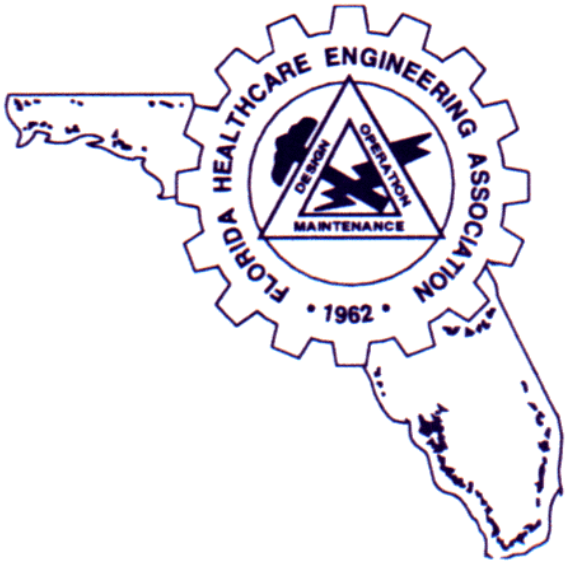
HOSPITALenERGY

POWER TO HEAL™



Best Practices in Energy

October 9, 2019

Natural Disasters Are Becoming the Norm

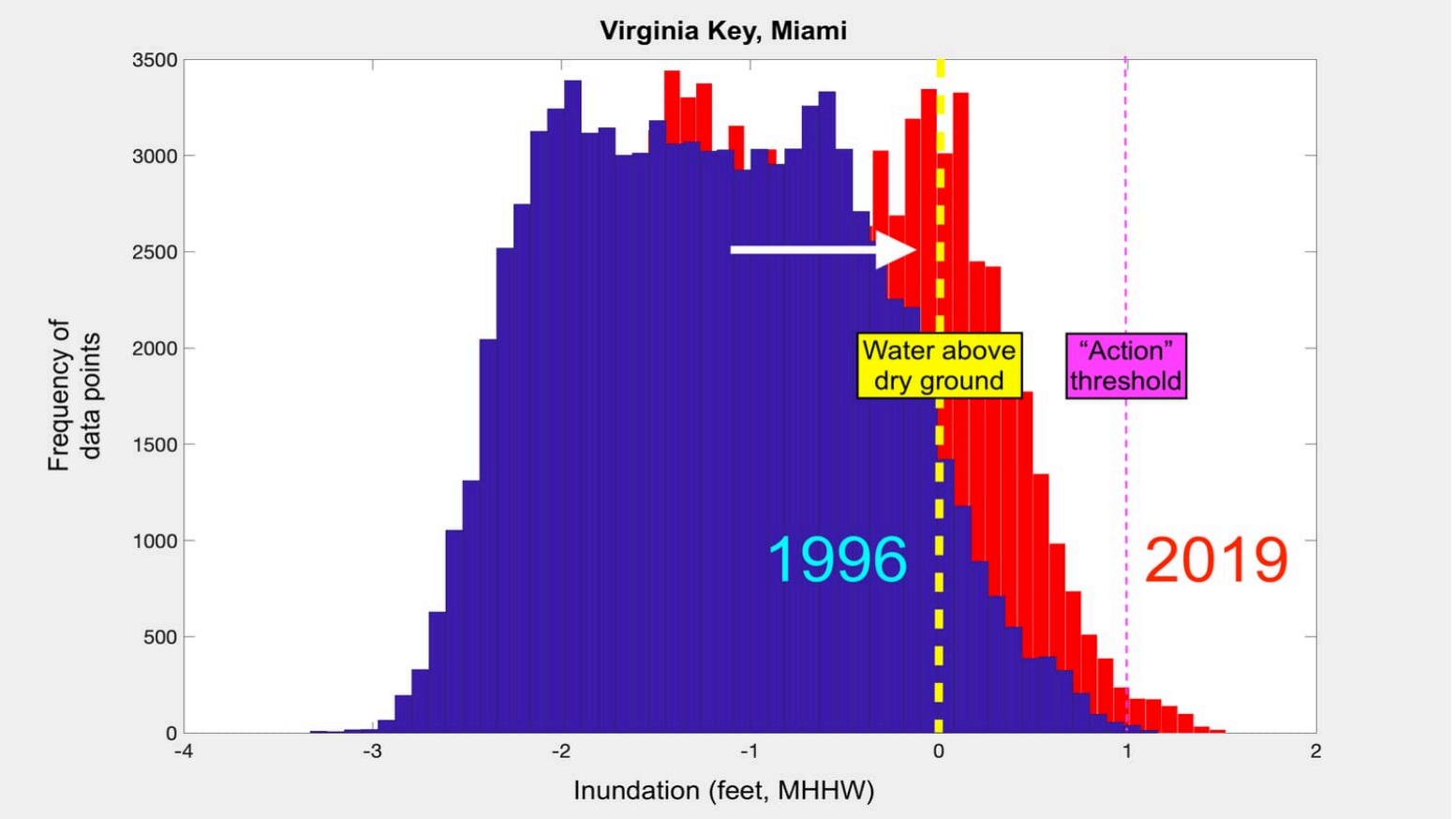
- In Florida, hurricanes are becoming more frequent, powerful and devastating in their effects.

- High tides are getting higher. Since 1960, high-tide related nuisances are up 300% to 900%.

- We are expected to set new flooding records for decades to come.

Miami Sea Level Rise

- Sea level rise is up 5.9 inches since 1996, (38% of amount needed to flood the city).
- However, flooding is up 320% because it's non-linear.



Hurricanes Are Forcing Change

- Hospitals need to operate a larger array of patient care operations under emergency conditions for longer periods of time.
- Hospitals need to allocate resources to resiliency despite continual financial pressure and changing regulatory and market forces.
- Hospitals should view on-campus power generation as a method of reducing the cost of external power supply.

CMS Rules Are Forcing Change

- Hospitals are "required to meet the subsistence needs of staff and patients… including… **alternate sources of energy** to maintain temperatures to protect patient health and safety and for the safe and sanitary storage of such **provisions**. …."

- The hospital can avoid installing generators to maintain temperatures only if:

  1) the hospital is able to move inpatients to areas that meet temperature requirements; or

  2) the hospital plans evacuation of all patients in the event of emergency.

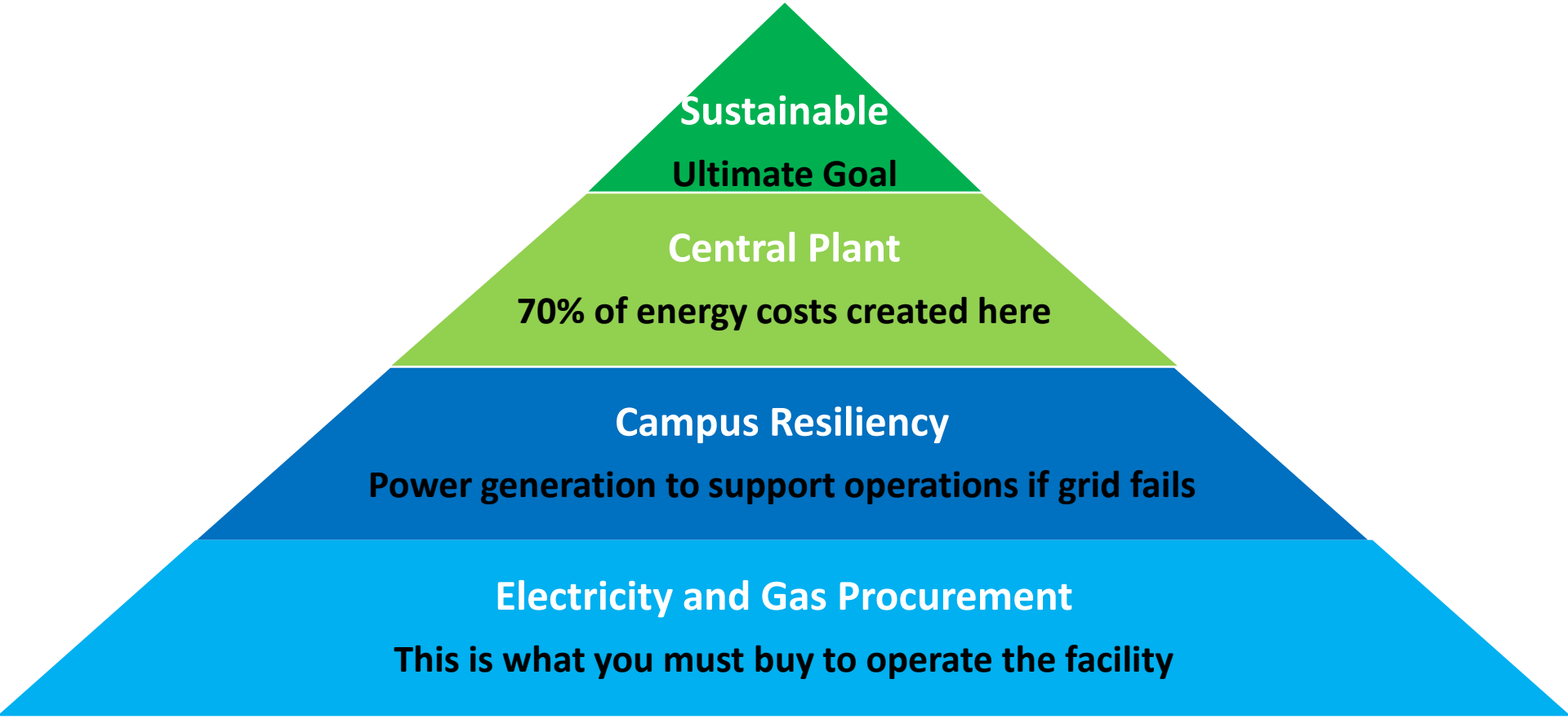
Complying with CMS Emergency Power Rule

Most hospitals currently have **<25%** of electric load back-up capability.

Adding air conditioning would require up to **60%** of typical electric load.

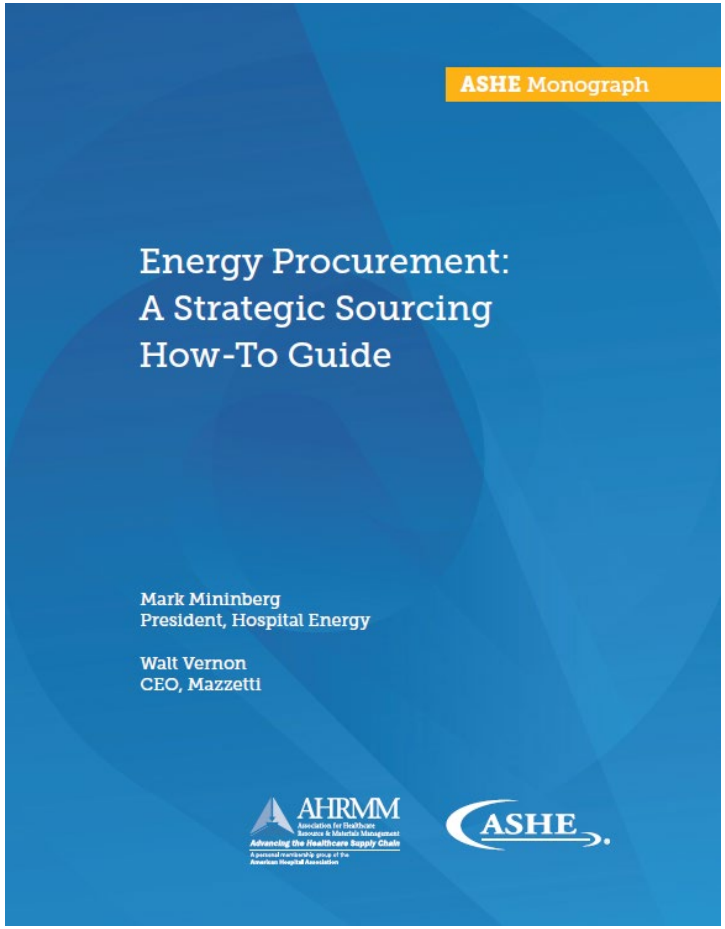
"Our backup power is sufficient only to maintain lighting and fire suppression during evacuation."
~ Facility Director
Major Hospital IDN

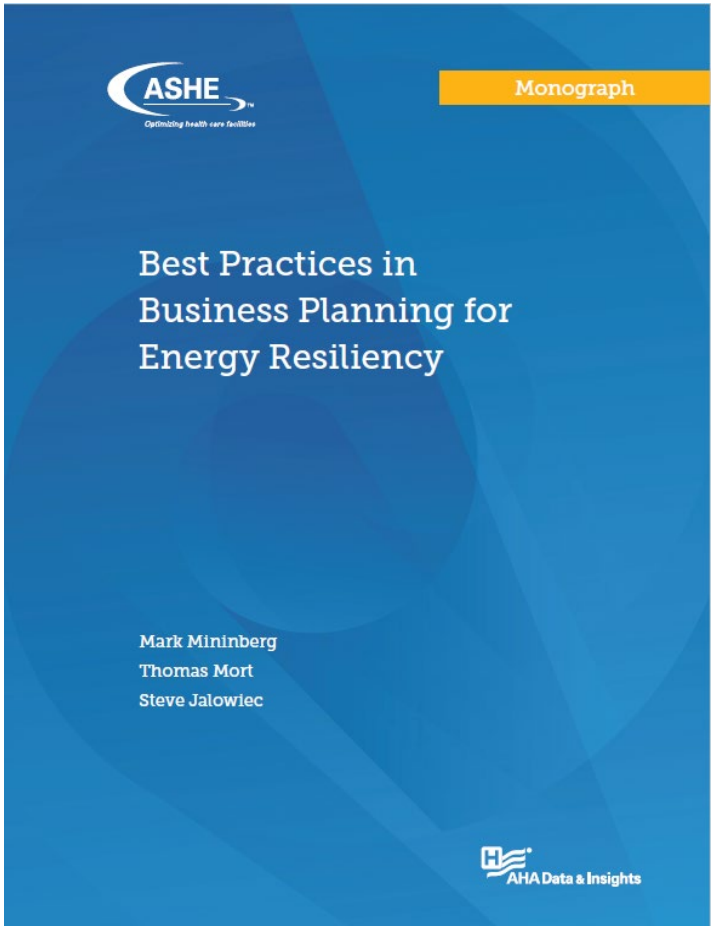
Hospital Energy Best Practices



AHA Best Practices in Energy Management

Hospital Energy authored AHA Best Practices in Energy Procurement (2017) and Business Planning for Energy Resiliency (2018).





Best Practice Principles

- **Align** facilities, finance and supply chain leaders by creating an energy committee to develop and administer overall strategy.
- **Aggregate** all campuses around the central strategy.
- **Analytics** integrate engineering and financial approaches to guide wise decision making.

"While annual savings are important, I think the Best Practices process…is even more vital. It led to a cultural change in which facilities and finance aligned in implementing a common long-term strategy."

Mike Malewicz
Treasurer/Chief Investment Officer
SSM Healthcare
St. Louis

Making the Resiliency Case to the CFO

Engineers calculate a project's payback, but it's rejected. Why?

The reasons:

1) The CFO has many other valuable projects that take precedence and generate Medicare revenue.

2) The facility manager is presenting a case that doesn't communicate sufficient value to the CFO; and

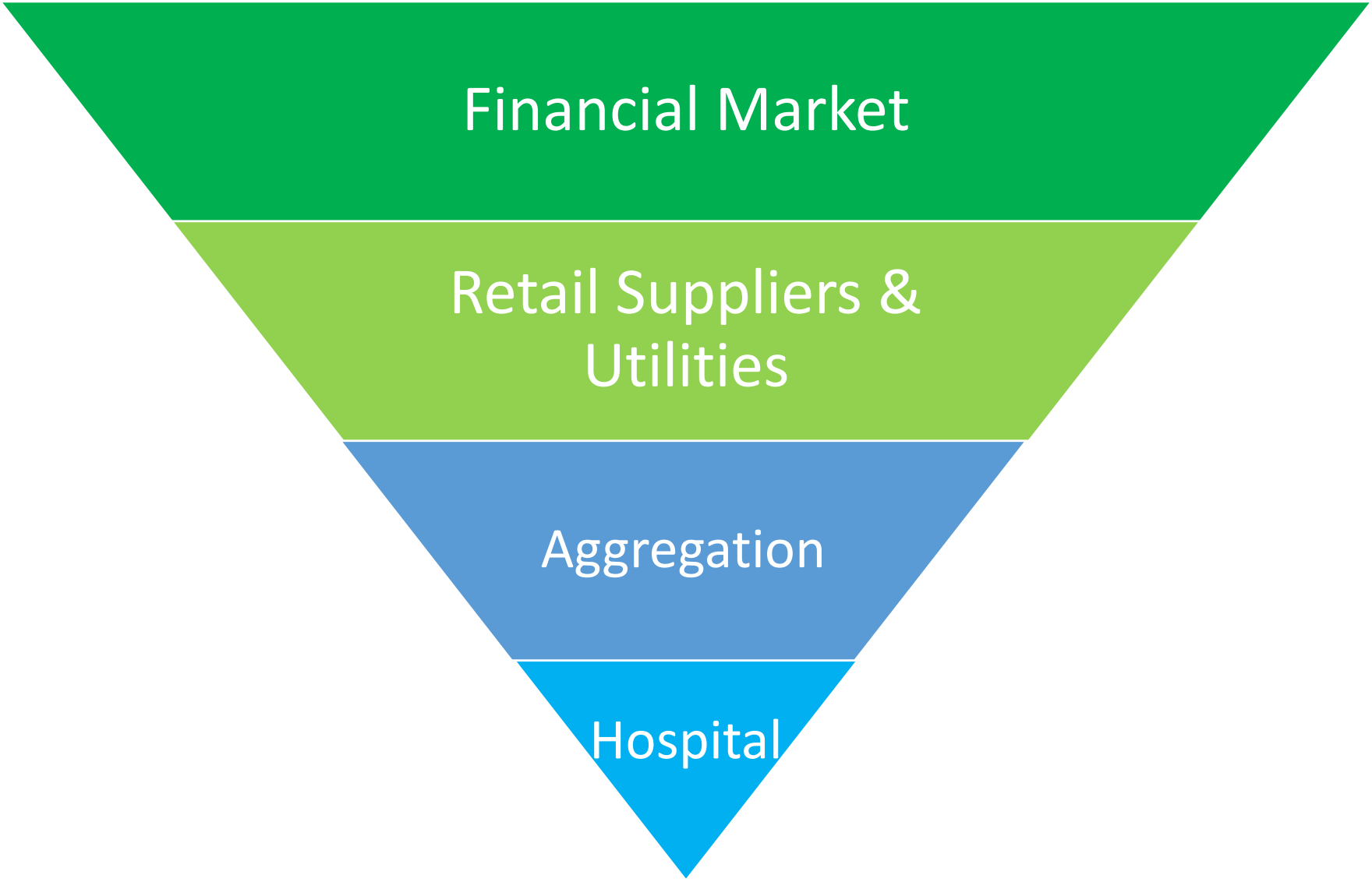
3) The facility manager and CFO do not speak the same language.

To be successful, the facility manager must communicate a better value proposition and do so in terms the CFO will readily grasp.

What the CFO is Thinking

- **One quarter of nonprofit hospitals experience operating losses.**
- **(Profit) margins have fallen to an all-time low of 1.6%** operating and 8.1% of operating cash flow.
- However, it's not all bad news, as median unrestricted cash and **investments growth rate improved to 8.9% thanks to strong market returns and steady capital spending**.
- **This points to a fundamental problem <u>and</u> opportunity for healthcare resiliency planning.**

Energy is a Financial Market



Who Dominates the Energy Market?

Wholesale Energy Counterparties	Revenues	Assets	Credit Ratings
JP Morgan	$109 billion	2.7 trillion	A+
Goldman Sachs	$36 billion	$1.5 trillion	A+
Bank of America	$110 billion	$2.3 trillion	A-
Wells Fargo	$86 billion	$1.9 trillion	A-
Deutsche Bank	$25 billion	1.35 trillion	A-

S&P Credit Rating Hierarchy
Investment Grade
AA
AA-
A+
A
A-
BBB+
BBB
BBB-
Non Investment Grade
BB+
BB
BB-
B+
B
B-
CCC

Comparative Utility and Hospital Ratings

Florida Utilties	Revenue	Assets	Credit Ratings
Engie	$66 billion	$120 billion	A
Duke Energy	$23 billion	$132 billion	A-
NextEra Energy, Inc. (Florida Power & Light)	$18 billion	$98 billion	A-
Emera (Tampa Electric)	$6.5 billion	$32 billion	BBB+

Florida Hospitals	Revenue	Assets	Credit Ratings
Jackson Memorial - Miami	$5.5 billion		A
Florida Hospital - Orlando	$3.4 billion		A

S&P Credit Rating Hierarchy
Investment Grade
AA
AA-
A+
A
A-
BBB+
BBB
BBB-
Non Investment Grade
BB+
BB
BB-
B+
B
B-
CCC

Hospitals Are Staying Ahead Due to Strong Investment Returns

- **Hospitals are investing** not only in clinical equipment that generates Medicare revenue, but also the equity and credit markets, real estate and even third-party energy projects.

- **Investments in hospital facilities infrastructure are not Medicare reimbursable** and are therefore always undervalued.

- **Finance staff are trained to make decisions based on the Return on Investment (ROI),** meaning the amount of revenue generated by the investment.

- **Engineering staff typically limit their analysis to simple payback,** which doesn't show its true value**.**

Resiliency is A Vital Investment. Now Prove It!

- **Calculate the savings from the investment. Then calculate the cost of not undertaking the investment,** including lost patient revenue and damage to the institution's reputation and standing in the community.

- **Demonstrate how the investment fulfills the health system's Master Plan (10 to 20 years), which generates patient revenue.**

- **Evaluate the investment based on how it reduces costs while supporting resiliency,** (e.g., multiple unit generators create opportunity to reduce utility demand charges)

Comparing Energy Savings to Key Financial Metrics

Priority	Project	Annual Savings Potential	Equivalent Patient Revenue[1]	Patient Days[2]	Payback (years)
1	Weinberg humidifier steam leaks	$154,000	$14,221,900	2.73	1.36
2	Steam trap audit and repairs	$100,000	$9,235,000	1.77	0.6
3	Repair leakage in Atrium dampers	$145,000	$13,390,750	2.57	0.68
4	Remove lights in storage rooms	$87,430	$8,074,161	1.55	0.34
5	Install additional LED lights	$245,000	$22,625,750	4.35	2.04
6	Chilled water temperature reset	$300,000	$27,705,000	5.32	3.3
	Total	**$1.03MM**	**$95.2MM**	**18.29**	1.8

[1] Calculated at 0.9235% margin
[2] Calculated at $5,202,872/per patient day

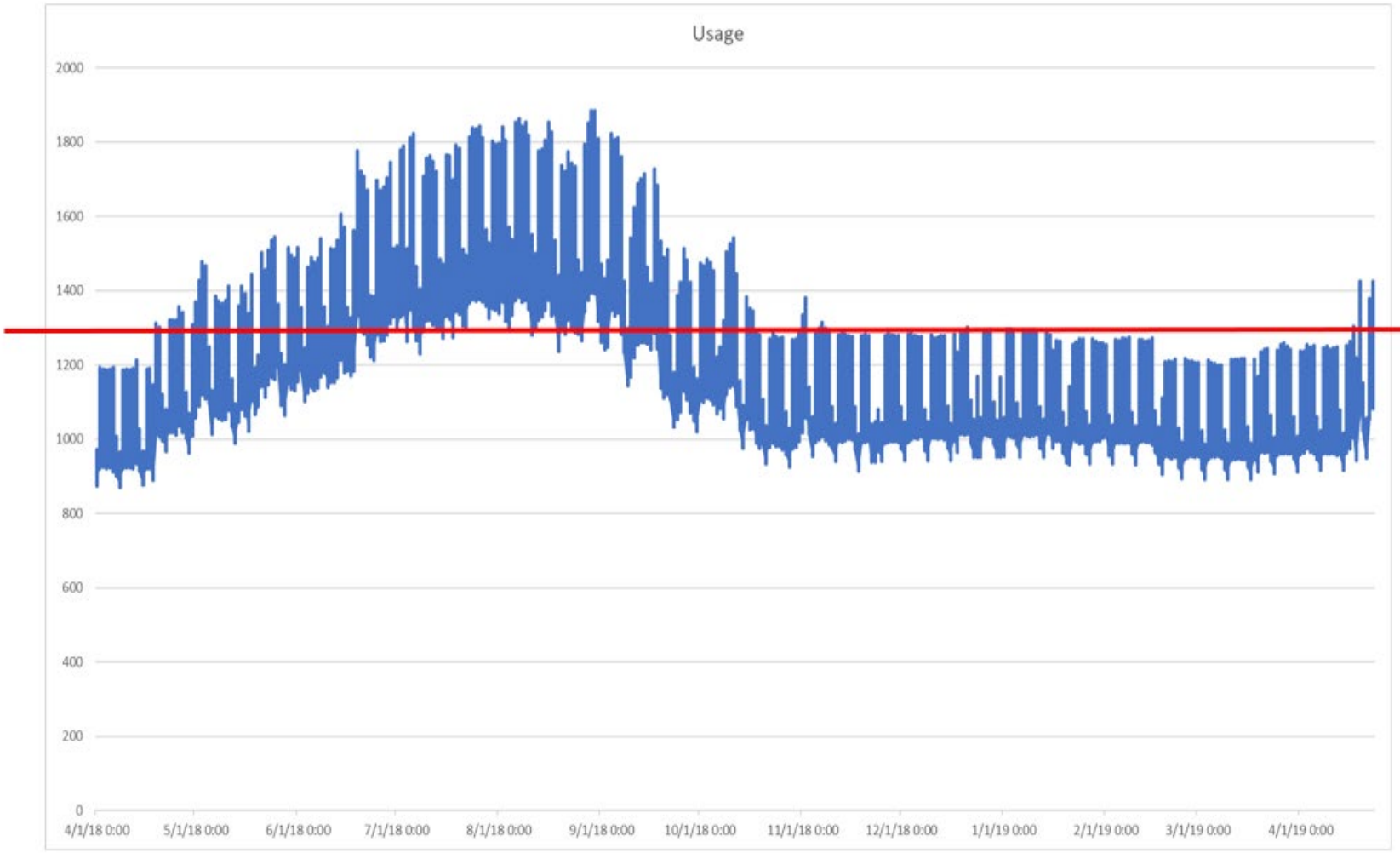
Creating Financial Savings to Support Resiliency

The Changing Energy Management Landscape

- **Utility Pricing** is more complicated
- **Multiple Suppliers** are engaged at the same time
- **Multiple Tariff Rates** are impacting the budget at the same time
- A heavier weight is placed on **Demand (kW) costs**
- Increased need for **Energy Supply and Conversion Resiliency**
- **Energy, Chilled Water, Steam, Emergency Power Service Contracts or Power Purchase Agreements (PPAs)**
- **Renewable Energy** options
- **Demand Response (DR) and Distributed Energy Resources (DERs)**

- **Utility Pricing and Rate Schedules and Financial Options** are often not fully integrated as part of energy equipment design, purchase and operations decisions.
- **THEY SHOULD BE.**

Tariff Knowledge + Interval Data Provides A Powerful Analytical Tool



Calculating Generator Savings

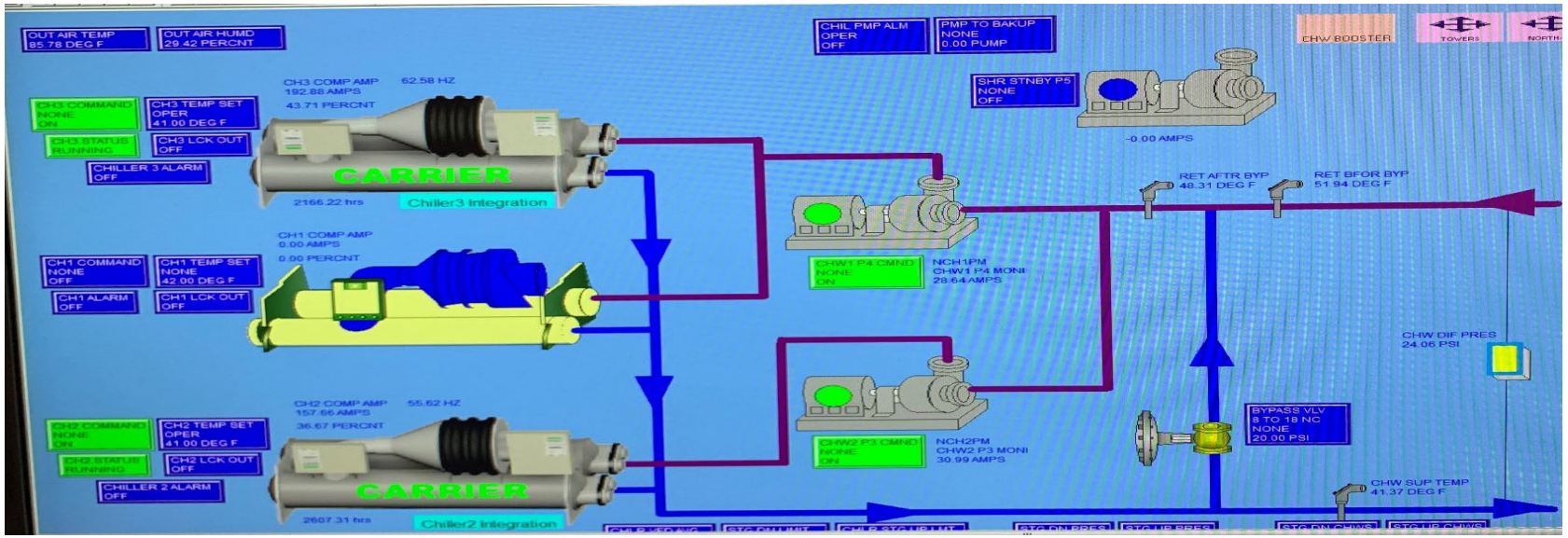
- **Total annual electric usage:** 11 million kWh
- **Total annual electric cost:** $1,430,000 **Average cost** $0.13/kWh

- **Energy Cost**: Capacity: $11.40/kW Demand : $25.37/kW Energy: $0.08/kWh
- Chillers: 700,000 kWh: **Electricity cost for chillers:** $198,000 average: $0.28/kWh

- **1,100 hours per year of demand** > 1,500 kW

- A **400 kW Natural Gas Generator operating only 1,100 hours** per year would **limit the peak demand to 1,500 kW** and result in **annual savings of $114,000 per year**.

Chilled Water Systems Drive Peak Demand Charges



Problem:

- Chillers are guilty most of the time for setting peak demand charges.
- Demand charges account for 20% up to 50% of electric cost.

Options:

- Natural gas engine driven chillers (if you're upgrading existing chiller).
- Natural gas engine generator (if your existing chillers are good).
- Natural gas engine generator + heat recovery electric chiller (max efficiency)

Structured Assessment of Central Plant and Bundling of Projects Yields Resiliency That Pays for Itself.

#	Description	Estimated Savings	Estimated Cost
1	**Control Room Monitoring, Decision Making Tools, and Operator Training**	$14,000	$25,000
2	**Chilled Water System Set Point Challenge**	$68,000	Incl in Proj:1+3
3	**VFD's for Chilled Water Pumps 1 and 2**	$21,000	$27,000
4	**Upgrade to a new high efficiency condensing steam boiler(s)**	$92,000	$400,000 -$32,000 rebate $368,000 cost
5	**Resiliency: 400 kW Natural Gas Generator**	$114,900	$370,000
6	**Sewer adjustment for evaporation**	$23,000	$12,000
7a	**Fuel Cell PPA**	$104,000	PPA no cost
7b	**Fuel Cell Steam value**	$97,000	PPA no cost
	Totals	**$533,900**	**$802,000**

Business Process Elements

- Bundle all available government and utility efficiency incentives and bank the project savings toward resiliency projects.

- Explore all financing options, including hospital treasury investment, equipment supplier loans, financing on the electricity supplier bill, tax credits, etc.

- The hospital should run a competitive sourcing process for the equipment, installation and service and not settle for the convenience of sole source.

- Group procurement is preferred in order to drive down supplier margins.

Thank you!

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