

Plexigrid

Reinventing Electricity Grids for the Energy Transition



THE PROBLEM

Electricity Grids are becoming the **Largest Bottleneck** of the **Energy Transition**

■ Congestions & Unstability

As millions of EVs, solar panels, heat pumps, ... unfold across the grid, operators are confronting unprecedented levels of overvoltages, undervoltages, overloads and stability issues



European Distribution System Operators Observatory



Reinventing electricity grids for the energy transition

■ Delays & Cancellations

Grids are the **#1 cause of delays and cancellations** of new renewable projects and electrification projects



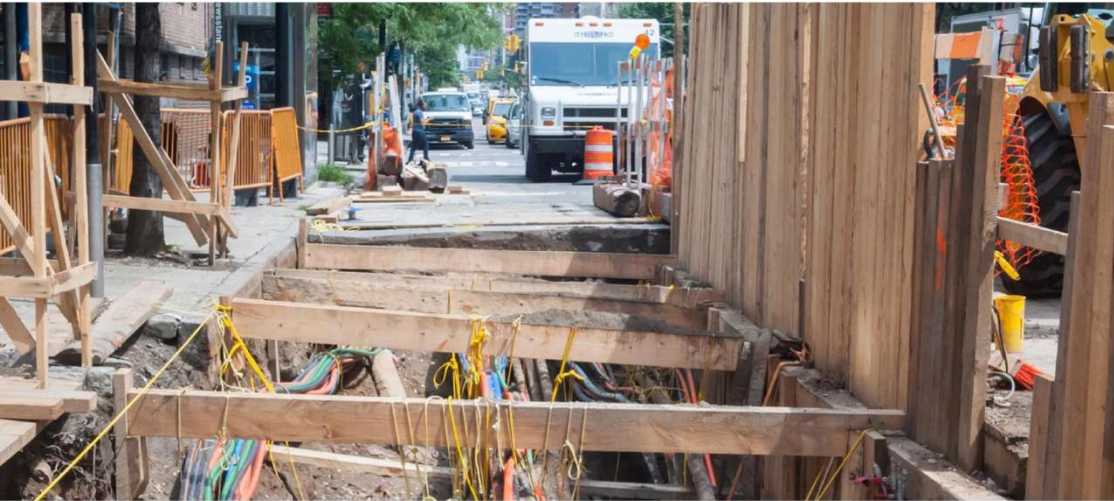
■ Rising Costs

Using the traditional approach alone can lead to a doubling of grid costs over the coming decade, causing consumer affordability issues



THE SOLUTION

Combining the traditional approach with Plexigrid's technology



The traditional way:

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

The Plexigrid way:

- with **software**, on the **demand side**
- **actively managing and reducing peak loads**
- **faster and cheaper**, benefiting customers, grid operators and retailers



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THE SOLUTION

By **mobilizing demand flexibility**, Plexigrid **resolves bottlenecks**, releases hosting capacity to connect more renewables, EVs, heat pumps... and reduces electricity distribution costs by 30%-40%

Design for peak capacity

“Reinforce the grid to guarantee capacity for peak demand”

Observation

- Peak Consumption is about to reach Max Capacity. The grid is full!

Reaction = Problem

- Increase network capacity through CAPEX investments!

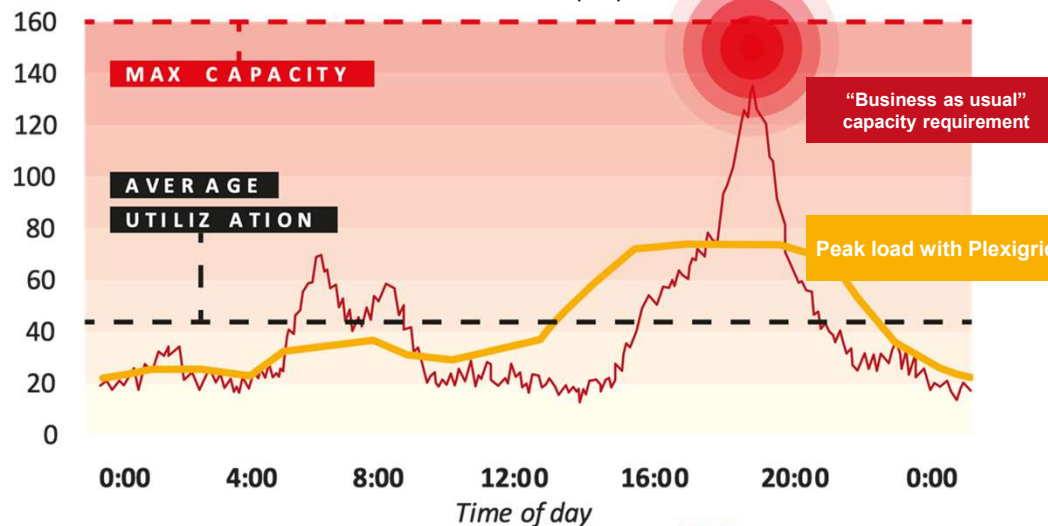
Result

- Increasing consumer grid costs
- Long lead times
- Unsustainable raw material use



Reinventing electricity grids for the energy transition

ELECTRICITY DEMAND THROUGHOUT THE DAY (KW)



Tom

Electrical Engineer



Sofia

Telecom Engineer



Design for optimal utilization

“Optimize grid utilization by adapting demand to available capacity”

Observation

- Why is the average utilization so low? There is plenty of capacity available

Reaction = Opportunity

- Exploit flexibility of demand and supply to distribute load more evenly

Result

- No/minimum need for upgrades
- Reduced cost for consumers
- Fast adaption to increased demand
- Increased hosting capacity for renewables

THE SOLUTION. IMPACT

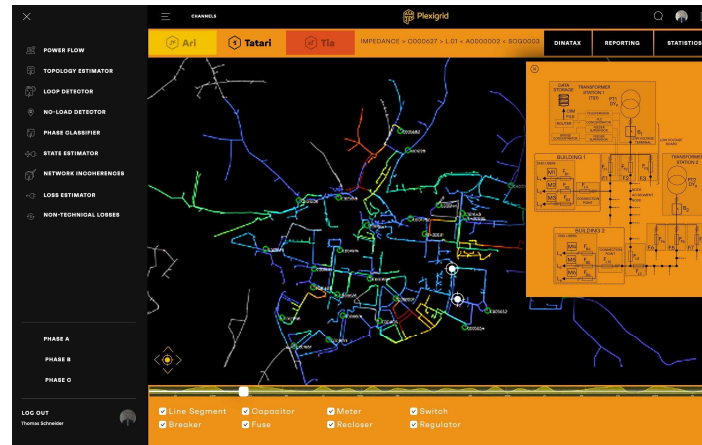
Plexigrid's superpowers drive game-changing improvements across, **planning, operations and flexibility management**

GRID OPERATIONS



Reduction of operational costs and improvements in grid performance

GRID PLANNING



Tighter, “bottleneck focused” capacity planning, reduction of electrical losses

FLEXIBILITY MANAGEMENT

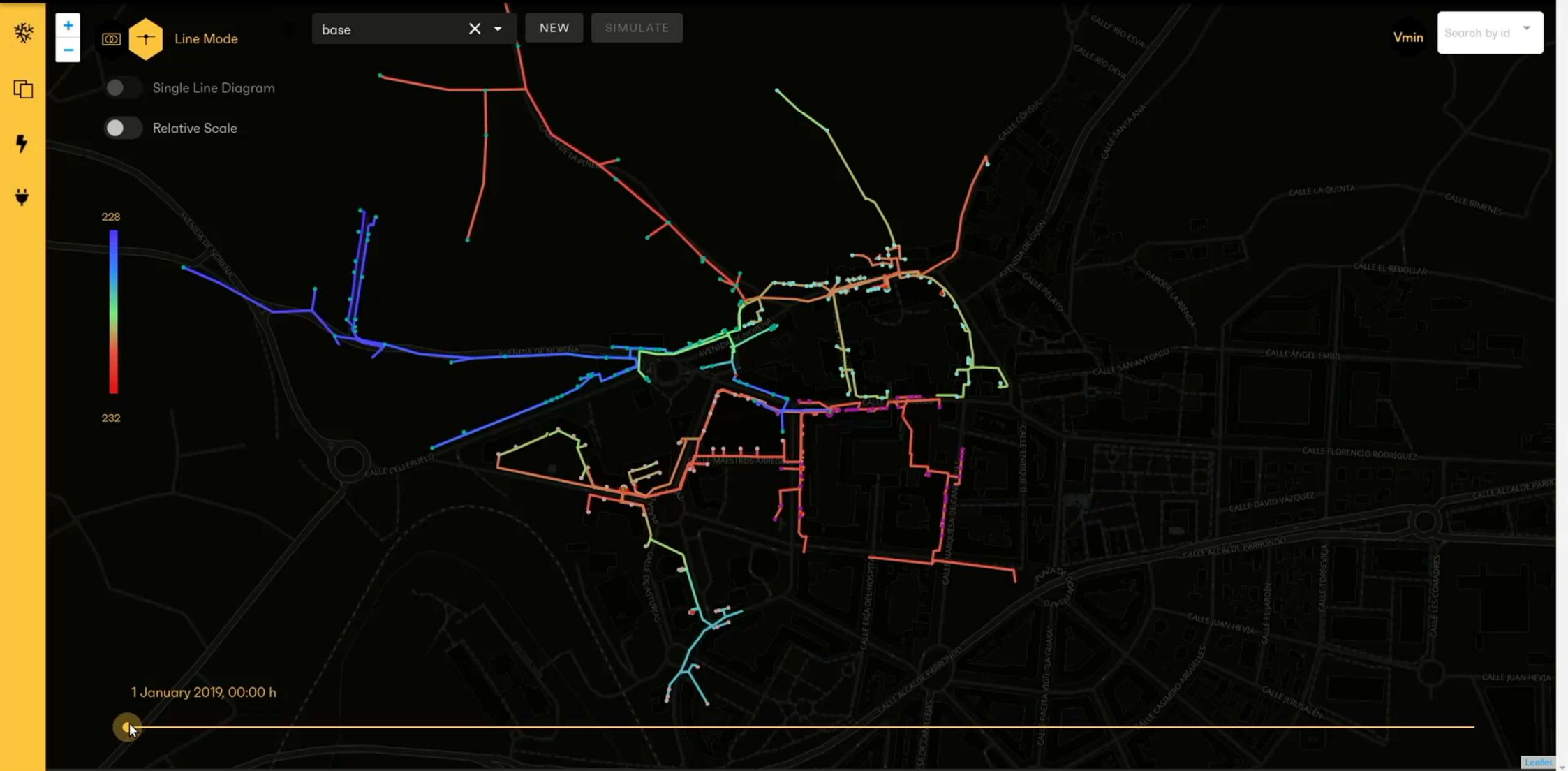


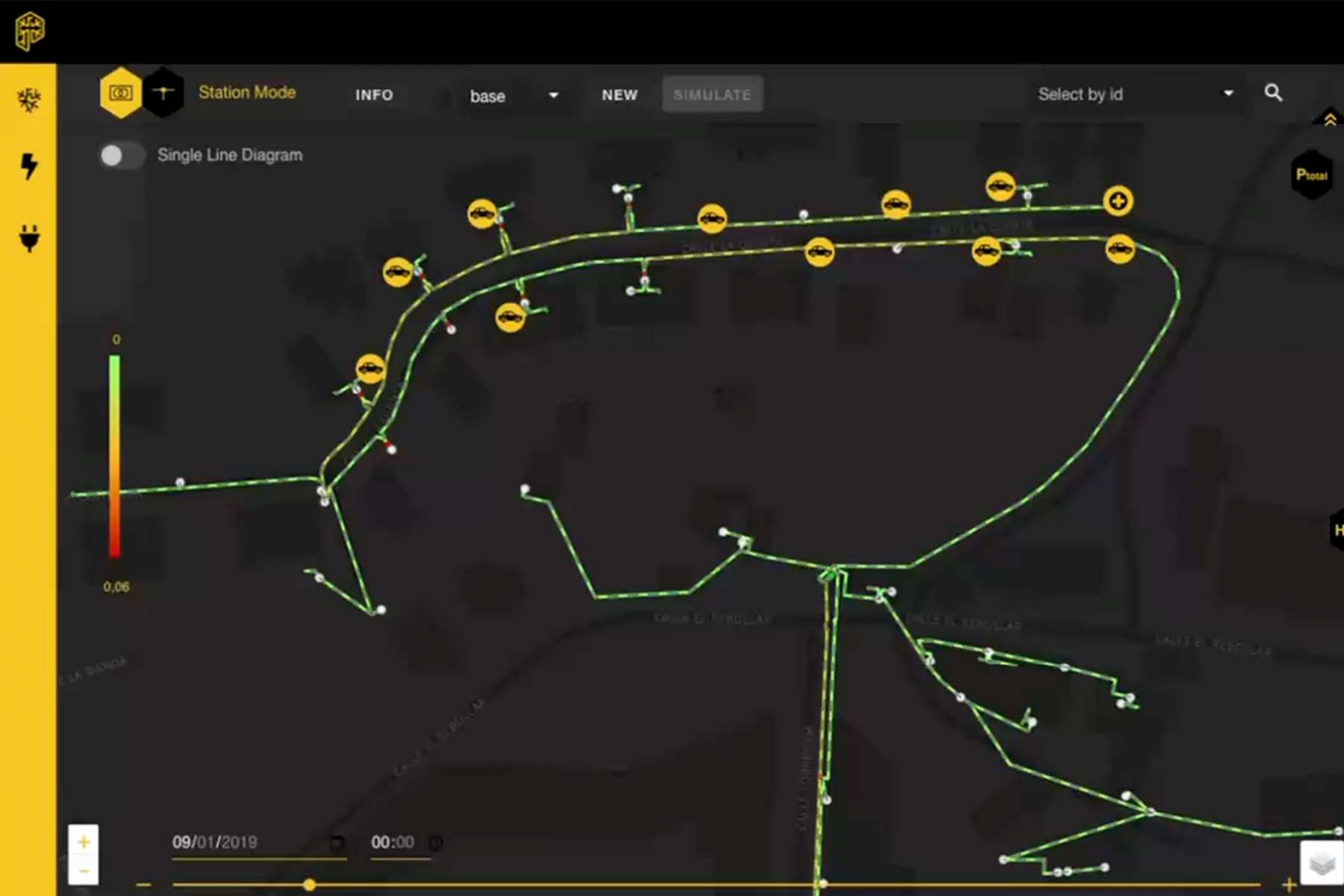
Resolution of bottlenecks with flexibility instead of additional capacity

Up to 35% reduction of energy and grid costs for grid operators and consumers



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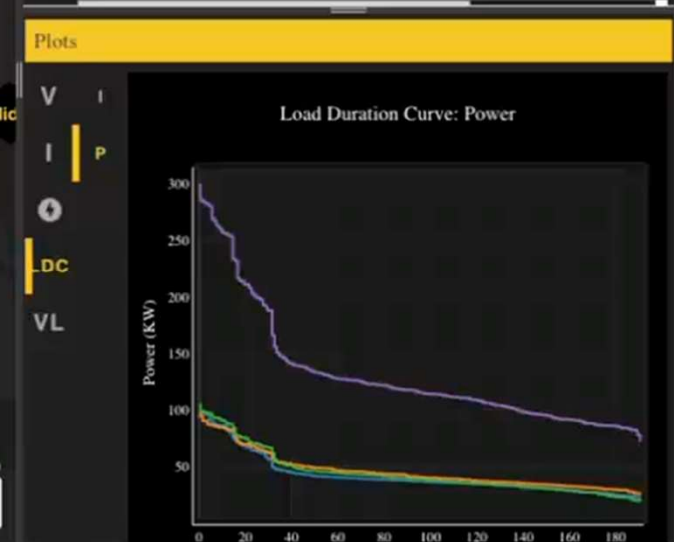


Station 65019

2019-01-08 / 2019-01-15

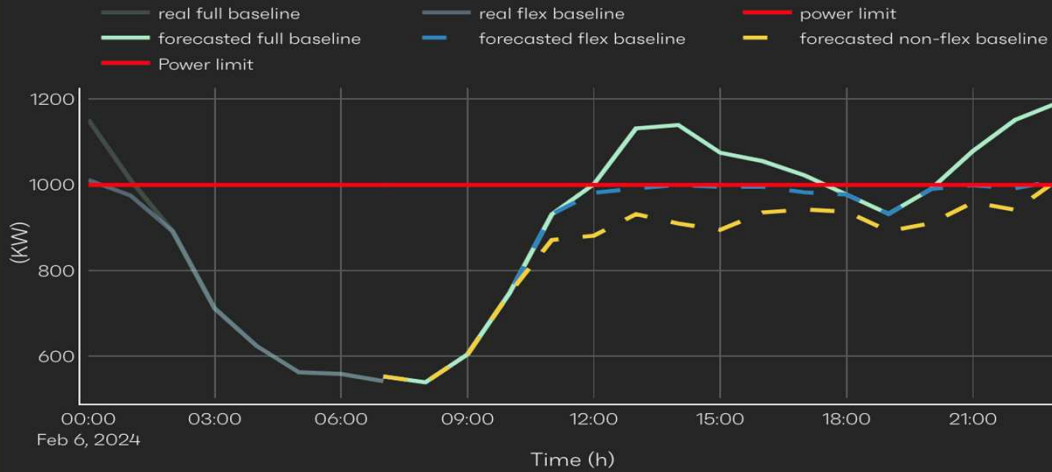
KPIs

Unit	Phase	Base	base21	base2flex	base22flex1	base22flex2
— KPI: Apparent Power: Avg X						
kVA	3P	113.57	133.12	197.7	182.79	162.79
kVA	A	35.83	42.42	62.86	57.91	51.79
kVA	B	39.66	46.07	68.58	63.62	56.79
kVA	C	38.08	44.62	66.25	61.26	54.21
kVA	N	0	0	0	0	0
— KPI: Apparent power: Phase Share (Avg) X						



MAP

Expected for tomorrow Today Yesterday Last Week Last Month Last Year



MONITORING

KPIS

Select b...

EVENTS

Power set-up and real-time power

<p>Actual power (KW) 541.989 / 519.688 Measured / Aggregated</p>	<p>Maximum power (KW) 1000 Locked </p>	<p>Minimum power (KW) 50 Locked </p>
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Customers log

<p>Total Customers 261 / 260 Registered / Connected</p>	<p>Non - active 249 / 248 Registered / Connected</p>	<p>Active 12 / 12 / 2 Reg. / Conn. / Activated</p>
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Historical Flex

<p>Avg violation (kW) 128.147 Average flex activation (kW)</p>	<p>Max flex activation (kW) 229.475 Maximum flex activation (kW)</p>	<p>Flex activation duration (h) 24 Hours with flex activation</p>	<p>Real violation duration (h) 15 Hours with real power violation</p>
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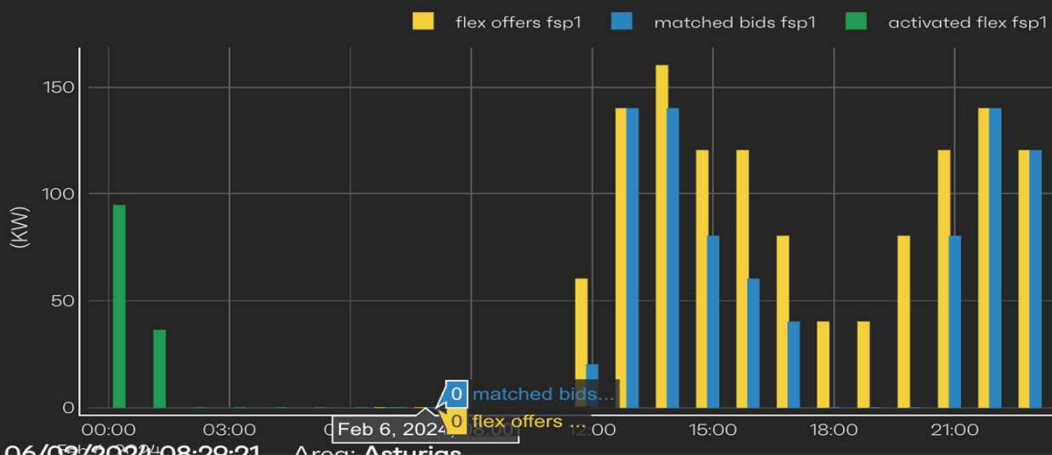
Forecast Flex

<p>Avg violation (kW) 112.018 Average violation when above the limit (kW)</p>	<p>Max violation (kW) 265.373 Maximum violation when above the limit (kW)</p>	<p>Flex requests duration (h) 25 Number of hours with flex requestes (hours)</p>	<p>Flex deficit duration (h) 1 Number of hours with flexibility deficit (hours)</p>
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MARKET

BILATERAL AGREEMENTS

NON-FIRM CONNECTIONS





Plexigrid

Thanks !!