



# Reinventing electricity grids for the energy transition

Energy Innovation Summit, Liverpool, 2023



# About Plexigrid



Founded July 2020 as a spin-off from the University of Oviedo, Gijon



30 coworkers



14 nationalities



Offices in Sweden and Spain



S O L A R





# 1

## THE ENERGY TRANSITION

potentially Humanity's #1  
21st Century Challenge

# 2

## THE ELECTRICITY GRID

the backbone, but also  
**the bottleneck** of the  
Energy Transition

# 3

## PLEXIGRID

has created the  
technology to  
**resolve this bottleneck**  
in the...

...most Affordable...  
...most Sustainable...  
...and Fastest Way

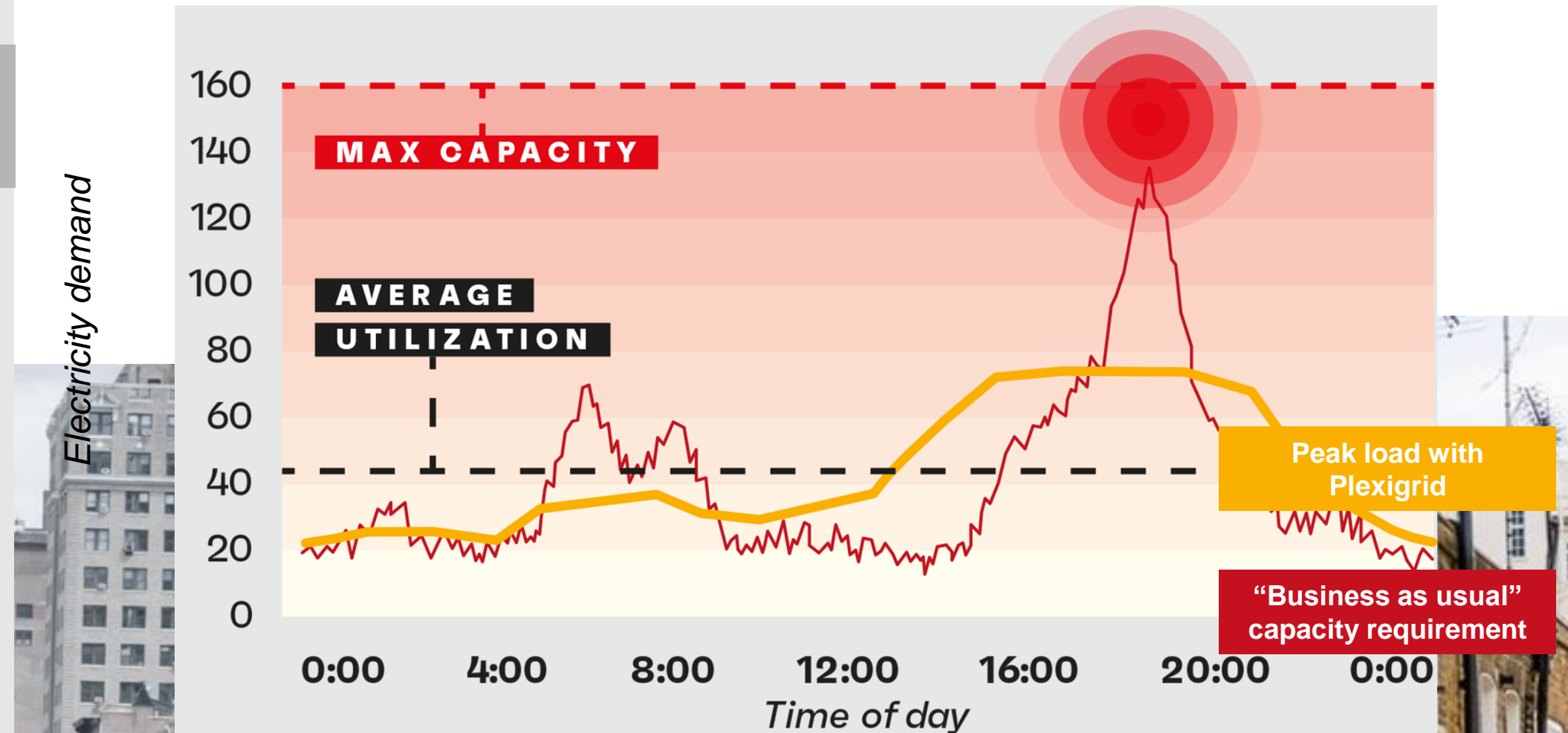


# How can we turn electricity grids into enablers of the energy transition?

## The traditional way

### Design for peak capacity

- with more hardware, on the supply side
- dimensioning for unmanaged peak loads
- requiring multibillion € annual network upgrades



## The Plexigrid way

### Design for maximal utilization

- with software, on the demand side
- actively reducing peak loads
- at a fraction of the cost, benefiting customers, DSOs and energy suppliers



Increasing need of grid capacity



Towards a sustainable future



# Plexigrid provides Grid Operators with 3 Superpowers

## ARI – Full Grid Visibility



**Reducing operational and administration costs**

- ✓ Unique full visibility into low voltage
- ✓ Breaks the silos by integrating data across DSO systems
- ✓ Grid monitoring in real time

## TATARI – Real Time Analytics



**30% Improvement in grid planning, and 30% reduction of CAPEX**

- ✓ Full model Grid Digital Twin
- ✓ Identifies where, when and why grid bottlenecks occur
- ✓ Optimizes grid planning and grid operations

## TIA – Real Time Flexibility



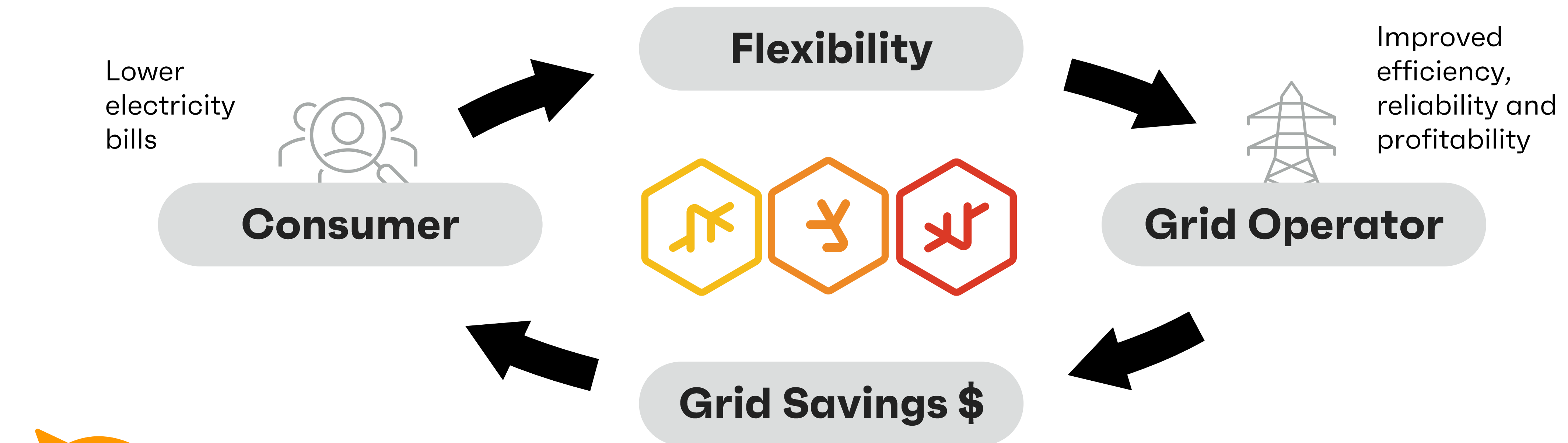
**Up to 35% reduction of energy and network costs (CAPEX/OPEX) for DSOs and consumers**

- ✓ Predicts behind-the-meter assets
- ✓ Detects grid congestions in real time
- ✓ Activates flexible demand devices



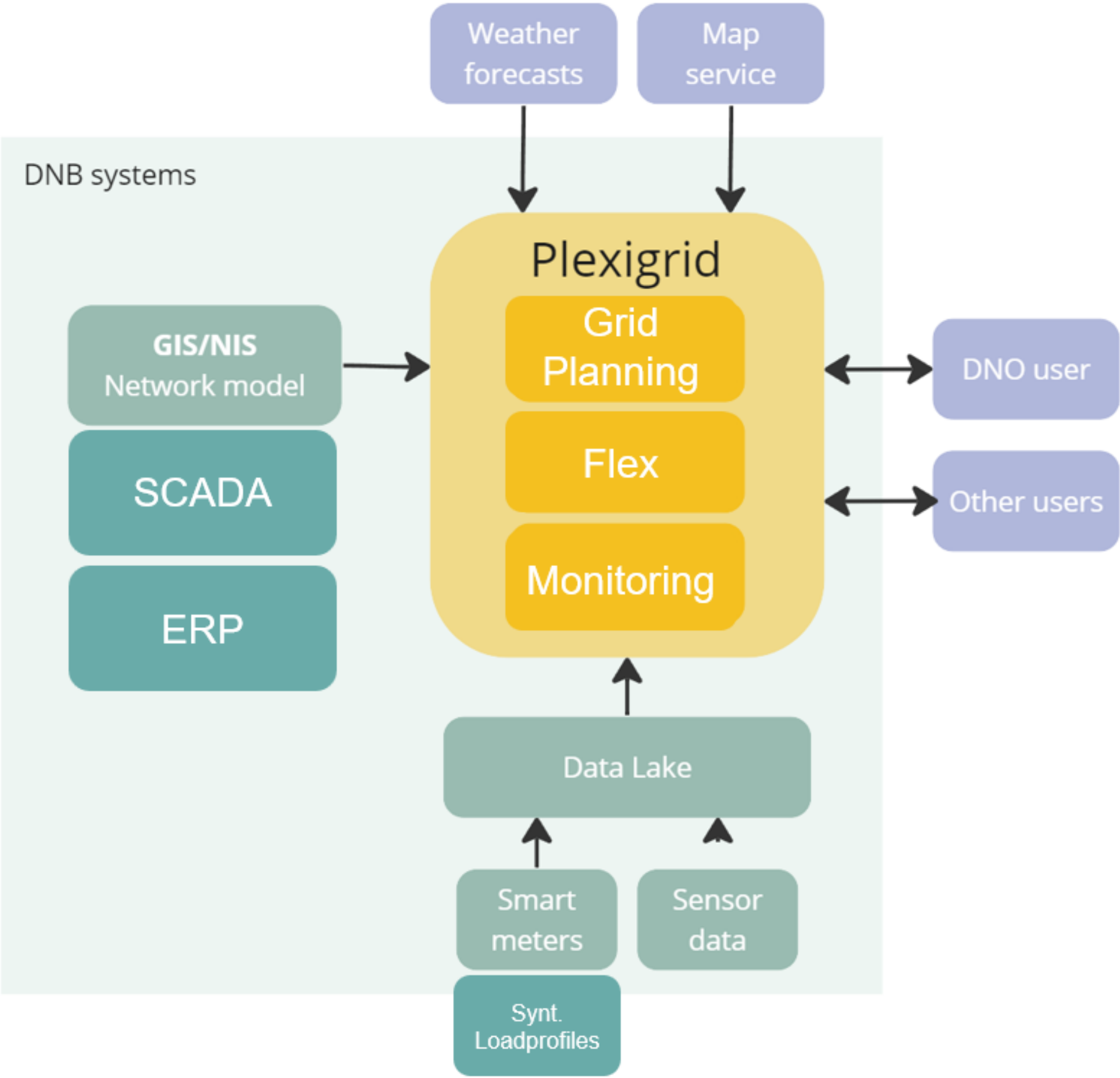
# A win-win for everybody!

By combining these **three superpowers** grid operators can save **hundreds of billions** in grid capacity upgrades that can be shared with consumers in exchange for their flexibility.



**At scale, Plexigrid technology would give grid operators CAPEX and OPEX savings of 150 B\$/year until 2030 and 300 B\$/year between 2030-40**

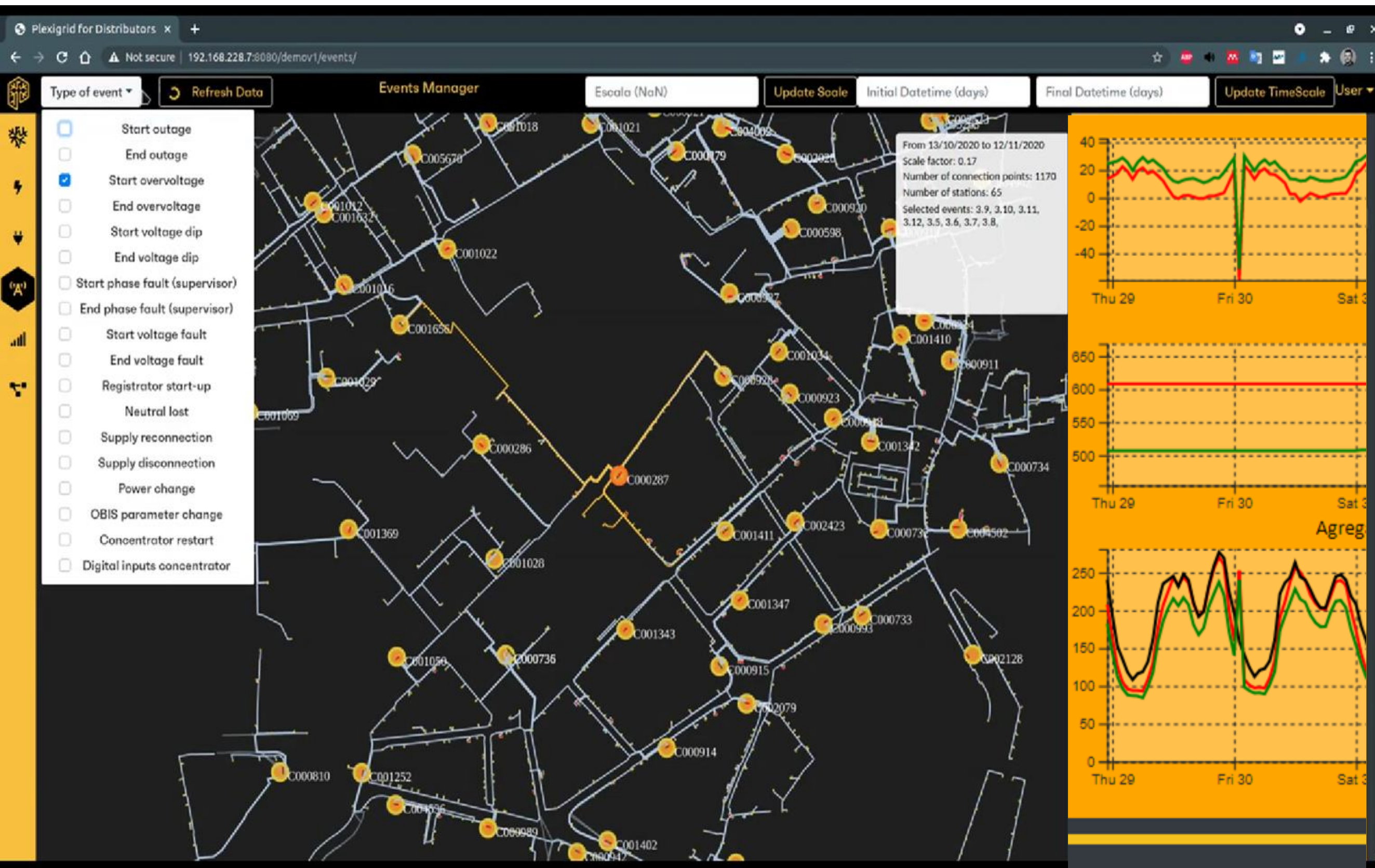
# Plexigrid system integration





# Use case examples

## Grid monitoring and operations



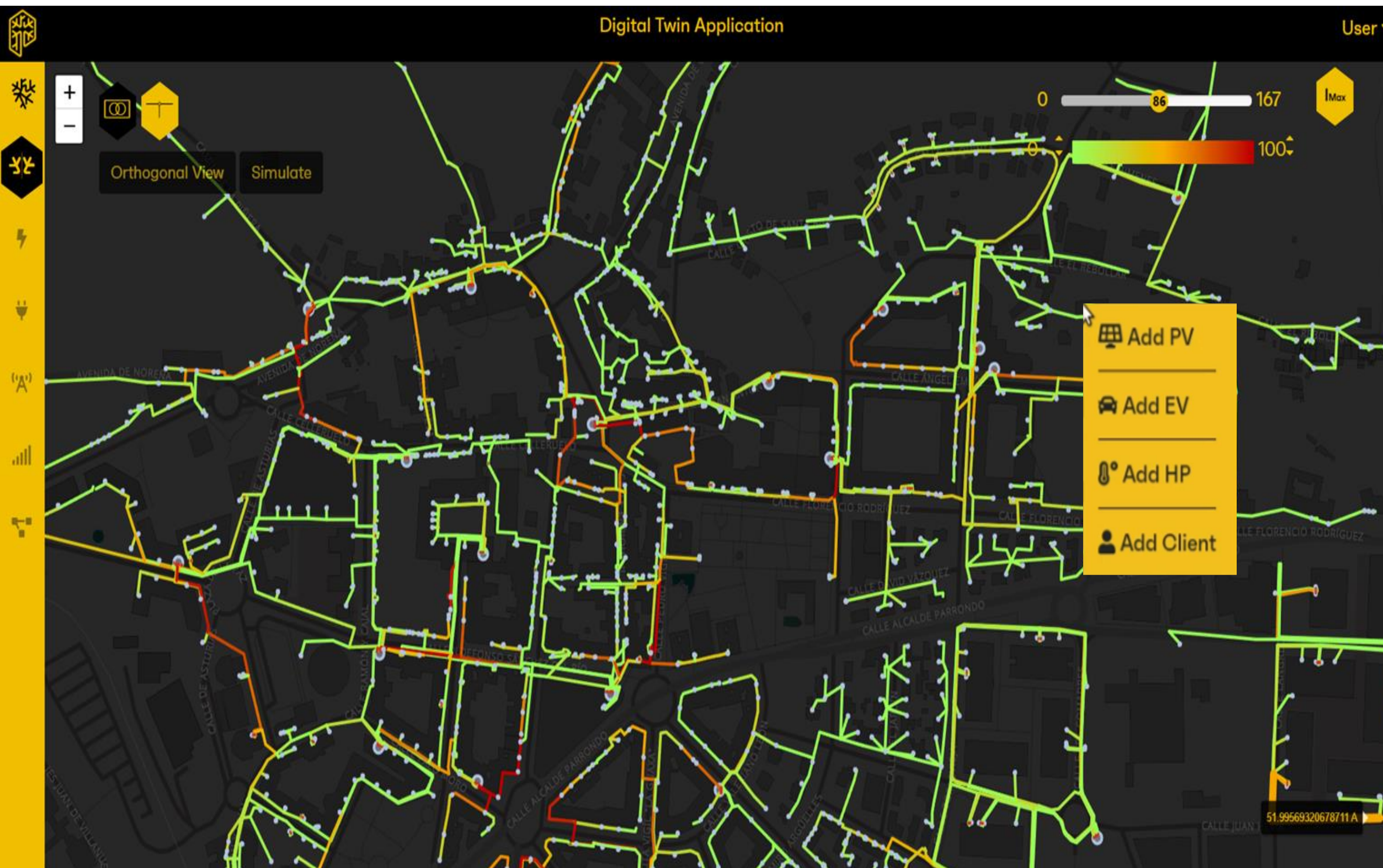
### Low voltage monitoring (LV + MV)

- Quality assurance of LV data
- Full grid analytics, three phase down to 220 V
- Optimize load flows and grid configuration
- Solve phase unbalances
- Reduce losses
- Fast and accurate outage detection



# Use case examples

## Grid planning



### New connections

- Publish capacity heat maps for load and generation
- Simulate impact of new connections within seconds
- Reduce time for connection requests

### Grid planning

- Identify grid bottlenecks down to low voltage
- Scenario based Monte Carlo simulations of future load and generation
- Simulation of flex alternatives to grid reinforcements



# Use case examples

## Flexibility management



### Identify grid capacity need

- Congestion forecasts in HV/MV/LV
- Identify bottlenecks in real time
- Validate solution alternatives

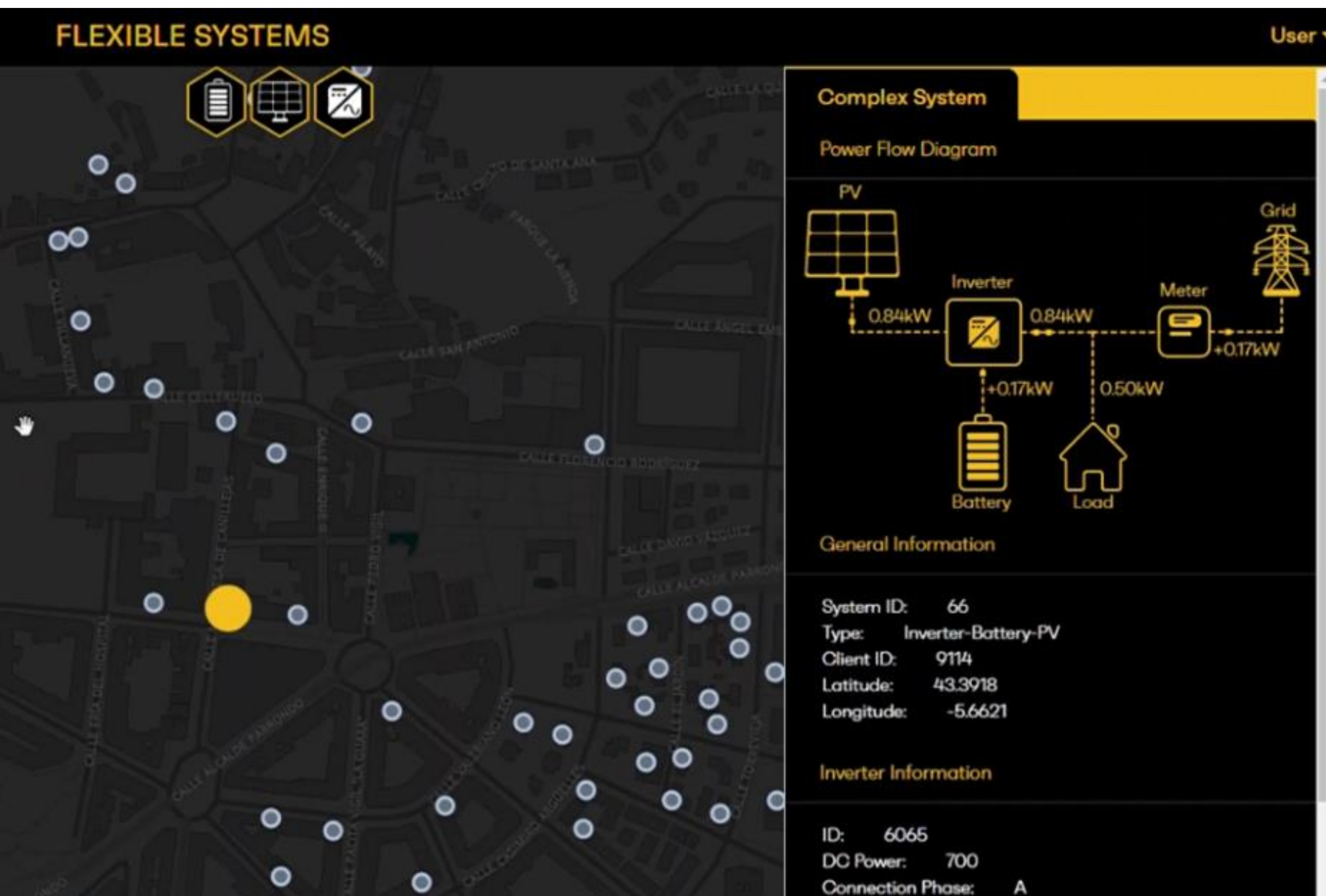
### Activate flexibility

- Integration with capacity markets
- Manage flex/interruptable connections
- Increase grid capacity utilization
- Defer CAPEX investments using non-wires alternatives



# Use case examples

## Distributed Energy Resource Management



### Customer/DER services

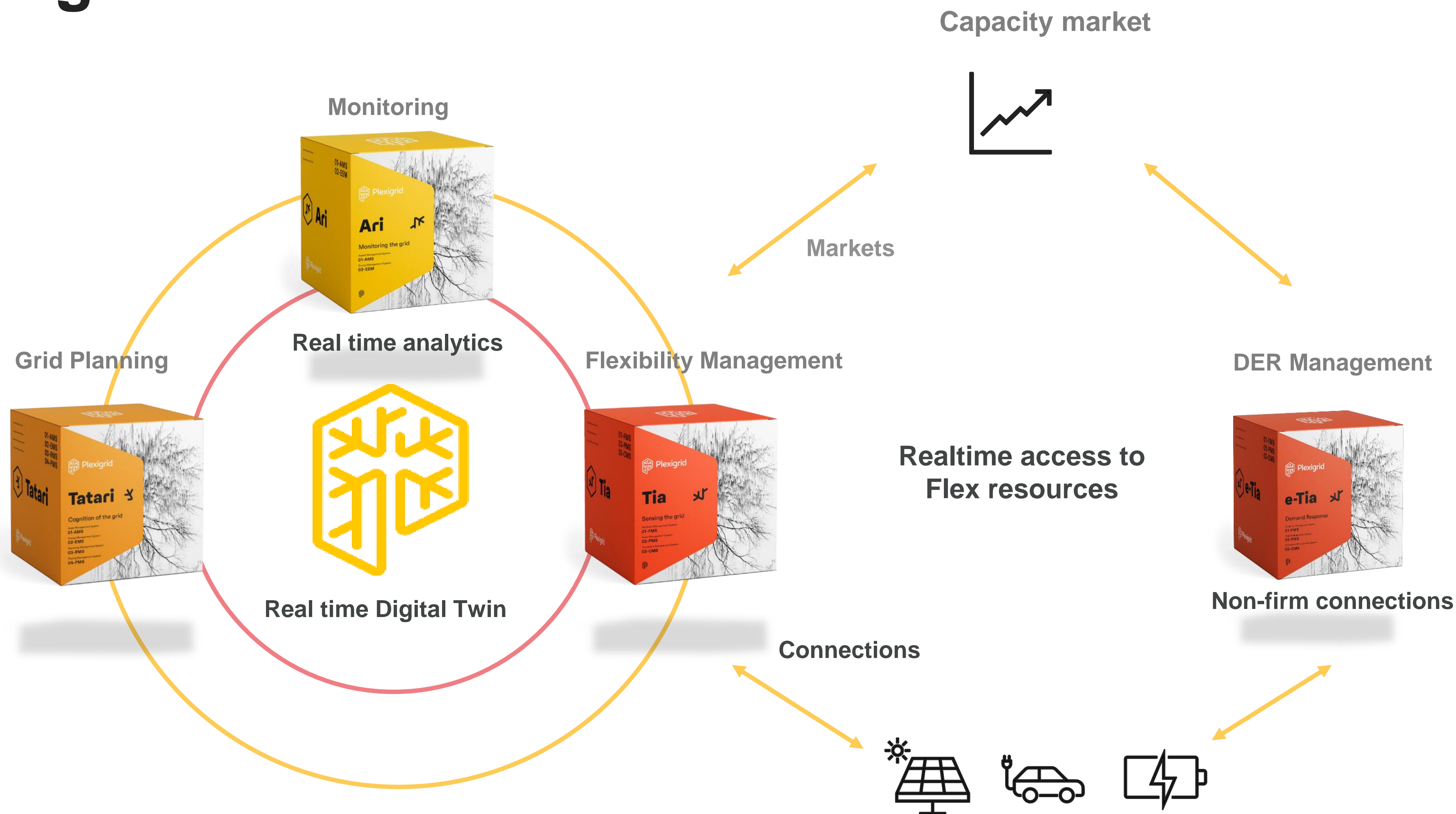
- DER control behind the meter
- Peak shaving
- Energy optimization
- Community self consumption

### Centralized management

- Remote monitoring and control
- Asset inventory and analytics
- Forecasting available flexibility



# Plexigrid solutions





# PlexiLITE

## Plug-and-play grid analytics

### INSTANT SYSTEM ACCESS

- Deploy a standardized system in no-time
- Fast and easy piloting of new functionality
- Easy access to system support

### HASSLE FREE SYSTEM MANAGEMENT

- No additional hardware
- System size scales to your needs
- Automatic software upgrades

### STANDARDIZED DATA INTEGRATION

- Self service data import
- CIM/CGMES compliant interface
- Implementing security standards and best practices







# Plexigrid

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for the energy transition

**Thank you for listening!**

**Pär Schröder**

[par.schroder@plexigrid.com](mailto:par.schroder@plexigrid.com)





## ARI LV Monitoring



- ✓ Full visibility into low voltage
- ✓ Grid monitoring in real time
- ✓ Optimize load flows and grid configuration
- ✓ Reduce losses

## TATARI Grid Planning



- ✓ Identify grid bottlenecks
- ✓ Simulate alternatives to grid reinforcements
- ✓ Simulate impact of new connections

## TIA Flexibility Management



- ✓ Forecasting future congestions
- ✓ Direct control of flexible connections
- ✓ Integration with local capacity markets

## E-TIA DER Management



- ✓ Forecasting available flexibility
- ✓ Remote dynamic DER control

