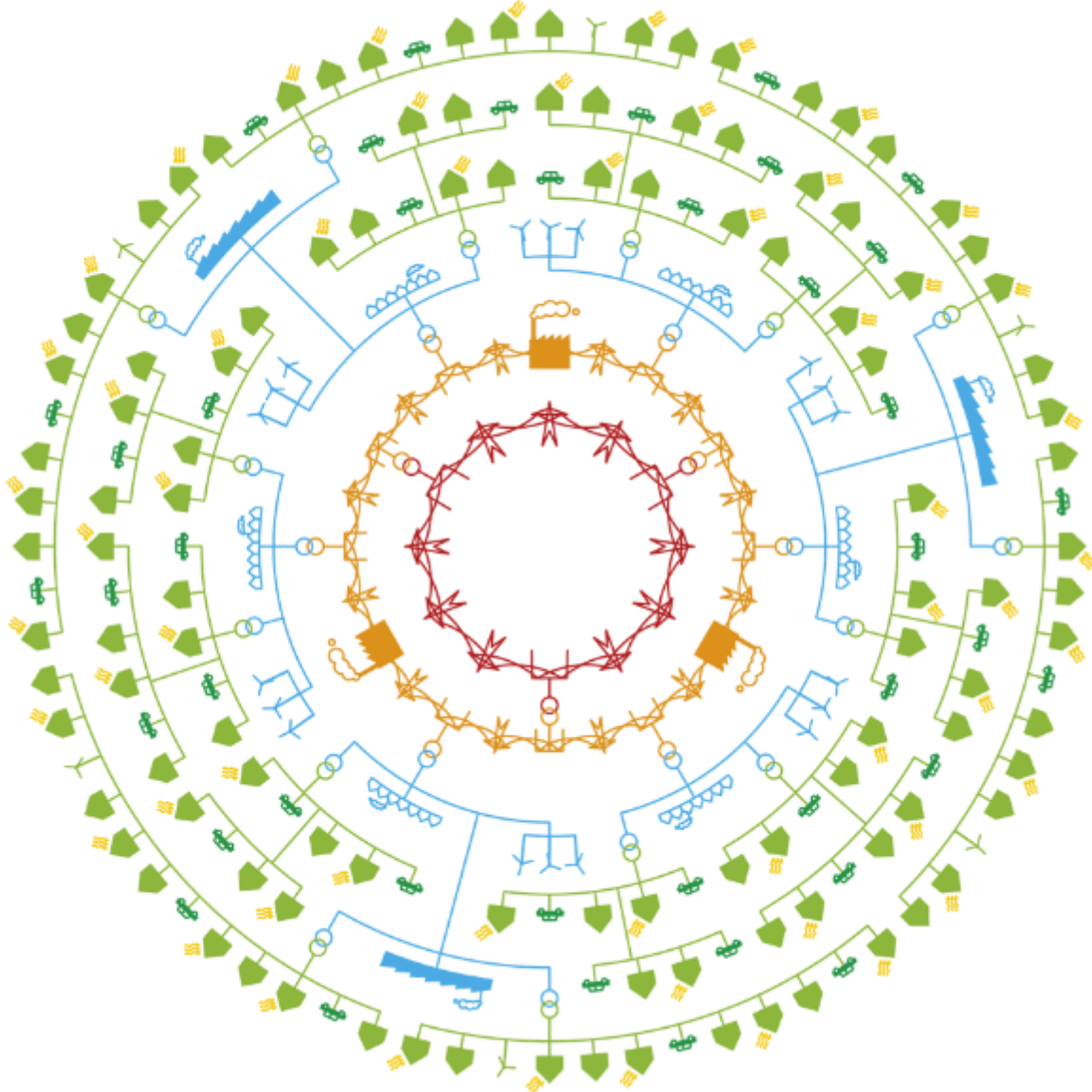


# Edge computing practical value for energy grids

4 December 2023, EUCloudEdgeIoT



WISKUNDE  
NATUURKUNDE  
INFORMATICA  
+  
PHASE TO PHASE



Redefining  
solutions



# Technolution in Gouda (NL) since 1987

technology integrator  
250 technology passionates

- **Revenue:** ~40M€  
#17 in NL top 50 engineering firms
- **R&D:** 10-15% of revenue  
#29 in NL top 30 R&D

source: Technisch Weekblad



**Technology integrator:** we make new, open, secure connections ...

... between **digital** and ...

- ❖ (embedded) **software**
- ❖ privacy, **security**
- ❖ data **communication**
- ❖ **hardware**, electronics

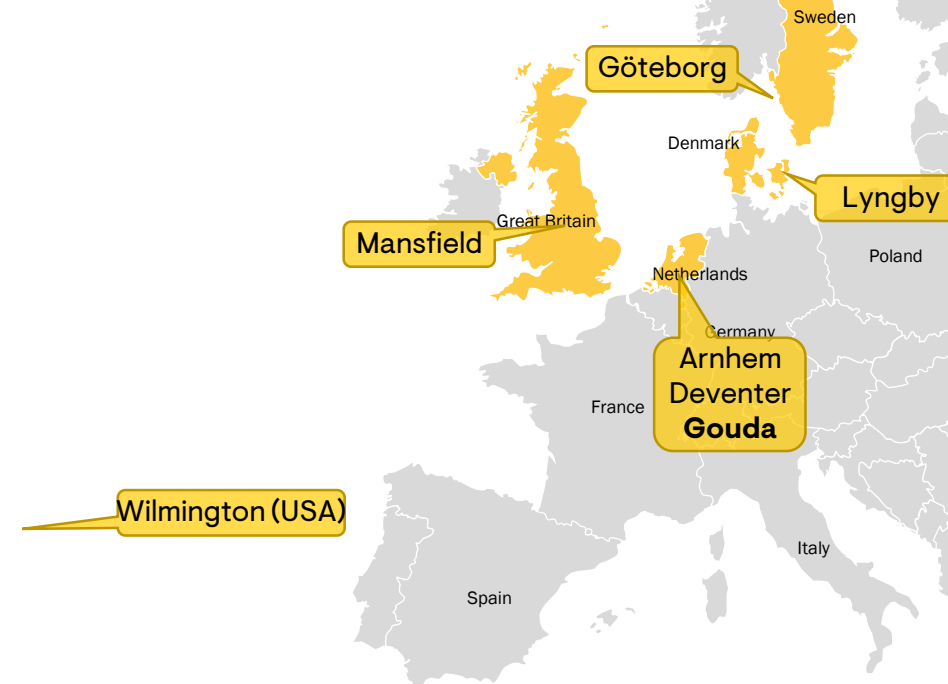
... **physical** worlds



# PHASE TO PHASE in Arnhem (NL) since 2001

state of art grid calculation  
8 technology passionates

- **ownership:** 100% with mgt and active employees
- **employee happiness:** 8,5 out of 10, +44 Net Promotor Score



## mobility & infrastructure



integral traffic-  
management



monitoring & control  
*tunnels, bridges*



control rooms  
*roads, waterways*

## public safety & security



observation grids  
*air, radiation, water*



high assurance  
*NBV certified*



critical datacom  
*C2000, P2000*



electron optics  
& imaging



high volume data  
processing & control



grid digital twins  
*Phase to Phase*



grid operation  
*assetmanagement*



market facilitation  
*smart meters*



energy-  
management



## high tech industry

## energy & grids

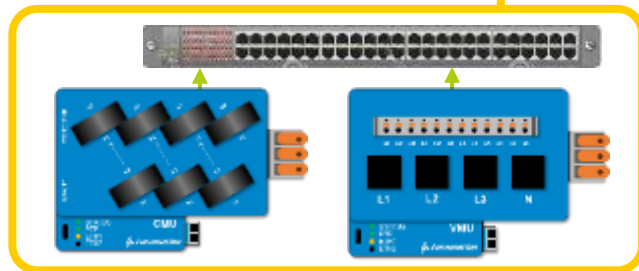
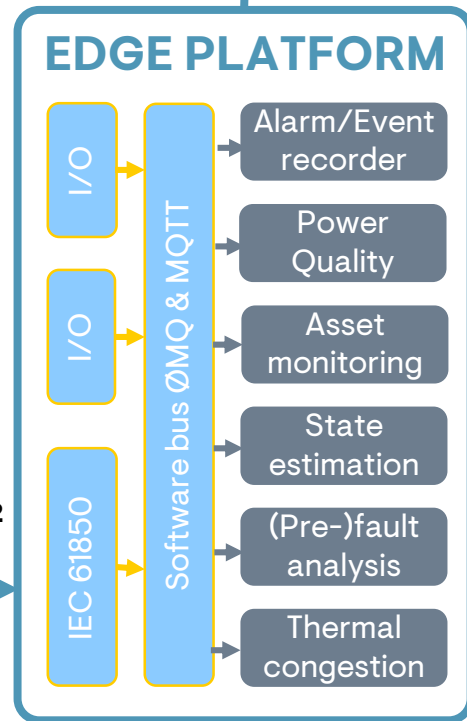
# Edge computing embedded in automation: Opening up the substation



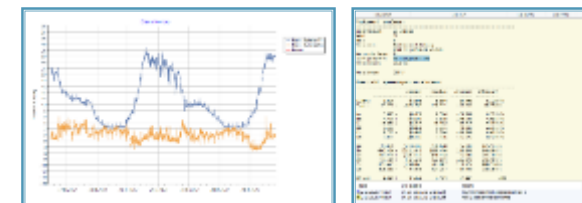
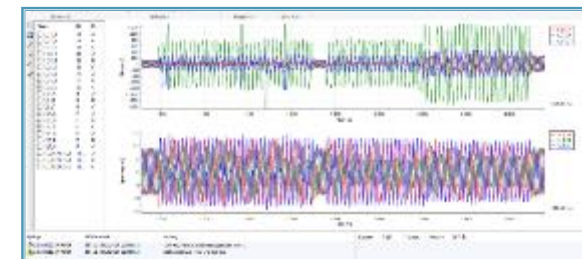
Central Control room

Control room of the Future **TU Delft**

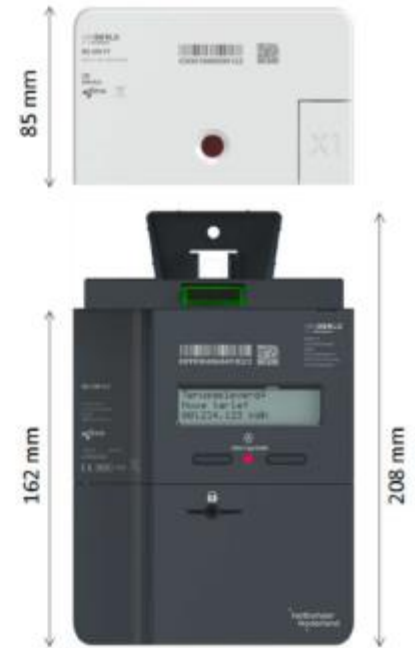
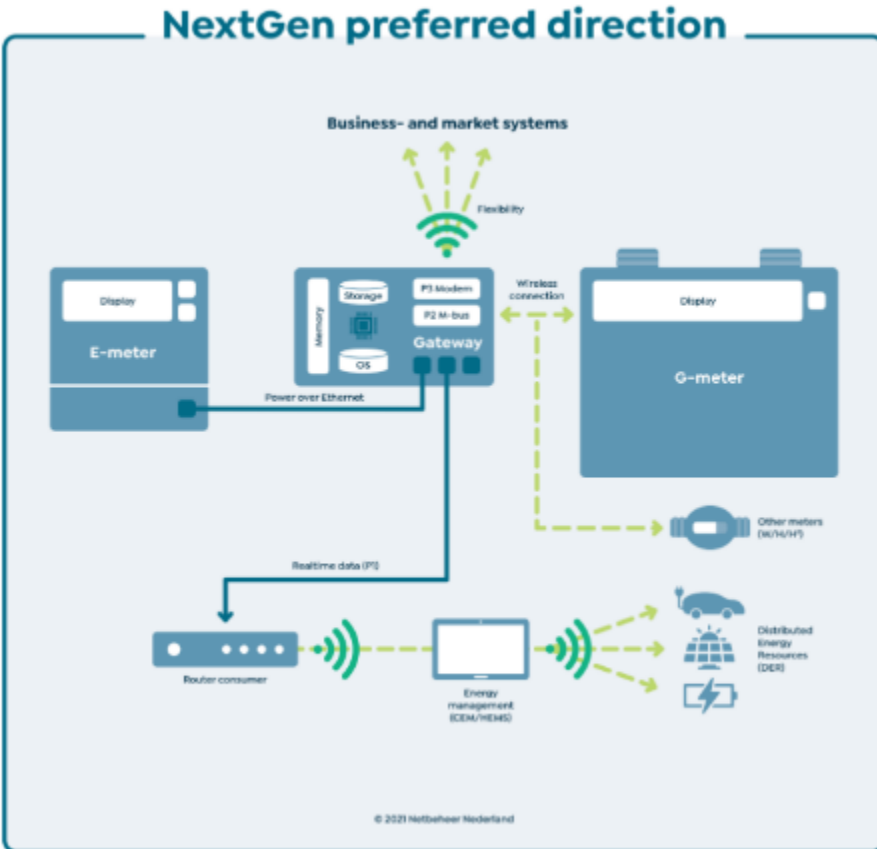
Station Protection and Control Systems



IEC 61850-9-2



# NextGen: modular concept for future Dutch smart meters



Netbeheer  
Nederland

# Direct data governance by citizens demonstrator at GreenVillage TU Delft



(2) The citizen allows access to data by installing 'apps' (level playing field) and giving goal binding mandates.



(1) All data resides on the smart meter in the citizen's house (data federation).



(3) Data is accessible in-house, for grid operators and market party's by citizen mandate ONLY.

# Redefining **solutions**