



CONNECTIONS SUMMIT

◆ ELECTRICITIES

Applications of AI in the Smart Grid

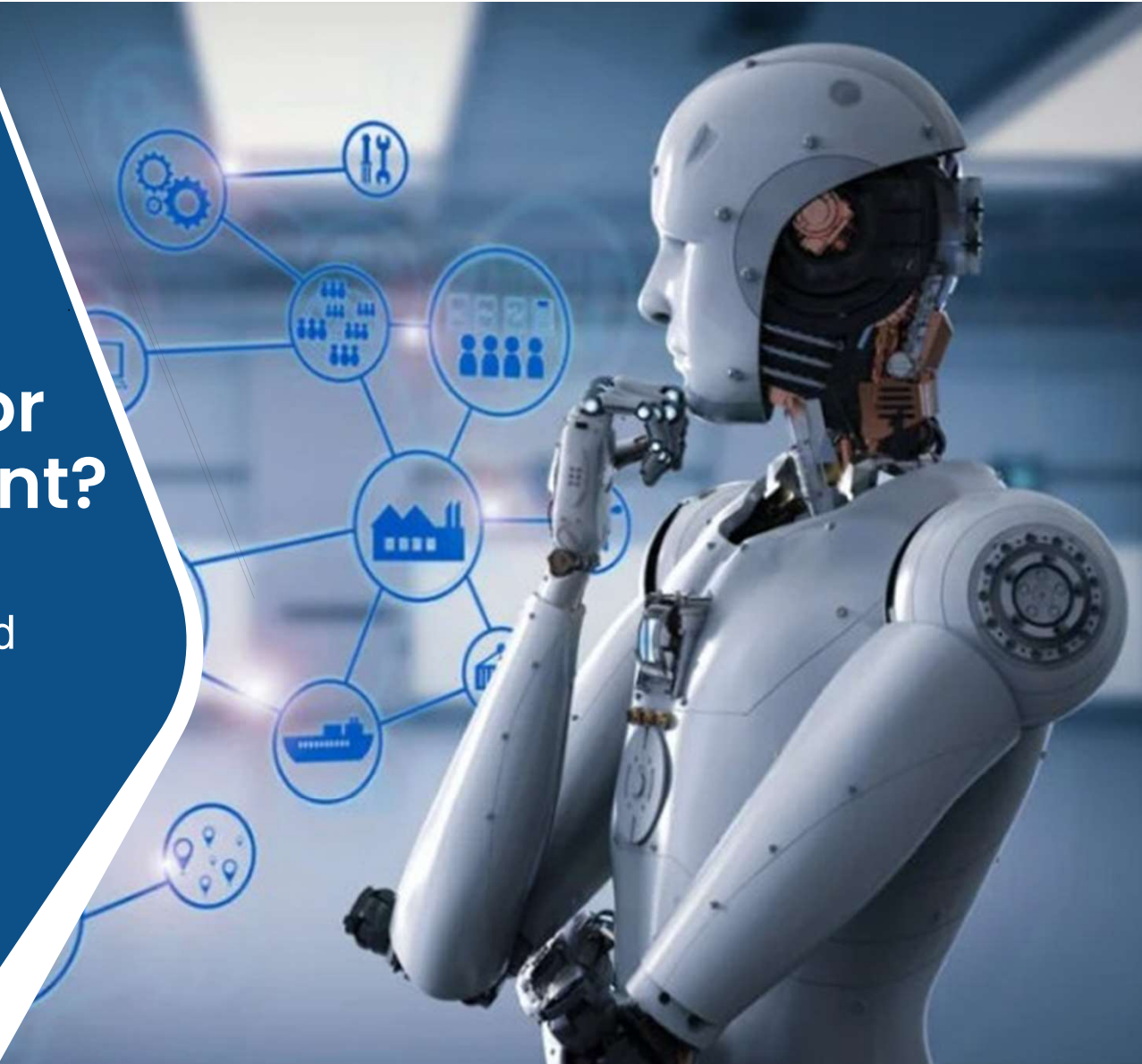
Costa Apostolakis

Founder & CEO

nexgrid

Why is AI needed for Energy Management?

- Mass amount of data collected
- Real time communication
- Advanced sensors



Nexgrid AI Focus Areas

- **Operational Savings**
- **Energy Savings**
- **Safety**

AI Powered

Electric Vehicle Management

- Identify Level II Charger Installs
- Electric Vehicle Readiness
- Shift Charging to Off-Peak Times



AI Powered

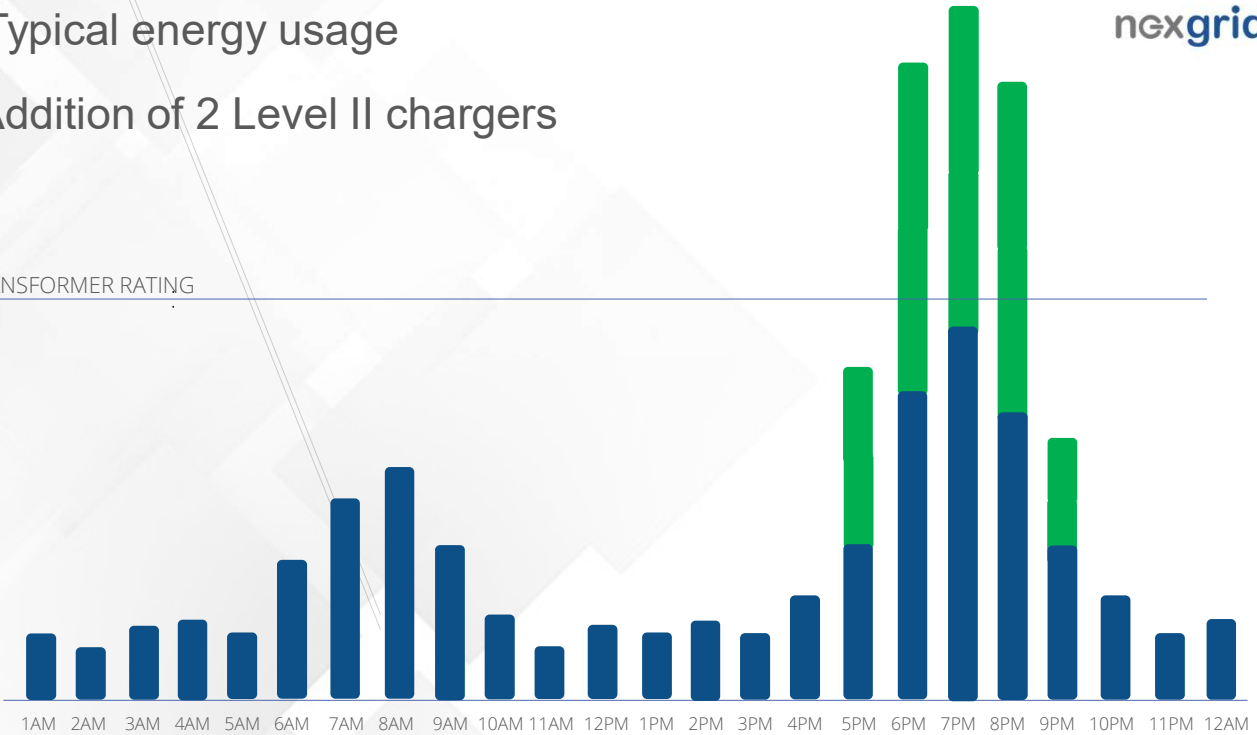
EV Impact

24 Hour Simulation



Typical energy usage
Addition of 2 Level II chargers

TRANSFORMER RATING



25 kVA

11.5 kW

11.5 kW

AI Powered

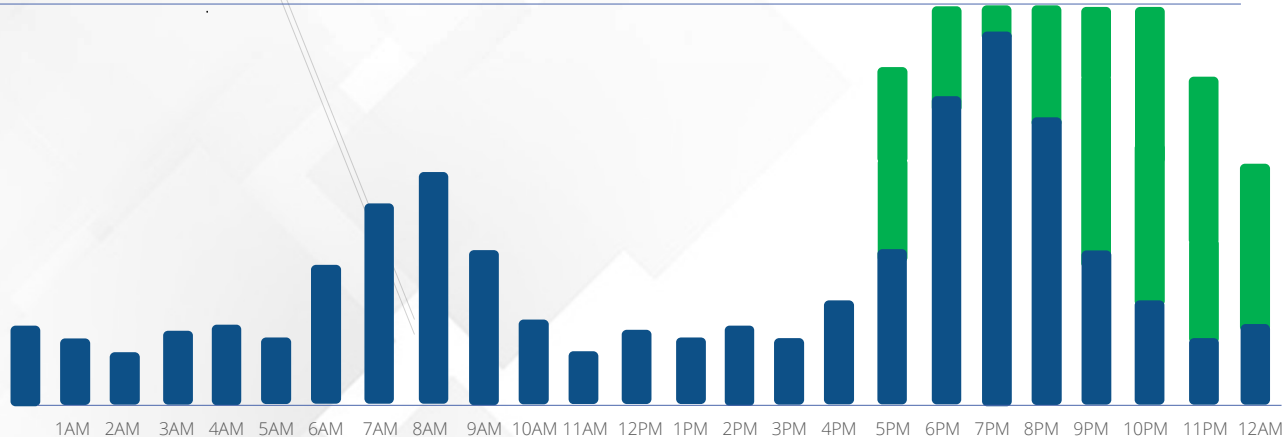
EV Impact



Typical energy usage

Addition of 2 Level II chargers

TRANSFORMER RATING



25 kVA

11.5 kW

11.5 kW

EV READINESS

Transformer ability to support Level II charging.

Electric Vehicle Management Home Chargers Stations Vehicles AI ? x

EV Readiness *(Monitored Electric Vehicle chargers installed on the system)*

Show entries Showing 81 to 100 of 1,567 entries

↑↓	↑↓	Name	Address	↑↓ Size	↑↓ Meters	↑↓ Year Peak	↑↓	↑↓ Chargers	↑↓ Est Peak	↑↓
81	▼	U1-1044	1084 E Santa Fe St	50 kVa	4	30.19kW	🟢	2	53.19kW	
82	▼	U1-1043	1009 E Santa Fe St	50 kVa	4	28.48kW	🟢	2	51.48kW	
83	▼	U1-1042	1044 E Santa Fe St	50 kVa	4	30.75kW	🟢	2	53.75kW	
84	▼	U1-1041	1044 E Santa Fe St	50 kVa	4	45.52kW	🟡	0	45.52kW	
85	▼	U1-1040	1000 E Santa Fe St	50 kVa	4	33.37kW	🟢	1	44.87kW	
86	▼	U3-155	18701 S Gardner Rd	300 kVa	1	175.64kW	🟢	13	325.14kW	
87	▼	U1-1017	887 S Creekside Dr	50 kVa	4	45.3kW	🟡	0	45.3kW	
88	▼	U3-153	R447+2V	225 kVa	19	66.49kW	🟢	15	238.99kW	
89	▼	U3-154	R447+2V	225 kVa	18	65.96kW	🟢	15	238.46kW	
90	▼	U3-152	18150 Cedar Niles Rd	45 kVa	1	4.27kW	🟢	3	38.77kW	
91	▼	U1-1024	1004 Cimarron Trail	25 kVa	0	0W	🟢	2	23kW	
92	▼	U1-1025	1004 Cimarron Trail	25 kVa	1	13.07kW	🟢	1	24.57kW	
93	▼	U1-1026	1004 Cimarron Trail	25 kVa	2	16.24kW	🟡	0	16.24kW	
94	▼	U1-1034	1009 E Santa Fe St	50 kVa	0	0W	🟢	4	46kW	

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Previous 1 ... 4 **5** 6 ... 79 Next

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Transformer Efficiency

Transformer Details

Home Pictures Maps Reports Meters EV Graphs AI

Make PDF

ID	Name	Status
91267612	MCCOMBS, WILLIAM & DEBORAH	OPTIMUM
91267613	SHELTON, AMANDA	OPTIMUM
91268722	COOPER, ROBERT	OPTIMUM
91268671	HAMELL, CYNTHIA	OPTIMUM
91268719	BOLDEN, PAULETTE	OPTIMUM
91268720	CRUM, WILLIAM	OPTIMUM
91267559	COWLES, BARBARA	OPTIMUM

Voltage Optimization

Transformer Efficiency (1 Year)

EV Readiness 0

Line Balance

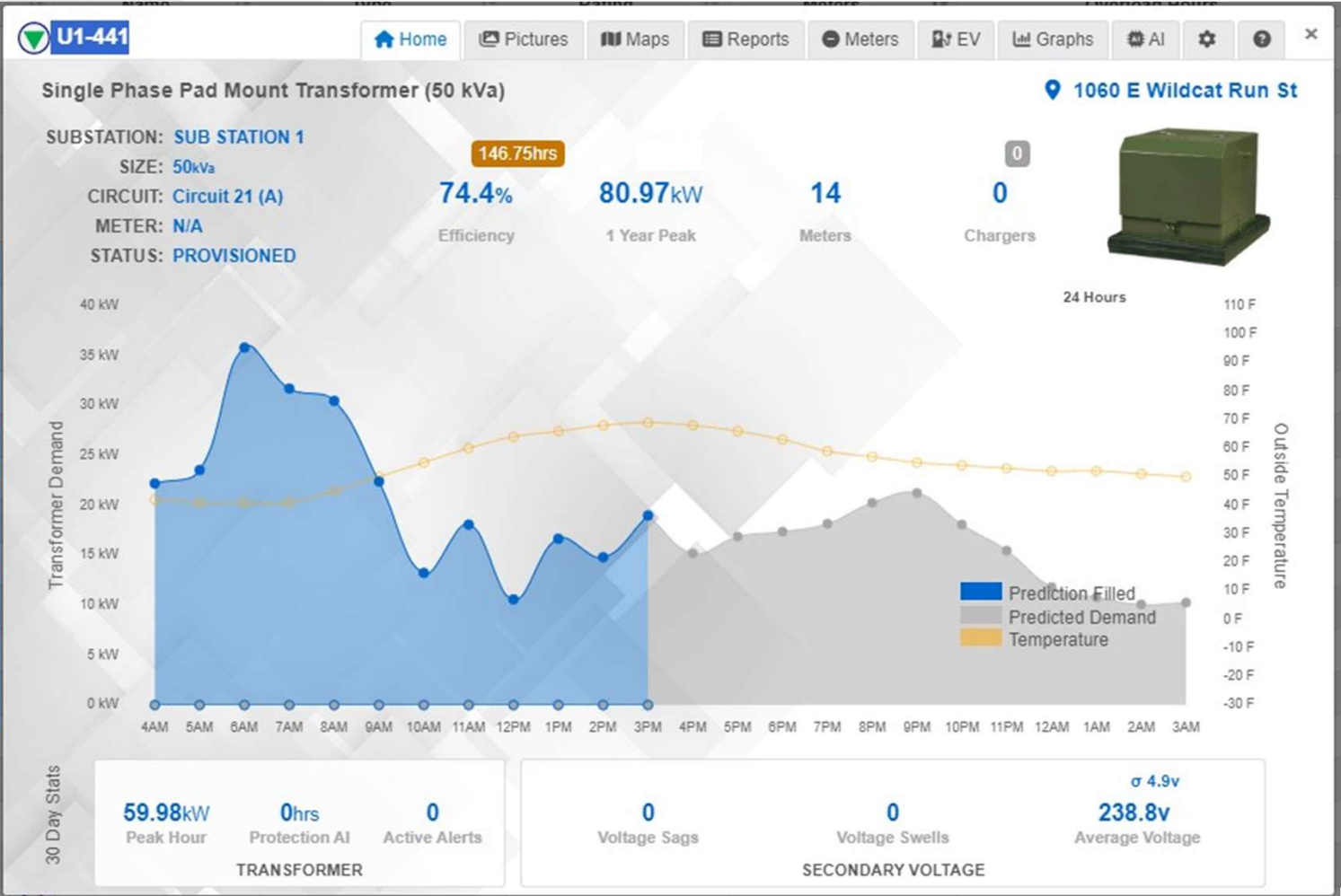
FUTURE

FUTURE

FUTURE

Demand Forecasting

- Weather Forecast
- Week of the Year
- Day of the Week
- Historical Usage



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Grid Optimization Transformer



Transformer Sizing

Optimal distribution transformer sizing based on historical demand from aggregated meter data.



Transformer Efficiency

Historical load analysis to produce a transformer profile that includes underloaded and overloaded conditions.



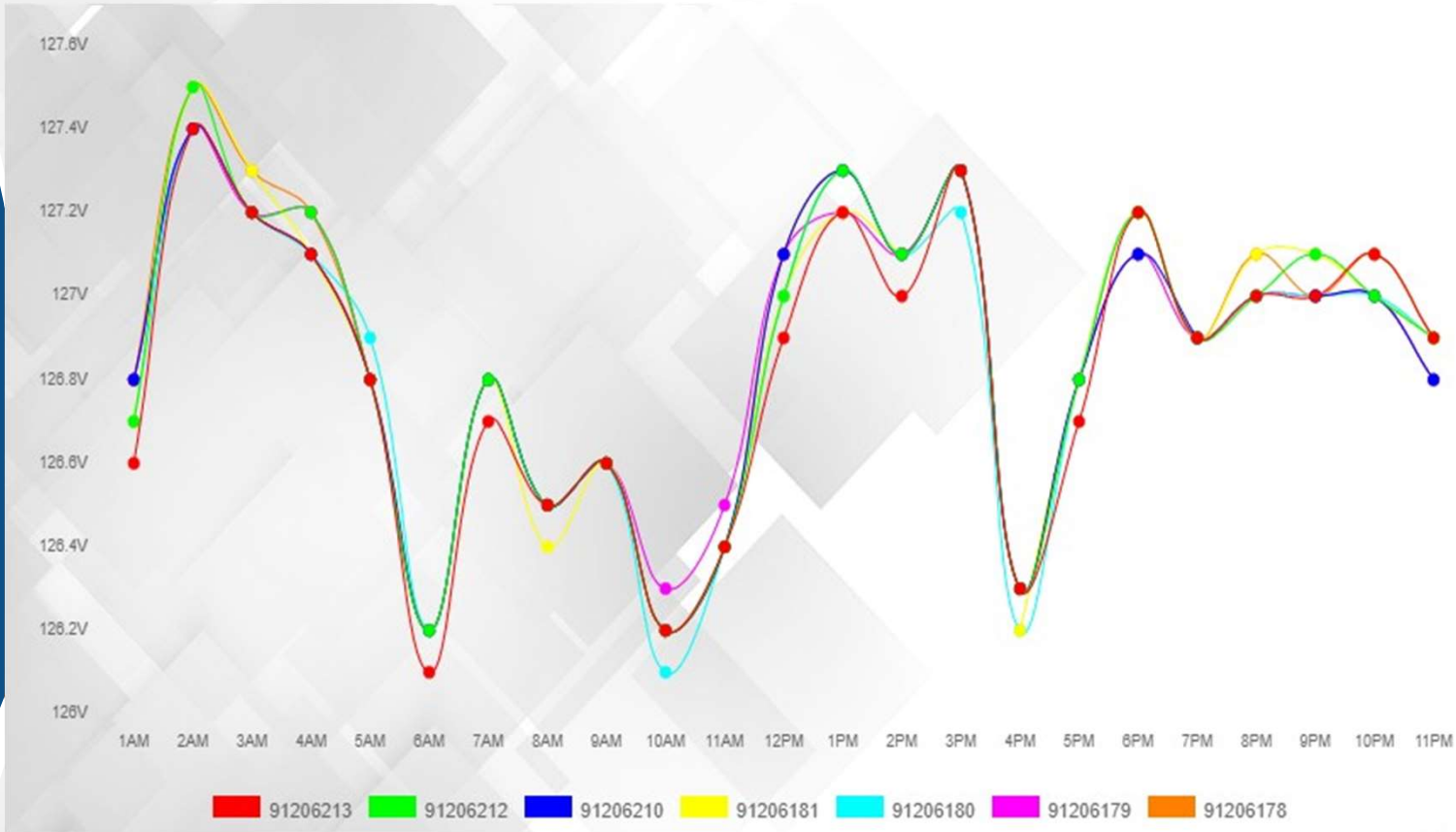
Voltage Optimization

Meter and transformer voltage signatures identify maintenance issues and safety concerns.

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Voltage Signatures

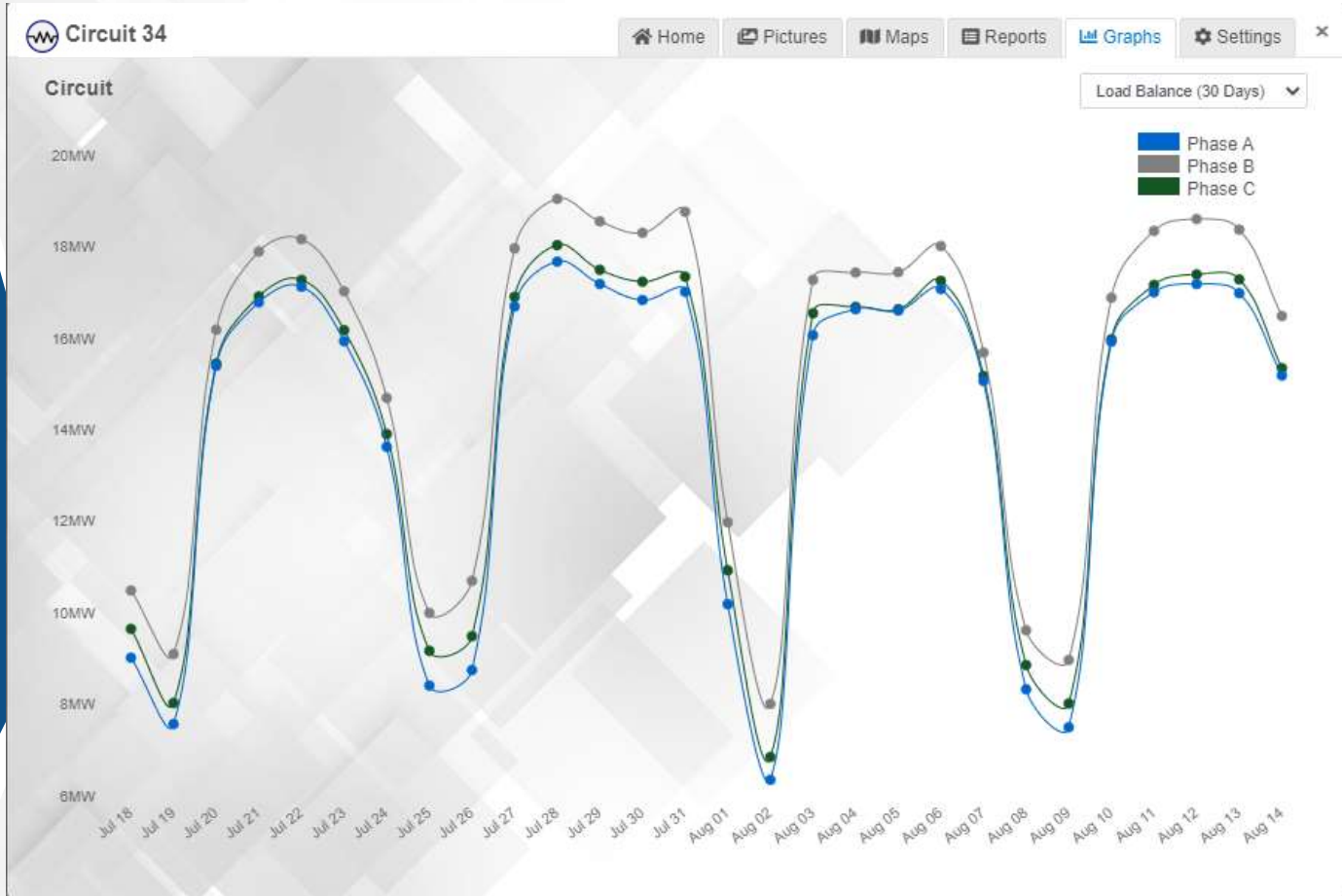


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AI Diagnostics: Change 6 transformer taps



Circuit Balancing



System Losses

- Area of Loss
- Administrative or Technical

5-STATE FARM

Substation (18750 kVa) 169 Ayers Ln Administrative Line Loss

Show 20 entries Showing 21 to 40 of 58,662 entries

Time	Actual	Usage	Loss	%	Received	Meters	Reporting
3/5 3:00 PM	22.95MW	22.11MW	843.4kW	4.118%	26.26kW	8899	100%
3/5 2:00 PM	23.49MW	22.64MW	852kW	4.229%	26.71kW	8899	100%
3/5 1:00 PM	24.05MW	23.22MW	877.9kW	4.114%	26.71kW	8899	100%
3/5 12:00 PM	24.01MW	23.23MW	783.3kW	3.964%	35.12kW	8899	99.9%
3/5 11:00 AM	23.91MW	23.12MW	796.79kW	3.902%	32.5kW	8899	100%
3/5 10:00 AM	23.84MW	23.04MW	798.75kW	4.148%	21.79kW	8899	100%
3/5 9:00 AM	22.94MW	22.12MW	814.58kW	4.34%	11.26kW	8899	100%
3/5 8:00 AM	22.71MW	21.89MW	826.52kW	4.416%	14.44kW	8899	100%
3/5 7:00 AM	22.09MW	21.04MW	1.05MW	5.174%	24.58kW	8899	100%
3/5 6:00 AM	21.11MW	19.94MW	1.17MW	5.974%	24.17kW	8899	100%
3/5 5:00 AM	20.85MW	19.67MW	1.18MW	6.09%	12.93kW	8899	100%
3/5 4:00 AM	20.79MW	19.6MW	1.19MW	6.128%	8.27kW	8899	100%
3/5 3:00 AM	21.02MW	19.82MW	1.2MW	6.104%	6.07kW	8899	100%
3/5 2:00 AM	20.88MW	19.67MW	1.21MW	6.156%	7.03kW	8899	100%

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◆ ELECTRICITIES

Thank You!