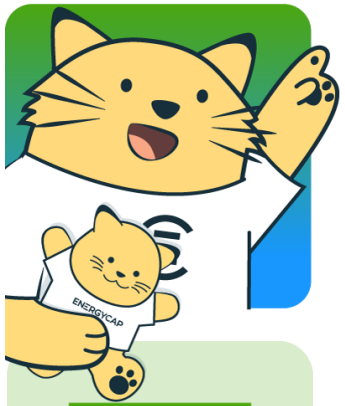
CATALYST converge '26



Beyond the Meter:
Bringing in Accurate Data for Energy Management, with the University of Central Florida

Keith Coelho

Senior Manager, Utilities Smart Infrastructure

University of Central Florida

Agenda

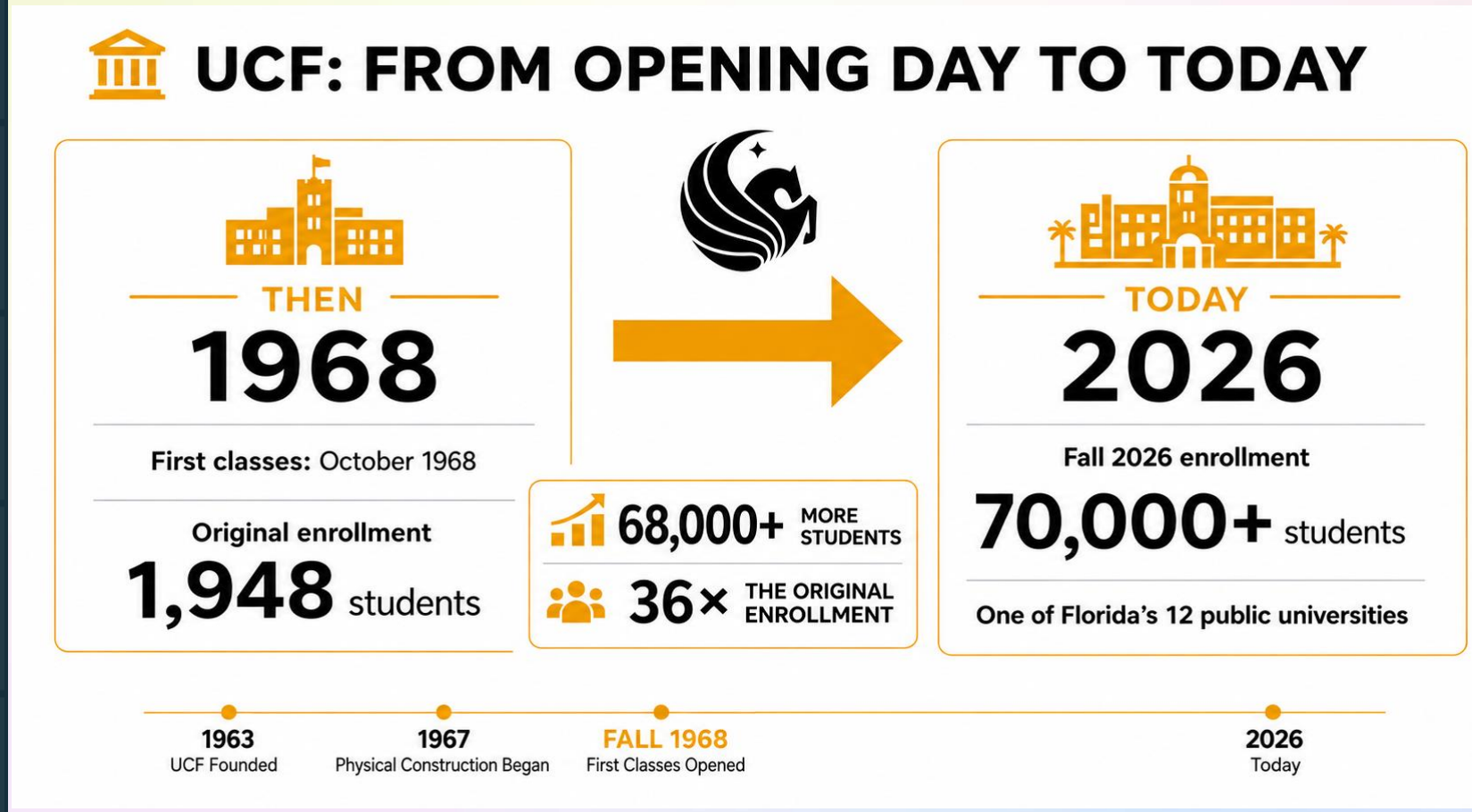
1. About UCF
2. Utilities Overview
3. Historical Challenges
4. Implementing Change
5. Metering with a Utility Focus
6. Intelligent Systems and Integrations
7. Data Focused
8. Verify Everything!
9. Actionable Intelligence

About UCF

© 2026 EnergyCAP. All rights reserved.

By the numbers

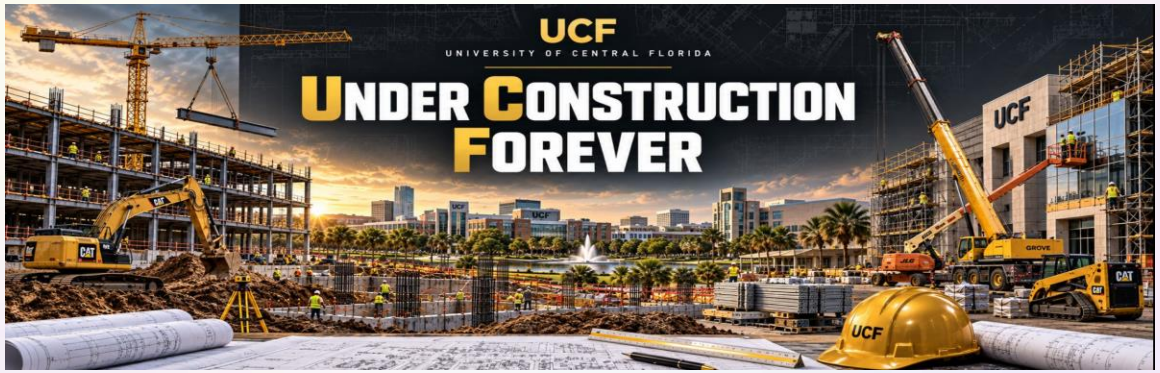
- Founded in 1963 to provide talent for Central Florida and the growing U.S. space program
- Current operating budget of $2B
- 12 Colleges, 250 Degree Programs
- 70,674 Students Enrolled
- 13,000+ Faculty & Staff
- Main Campus : 10.3M GSF and 270+ Facilities



© 2026 EnergyCAP. All rights reserved.

By the numbers

Growth with Humor



© 2026 EnergyCAP. All rights reserved.

EAST ORLANDO

Main Campus & Research Park

UCF's largest campus footprint and adjacent research district

A Main Campus

Owned buildings

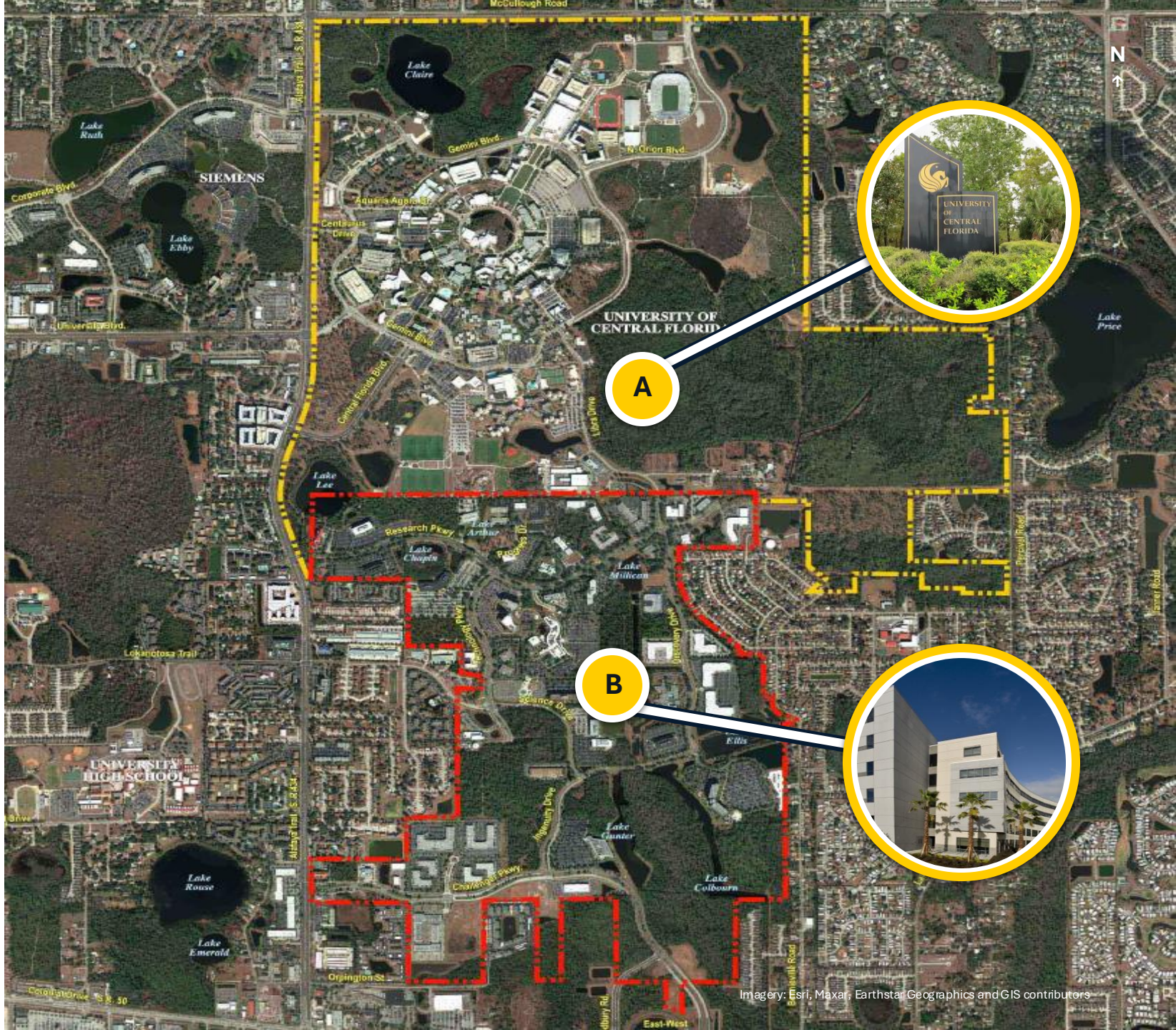
NET SQUARE FEET	FOOTAGE
9,321,302	10,345,805
ACREAGE	**BUILDINGS**
1,415	274

B Central Florida Research Park

Owned buildings

NET SQUARE FEET	FOOTAGE
505,138	565,163
ACREAGE	**BUILDINGS**
81	10

Source: UCF Facts 2025–2026



ORLANDO METRO

UCF Downtown, Rosen College, & Lake Nona Campus

Three distinct branch campus locations across the greater Orlando region

A UCF Downtown

NET SQUARE FEET	FOOTAGE
641,724	1,314,194
ACREAGE	**BUILDINGS**
21	8

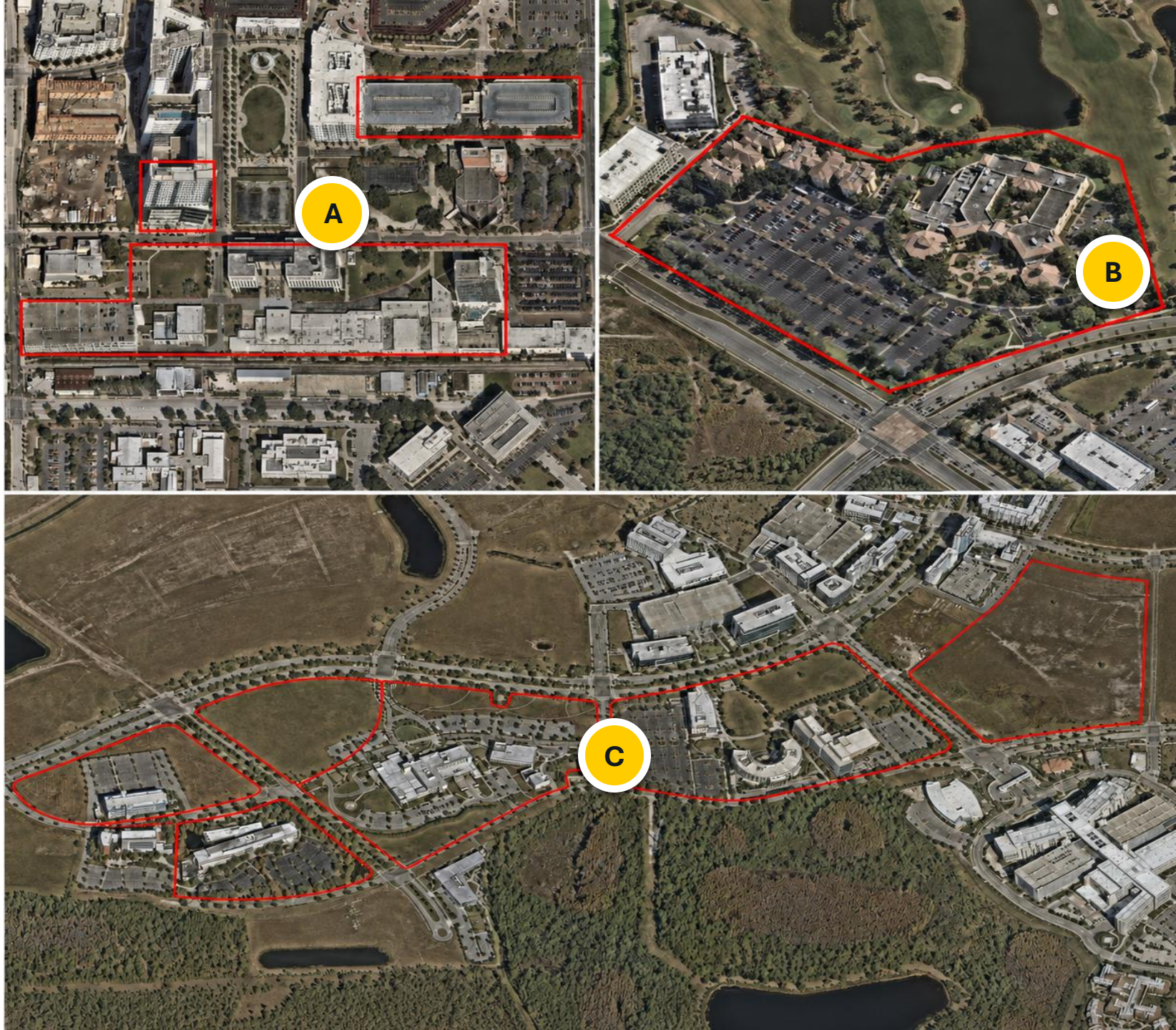
B Rosen College of Hospitality Management

NET SQUARE FEET	FOOTAGE
266,837	305,881
ACREAGE	**BUILDINGS**
20	4

C Health Sciences Campus at Lake Nona

NET SQUARE FEET	FOOTAGE
896,505	1,014,702
ACREAGE	**BUILDINGS**
87	8

Source: UCF Facts 2025–2026



Utilities Overview

UCF Utilities and Engineering Services

© 2026 EnergyCAP. All rights reserved.

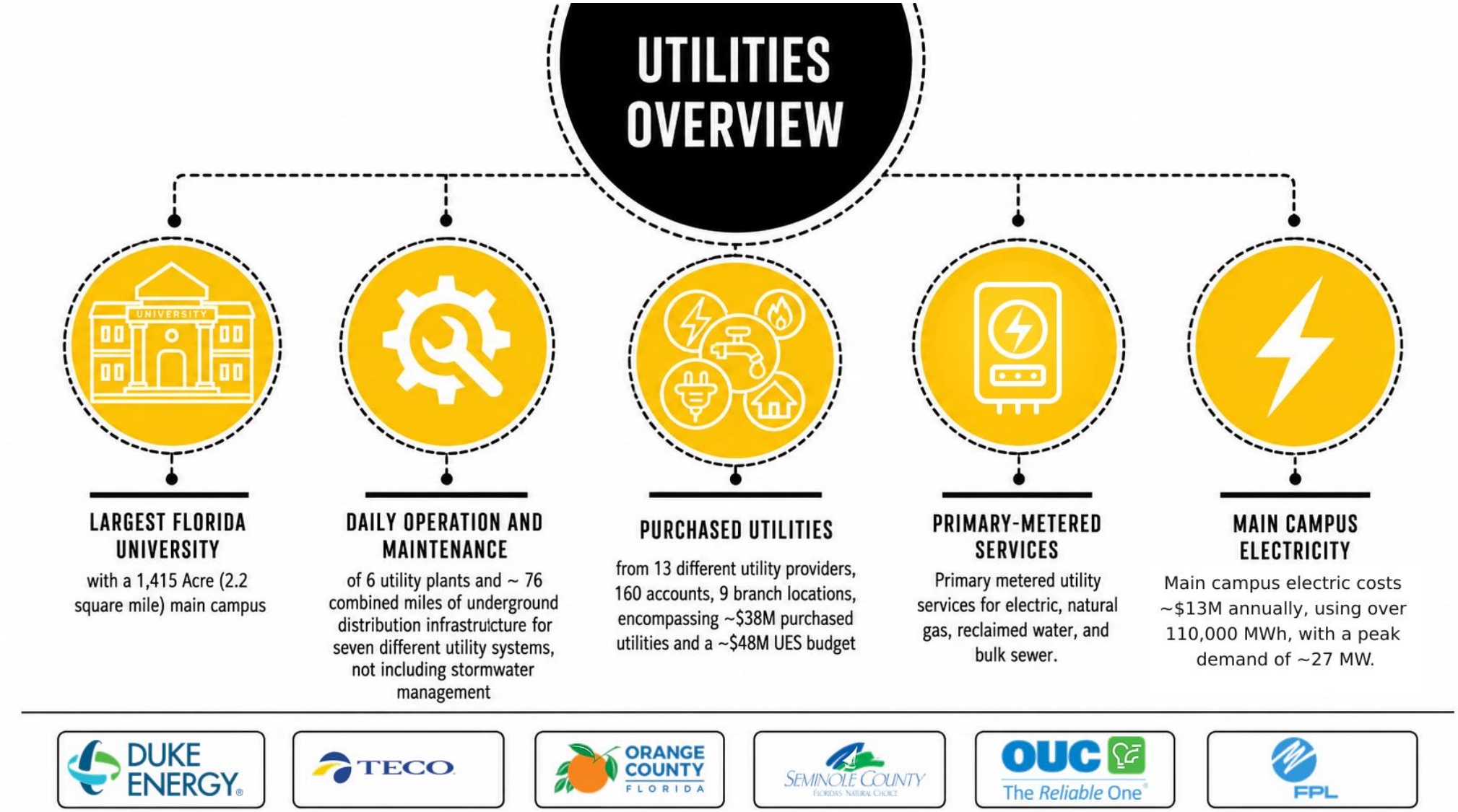
UCF:
Utilities & Engineering Services

Division of **University Operations**

- Facilities Operations
- Human Resources
- Planning, Design, and Construction (PDC)
- Strategic Campus Planning
- Administrative Operations
- Finance and Operational Excellence
- Information Technology
- Public Safety
- **Utilities & Engineering Services**
  - **Utilities Operations**
  - **Engineering**
  - **Utilities Smart Infrastructure**
  - **GIS**
  - **Stormwater**
  - **Building Automation**
  - **Asset Management**

© 2026 EnergyCAP. All rights reserved.

Utilities Overview



© 2026 EnergyCAP. All rights reserved.

UCF Utility Systems at a Glance

Campus utility systems supported by one shared digital operating foundation

POTABLE WATER

205–235M

gallons produced annually

- 4 wells, 21 miles of pipe
- 260+ metered services
- 385M gallons permitted annually
- $25M replacement plant in design

DISTRICT ENERGY

21,150

tons of cooling capacity

- 4 plants, 17+ miles of distribution
- 43M ton-hours delivered annually
- 120+ metered services
- 0.73 kW/ton system efficiency

ELECTRIC

~27 MW

calculated campus peak

- 80 MW peak capacity
- 2 substations, 6 primary feeders
- 189 transformers, 72 manholes
- 292+ electric meters

NATURAL GAS

9.6 miles

distribution system

- 2 TECO primary supplies
- 42+ metered services
- 49 CFR 191.3 master meter system
- Annual testing and compliance

WASTEWATER

225M+

gallons transported annually

- 16 miles of force and gravity mains
- 22 lift stations, 266 manholes
- 17 sewer meters
- SCADA control and monitoring

SHARED DIGITAL OPERATIONS

GIS & FIELD INTELLIGENCE

- Campus utility mapping and asset visualization
- 811 self-locates, excavation verification and aerial updates
- Real-time outage and notification dashboards

SMART INFRASTRUCTURE (Metering/Network)

- AMR/AMI network with 3 cellular APs and 5 relays
- Electric, water, gas, chilled water, reclaim and sewer metering
- 26 sensors for cathodic protection level measurement

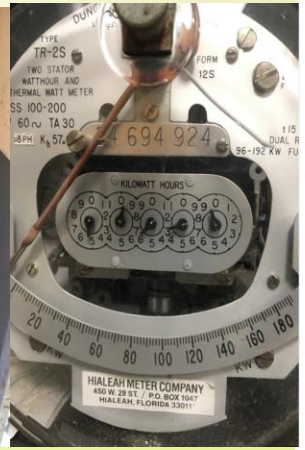
© 2026 EnergyCAP. All rights reserved.

Historical Challenges

Where we were!







© 2026 EnergyCAP. All rights reserved.

Historical Challenges : The gap was much more than technology!

EARLY ISSUES

- Fragmented Ownership (3 Separate Departments)
- Homegrown Billing System (many years ago)
- Manual Handling – Field to Database (Paper!)
- Aged Mechanical Hardware
- No standardization – Installations, Testing, Commissioning
- Low Grade Meter Accuracy
- No interval data (monthy bill readings)
- No event data, diagnostics
- No intelligence
- No local memory
- Replacing Meter = Shutdown Coordination = Time/$$$
- No modern systems or integrations
- Non-Existing Workflows for Service Requests & Account Creation
- Lagging Rates benefitted customers (staff were aware!)
- No rate modeling (no capital, repair, or systems overhead)
- Metering vs Maintenance Trades – Not the same!

RESULTING IMPACT

- Poor Operational Visibility
- Poor Customer Service
- Limited Data and Reliability
- Poor Data Collection – Errors, Errors, Errors!
- Failed stakeholder trust
- Fractured/Error Prone Reporting
- Created and maintained Silos!
- Increased Cost - Constant rework – Installation Errors
- Reduced morale – All Sides!
- Revenue accountability failure
- Revenue Loss – Under/Over Billing
- Fractured Audit Workflow
- Useless M&V – Poor data = Poor Baseline = Loss!

© 2026 EnergyCAP. All rights reserved.

Implementing Change

Paving the path Forward!




© 2026 EnergyCAP. All rights reserved.

Strategic Changes

- Centralized ownership of all utility operations. **One department, One focus! Utilities!**
- Transitioned to Auxilliary Department – Self Supporting through Rate Structure
- Implemented and Integrated EnergyCAP with University ERP systems
- Constructed proper rate models (3rd Party Confirmation)
- Developed and Implemented High-Level Meter-to-Cash Workflow
- Developed Utility Policies – Teeth to Bite!
- Researched, planned, and implemented high quality, revenue-grade Smart metering
    - Mechanical Meters > Ultrasonic, Electromagnetic
    - Solid State Electric Meters w/Local Memory
    - Wireless Transmitters w/Local Storage
- Implemented AMR Itron Wireless Network, RFP to existing AMI Network
- Built and implemented high-quality detailed Utility Standards
- Developed Testing requirements, cycles, and accuracy thresholds
- Generated Lifecycle Replacement Schedules

One department. One point of contact. Unified utility services delivering consistent, repeatable, and defensible output.

© 2026 EnergyCAP. All rights reserved.

Overall Results

UTILITY FOUNDATION

ONE UTILITY ORGANIZATION

One department, one team, and one point of contact

SPECIALIZED UTILITY WORKFORCE

Utility-specific positions supported by targeted technical training

STANDARDIZED WORKFLOWS

Utility processes aligned from design through commissioning

INSTALLATION STANDARDS

Consistent installation and interconnection requirements, including DIV 33

OPERATIONAL RESULTS

INTEGRATED SYSTEMS OF RECORD

Connected platforms automate meter collection and billing workflows

OPERATIONAL INTELLIGENCE

Interval data, alarms, diagnostics, and analytics guide action

FINANCIAL ACCOUNTABILITY

Defensible billing, rates, reporting, and audit controls

EARLY PROJECT INTEGRATION

Utility involvement reduces rework and supports future growth

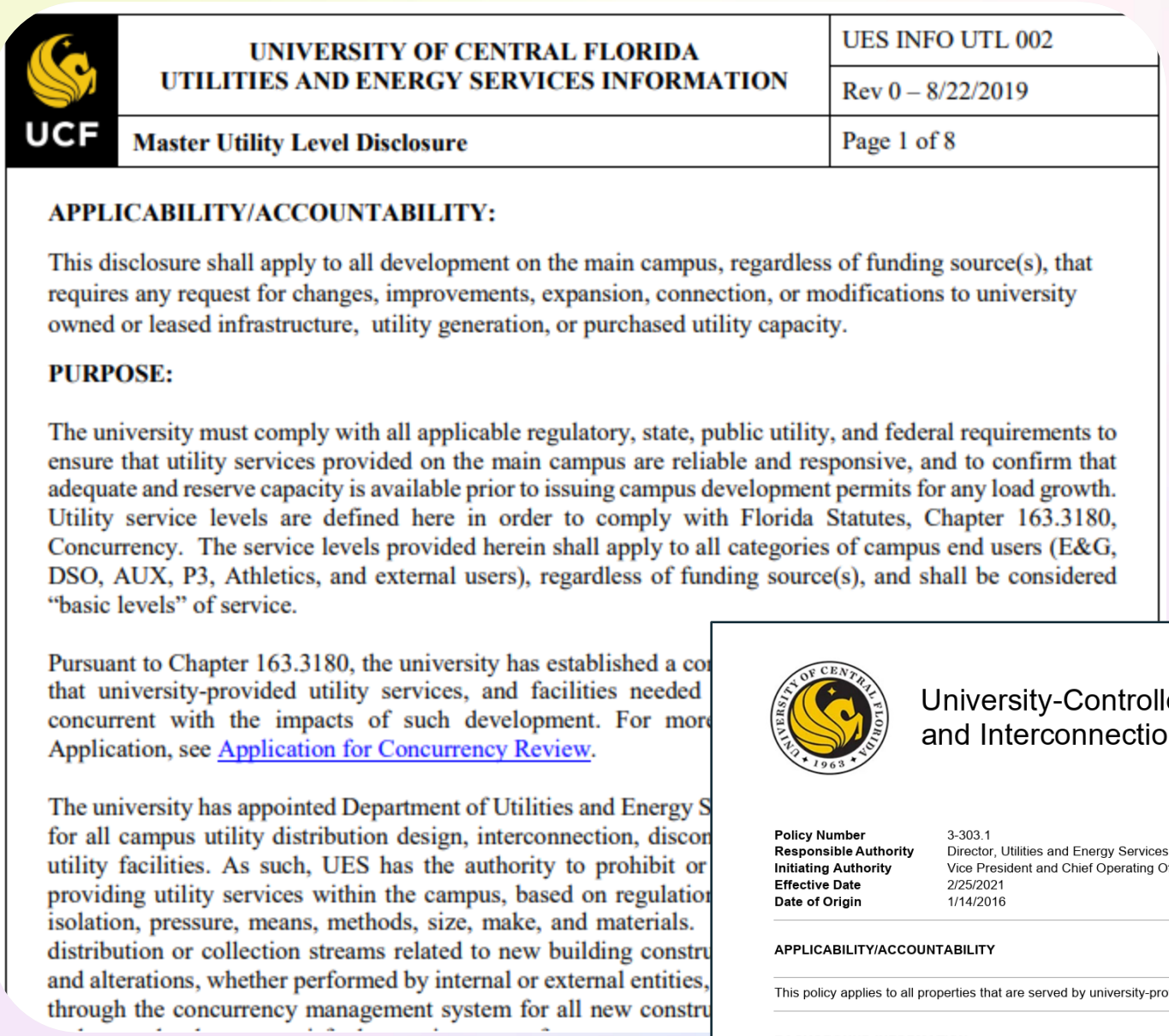
© 2026 EnergyCAP. All rights reserved.

Establishing Utility Authority through Policy

Establish UES as the accountable authority and single point of contact for all utility interconnection, modification, or generation activity for all campus locations.

Driven by UES:

- Interconnection for New Construction/Renovations
- Energy and Water Efficiency Requirements
- Modeled Utility Rates
- Production Impacts
- Energy Procurement Impacts
- Capital Infrastructure and Facilities Condition Assessments
- Building Energy Requirements
- Design and Construction Standards



UCF	UNIVERSITY OF CENTRAL FLORIDA UTILITIES AND ENERGY SERVICES INFORMATION	UES INFO UTL 002
		Rev 0 – 8/22/2019
	Master Utility Level Disclosure	Page 1 of 8

APPLICABILITY/ACCOUNTABILITY:

This disclosure shall apply to all development on the main campus, regardless of funding source(s), that requires any request for changes, improvements, expansion, connection, or modifications to university owned or leased infrastructure, utility generation, or purchased utility capacity.

PURPOSE:

The university must comply with all applicable regulatory, state, public utility, and federal requirements to ensure that utility services provided on the main campus are reliable and responsive, and to confirm that adequate and reserve capacity is available prior to issuing campus development permits for any load growth. Utility service levels are defined here in order to comply with Florida Statutes, Chapter 163.3180, Concurrency. The service levels provided herein shall apply to all categories of campus end users (E&G, DSO, AUX, P3, Athletics, and external users), regardless of funding source(s), and shall be considered "basic levels" of service.

Pursuant to Chapter 163.3180, the university has established a co
that university-provided utility services, and facilities needed
concurrent with the impacts of such development. For mor
Application, see Application for Concurrency Review.

The university has appointed Department of Utilities and Energy S
for all campus utility distribution design, interconnection, discon
utility facilities. As such, UES has the authority to prohibit or
providing utility services within the campus, based on regulatio
isolation, pressure, means, methods, size, make, and materials.
distribution or collection streams related to new building constru
and alterations, whether performed by internal or external entities,
through the concurrency management system for all new constru

University-Controlled Utilities and Interconnections

Policy Number	3-303.1
Responsible Authority	Director, Utilities and Energy Services
Initiating Authority	Vice President and Chief Operating Officer
Effective Date	2/25/2021
Date of Origin	1/14/2016

APPLICABILITY/ACCOUNTABILITY

This policy applies to all properties that are served by university-provided utilities.

BACKGROUND INFORMATION

University-controlled utilities and interconnections are governed by Florida Statutes, Florida Board of Governors (BOG) Regulations, and university policies and regulations. Adherence to the practices set forth in these statutes and regulations will reduce utility demands and the need for additional infrastructure and capacity.

© 2026 EnergyCAP. All rights reserved.

Standards – UCF Design and Construction Standards (Div33)

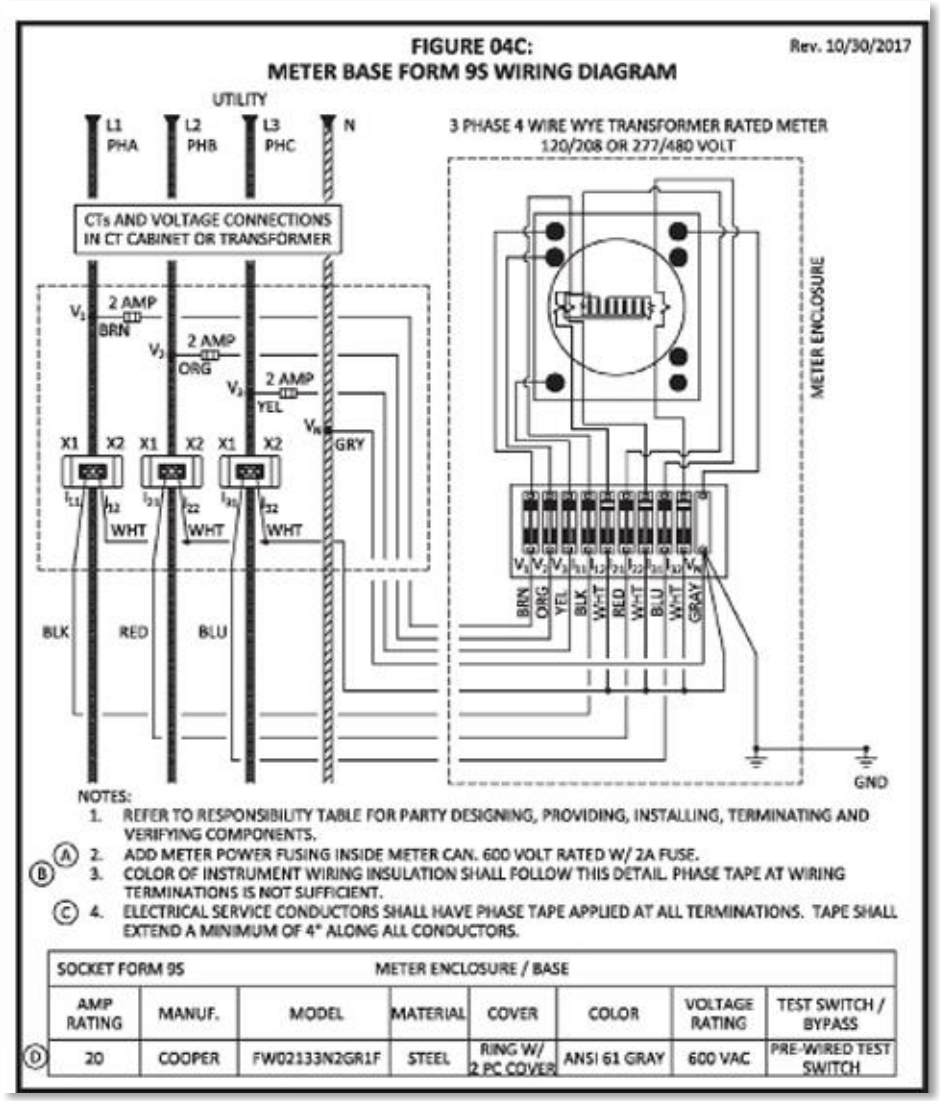
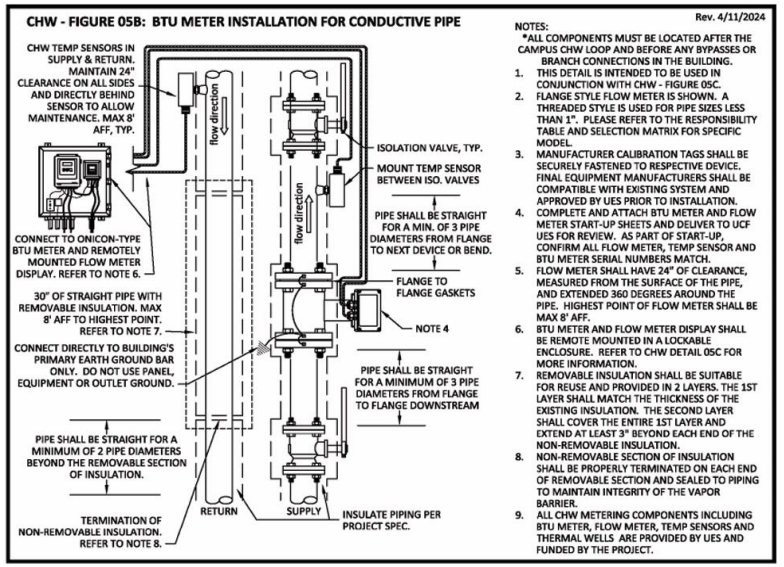


FIGURE 04C:
METER BASE FORM 9S WIRING DIAGRAM
Rev. 10/30/2017

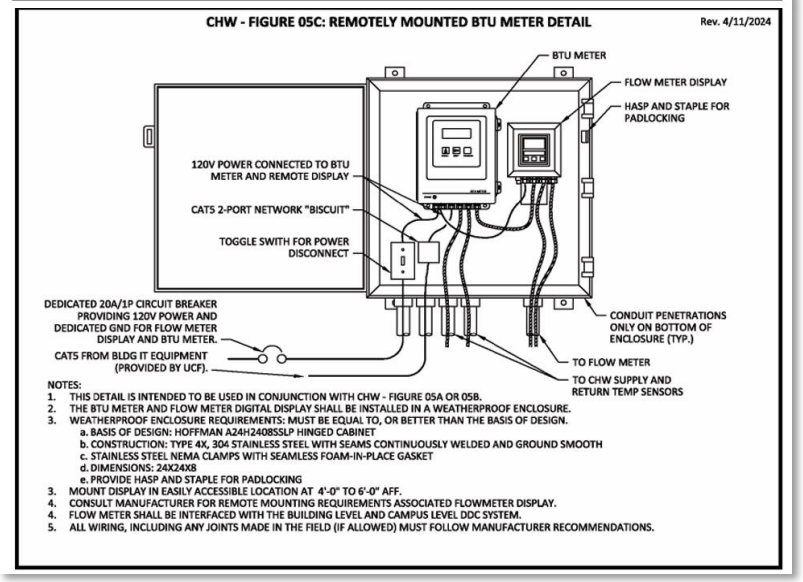
NOTES:
1. REFER TO RESPONSIBILITY TABLE FOR PARTY DESIGNING, PROVIDING, INSTALLING, TERMINATING AND VERIFYING COMPONENTS.
(A) 2. ADD METER POWER FUSING INSIDE METER CAN. 600 VOLT RATED W/ 2A FUSE.
(B) 3. COLOR OF INSTRUMENT WIRING INSULATION SHALL FOLLOW THIS DETAIL. PHASE TAPE AT WIRING TERMINATIONS IS NOT SUFFICIENT.
(C) 4. ELECTRICAL SERVICE CONDUCTORS SHALL HAVE PHASE TAPE APPLIED AT ALL TERMINATIONS. TAPE SHALL EXTEND A MINIMUM OF 4" ALONG ALL CONDUCTORS.

SOCKET FORM 9S	METER ENCLOSURE / BASE						
AMP RATING	MANUF.	MODEL	MATERIAL	COVER	COLOR	VOLTAGE RATING	TEST SWITCH / BYPASS
(D) 20	COOPER	FW02133N2GR1F	STEEL	RING W/ 2 PC COVER	ANSI 61 GRAY	600 VAC	PRE-WIRED TEST SWITCH



CHW - FIGURE 05B: BTU METER INSTALLATION FOR CONDUCTIVE PIPE
Rev. 4/11/2024

NOTES:
*ALL COMPONENTS MUST BE LOCATED AFTER THE CAMPUS CHW LOOP AND BEFORE ANY BYPASSES OR BRANCH CONNECTIONS IN THE BUILDING.
1. THIS DETAIL IS INTENDED TO BE USED IN CONJUNCTION WITH CHW - FIGURE 05C.
2. FLANGE STYLE FLOW METER IS SHOWN. A THREADED STYLE IS USED FOR PIPE SIZES LESS THAN 1". PLEASE REFER TO THE RESPONSIBILITY TABLE AND SELECTION MATRIX FOR SPECIFIC MODEL.
3. MANUFACTURER CALIBRATION TAGS SHALL BE SECURELY FASTENED TO RESPECTIVE DEVICE. FINAL EQUIPMENT MANUFACTURERS SHALL BE COMPATIBLE WITH EXISTING SYSTEM AND APPROVED BY UES PRIOR TO INSTALLATION.
4. COMPLETE AND ATTACH BTU METER AND FLOW METER START-UP SHEETS AND DELIVER TO UCF UES FOR REVIEW. AS PART OF START-UP, CONFIRM ALL FLOW METER, TEMP SENSOR AND BTU METER SERIAL NUMBERS MATCH.
5. FLOW METER SHALL HAVE 24" OF CLEARANCE, MEASURED FROM THE SURFACE OF THE PIPE, AND EXTENDED 360 DEGREES AROUND THE PIPE. HIGHEST POINT OF FLOW METER SHALL BE MAX 8' AFF.
6. BTU METER AND FLOW METER DISPLAY SHALL BE REMOTE MOUNTED IN A LOCKABLE ENCLOSURE. REFER TO CHW DETAIL 05C FOR MORE INFORMATION.
7. REMOVABLE INSULATION SHALL BE SUITABLE FOR REUSE AND PROVIDED IN 2 LAYERS. THE 1ST LAYER SHALL MATCH THE THICKNESS OF THE EXISTING INSULATION. THE SECOND LAYER SHALL COVER THE ENTIRE 1ST LAYER AND EXTEND AT LEAST 3" BEYOND EACH END OF THE NON-REMOVABLE INSULATION.
8. NON-REMOVABLE SECTION OF INSULATION SHALL BE PROPERLY TERMINATED ON EACH END OF REMOVABLE SECTION AND SEALED TO PIPING TO MAINTAIN INTEGRITY OF THE VAPOR BARRIER.
9. ALL CHW METERING COMPONENTS INCLUDING BTU METER, FLOW METER, TEMP SENSORS AND THERMAL WELLS ARE PROVIDED BY UES AND FUNDED BY THE PROJECT.



CHW - FIGURE 05C: REMOTELY MOUNTED BTU METER DETAIL
Rev. 4/11/2024

NOTES:
1. THIS DETAIL IS INTENDED TO BE USED IN CONJUNCTION WITH CHW - FIGURE 05A OR 05B.
2. THE BTU METER AND FLOW METER DIGITAL DISPLAY SHALL BE INSTALLED IN A WEATHERPROOF ENCLOSURE.
3. WEATHERPROOF ENCLOSURE REQUIREMENTS: MUST BE EQUAL TO, OR BETTER THAN THE BASIS OF DESIGN.
   a. BASIS OF DESIGN: HOFFMAN A24H2408SSLP HINGED CABINET
   b. CONSTRUCTION: TYPE 4X, 304 STAINLESS STEEL WITH SEAMS CONTINUOUSLY WELDED AND GROUND SMOOTH
   c. STAINLESS STEEL NEMA CLAMPS WITH SEAMLESS FOAM-IN-PLACE GASKET
   d. DIMENSIONS: 24X24X8
   e. PROVIDE HASP AND STAPLE FOR PADLOCKING
3. MOUNT DISPLAY IN EASILY ACCESSIBLE LOCATION AT 4'-0" TO 6'-0" AFF.
4. CONSULT MANUFACTURER FOR REMOTE MOUNTING REQUIREMENTS ASSOCIATED FLOWMETER DISPLAY.
4. FLOW METER SHALL BE INTERFACED WITH THE BUILDING LEVEL AND CAMPUS LEVEL DDC SYSTEM.
5. ALL WIRING, INCLUDING ANY JOINTS MADE IN THE FIELD (IF ALLOWED) MUST FOLLOW MANUFACTURER RECOMMENDATIONS.

© 2026 EnergyCAP. All rights reserved.

From Fragmented Operations to a Utility Operating Model

CATEGORY	HISTORICAL ISSUES		TODAY'S RESULTS
OWNERSHIP & ACCOUNTABILITY	Utility responsibilities divided among three departments	→	Centralized utility ownership with one department and one point of contact
SYSTEMS & DATA COLLECTION	Homegrown billing, paper processes and disconnected systems	→	Automated field-to-system collection integrated with EnergyCAP, AMI, GIS and reporting
METERING & STANDARDS	Aging mechanical meters with inconsistent installation and testing practices	→	Modern utility-grade metering supported by standardized installation, testing and commissioning
DATA & VISIBILITY	Monthly totals, limited reliability and little operational insight	→	Interval data, alarms, diagnostics and analytics provide near-real-time operational visibility
BILLING & CUSTOMER SERVICE	Manual billing decisions, inconsistent rates and undefined service workflows	→	Standardized meter-to-cash processes, transparent rates and defined customer service workflows
PEOPLE & UTILITY CULTURE	Metering treated as a general facilities task with departmental silos	→	Specialized utility roles, common terminology, formal training and cross-functional alignment

THE RESULT Reliable Data • Improved Customer Service • Proactive Operations • Stronger Cost Recovery • Greater Accountability • Better-Informed Decisions

© 2026 EnergyCAP. All rights reserved.

Fruits of UCF Labor – Payoff Examples!

$630K / year

Arena chilled-water audit correction

>$110K / year

Research Park sewer correction + 17M gallons

>$100K

Water / wastewater leak detection and audits

>$75K

Electric peak-demand billing errors - Duke Energy

~$50K

One-time Natural-gas nomination error

~$120K / year

Meter-replacement corrections and recovery

~$90k

One-time savings due to blown fuse on control wires for CT Meter

Intelligent Systems and Hardware proving their impact in just a handful of ways

© 2026 EnergyCAP. All rights reserved.

Metering with a Utility Focus

UCF Utilities and Engineering Services

© 2026 EnergyCAP. All rights reserved.

Primary Focus

Operate Like a Utility

- Treat meters as revenue and operational assets. CASH REGISTER!
- Centralize ownership of data and services.
- Manage each commodity as a distinct utility revenue stream.
- Maintain defensible rates / cost recovery.
- Control temporary and permanent utility interconnections.
- Provide formal start, stop, and update service processes.
- Maintain distribution-system and customer hierarchies.
- Locate your utilities! Noone knows them better than you.

Standardize Like a Utility

- Adopt clearly defined standards for installation and commissioning
- Establish approved meter and sensor technologies.
- Create formal service-interconnection requirements and workflows. (start/stop service)
- Maintain standard asset identifiers.
- Establish meter, transformer, feeder, facility relationships
- Define testing and replacement intervals.

Talk Like a Utility

- **Use of the same technical language** for standards, processes, rates/tariffs, and performance measures as our utility providers.
- **Create utility-specific roles** focused on clear ownership of metering, billing, field operations, data analytics and integration.
- **Approach decisions from a utility perspective**—prioritizing safety, reliability, compliance, lifecycle planning, cost recovery, and customer service

© 2026 EnergyCAP. All rights reserved.

Focus on Metering Technology and Hardware

Electric Metering

- Solid-Core CT's, with Revenue Grade +/- 0.15S Accuracy Class
- Test Switches/Bypass Levers
- Moved installations to Utility Transformer
  (Duke CT's wired to UCF Meter)
- 4160V Metering on Same Network (SUSI Adapters)

Water/Reclaim/Sewer

- Solid State Ultrasonic and Electromagnetic Metering
- Meter-Level Leak Detection
- Optional Sensors for Advanced Meters (Temperature, Pressure)
- Local Memory/Storage
- Multiple Outputs

Chilled Water

- High Accuracy in-line metering
- BacNET-IP Protocol
  (future AMI Integration target)
- Remote displays (safety)
- Design Insulation Removal for Testing all meters

© 2026 EnergyCAP. All rights reserved.

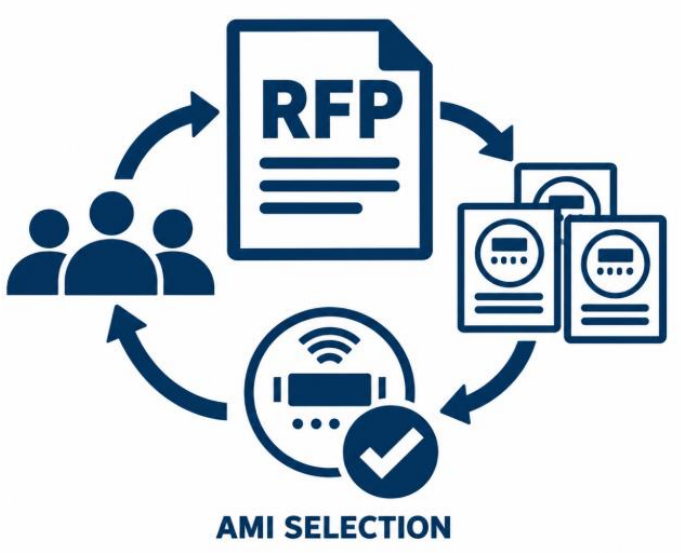
RFP for Advanced Metering Infrastructure (AMI)

Minimum Requirements

- Meter Agnostic
- High-Speed Mesh Capability
- Real-Time Events/Alarms
- Flexible high-resolution data exports and integration formats
- Compatible NIC for Wide Range of Meters
- High Speed Wireless Network
- On Demand Reads, Pings, and Real-Time Visibility
- Wireless Programming and Firmware Upgrades
- 3rd Party Vendor EcoSystem
- Expandable Mesh – Streetlight Canopy

Process

- Researched utilities and available network solutions
- Utilized 3rd Party Consultant to develop RFP
- Strict vendor selection (only one capable of need)
- Phased Implementation
- Heavy integration Focus

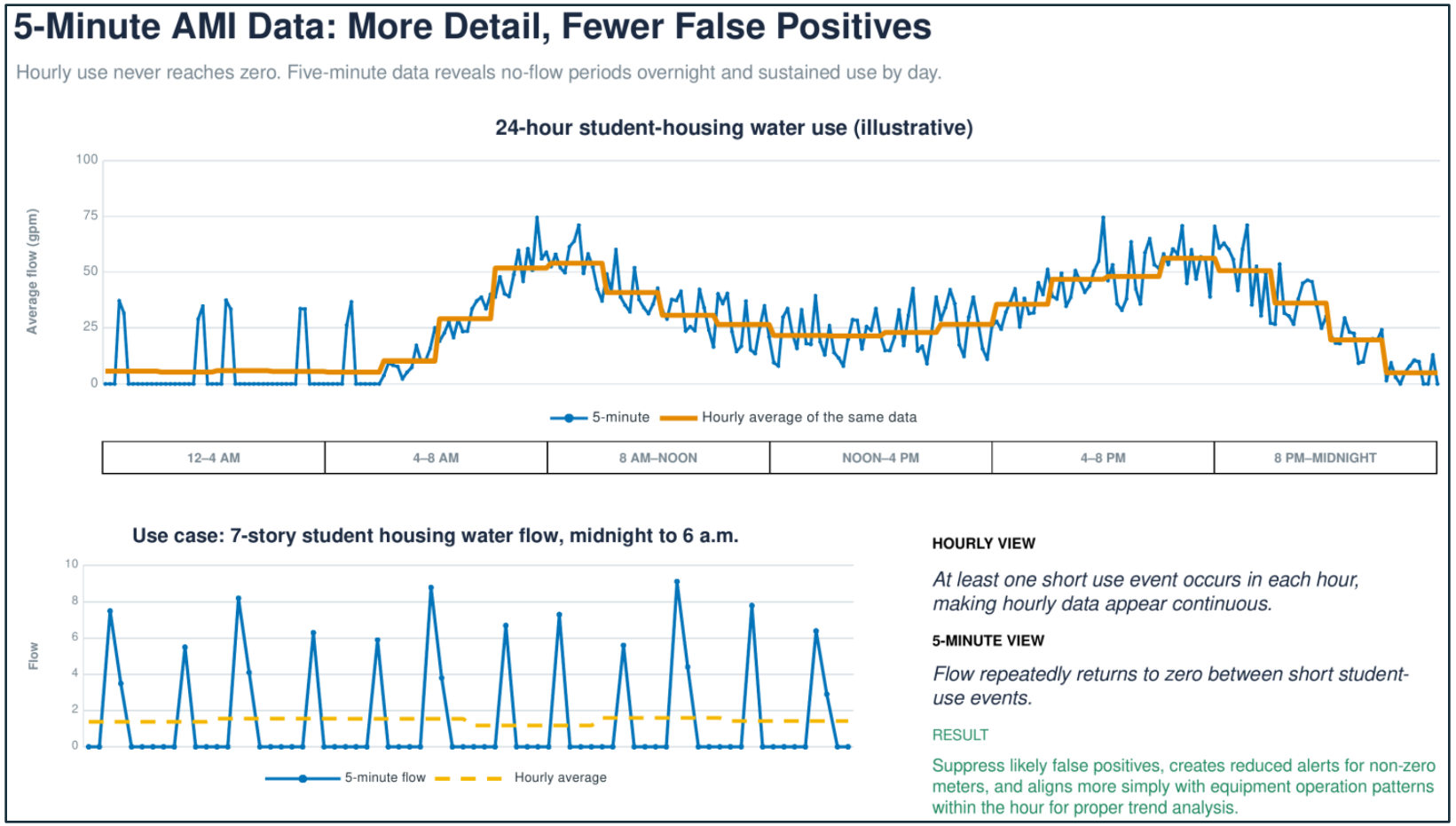


© 2026 EnergyCAP. All rights reserved.

Resulting Granularity through AMI

Interval Data Granularity

- Electric
  - 5 Minute Interval Data received every 5 minutes
- Water/Sewer/Reclaim
  - 5 Minute Interval Data received every 4 hours
  - Reduced delivery time to uphold endpoint battery life
- Natural Gas
  - 5 Minute Interval Data received every 4 hours
  - Reduced delivery time to uphold endpoint battery life
- Chilled Water
  - Future Integration
  - Currently 5-minute API push



Interval Resolution and Frequency (how often data is delivered to UCF) are different, but both are extremely important!

© 2026 EnergyCAP. All rights reserved.

Utility Plants (The Big Fish!) – High Accuracy Metering Infrastructure

The largest loads with the smallest errors still yield a heavy impact, affecting projects, budgets, cost allocation, projections, sizing, dosing, and more.

- 100% Solid-State and flanged “In-Line” Electromagnetic or Ultrasonic High-Accuracy metering
  - *NO MECHANICAL, NO INSERTION*
- Isolated Breakers for maintenance
- Remote mount heads/displays
- Singular point of access within plants for easy access and configuration
- Itron AMI + BacNET/IP
- Tested Annually – All Commodities

© 2026 EnergyCAP. All rights reserved.

Intelligent Systems & Integrations

Solutions to data collection and automation

© 2026 EnergyCAP. All rights reserved.

Technology & Automation compressed days of collection into hours

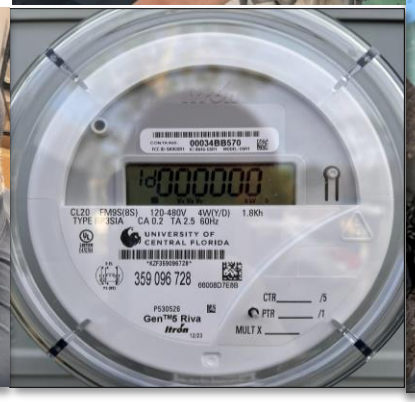
5 DAYS → < 2.5 HOURS
Manual reading and verification effort

99.8%
Interval data collection

99.8%
Reading interval collection

- Less transcription and manual processes
- Staff time redirected to other high-value tasks, PM's and lagging project work
- Real-Time Data, Events, Alarms
- Mobile applications for testing, programming and validation
- Detailed network insight in real-time



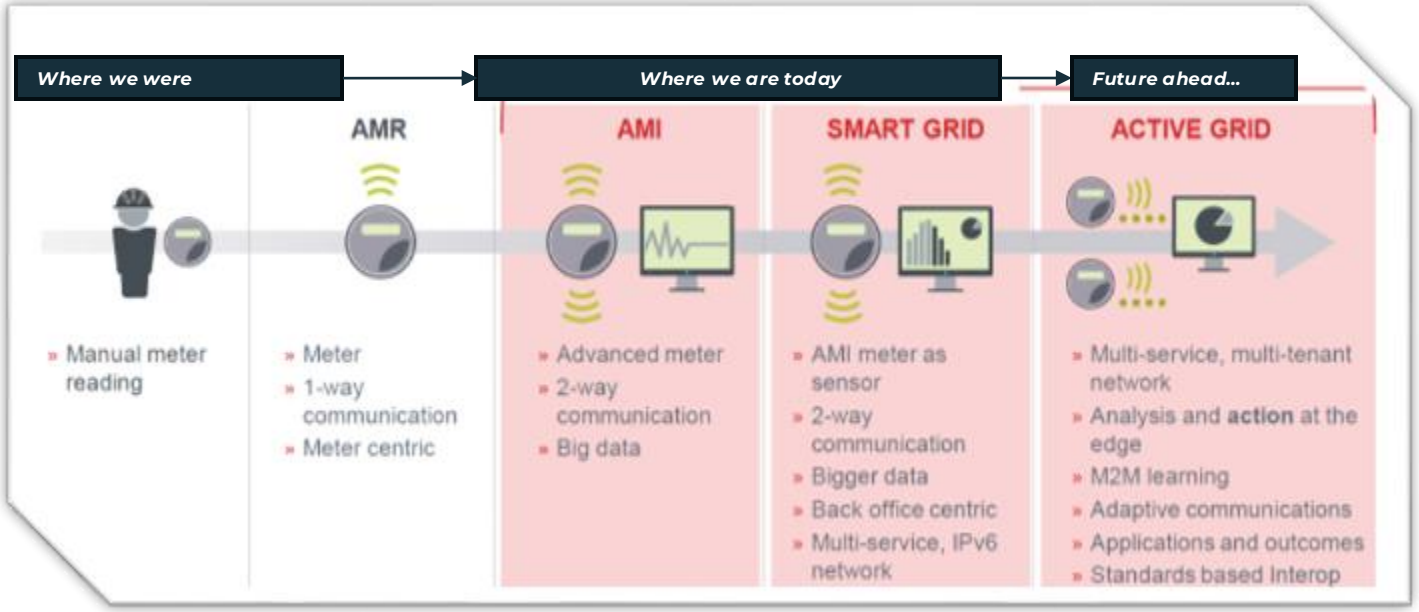
© 2026 EnergyCAP. All rights reserved.

What is AMI?

Advanced Metering Infrastructure (AMI) is an integrated system of smart meters, communications networks, and data management systems that enables two-way IP-based communication between utility metering, head-end systems, and customers

Key Features

- Two-Way, IP-Based, Communication
- IPV6 – High Speed NIC
- Real-time On-Demand Data
- Real-time outage detection
- Edge Intelligence
- Fast Network

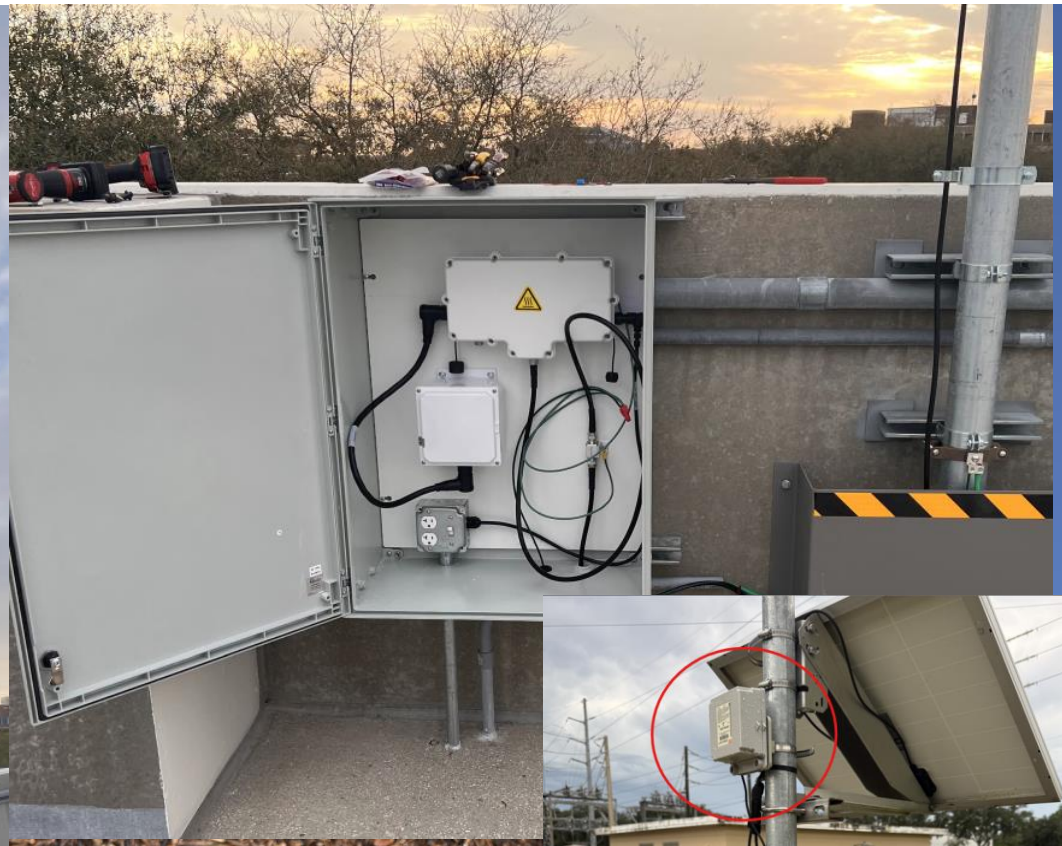


Benefits

- Reliable self-healing network
- Improved data accuracy
- Operational Efficiency
- Critical Event and Alarm Notifications
- Improved billing and analytics
- 3 Load Profiles, 36 Interval Values (min/max/avg, kW,kVA, KVAR, I, PF, and more)
- Real-Time Outage and Restoration Notifications

© 2026 EnergyCAP. All rights reserved.

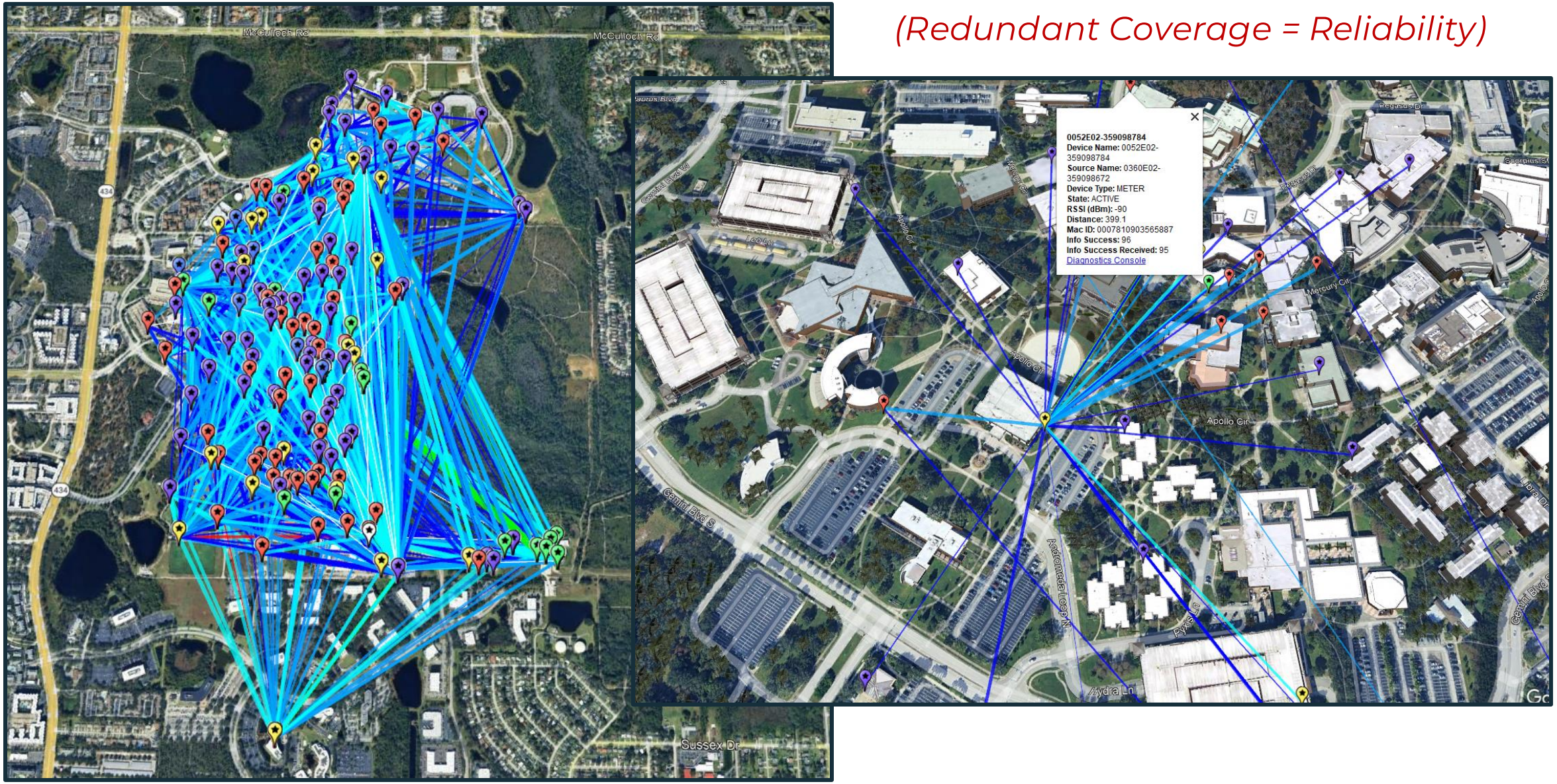
AMI Network Deployment



© 2026 EnergyCAP. All rights reserved.

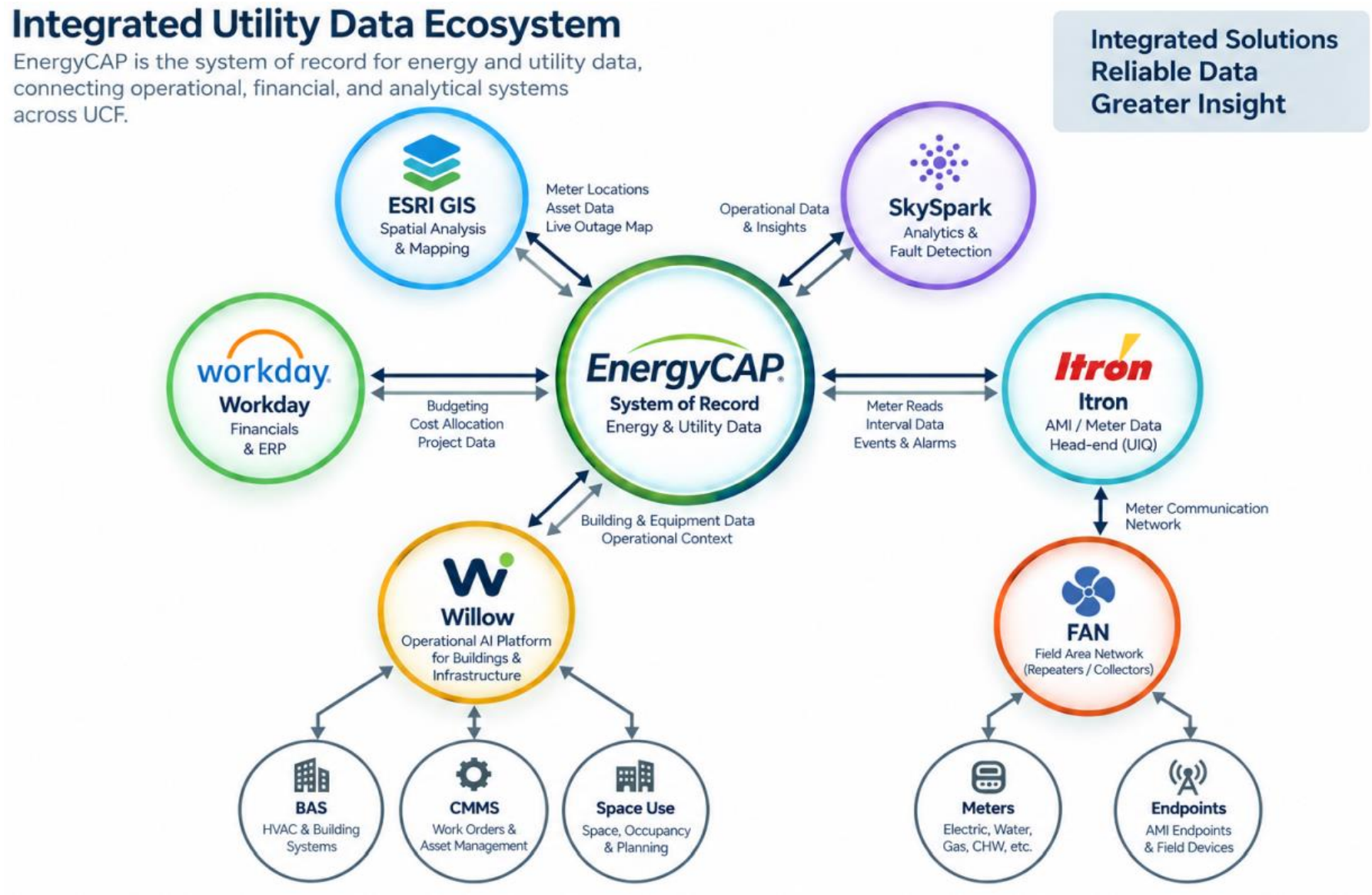
AMI Mesh – Link Analysis

(Redundant Coverage = Reliability)



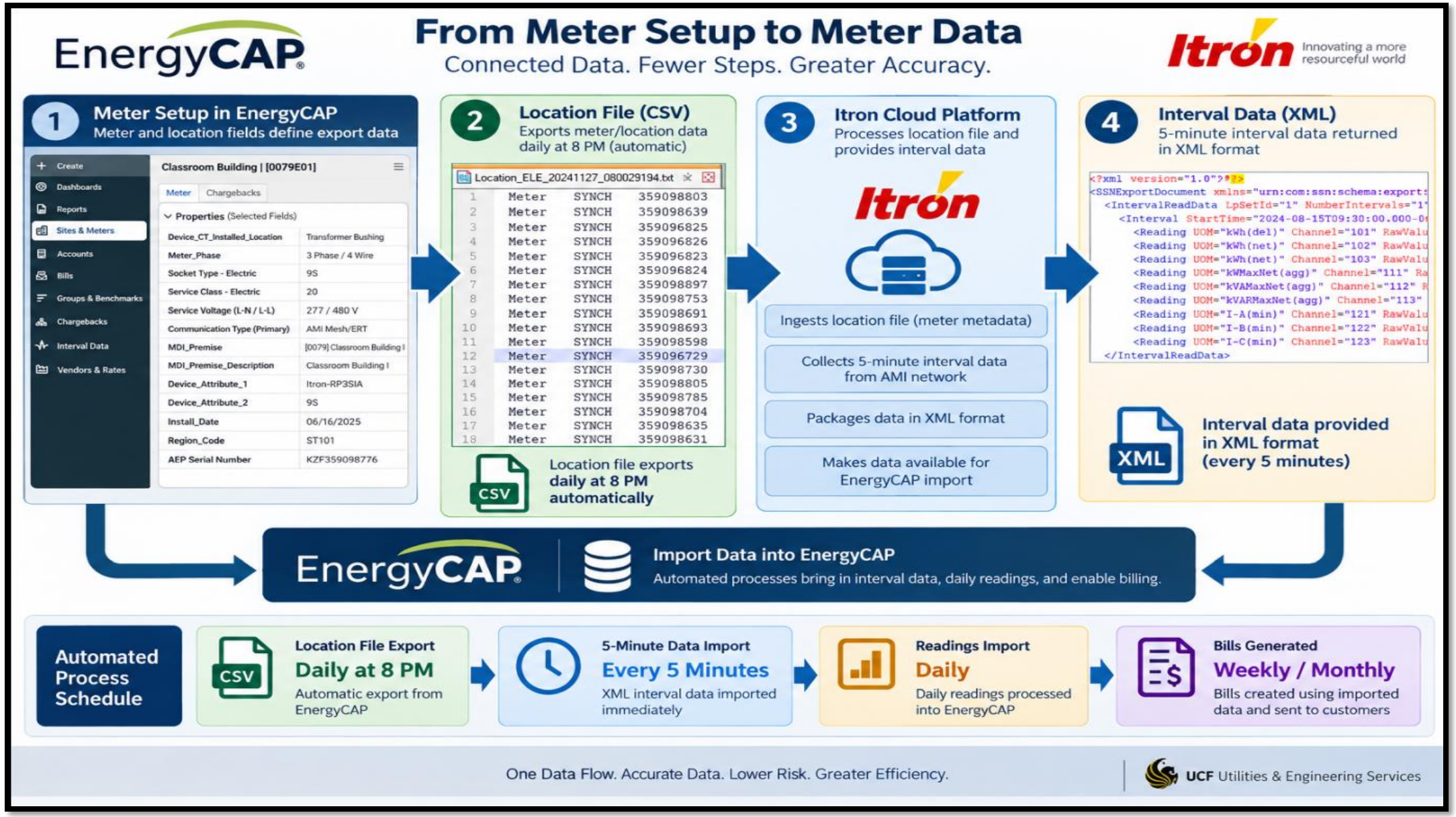
© 2026 EnergyCAP. All rights reserved.

Integration is Key: EnergyCAP as the System of Record



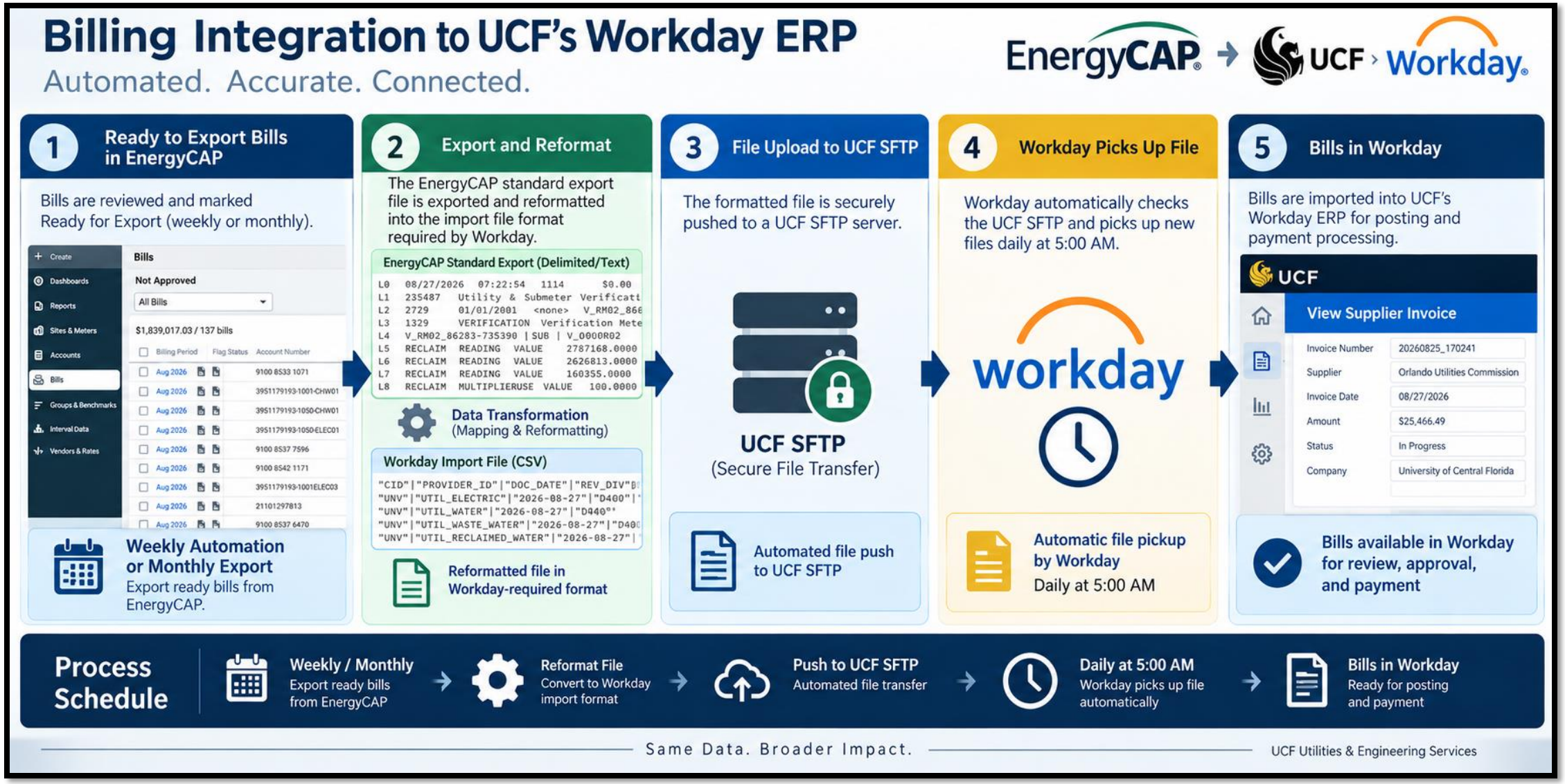
© 2026 EnergyCAP. All rights reserved.

Workflow Automation: EnergyCAP & Itron



© 2026 EnergyCAP. All rights reserved.

Workflow Automation: EnergyCAP & Workday



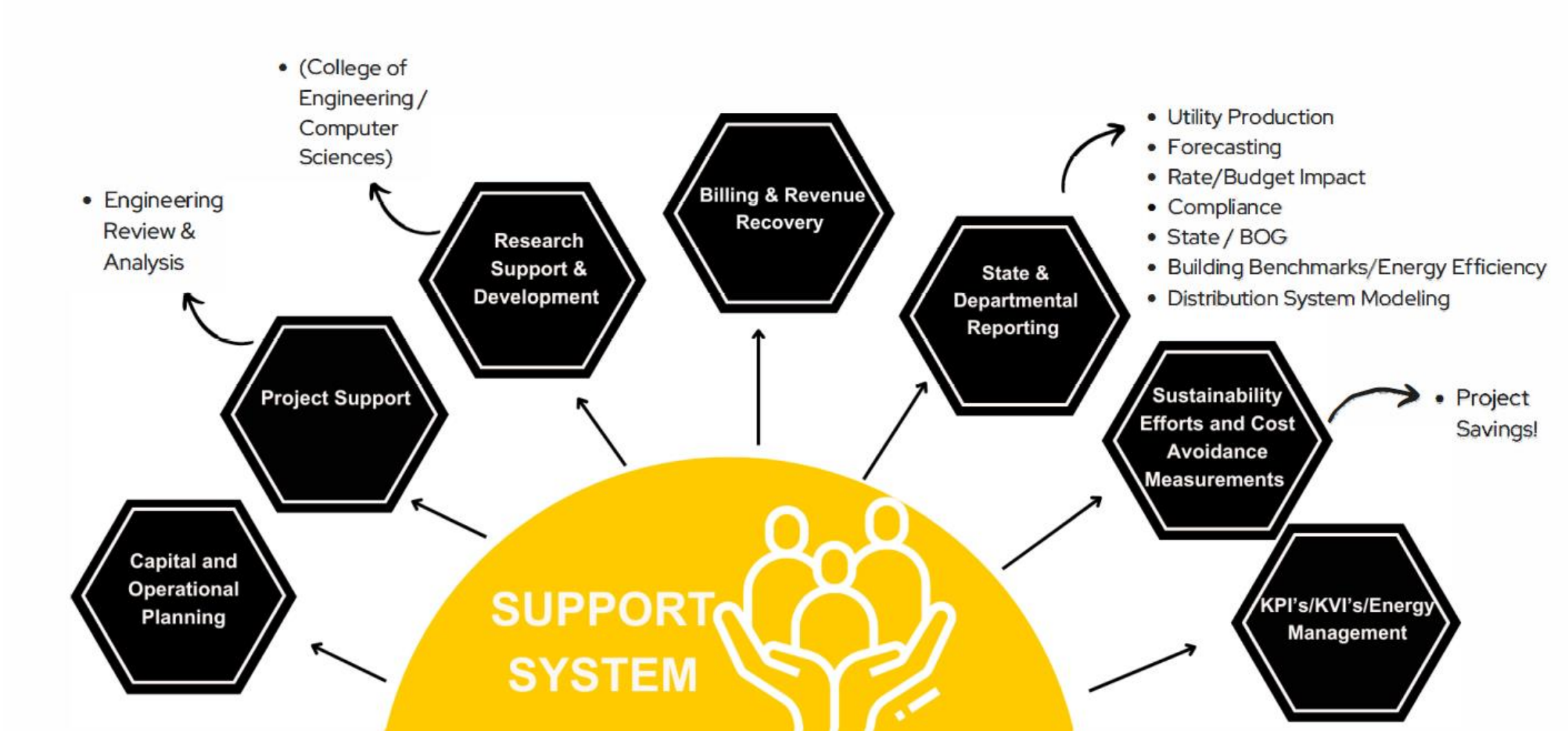
© 2026 EnergyCAP. All rights reserved.

Data Focused: Accuracy and Integrity

UCF Utilities and Engineering Services

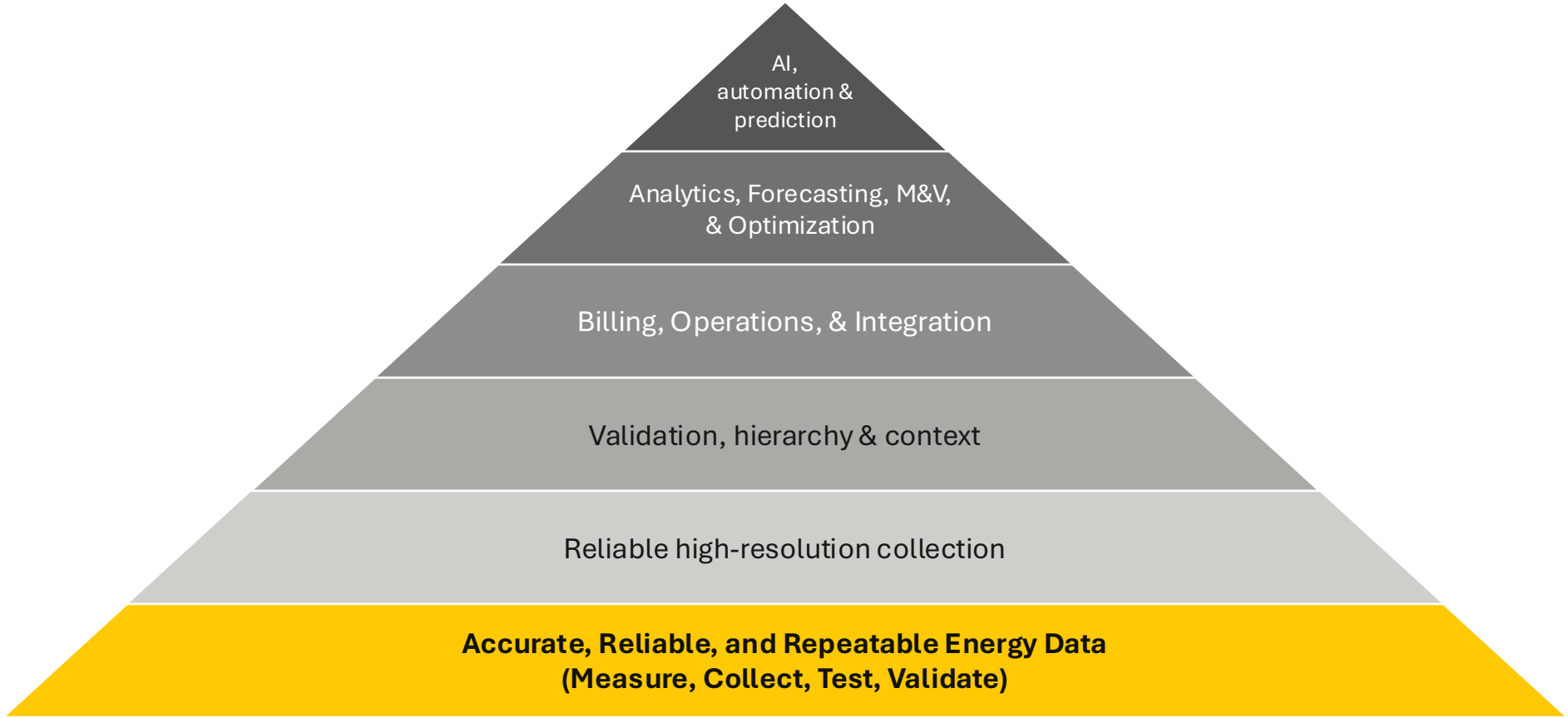
© 2026 EnergyCAP. All rights reserved.

Who we serve



© 2026 EnergyCAP. All rights reserved.

Data comes first – everything depends on it



Collect at the highest practical resolution. Preserve raw data. Aggregate only when needed.
Treat Meters as "Revenue Assets"

© 2026 EnergyCAP. All rights reserved.

Test your meters – Investing In Data Quality

Don’t wait to be wrong, prove your right!

Electric

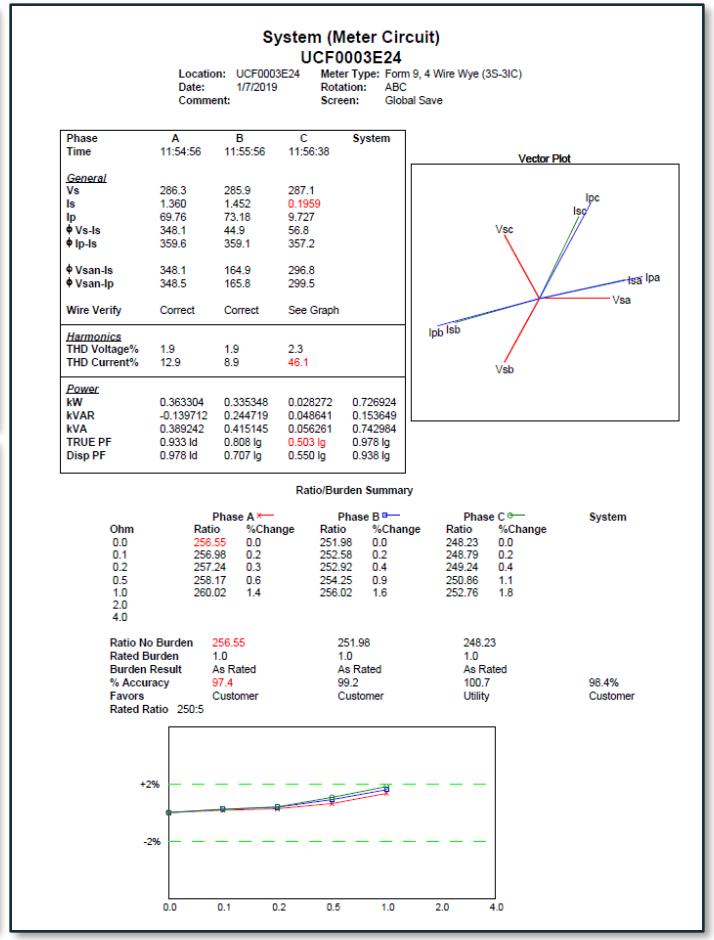
- The most common issues with electric meters are wiring related, not the meter. Utilities deploy teams to test accuracy and wiring for reliability

Potable and Reclaim Water

- Primary failures across the industry are due to low-flow performance and mechanical deterioration.

Natural Gas

- Primary failures are mechanical. Natural gas is advancing, but most common failures are due to dirt, wear, oil levels and even electronic transducer / sensor failures.



System (Meter Circuit)
UCF0003E24

Location: UCF0003E24 Meter Type: Form 9, 4 Wire Wye (3S-3IC)
Date: 1/7/2019 Rotation: ABC
Comment: Screen: Global Save

Phase	A	B	C	System
Time	11:54:56	11:55:56	11:56:38	
General				
Vs	286.3	285.9	287.1	
Is	1.360	1.452	0.1959	
Ip	69.76	73.18	9.727	
∠ Vs-Is	348.1	44.9	56.8	
∠ Ip-Is	359.6	359.1	357.2	
∠ Vsan-Is	348.1	164.9	296.8	
∠ Vsan-Ip	348.5	165.8	299.5	
Wire Verify	Correct	Correct	See Graph	
Harmonics				
THD Voltage%	1.9	1.9	2.3	
THD Current%	12.9	8.9	46.1	
Power				
kW	0.363304	0.335348	0.028272	0.726924
kVAR	-0.139712	0.244719	0.048641	0.153649
kVA	0.389242	0.415145	0.056261	0.742984
TRUE PF	0.933 Id	0.808 Ig	0.503 Ig	0.978 Ig
Disp PF	0.978 Id	0.707 Ig	0.550 Ig	0.938 Ig

Vector Plot
Ipc
Isc
Vsc
Isa Ipa
Vsa
Ipb Isb
Vsb

Ratio/Burden Summary

Ohm	Phase A Ratio	Phase A %Change	Phase B Ratio	Phase B %Change	Phase C Ratio	Phase C %Change	System
0.0	256.55	0.0	251.98	0.0	248.23	0.0	
0.1	256.98	0.2	252.58	0.2	248.79	0.2	
0.2	257.24	0.3	252.92	0.4	249.24	0.4	
0.5	258.17	0.6	254.25	0.9	250.86	1.1	
1.0	260.02	1.4	256.02	1.6	252.76	1.8	
2.0							
4.0							
Ratio No Burden	256.55		251.98		248.23		
Rated Burden	1.0		1.0		1.0		
Burden Result	As Rated		As Rated		As Rated		
% Accuracy	97.4		99.2		100.7		98.4%
Favors	Customer		Customer		Utility		Customer
Rated Ratio	250:5						

+2%
-2%
0.0 0.1 0.2 0.5 1.0 2.0 4.0

You must budget for these services and equipment in your rates. This is necessary to critical revenue protection and validation!

© 2026 EnergyCAP. All rights reserved.

At Utility Plant Scale, Small CT Errors Become Large Dollars

CT ACCURACY • FINANCIAL EXPOSURE

31.6M	×	$0.16	=	$5.056M	EVERY 1% OF ERROR = $50,560 / YEAR
kWh / year		per kWh		annual measured energy value	

What persistent CT measurement error means, and why High-Accuracy/Solid-Core CT's are essential for accuracy!

Potential annual under- or over-registration

0.15%	2%	5%	8%	10%
High-accuracy benchmark	Less-accurate or Drifting CT example	Failed-test result	Failed-test result	Severe CT error
$7,584 per year	$101,120 per year	$252,800 per year	$404,480 per year	$505,600 per year
Modeled at 0.15% error	13.3× benchmark exposure	33.3× benchmark exposure	53.3× benchmark exposure	66.7× benchmark exposure

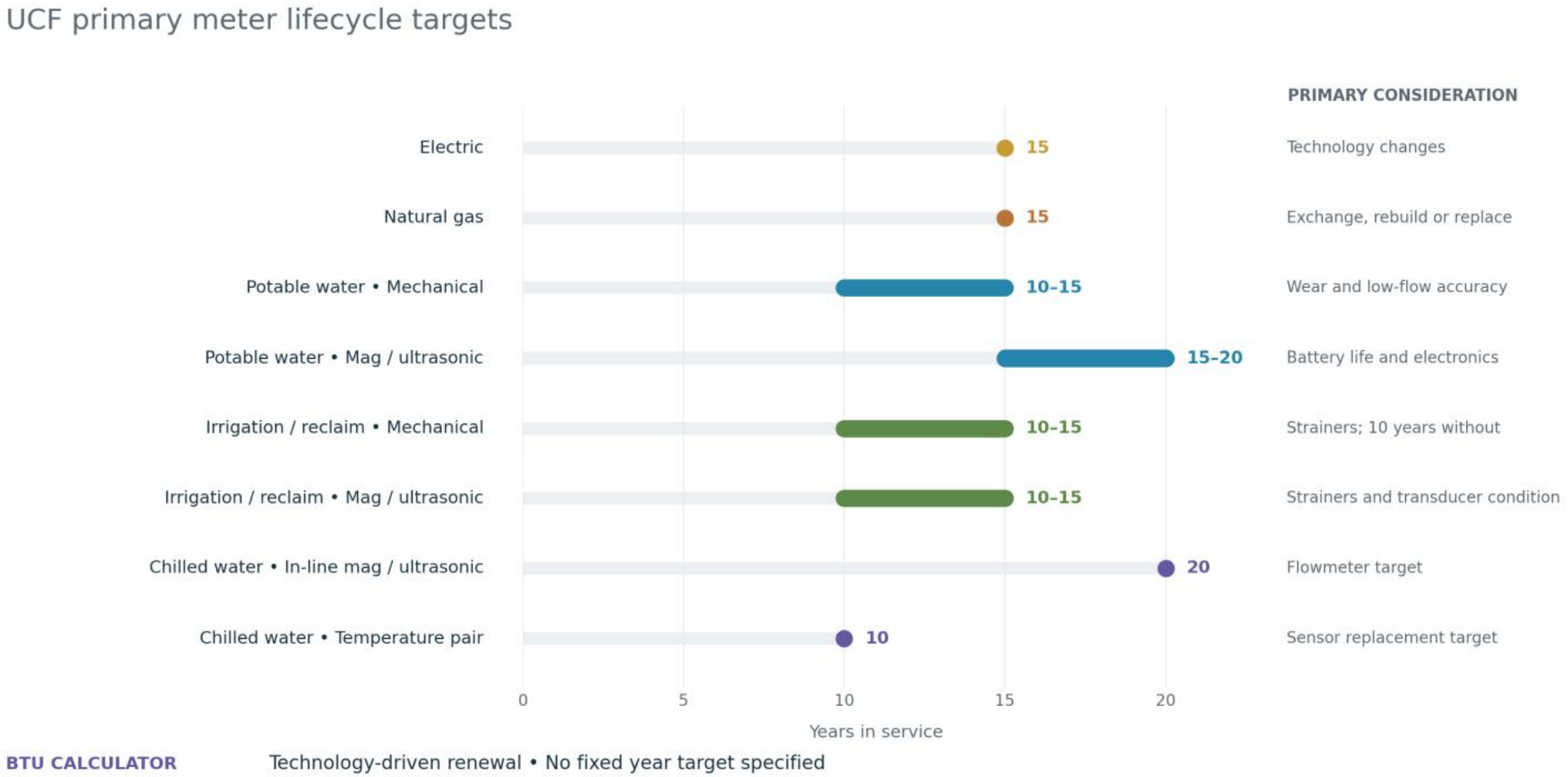
WHY ACCURACY MATTERS

A seemingly small 2% CT bias skews > $100,000 of plant cost or 632,000 kWh of energy data used in efficiency calculations at risk!

Illustrative exposure assumes the percentage error persists across the full 31.6 million kWh annual plant load.

© 2026 EnergyCAP. All rights reserved.

Plant the replacement. Protect the data. Testing isn't enough!



Budget for lifecycle renewal | Use testing to guide timing | Replace before failure

© 2026 EnergyCAP. All rights reserved.

Verify Everything!

Measure First, Trust Later!

© 2026 EnergyCAP. All rights reserved.

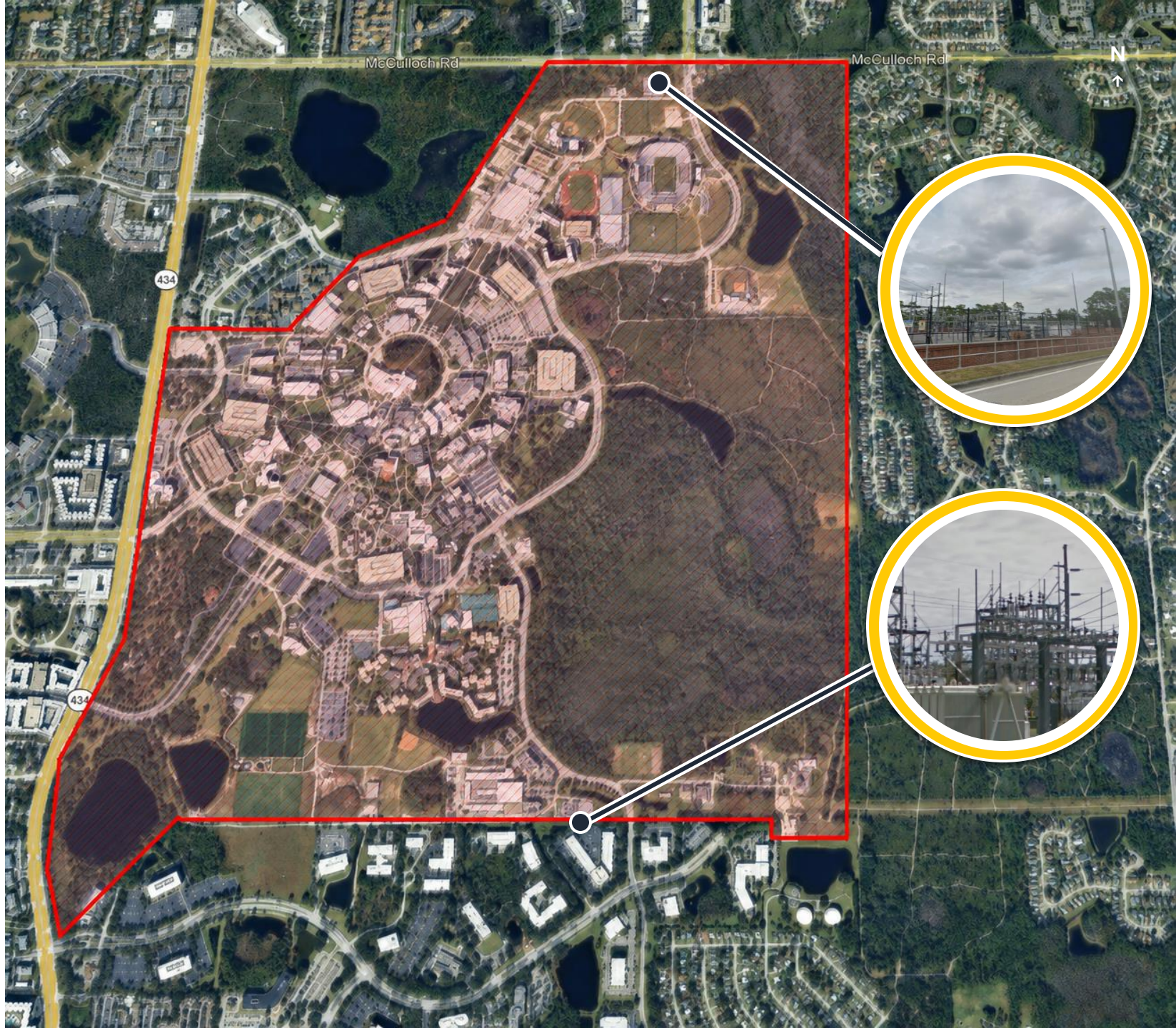
Main Campus Grid

North Substation

- 4 Primary Feeders
- 8 Duke Meters / 8 UCF Meters
- Connected to same instrument Transformers

South Substation

- 2 Primary Feeders
- 4 Duke Meters / 4 UCF Meters
- Connected to same instrument transformers



Source: UCF Facts 2025–2026

Trust Nothing, Verify the Measurement!

North Substation
Metering for 1 Feeder

South Substation
Metering for 2 Primary Feeders

© 2026 EnergyCAP. All rights reserved.

Main Campus Natural Gas System

West Interconnect

- 100 PSI – Primary 2” Service
- 1 TECO/PeoplesGas Meter w/Shared valve for demarcation
- 1 UCF Meter Downstream w/Cellular real-time output and Itron
- Real Time Data w/Pressure and Temperature

South Interconnect

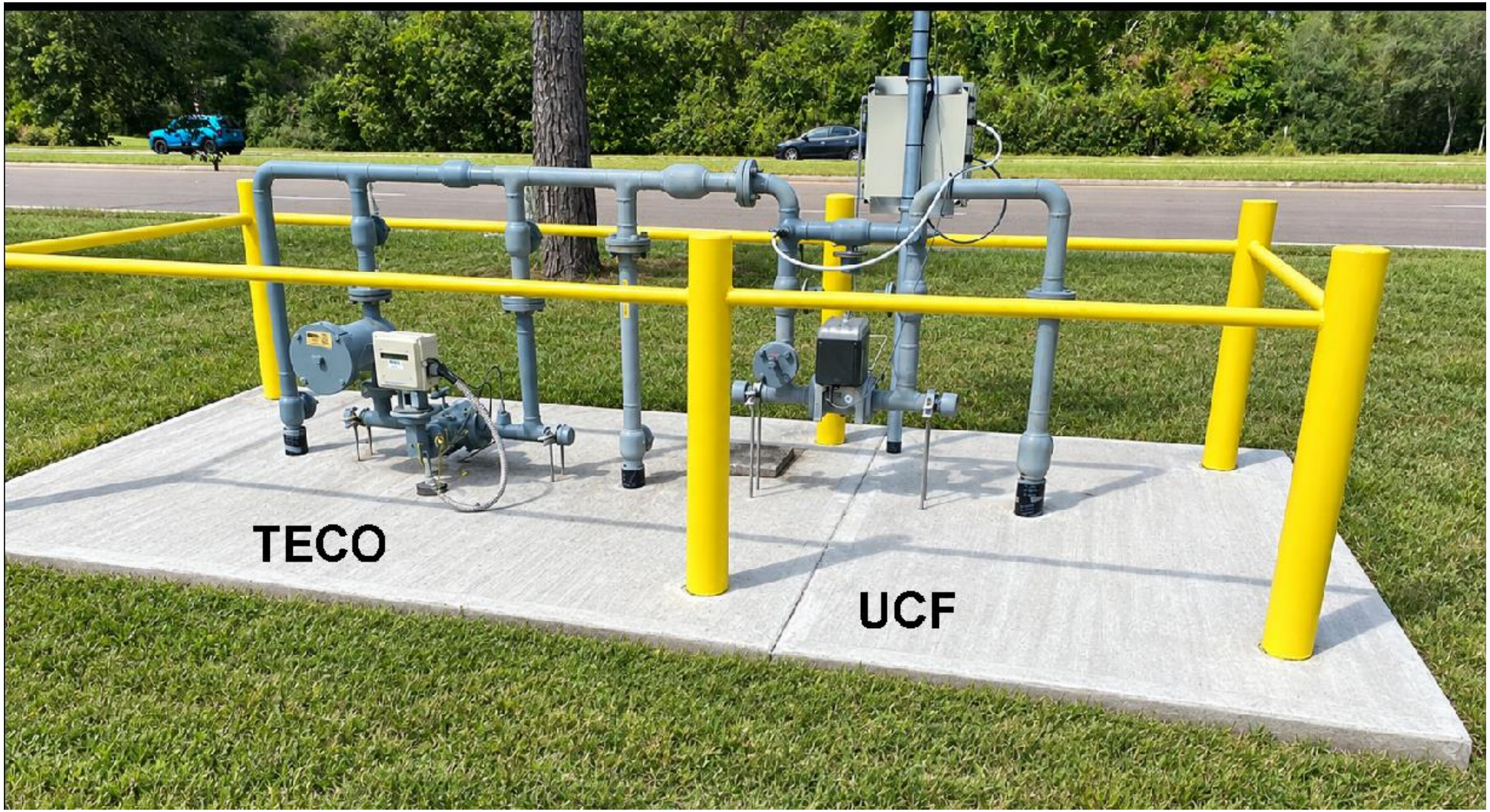
- 100 PSI – Primary 4” Service
- 1 TECO/PeoplesGas Meter w/Shared valve for demarcation
- 1 UCF Meter Downstream w/Cellular real-time output and Itron
- Real Time Data w/Pressure and Temperature

Source: UCF Facts 2025–2026

South 4” Interconnect – Installing UCF Meter

© 2026 EnergyCAP. All rights reserved.

West 2” Interconnect – Installing UCF Meter



© 2026 EnergyCAP. All rights reserved.

Actionable Intelligence

Utilizing the data for insights and outcomes

© 2026 EnergyCAP. All rights reserved.

Utilizing AI to Analyze and Evaluate Critical Meter Events

Itron Electric meters are capable of emitting over 250 defined events.

Each event has an associated EventID and a general description of what that event represents.

However, event descriptions are not intuitive and must be interpreted.

By continuing to build the reference list with ongoing notes (matching EventID's to "possible" problems), the list can slowly be refined to analyze real-time events and prioritize accordingly for assignment/correction.

Initial testing has revealed good success with correlating repeat events, high volume events, possible causes, action to take, and provide steps for correction.

© 2026 EnergyCAP. All rights reserved.

Itron's Event Reference List – Over 250+ Events Available

Itron AMM Event List (2026)

EventID	Code	Description	Further Explanation	Severity	Reme	Source from Meter
280159	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL1_SAG_EVENT_PHASE_A	RMS Voltage Threshold Detection Level 1 Sa	The Sag Level 1 Phase A Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196658
280161	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL1_SAG_EVENT_PHASE_B	RMS Voltage Threshold Detection Level 1 Sa	The Sag Level 1 Phase B Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196660
280163	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL1_SAG_EVENT_PHASE_C	RMS Voltage Threshold Detection Level 1 Sa	The Sag Level 1 Phase C Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196662
280165	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL2_SAG_EVENT_PHASE_A	RMS Voltage Threshold Detection Level 2 Sa	The Sag Level 2 Phase A Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196664
280167	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL2_SAG_EVENT_PHASE_B	RMS Voltage Threshold Detection Level 2 Sa	The Sag Level 2 Phase B Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196666
280169	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL2_SAG_EVENT_PHASE_C	RMS Voltage Threshold Detection Level 2 Sa	The Sag Level 2 Phase C Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196668
280171	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL3_SAG_EVENT_PHASE_A	RMS Voltage Threshold Detection Level 3 Sa	The Sag Level 3 Phase A Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196670
280173	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL3_SAG_EVENT_PHASE_B	RMS Voltage Threshold Detection Level 3 Sa	The Sag Level 3 Phase B Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196672
280175	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL3_SAG_EVENT_PHASE_C	RMS Voltage Threshold Detection Level 3 Sa	The Sag Level 3 Phase C Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196674
280183	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL1_SWELL_EVENT_PHASE_A	RMS Voltage Threshold Detection Level 1 Sv	The Swell Level 1 Phase A Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196682
280185	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL1_SWELL_EVENT_PHASE_B	RMS Voltage Threshold Detection Level 1 Sv	The Swell Level 1 Phase B Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196684
280187	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL1_SWELL_EVENT_PHASE_C	RMS Voltage Threshold Detection Level 1 Sv	The Swell Level 1 Phase C Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196686
280189	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL2_SWELL_EVENT_PHASE_A	RMS Voltage Threshold Detection Level 2 Sv	The Swell Level 2 Phase A Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196688
280191	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL2_SWELL_EVENT_PHASE_B	RMS Voltage Threshold Detection Level 2 Sv	The Swell Level 2 Phase B Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196690
280193	RIVA_DLMS_RMS_VOLTAGE_DETECTION_LEVEL2_SWELL_EVENT_PHASE_C	RMS Voltage Threshold Detection Level 2 Sv	The Swell Level 2 Phase C Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196692
280195	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL3_SWELL_EVENT_PHASE_A	RMS Voltage Threshold Detection Level 3 Sv	The Swell Level 3 Phase A Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196694
280197	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL3_SWELL_EVENT_PHASE_B	RMS Voltage Threshold Detection Level 3 Sv	The Swell Level 3 Phase B Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196696
280199	RIVA_DLMS_RMS_VOLTAGE_THRESHOLD_DETECTION_LEVEL3_SWELL_EVENT_PHASE_C	RMS Voltage Threshold Detection Level 3 Sv	The Swell Level 3 Phase C Algorithm has been triggered.	WARNING	Refer to r	Event ID: 196698
280222	RIVA_DLMS_UNFILTERED_MOMENTARY_INTERRUPTION	Unfiltered Momentary Interruption	An Unfiltered Momentary Interruption event has been triggered.	WARNING	Refer to r	Event ID: 262202
280223	RIVA_DLMS_FILTERED_MOMENTARY_INTERRUPTION	Filtered Momentary Interruption	A Filtered Momentary Interruption event has been triggered.	WARNING	Refer to r	Event ID: 262203
280007	RIVA_DLMS_LOW_BATTERY	Low Battery	This is logged when we detect that battery voltage is low.	CRITICAL	Refer to r	Event ID: 65545
280013	RIVA_DLMS_DEAD_BATTERY_DETECTED	Dead Battery Detected	The battery is dead.	CRITICAL	Refer to r	Event ID: 65552
280028	RIVA_DLMS_MAGNETIC_TAMPER_DETECTED	Magnetic Tamper Detected	Tamper magnetic has been detected.	CRITICAL	Refer to r	Event ID: 131075
280029	RIVA_DLMS_METER_INVERSION_DETECTED	Meter Inversion Detected	The meter has been detected to be in an inverted state.	CRITICAL	Refer to r	Event ID: 131076
280031	RIVA_DLMS_METER_REMOVAL	Meter Removal	Tamper socket removal has occurred.	WARNING	Refer to r	Event ID: 131079
280039	RIVA_DLMS_REVERSE_ENERGY_DETECTED	Reverse Energy Detected	Energy has accumulated in the reverse direction.	CRITICAL	Refer to r	Event ID: 196618
280047	RIVA_DLMS_RMS_VOLTAGE_HIGH_ANOMALY	RMS Voltage High Anomaly	RMS Voltage Exceeded the configured threshold.	CRITICAL	Refer to r	Event ID:196632
280048	RIVA_DLMS_RMS_VOLTAGE_LOW_ANOMALY	RMS Voltage Low Anomaly	RMS Voltage dropped below the configured threshold.	CRITICAL	Refer to r	Event ID: 196633
280050	RIVA_DLMS_CURRENT_HIGH_ANOMALY	Current High Anomaly	Current Exceeded the configured threshold.	CRITICAL	Refer to r	Event ID: 196635
280051	RIVA_DLMS_CURRENT_LOW_ANOMALY	Current Low Anomaly	Current dropped below the configured threshold.	CRITICAL	Refer to r	Event ID: 196636
280063	RIVA_DLMS_TEMPERATURE_THRESHOLD_EXCEEDED	Temperature Threshold Exceeded	Temperature exceeded Threshold.	CRITICAL	Refer to r	Event ID: 196649
280068	RIVA_DLMS_DIAGNOSTIC_1_ON	Diagnostic 1 On	SiteScan Diagnostic 1 failure occurred.	CRITICAL	Refer to r	Event ID: 262149
280069	RIVA_DLMS_DIAGNOSTIC_2_ON	Diagnostic 2 On	SiteScan Diagnostic 2 failure occurred.	CRITICAL	Refer to r	Event ID: 262150
280070	RIVA_DLMS_DIAGNOSTIC_3_ON	Diagnostic 3 On	SiteScan Diagnostic 3 failure occurred.	CRITICAL	Refer to r	Event ID: 262151
280071	RIVA_DLMS_DIAGNOSTIC_4_ON	Diagnostic 4 On	SiteScan Diagnostic 4 failure occurred.	CRITICAL	Refer to r	Event ID: 262152
280080	RIVA_DLMS_ARC_DETECTION_TRIGGERED	Arc Detection Triggered	The arc detection algorithm has been triggered and will transition fr	CRITICAL	Refer to r	Event ID: 262161
280098	RIVA_DLMS_SELF_READ_DATA_FAILURE	Self Read Data Failure	A requested data value could not be captured in self-read.	WARNING	Refer to r	Event ID: 655363
280221	RIVA_DLMS_SUSTAINED_INTERRUPTION	Sustained Interruption	A Sustained Interruption event has been triggered.	WARNING	Refer to r	Event ID: 262201
280008	RIVA_DLMS_DST_PERIODS_EXHAUSTED	DST Periods Exhausted	This event is logged when the DST calendar enters final year.	CRITICAL	Refer to r	Event ID: 65546
280011	RIVA_DLMS_TIME_ADJUSTMENT_FAILED	Time Adjustment Failed	Adjustment of the system clock has failed	WARNING	Refer to r	Event ID: 65550

Actual Timestamped Meter Events

event_id	event_name	event_time	insertion_time	event_args	event_severity	event_text	src_name	src_location_util_id
280070	Diagnostic 3 On	9/7/2026 15:19	9/7/2026 15:23	{{0007810903563a23}{262151}}	Critical	Diagnostic 3 On for Meter 00:07:81:09:03:56:3a:23. Event Code: 262151.	0016E01-359098601	[0016] Facilities and Safety
280219	Low Current Threshold Restored Event	9/7/2026 15:19	9/7/2026 15:21	{{000781090367d77e}{196718}{Configured Threshold Duration: 60 seconds, Restored Reason: A Instantaneous Current threshold event was restored due to a	Information	Low Current Threshold Restored Event occurred for Meter 00:07:81:09:03:67:d7:7e. Event Code: 196718. Event Data: [Configured Threshold Duration: 60 seconds, Restored Reason: A Instantaneous Current threshold event was restored due to a monitoring algorithm].	0077E02-359098837	[MC_BUILDINGS] Main Campus
280218	Low Current Threshold Detected Event	9/7/2026 15:18	9/7/2026 15:21	{{0007810903563e70}{196717}{Configured Threshold Duration: 60 seconds}}	Warning	Low Current Threshold Detected Event triggered for Meter 00:07:81:09:03:56:3e:70. Event Code: 196717. Event Data: [Configured Threshold Duration: 60 seconds].	0004E02-359098591	[0004] Storm Water Research Lab
280070	Diagnostic 3 On	9/7/2026 15:18	9/7/2026 15:21	{{0007810903563db0}{262151}}	Critical	Diagnostic 3 On for Meter 00:07:81:09:03:56:3d:b0. Event Code: 262151.	0150E01-359098603	[0150] Public Safety Building
280074	Diagnostic 3 Off	9/7/2026 15:17	9/7/2026 15:21	{{00078109035669e4}{262155}}	Clear	Diagnostic 3 Off for Meter 00:07:81:09:03:56:69:e4. Event Code: 262155.	0024E01-359098690	[0024] Creative School I
280074	Diagnostic 3 Off	9/7/2026 15:17	9/7/2026 15:21	{{0007810903563db0}{262155}}	Clear	Diagnostic 3 Off for Meter 00:07:81:09:03:56:3d:b0. Event Code: 262155.	0150E01-359098603	[0150] Public Safety Building
280074	Diagnostic 3 Off	9/7/2026 15:17	9/7/2026 15:21	{{0007810903563e01}{262155}}	Clear	Diagnostic 3 Off for Meter 00:07:81:09:03:56:3e:01. Event Code: 262155.	0050E07-359098763	[VERIF] Verification Meters
280071	Diagnostic 4 On	9/7/2026 15:17	9/7/2026 15:21	{{0007810903563df0}{262152}}	Critical	Diagnostic 4 On for Meter 00:07:81:09:03:56:3d:f0. Event Code: 262152.	0137E15-359098734	[0137] Knights Plaza
280070	Diagnostic 3 On	9/7/2026 15:16	9/7/2026 15:21	{{0007810903563db0}{262151}}	Critical	Diagnostic 3 On for Meter 00:07:81:09:03:56:3d:b0. Event Code: 262151.	0150E01-359098603	[0150] Public Safety Building
280070	Diagnostic 3 On	9/7/2026 15:16	9/7/2026 15:21	{{0007810903563e01}{262151}}	Critical	Diagnostic 3 On for Meter 00:07:81:09:03:56:3e:01. Event Code: 262151.	0050E07-359098763	[VERIF] Verification Meters
280074	Diagnostic 3 Off	9/7/2026 15:16	9/7/2026 15:21	{{0007810903563df0}{262155}}	Clear	Diagnostic 3 Off for Meter 00:07:81:09:03:56:3d:f0. Event Code: 262155.	0137E15-359098734	[0137] Knights Plaza
280075	Diagnostic 4 Off	9/7/2026 15:15	9/7/2026 15:21	{{000781090365cc66}{262156}}	Clear	Diagnostic 4 Off for Meter 00:07:81:09:03:65:cc:66. Event Code: 262156.	0050E13-359098831	[VERIF] Verification Meters

AI can connect utility events to operational response

Priority interpretation for leading meters

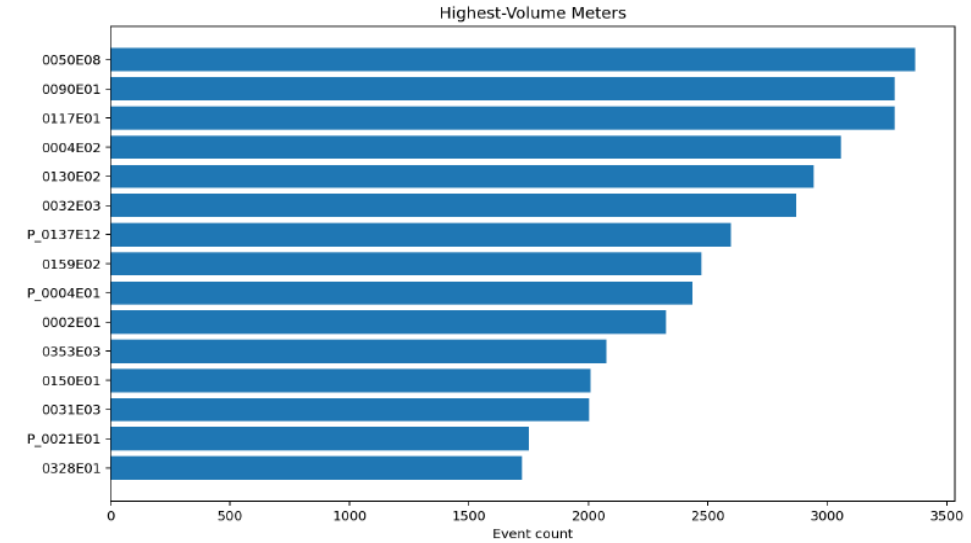
Meter	Observed event pattern	Updated interpretation	Next action
0353E03 - Solar Charging Station I	992 Phase-A Level-1 sag detections; worst about 206.2 V on 277 V base.	Repeated material Phase-A undervoltage threshold crossings. Because the service feeds EV/solar equipment, correlation with inverter/charger state and daylight is essential.	Pull V-A/V-B/V-C, I-A/I-B/I-C, kW, kVA and received/delivered energy for ±30 min. Compare 0353E01 and upstream peers.
0353E01 - Solar Charging Station I	575 Phase-A Level-1 sag detections; worst about 212.6 V; low THD-V peak.	Similar phase-specific pattern supports either a common supply/configuration issue or coordinated equipment operation.	Overlay timestamps with 0353E03, solar production, EV charging, and inverter switching. Verify nominal voltage and sag settings.
0072E90 / 0072E03	Eight very deep normalized sag records each.	The 4.3% normalized value may indicate actual near-interruption or a nominal-voltage/measurement-basis mismatch.	Verify the 2400/4160 V configuration, PT ratio, event-text units, and same-time phase values before ranking electrical severity.
0054E02/E03/E04 verification meters	High THD-V and loss-of-phase records.	AMM treats loss of phase as a critical alarm; extreme THD-V at weak/zero voltage can be a consequence of de-energization.	Prioritize the phase-loss sequence. Confirm whether these verification meters are intentionally de-energized or test-connected.
0132E03	Two arc detection records.	AMM classifies the trigger as a critical alarm and the later clear only as algorithm re-arming.	Review event pair/duration and maintenance history; inspect connections and thermal condition if unexplained.

Meter-level forensic priority

Rank	Meter / service	Evidence	AMM-informed disposition
1	0353E03 - Solar Charging Station I, 277/480 V	992 Phase-A sags; min 206.2 V (74.4%).	High recurrence and material depth. Correlate with EV chargers, solar inverter, daylight, and 0353E01.
2-3	0072E90 / 0072E03 - Utility Building 2, 2400/4160 V	8 sags each; about 4.3% normalized.	Potential near-interruption or scaling/basis mismatch. Verify PT ratio and event-text voltage basis first.
4	0353E01 - Solar Charging Station I, 277/480 V	575 Phase-A sags; min 212.6 V (76.8%).	Compare timestamp overlap with 0353E03 to distinguish common supply from individual equipment behavior.
5-7	0135E01 / 0028E01 / 0050E10	Sustained interruptions; max durations 76.7, 147.7, and 37,761.6 min.	Validate event start/end fields and outage corroboration; extreme duration may reflect missing/late state closure.
8-12	0054E02/E03/E04, 0052E03	THD-V 46.5-98.1%; phase-loss/outage context.	Prioritize phase-loss/outage state. Treat high THD-V at weak/zero load as secondary evidence.
14	0132E03	Two arc detections.	Critical AMM alarm family; inspect if not explained by testing or known work.

Event concentration and repeat offenders

The top 10 meters generated 25.7% of all records; the top 20 generated 41.2%. This concentration supports targeted remediation. High record volume alone is not equivalent to high risk; the event mix determines the corrective priority.



Meter	Total	Dominant event pattern	Assessment
0050E08	3,367	Low Current Threshold Detected Event (1,630), Low Current Threshold Restored Event (1,629)	Low-current threshold chatter; verify phase current, CT ratio/polarity, load intermittency, and threshold persistence.
0090E01	3,283	Diagnostic 3 On (1,592), Diagnostic 3 Off (1,591)	Diagnostic 3 toggling; identify configured Diagnostic 3 definition and inspect its source quantity/threshold.
0117E01	3,282	Diagnostic 3 Off (1,431), Diagnostic 3 On (1,431)	High-volume diagnostic toggling; same diagnostic mapping/configuration review required.
0004E02	3,058	Low Current Threshold Restored Event (1,483), Low Current Threshold Detected Event (1,483)	Low-current threshold chatter; compare event timestamps to load profile and phase currents.
0130E02	2,943	Diagnostic 3 Off (1,408), Diagnostic 3 On (1,408)	Diagnostic 3 toggling plus NIC registration failures; investigate both metrology threshold and RF/network stability.

Real-Time Outage Notification Dashboard (GIS)

Current Work in Progress
(target release October 2026)

Utilizes real-time event data from Itron AMI system

Logic to initiate real-time ping's across all electric meters in event of an outage

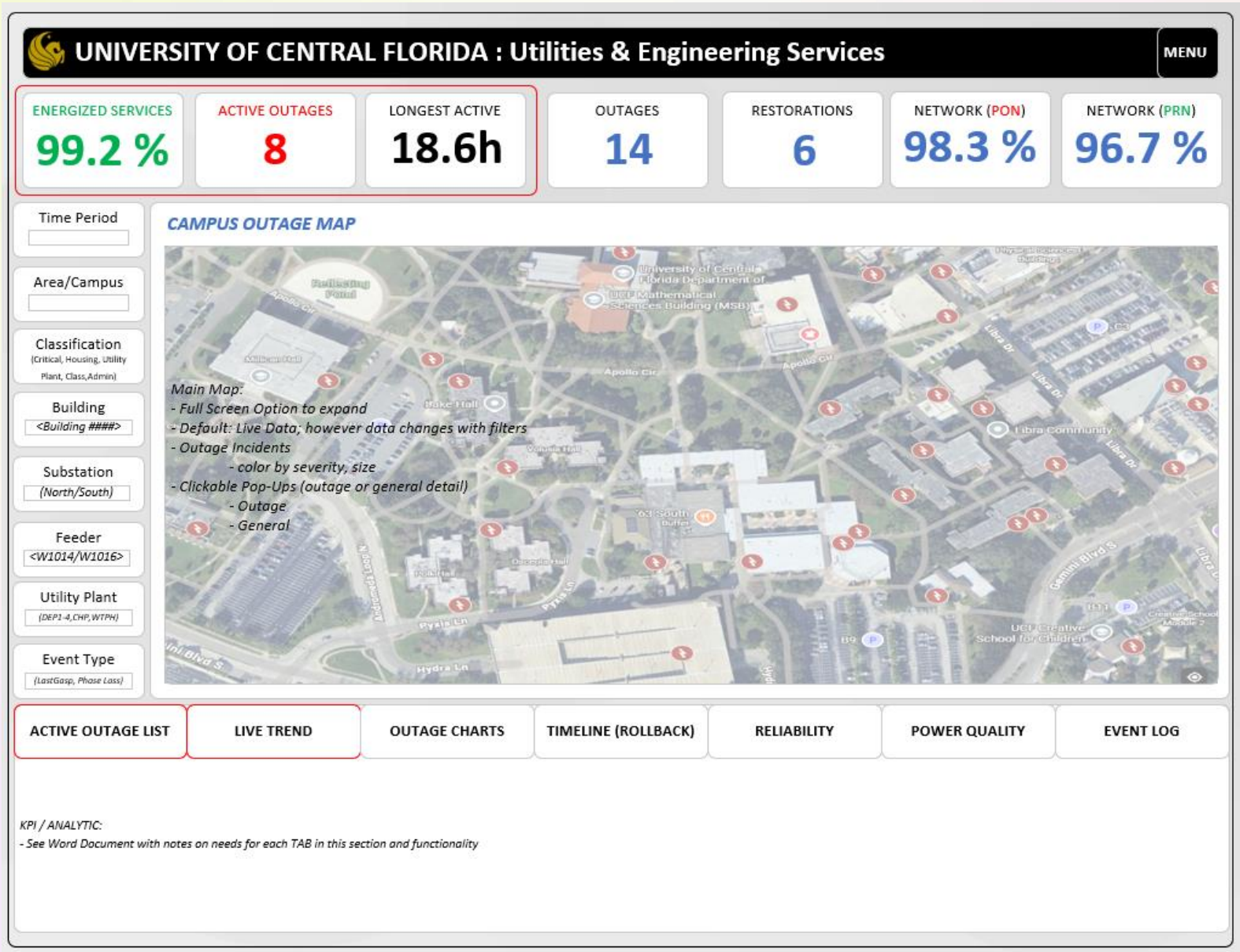
Live outage trends, summarized event logs, filtering, and visualized iconography to represent severity, quantity, impact and affected phasing.

Generate real-time email and text message notifications to specific group of recipients

Reliability metrics for messages received/missed

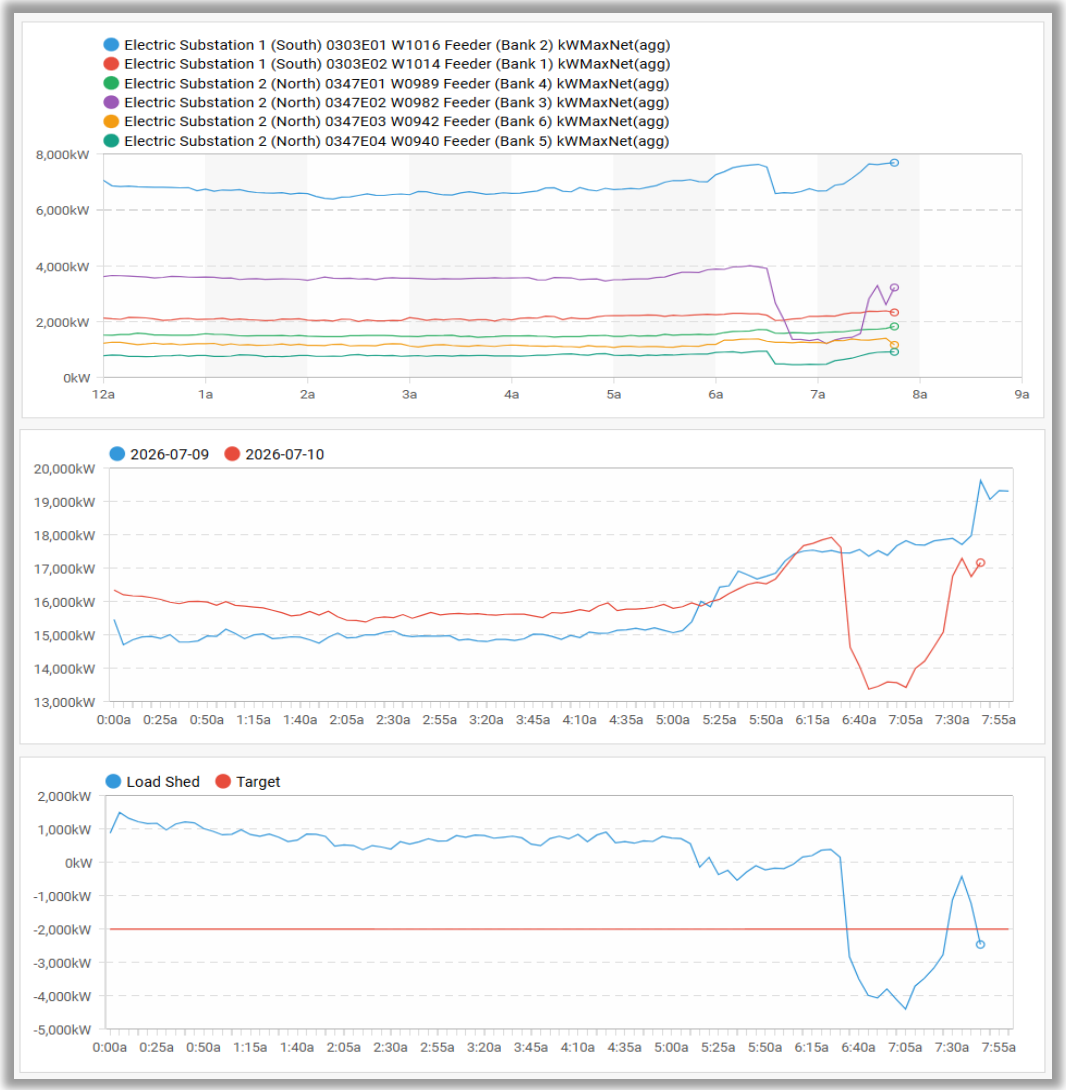
Operational PQ Insight, Visual Sag/Swell

Real-Time Outage & Event Notification Dashboard (ongoing)



© 2026 EnergyCAP. All rights reserved.

Real-Time Load Management Visibility through Metering!



~ 2 MW CST-3 Target
~ 4 MW Realized

Load-shed capability targeted and realized

~$2M /year Savings
~ 1 Month Payback

Annual value of curtailable service transition

Evaluation

Curtailable History - 19 Hours in 30 years

Implemented

47 Cellular ATS Controls – 24 Buildings

BAS Controls Setback – 16 Buildings

Chiller Plant Controls – 1 Chiller

Result

Investment ~$150k w/Rapid Payback

Importance of reliable real-time meter data - Supporting a successful team effort to realize a major tariff change for the campus to save!

© 2026 EnergyCAP. All rights reserved.

AMI “Big Data” Quickly Outgrows Manual Review

Software and AI narrow the growing data stream into the few issues that require action

DATA GROWS WITH GRANULARITY

Potential readings per meter each year

MANUAL REVIEW LIMIT

Monthly totals	12
Daily reads	365
Hourly intervals	8,760
15-minute intervals	35,040
5-minute intervals	105,120

Multiply by hundreds of meters and multiple commodities

Events, alarms and device status add a continuous stream

AUTOMATED DATA REDUCTION

ITRON AMI DATA

Intervals, usage, demand, voltage, flow, events, alarms and device health

INGEST AND VALIDATE

Combine sources, check completeness, normalize time and units

AI AND ANALYTICS

No Human’s Allowed!

EVENTS REQUIRING ACTION

Anomalies, errors failures, leaks and flags

FUTURE TARGET

AUTOMATING WORK ORDER CREATION

Create/route corrective work automatically after analytics confirm issue

Cadence counts show potential readings per meter. Actual collection intervals vary by commodity, endpoint and configuration.

© 2026 EnergyCAP. All rights reserved.

Thank you!
Questions?

Keith Coelho
Senior Manager, Utilities Smart Infrastructure
Utilities & Engineering Services
University of Central Florida
Keith.Coelho@ucf.edu

© 2026 EnergyCAP. All rights reserved.