

Jarrett Taylor

Intern - Grid Applications Developer
GAD Team
2019

About Me



Background:

- Coppel, TX
- Texas A&M: B.S. in Computer Science (Minor in EE)
- Hockey, 16 years
- Graduate May 2021: Software Application Developer



County Generation Display Introduction

Bastrop County

Total Gen: 1510.45

Maximum LMP: 42.60

SUBSTAT_1

CC1 (ON)

Output: 498.00 MW

SCED BP 406.50 Updtd BP 406.54 BP Dev 91.46

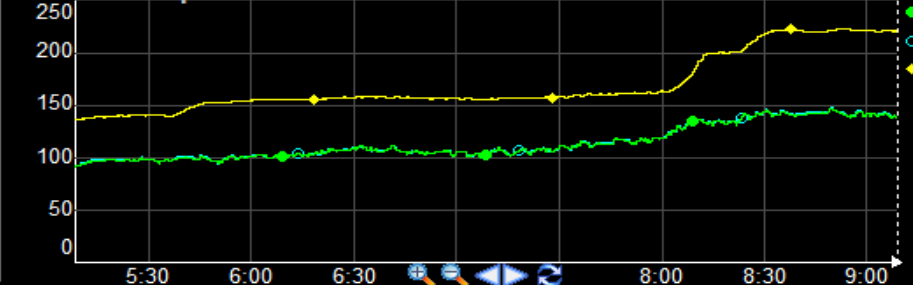
QSE RegUp Dep 0.00
LMP RegDn Dep 0.00

LSL	275.00	HSL	517.00	RURS	0.00
LDL	398.00	HDL	517.00	RDRS	0.00
LEL	275.00	HEL	517.00	RRRS	0.00
LASL	275.00	HASL	517.00	NSRS	0.00

UNIT_1	AVR ONLINE	PSS ONLINE
UNIT_2	AVR ONLINE	PSS ONLINE
UNIT_3	AVR ONLINE	PSS OFFLINE

Unit Name	MW	MVAR
UNIT_1	138.69	-4.00
UNIT_2	139.19	-3.00
UNIT_3	220.11	0.00

Unit MW Output



SUBSTAT_2

CC1 (ONREG)

Output: 494.10 MW

SCED BP 493.40 Updtd BP 492.32 BP Dev 1.78

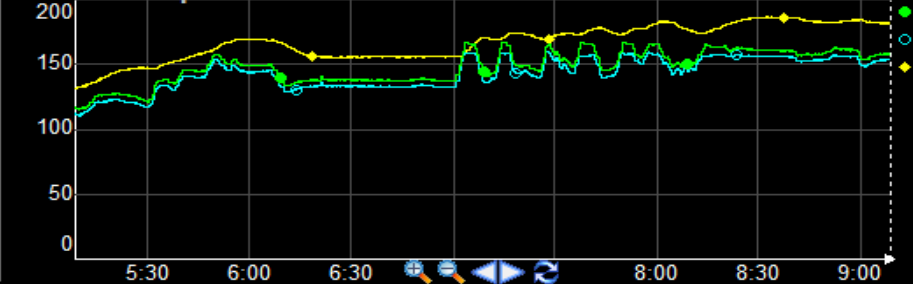
QSE RegUp Dep 3.18
LMP RegDn Dep 0.00

LSL	325.00	HSL	502.00	RURS	9.00
LDL	384.10	HDL	493.00	RDRS	0.00
LEL	325.00	HEL	502.00	RRRS	0.00
LASL	325.00	HASL	493.00	NSRS	0.00

UNIT_1	AVR ONLINE	PSS N/A
UNIT_2	AVR ONLINE	PSS N/A
UNIT_3	AVR ONLINE	PSS N/A

Unit Name	MW	MVAR
UNIT_1	158.70	-7.30
UNIT_2	153.70	-1.10
UNIT_3	181.50	-17.00






















Unit MW Output



Problem – ProcessBook

- Manual Maintenance
- Inefficient Updating
- Accuracy Problems
- Aging technology

Generation By County

	Archer County
	Atascosa County
	Bastrop County
	Baylor County
	Bell County
	Bexar County
	Borden County
	Bosque County
	Brazoria County
	Brazos County
	Brewster County
	Briscoe County
	Burnet County
	Calhoun County
	Cameron County
	Carson County
	Chambers Count
	Cherokee Count
	Clay County
	Coke County
	Collin County

Problem – Manual Updates

Harris County (Page 1) Go to

Total Gen: 4846.40 Maximum LI

Bastrop County

Total Gen: 1510.45 Maximum LI

Dallas County

Total Gen: 1510.45 Maximum LI

Matagorda County

Total Gen: 2599.95 Maximum LI

SUBSTAT_1

UNIT 1 (ONOS) Output: 570.36 MW

SCED BP 571.20 Updtd BP 571.13 BP Dev -0.77

QSE AVR ONI INF RegUp Dep 0.00

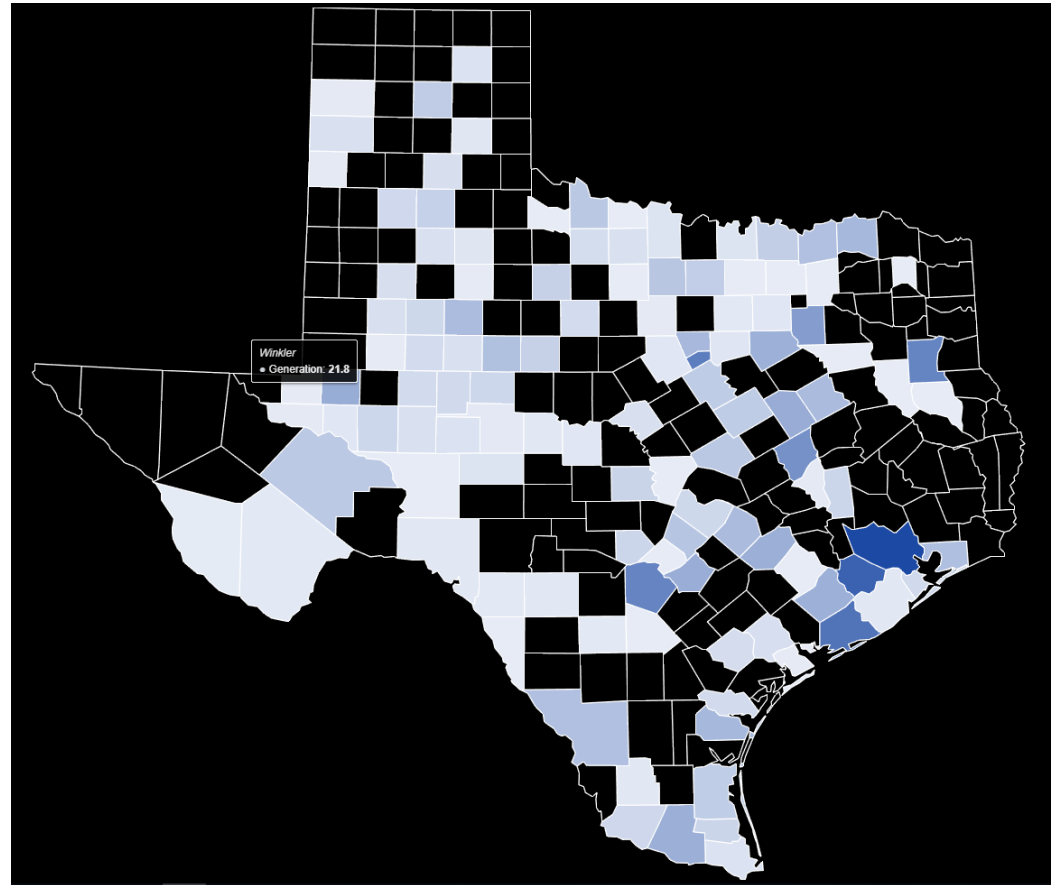
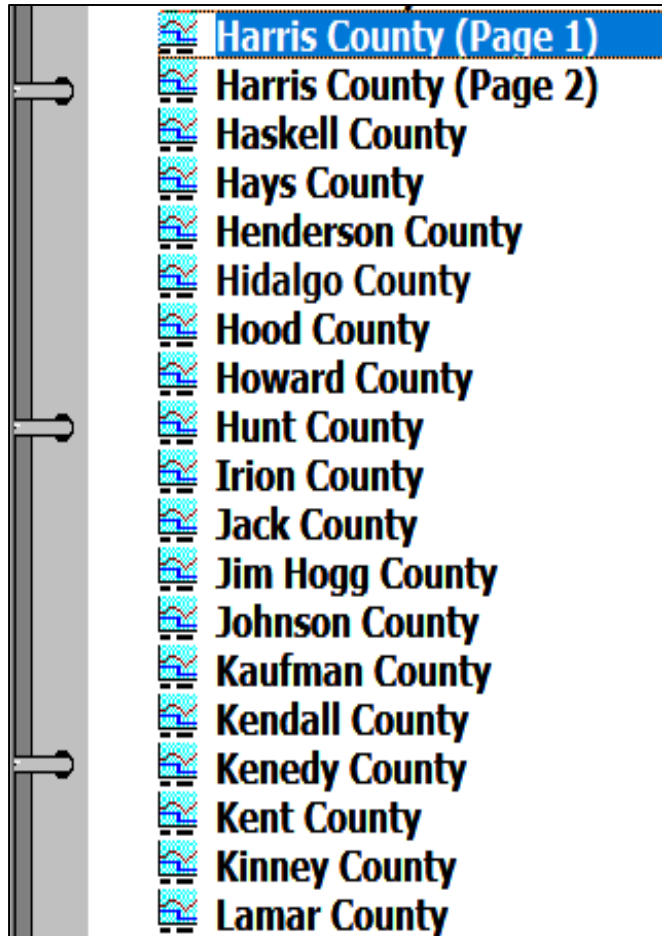
LMP 8999.99 PSS Exempt RegDn Dep 0.00

LSL	52.80	HSL	572.00	RURS	0.00
LDL	540.36	HDL	572.00	RDRS	0.00
LEL	52.80	HEL	591.80	RRRS	0.00
LASL	52.80	HASL	572.00	NSRS	0.00

All values must be placed and configured manually.

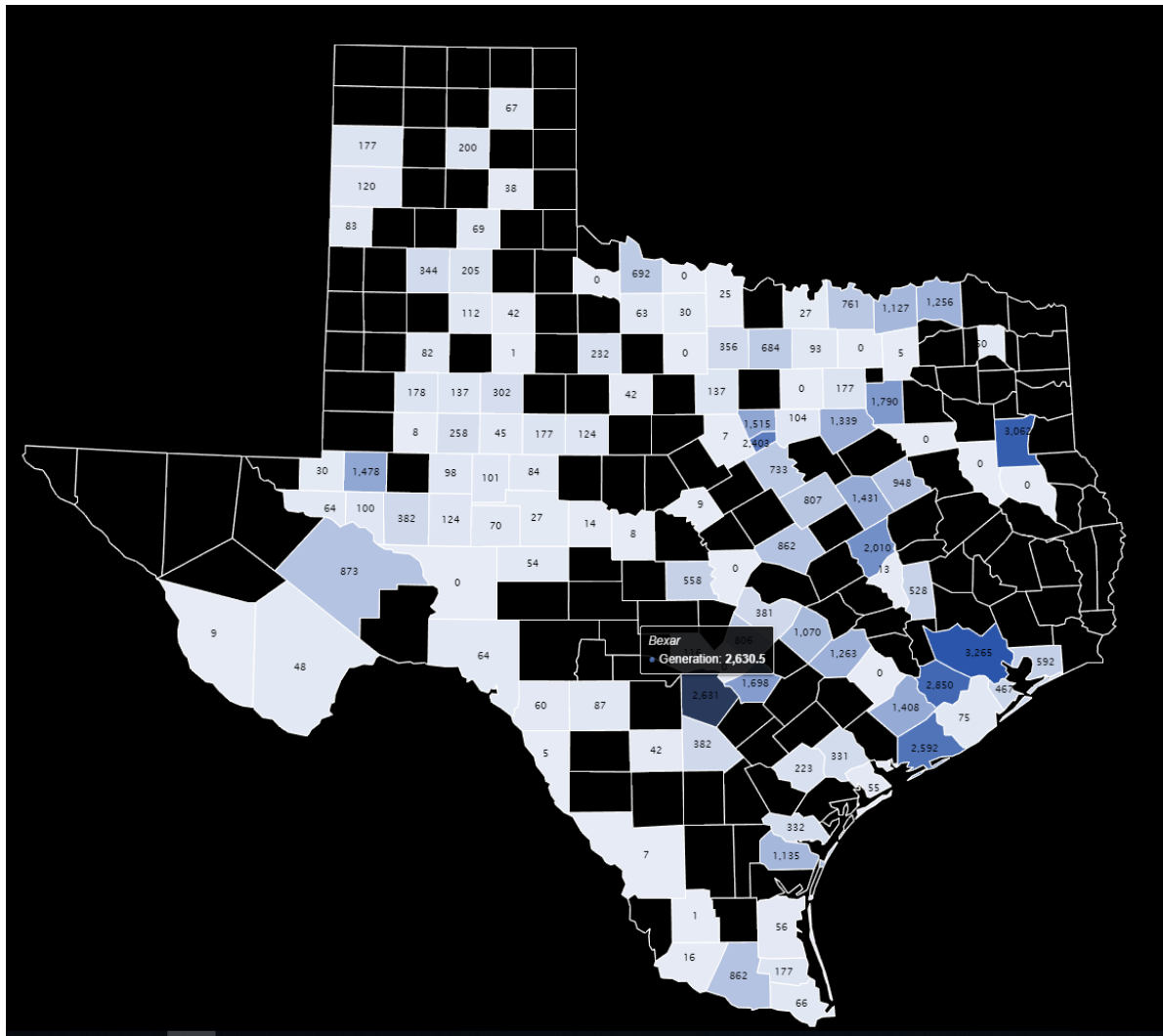
Solution – Transition: ProcessBook to Web Application

The displays will be moved from separate display files...



...to a single web based application which can be bookmarked.

Typical Use Case – Texas Map/Input Field



Archer

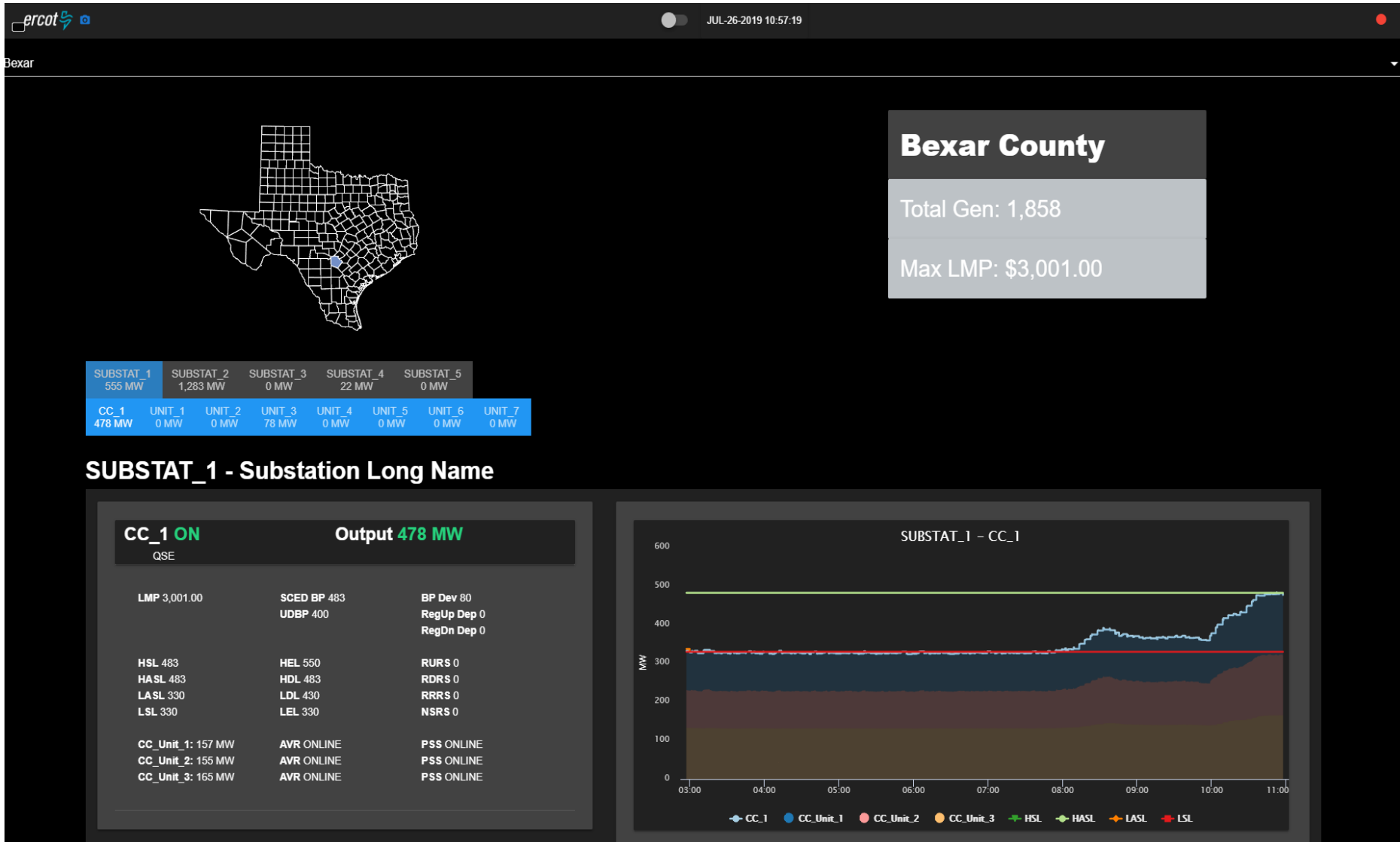
Atascosa

Bastrop

Baylor

Bell

Typical Use Case – County Drill-Down



Typical Use Case – Drill-Down Components

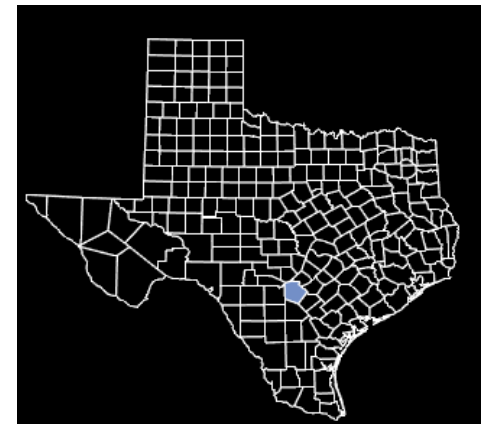
User can see all the generating substations within the county...

SUBSTAT_1 559 MW	SUBSTAT_2 1,332 MW	SUBSTAT_3 0 MW	SUBSTAT_4 22 MW	SUBSTAT_5 0 MW			
CC_1 483 MW	UNIT_1 0 MW	UNIT_2 0 MW	UNIT_3 76 MW	UNIT_4 0 MW	UNIT_5 0 MW	UNIT_6 0 MW	UNIT_7 0 MW

...and the generators within each substation

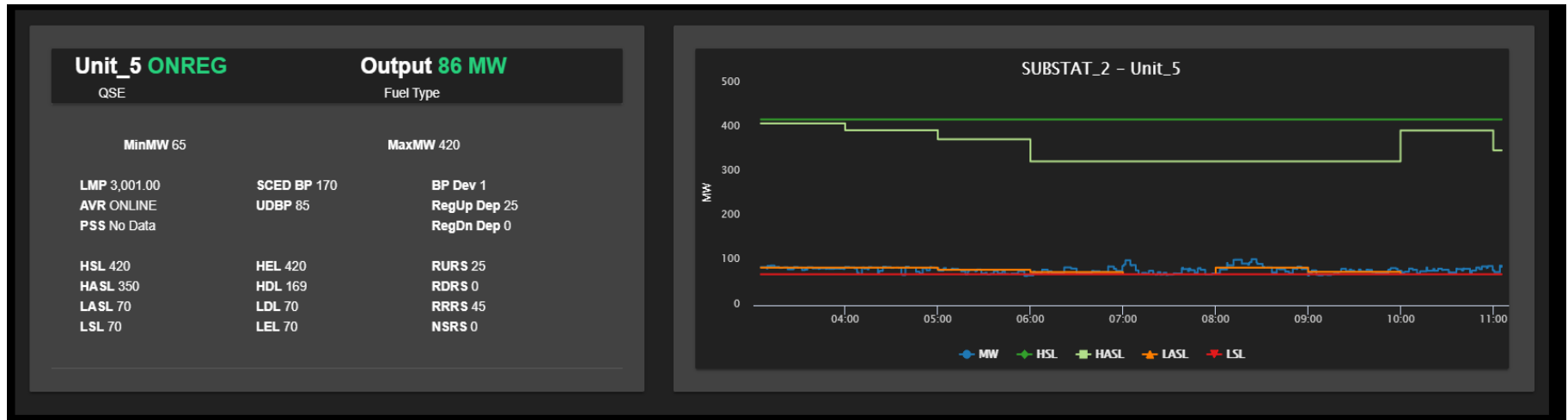
User can switch between any generating substation in the county.

SUBSTAT_1 557 MW	SUBSTAT_2 1,339 MW	SUBSTAT_3 0 MW	SUBSTAT_4 22 MW	SUBSTAT_5 0 MW			
UNIT_1 382 MW	UNIT_2 789 MW	UNIT_3 0 MW	UNIT_4 0 MW	UNIT_5 83 MW	UNIT_6 85 MW		



Typical Use Case – Fly-To Generator

SUBSTAT_1 561 MW	SUBSTAT_2 1,348 MW	SUBSTAT_3 0 MW	SUBSTAT_4 22 MW	SUBSTAT_5 0 MW	
UNIT_1 383 MW	UNIT_2 788 MW	UNIT_3 0 MW	UNIT_4 0 MW	UNIT_5 88 MW	UNIT_6 89 MW



SUBSTAT_2 - Unit_5

MW HSL HASL LASL LSL

Typical Use Case – Generator Data

Unit_5 ONREG

QSE

Output 88 MW

Fuel Type

MinMW 65

MaxMW 420

LMP 3,001.00

AVR ONLINE

PSS No Data

SCED BP 170

UDBP 85

BP Dev 2

RegUp Dep 24

RegDn Dep 0

HSL 420

HASL 350

LASL 70

LSL 70

HEL 420

HDL 169

LDL 70

LEL 70

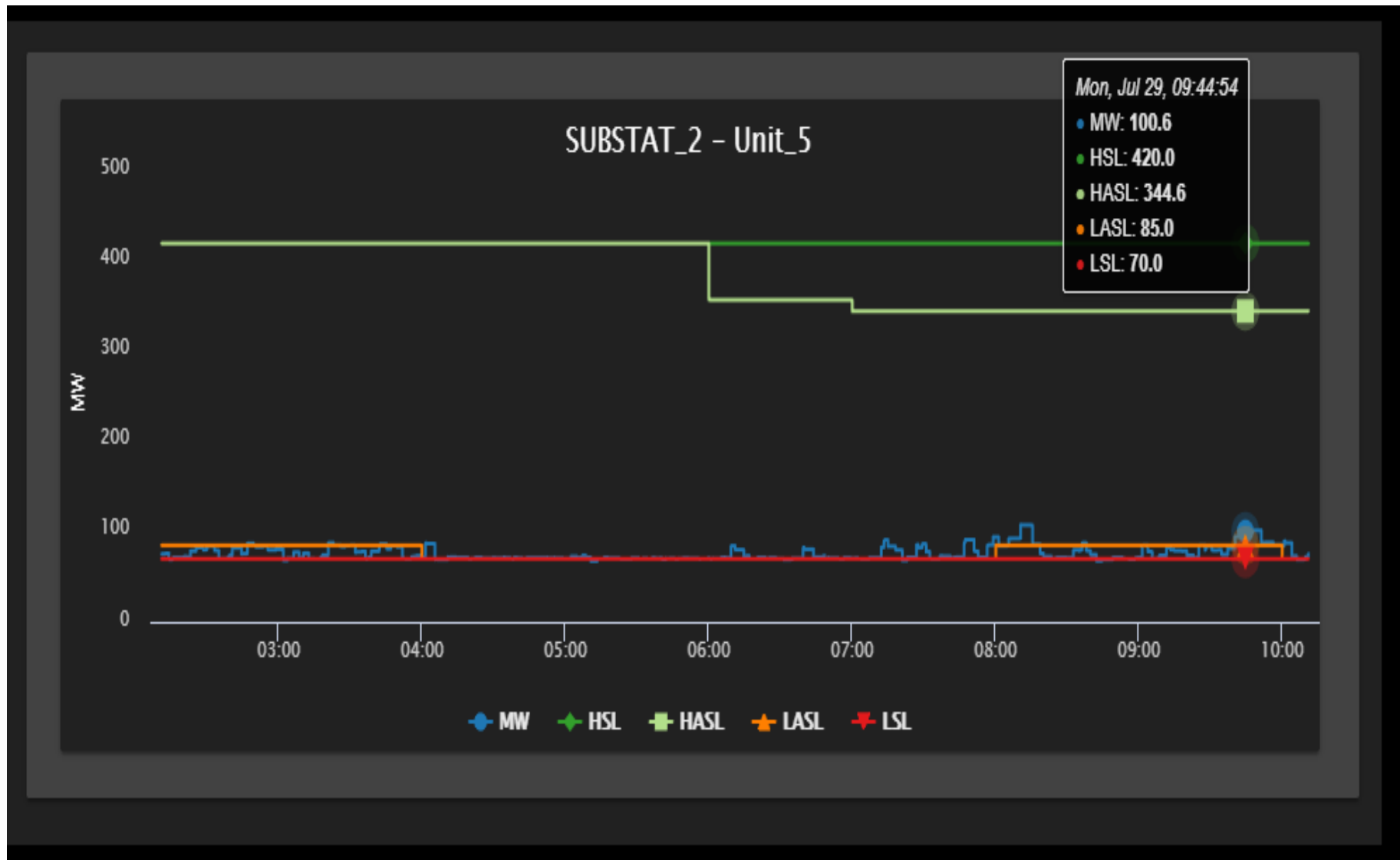
RURS 25

RDRS 0

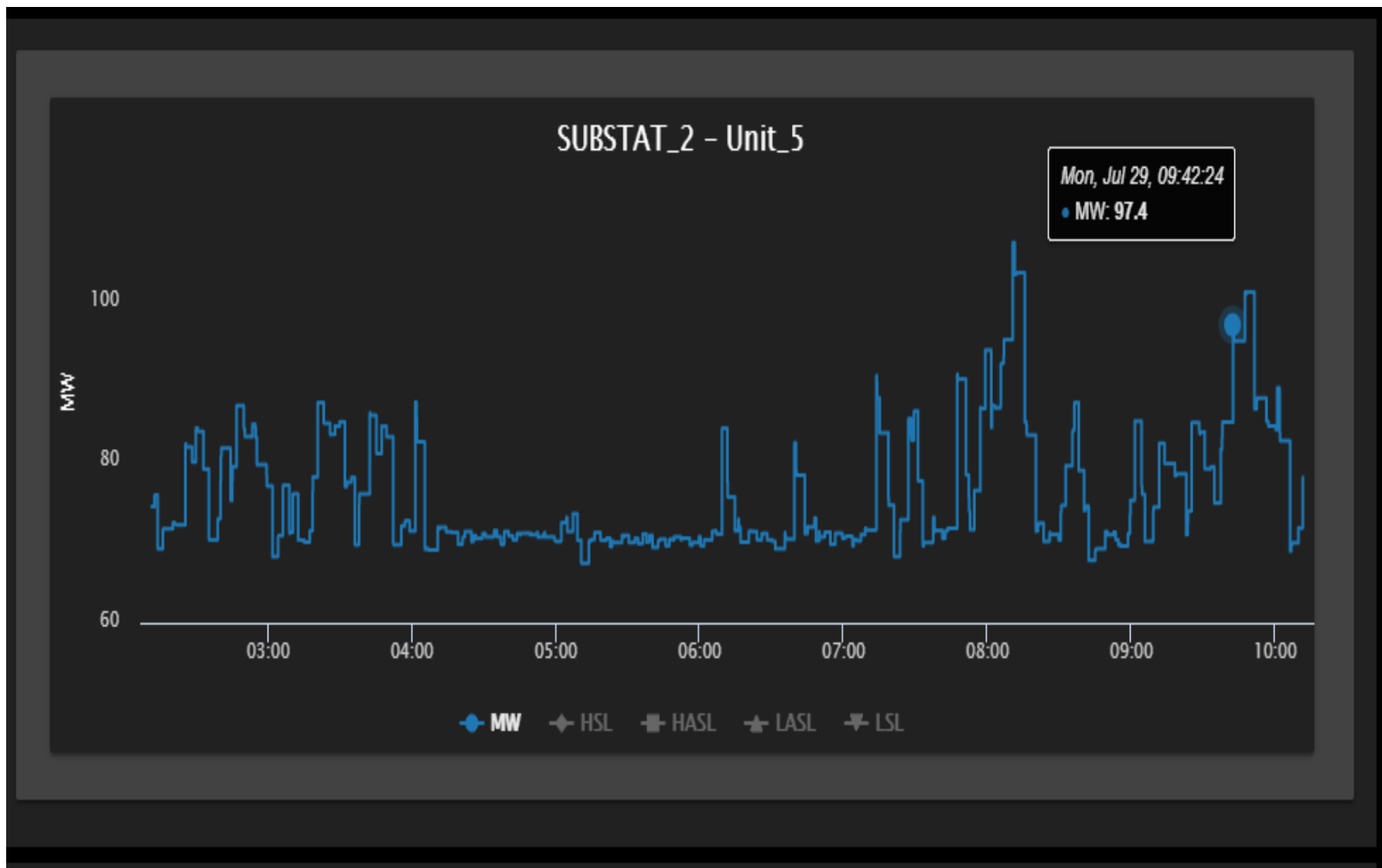
RRRS 45

NSRS 0

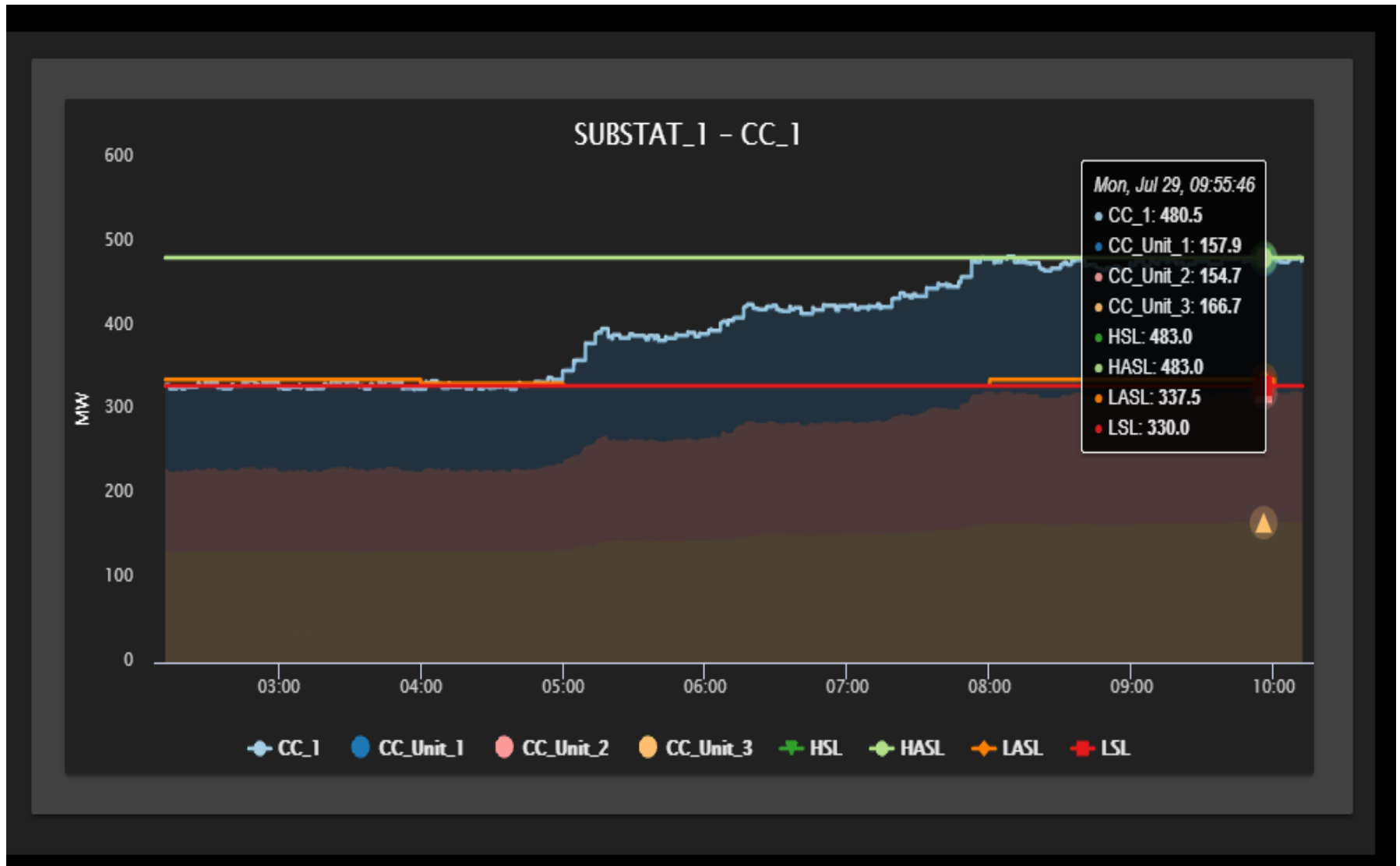
Typical Use Case – Graph



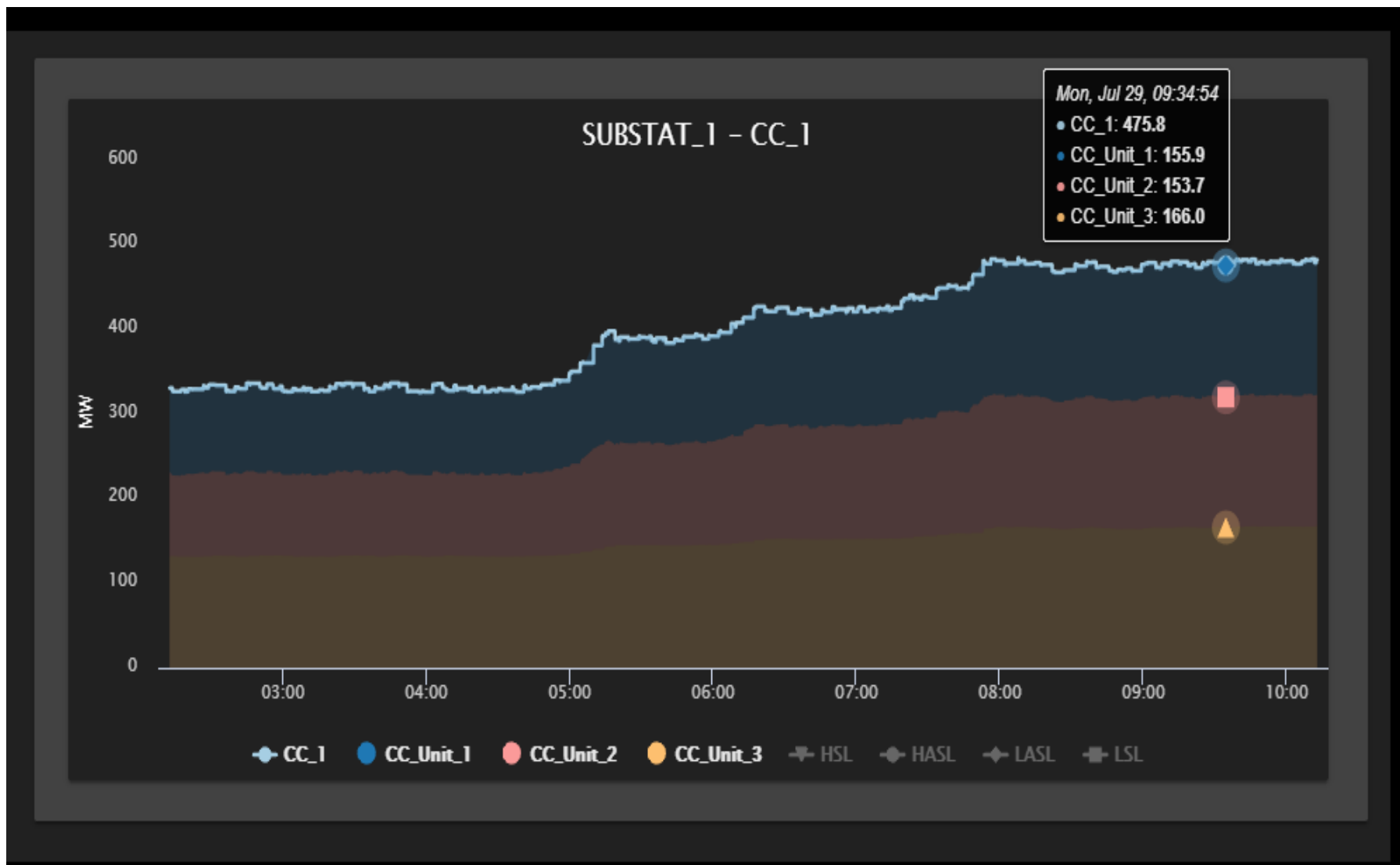
Typical Use Case – Graph Highlight



Typical Use Case – Stacked Graph

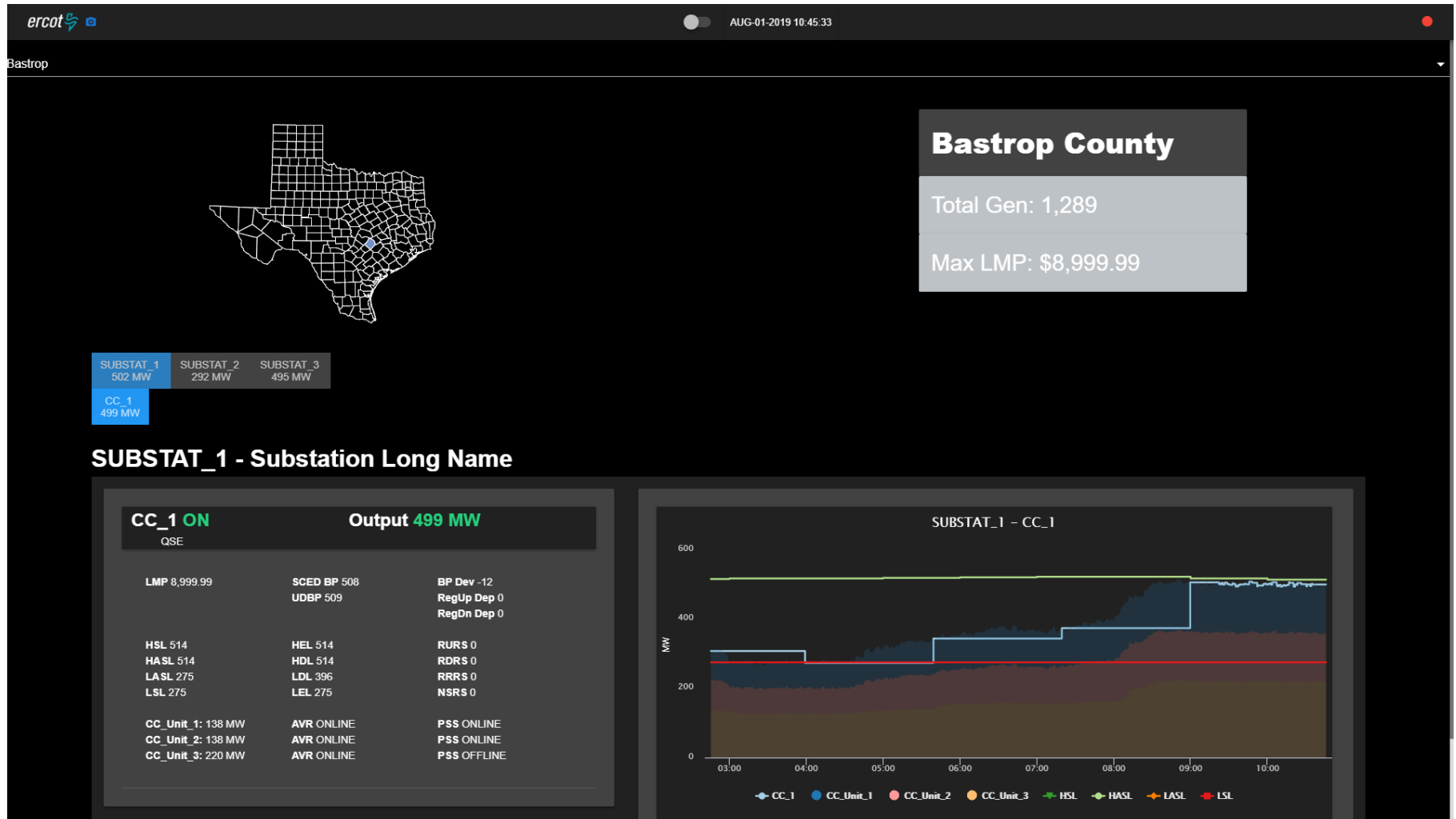


Typical Use Case – Stacked Graph Highlight



Solution – Product

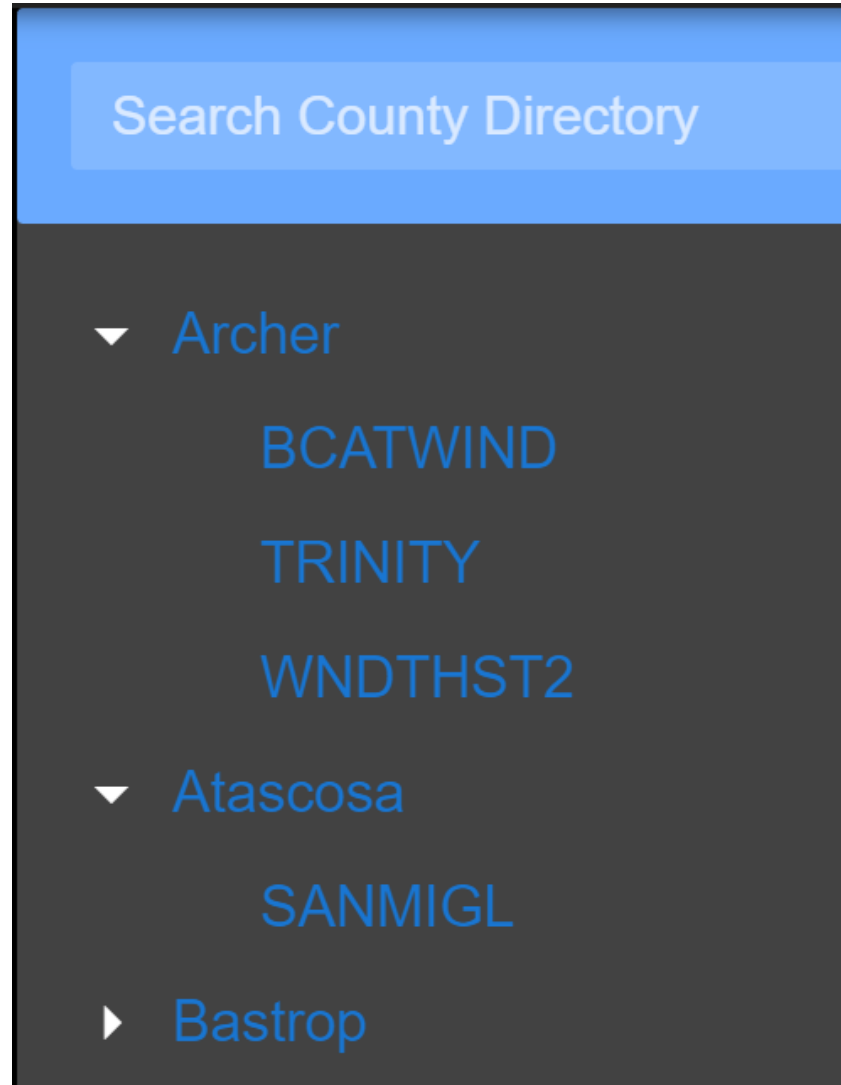
Model-Driven, Efficient, Accurate and Consistent Application



Comparison

Operation	ProcessBook	Web-based
Reusable Code		✓
Efficient and Consistent		✓
Easily Accessible		✓
User/Developer Friendly		✓
High Accuracy		✓
Model Driven		✓
Requires Tedious Manual Updating	✓	

Future Improvement – Substation Search



Technical Knowledge

Business Etiquette

ERCOT
Joel Koepke
GAD



Questions?