

# Edge computing monitoring infrastructure for scalable distribution grid monitoring

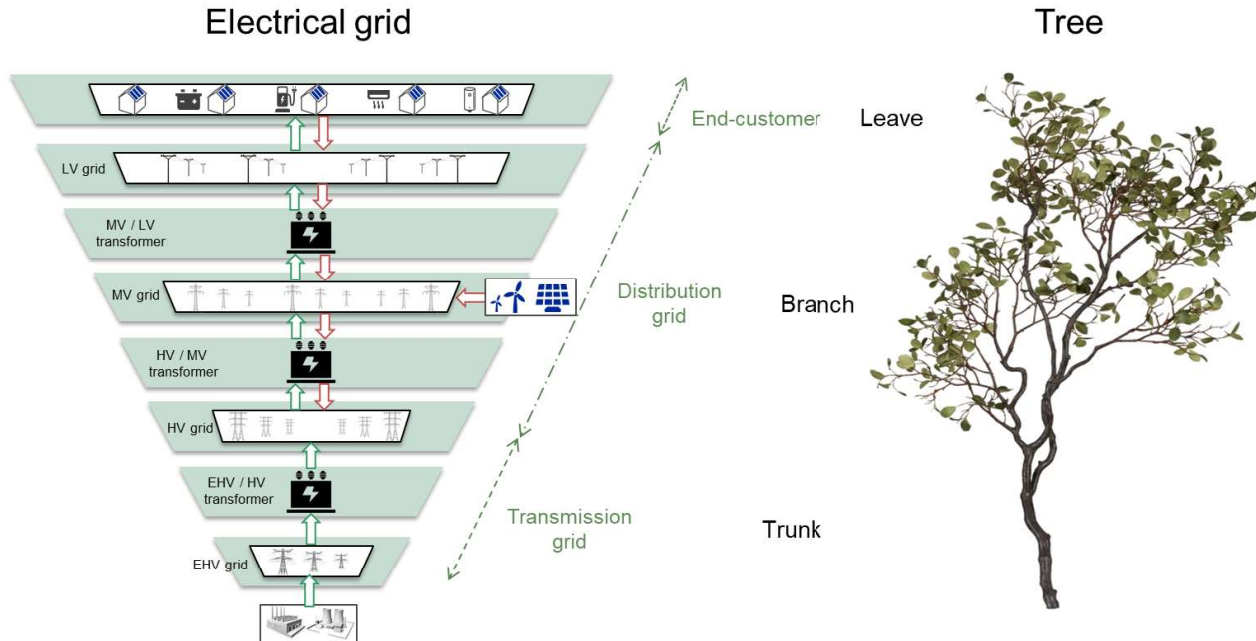
Omid Alizadeh-Mousavi, Director R&D

DEPsys SA, Switzerland



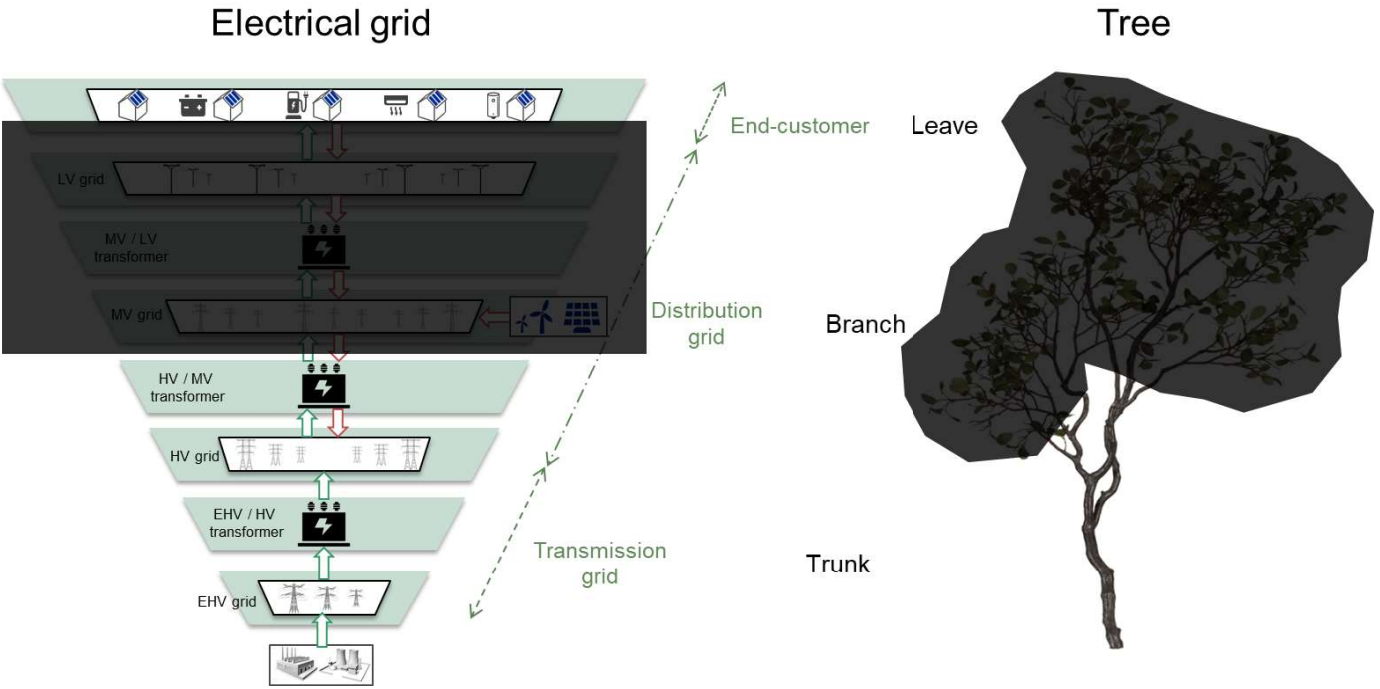
The 2nd IEEE International Conference on Smart Grid Synchronized Measurements and Analytics (SGSMA) *Virtual Event* | May 24-27, 2021

# Analogy between Electrical Grid & Tree



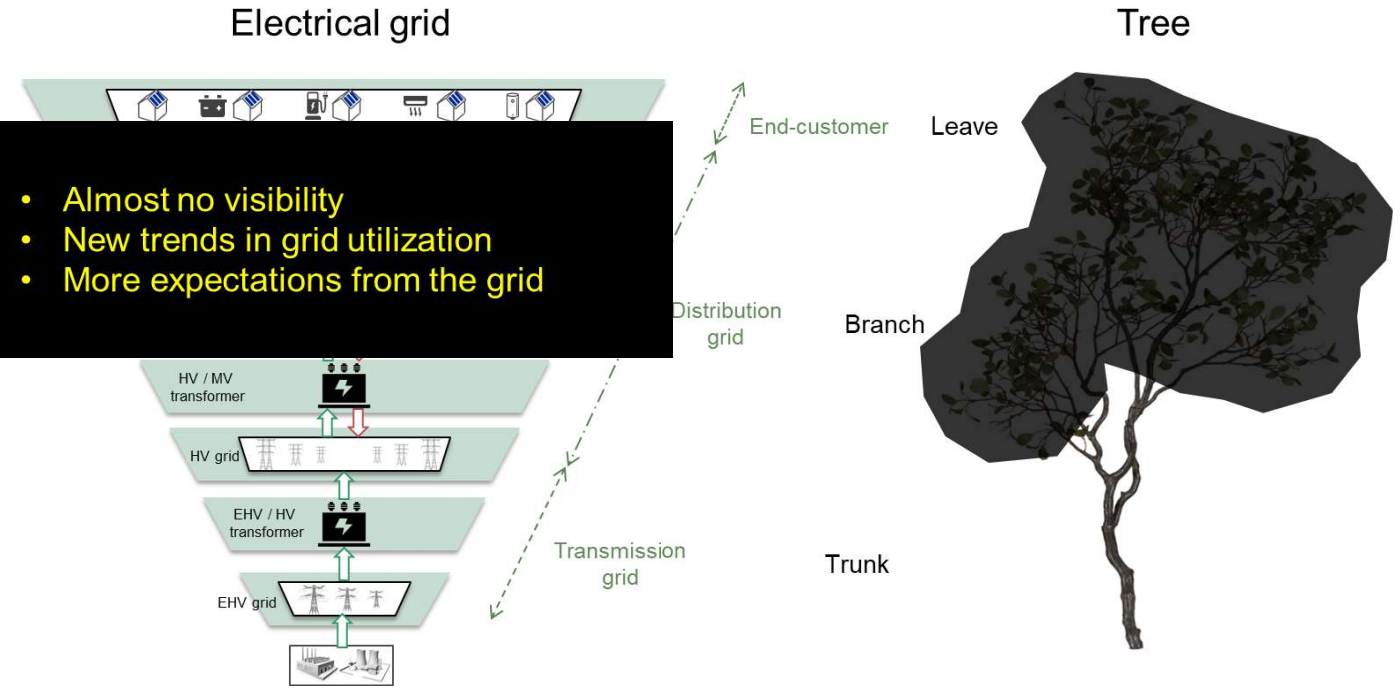
The 2nd IEEE International Conference on Smart Grid Synchronized Measurements and Analytics (SGSMA) Virtual Event | May 24-27, 2021

# Current Situation of Distribution Grids



The 2nd IEEE International Conference on Smart Grid Synchronized Measurements and Analytics (SGSMA) Virtual Event | May 24-27, 2021

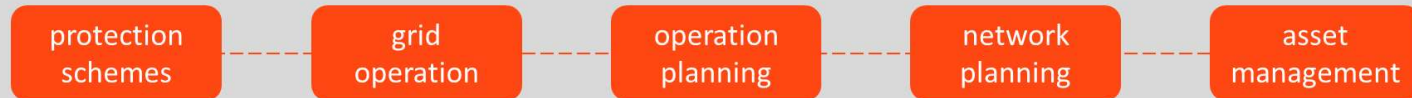
# Current Situation of Distribution Grids



The 2nd IEEE International Conference on Smart Grid Synchronized Measurements and Analytics (SGSMA) Virtual Event | May 24-27, 2021

# Grid Operator Businesses

Distribution grid operators do great jobs with very limited visibility!

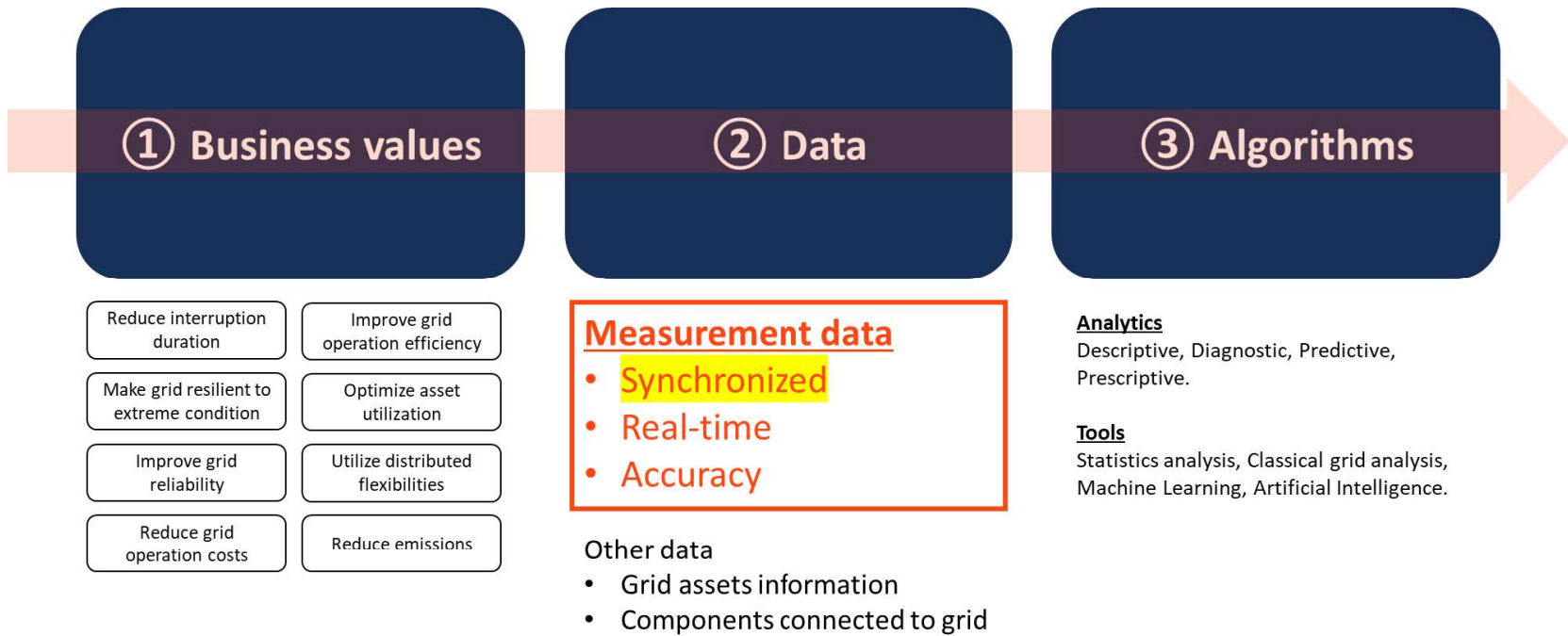


Where improvements are expected? (business value)



The 2nd IEEE International Conference on Smart Grid Synchronized Measurements and Analytics (SGSMA) Virtual Event | May 24-27, 2021

# Where are Synchronized Measurements in the Value Chain?



The 2nd IEEE International Conference on Smart Grid Synchronized Measurements and Analytics (SGSMA) Virtual Event | May 24-27, 2021

# Measurement Data for Business Insights & Analytics Tools

**Quality grid measurement data** are essential to

- run any kind of grid analytics algorithms
- use advanced algorithms and tools
- derive business insights
- improve distribution grid decision making process



The 2nd IEEE International Conference on Smart Grid Synchronized Measurements and Analytics (SGSMA) *Virtual Event* | May 24-27, 2021



# Edge Computing for Distribution Grid Monitoring

## Challenges of distribution grid monitoring

- **Grid size:** very large numbers of nodes and feeders in MV and LV grids
- **Data communication:** transfer of huge amount of phasors data in close to real-time is expensive and creates communication bottlenecks
- **Data volume:** huge amount of data generated by sensors creates big data issues, e.g. storage and processing

*These challenges prevent large deployment of grid monitoring technologies, specially uPMUs, in distribution grids.*

## Edge computing solving the challenges

- Generate high quality time-synchronized grid monitoring data where and when it is needed
- Maximum amount of processing at the edge computing device reducing data communication and volume

*The intelligent edge computing devices allows large scale deployment of grid monitoring sensors, enabling grid analytics and business insights at distribution grids.*



The 2nd IEEE International Conference on Smart Grid Synchronized Measurements and Analytics (SGSMA) Virtual Event | May 24-27, 2021