

## **Sustainability is a Financial Strategy**



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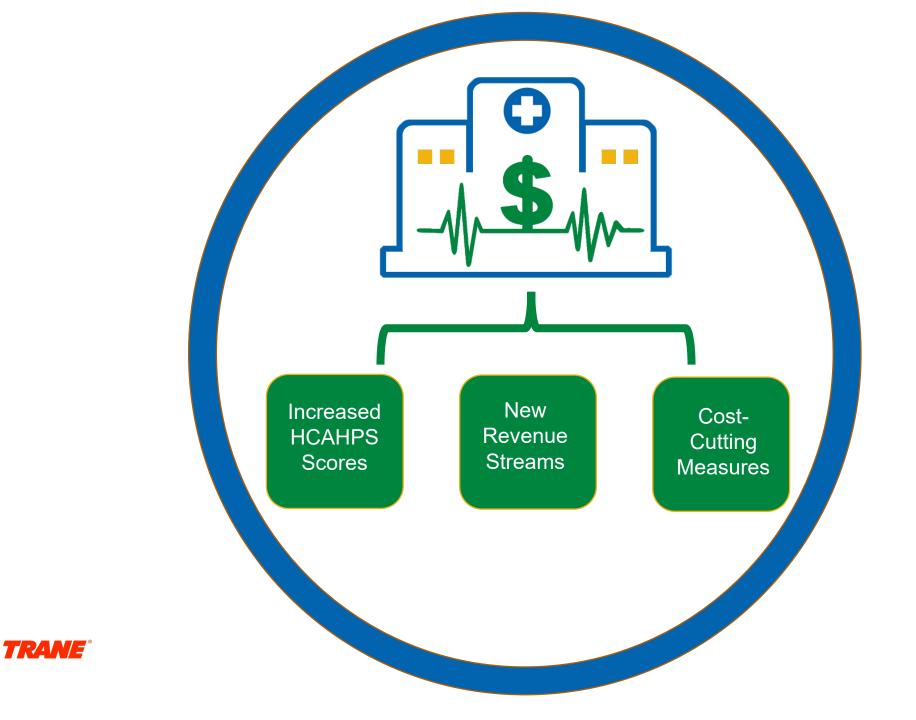


#### **Learning Objectives**

- Current trends among healthcare organizations
- Optics on the current state of utilities in Kentucky
- Building a business case





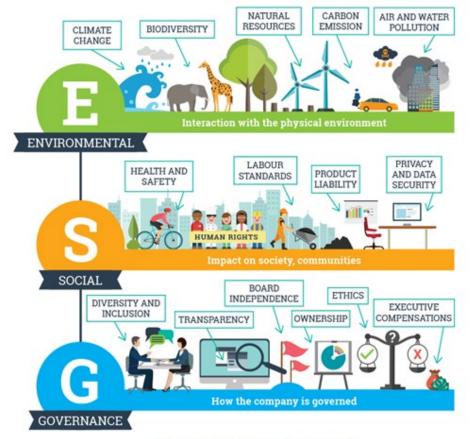




### Defining Sustainability

Sustainability is a broad policy concept that consists of three main pillars: environmental, social/equity, governance/ economical.







#### Resilience

Support uninterrupted operations and design systems and supply chains to withstand health and environmental emergencies



#### Leadership

Position health care organizations as leaders, responsive to community health and well-being



### Sustainability in Healthcare



#### Health and safety

Reduce pollution while prioritizing the use of safer products for the benefit of patients, health care workers, and communities



#### **Small footprint**

Minimize impacts, including carbon footprint, of products and services used to deliver health care



Healthcare is responsible for over 10% of U.S. GHG emissions.



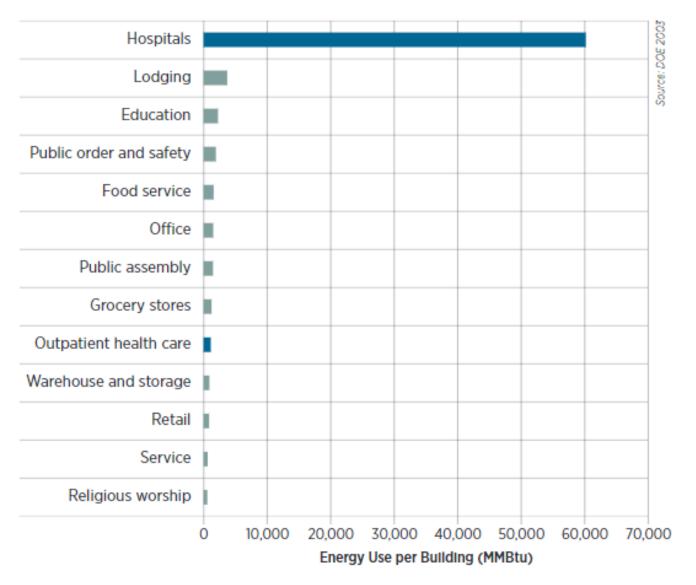


Figure 1-2 Energy use per building for common commercial building types

#### **Why it Matters**





#### **Supporting the Triple Bottom Line**

#### **Environmental Achievements**

Reduced Carbon Footprint

Reduced Energy Usage

Increased ENERGY STAR score

#### **Social Results**

Improved Patient Experience + Outcomes

**Business Continuity** 

**Human Capital Development** 

Reputation Management

#### **Financial Outcomes**

**Decreased Operating Costs** 

Return on Capital

Increased Real Estate Market Value

Increased Financial Performance



#### What's the buzz in healthcare?



Bold Statement
Carbon Neutrality by 2050



FutureVU: Sustainability | Vanderbilt University



#### **Bold Statement**

30% energy consumption reduction by 2030



Environmental Stewardship | Mayo Clinic



#### **Bold Statement(s)**

Patients, Caregivers, Community, Environment, Governance



Sustainability | Cleveland Clinic



### WARNING





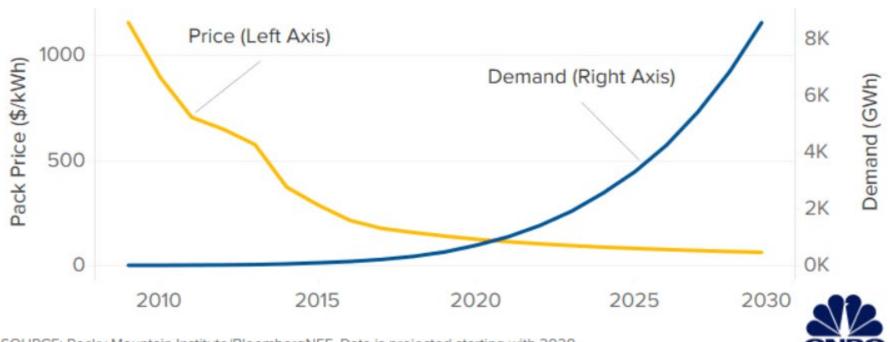
"Hospital energy resiliency requires us to look to the future of the energy grid and not to simply reinforce the methods of the past."

(Hospital executive)

## Kentucky Utility Landscape

#### How Elon Musk is Raising Your Facilities' Electric Spend

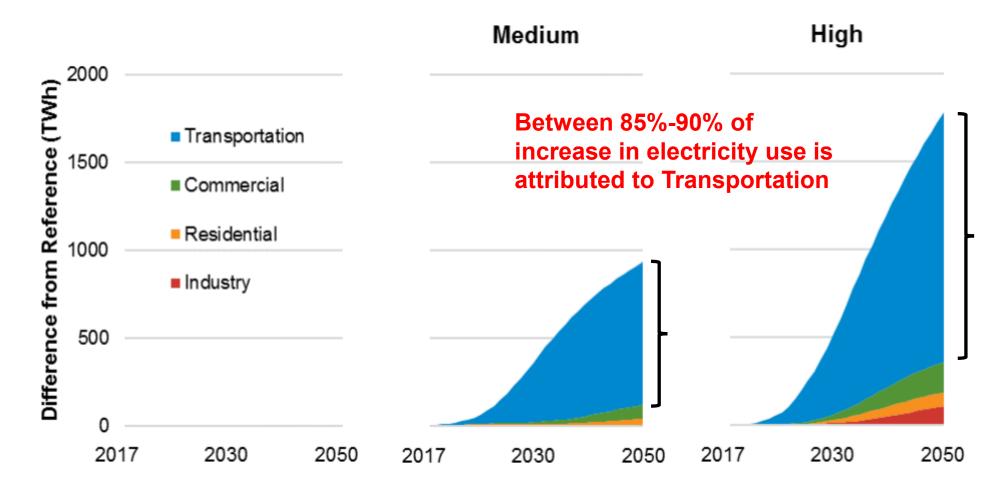
### Li-ion battery market development for electric vehicles







#### Role of Transportation Sector in Future Electric Use





#### **The Mall Parking Lot**





#### **Energy Outlook: Focus on Electric**

#### Key Takeaways:

- Two major components of the bill: Consumption & Demand
- Almost all electric utility rates are rising, and it will come in a combination of two billing components.

#### Consumption

How much is used.

kWh

258737

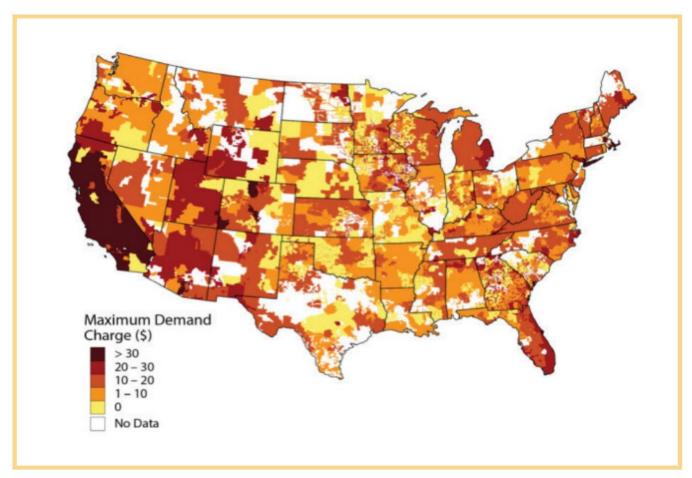
\$0.03 / unit

#### **Demand**

When its is used.



#### Maximum demand rates for electric utilities



Reprinted from McLaren, J., and National Renewable Energy Laboratory. (2017, September 19). A Survey of U.S. Energy Demand Charges. Clean Energy Group Webinar.

Kentucky was once thought to have the cheapest electric in the U.S. This is no longer the case.

Table 3. Top 10 States with the Most Commercial
Customers Estimated to be Eligible for Utility Rates That
Include Demand Charges of \$20/kW or Higher

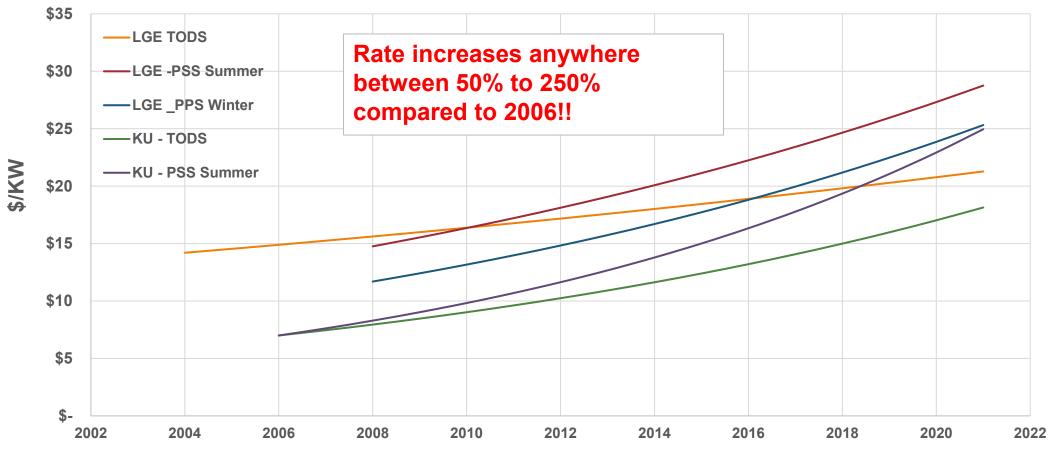
Number of Customers Eligible for	
Demand Charge >\$20/kW	

California	1,081,000
New York	648,000
Georgia	216,000
Michigan	205,000
Massachusetts	180,000
Kentucky	41,000
New Mexico	24,000
Alabama	23,000
Texas	23,000
lowa	23,000



#### **Electric Demand Price Trends in Kentucky**







#### Energy Outlook: LG&E / KU

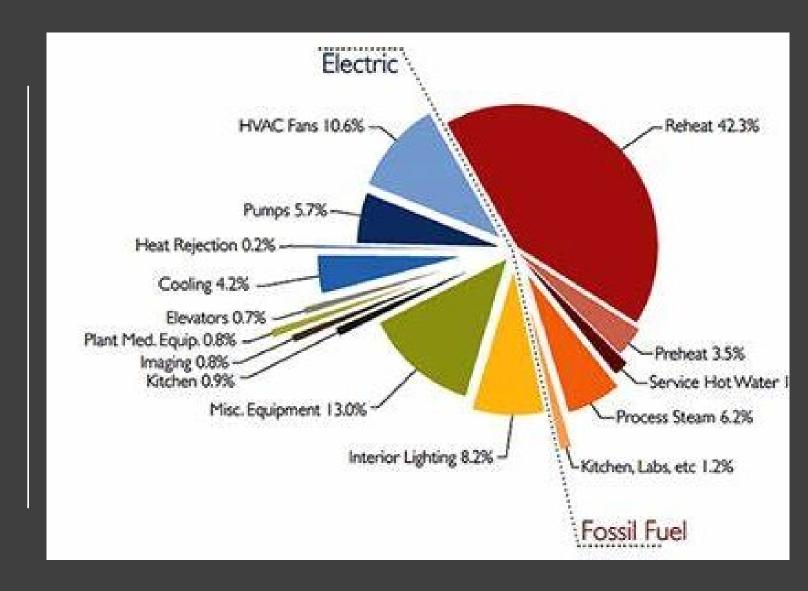
#### Key Takeaways:

- Consumption & Demand increasing.
- Critical to understanding if your rate structure is based on a 100% ratchet.

LG&E - Approved Elect	ric Rate C	hanges - July 2021				KU - Approved Electric Ra	te (	Change	s -	July 2021	
						KU - Power Service Rate				ndee	
LG&E - Power Service Rate - Secondary Service						KO - FOWER SERVICE NATE	- 36	econdary		rent (After July	
	Previou	pfuar Estimate	92692211 18	tric	Spend I	ncrease	D	revious	Cui	2021)	% Increase
Basic Service Charge - Per Day	\$ 2.96	\$ 2.96	0.00%			Charge - Per Day	Ś	2.96	Ś	2.96	0.00%
Energy Charge (\$/kWh) 770,00	0\$ _0.03441	\$ 0.03362	-2.30%		Energy Charg	•	\$	0.03249	Ś	0.03191	-1.79%
Summer Demand Charge (\$/kW)	\$ 24.06	\$ 27.57	14.59%			nand Charge (\$/kW)	\$	22.77	Ś	25.30	11.11%
Winter Demand Charge (\$/kW) 760,00	0\$ 21.19	\$ 24.28	14.58%			and <b>7.5.6; QQQ</b> /kw)	\$	20.39	\$	22.66	11.13%
							a	stand	ar	d 300.00	0 sa-ft
LG&E - Tiṃ்குடுவிடு	@y - Second	ary Service		ļ		(U - Time of Day - Se	ecor	dary Ser	χice	e <b>.</b>	
	Previous	Current (After July 2021)	% Increase	1		nos	рп	aı ∼8	<b>ZO</b> r	unchease	in total
Basic Service Charge - Per Day 740,00	0\$ 6.58	\$ 6.58	0.00%	ļ		eno	P	revious	ro	increase	%Increase
Energy Charge (\$/kWh)	\$ 0.02813	\$ 0.02958	5.15%	1	Basic Service				_		
Peak Demand Charge (\$/kVA) 2730,00	0\$ 9.89	\$ 9.70	-1.92%		Energy Charg	exp	e <mark>c</mark>	10,02658 1007658	9	<del>he nextof</del>	e <del>w Vďá</del> rs
Intermediate Demand Charge (\$/kVA)	\$ 7.63	•	-1.97%	1	Peak Deman				Ş		
Base Demand Charge (\$/kVA) = 720,00	*	7	63.48%		Intermediate Base Demand	≘ (\$/kVA)	\$	7.07 1.75	\$	6.64 3.25	-6.08% 85.71%
Total of all 3 Demand Tier Charges (\$/k₩A)	\$ 19.82	·	5.65%	1	Total of all 3	arges (\$/kVA)	Ś	17.61	Ś	18.14	3.01%
Note: Base Demand is a billed at 100% Ra7c1Q10					Note: Base D	d at 100% Ratchett	Ÿ	17.01	J	10.14	3.0170
er -		700,000			rioter base b	a de 15070 Natorice					
LG&E TTME, DE	Day - Prima					KU - Time of Day - I	Prim	nary Serv	ice		
ZOGEZ MINE, SV	Previous	Current	% Increase	1				•	$\overline{}$	rent (After July	
Basic Service Charge - Per Day 690,00		ŝ	0.00%				Pi	revious		2021)	% Increase
Energy Charge (\$/kWh)	\$ 0.02744	Ś	-2.99%	†	Basic Service	у	\$	10.84	\$	10.77	-0.65%
Peak Demand Charge (\$/kVA) 680,00		7	4.94%	-	Energy Charg		\$	0.02573	\$	0.02516	-2.22%
Intermediate Demand Charge (\$/kVA)	\$ 7.15	· -	4.94%	1	Peak Deman	)	\$	8.52	\$	9.20	7.98%
		<u> </u>		-	Intermediate	(1)	\$	6.84	\$	7.38	7.89%
, ,		\$ 2.45 \$ 2021 19.72	4.70%			d Charge (\$/kVA)	\$	2.03	\$	2.79	37.44%
Total of all 3 Demand Tier Charges (\$/kVA)	\$ 18.81	\$ 2021 19.72	4.84%	I	Total of all 3	Demand Tier Charges (\$/kVA)	\$	17.39	\$	19.37	11.39%
Note: Base Demand is a billed at 100% Ratchett											

Where does the energy go?

Nearly 75% of total energy used in Acute Care spaces are associated with HVAC



# Creating Internal Alignment

• Healthcare organizations continue to position investments in patient focused technology.

 How long can aging infrastructure remain in place to support these new investments?

• Nearly every healthcare facility present opportunities for improved energy performance.

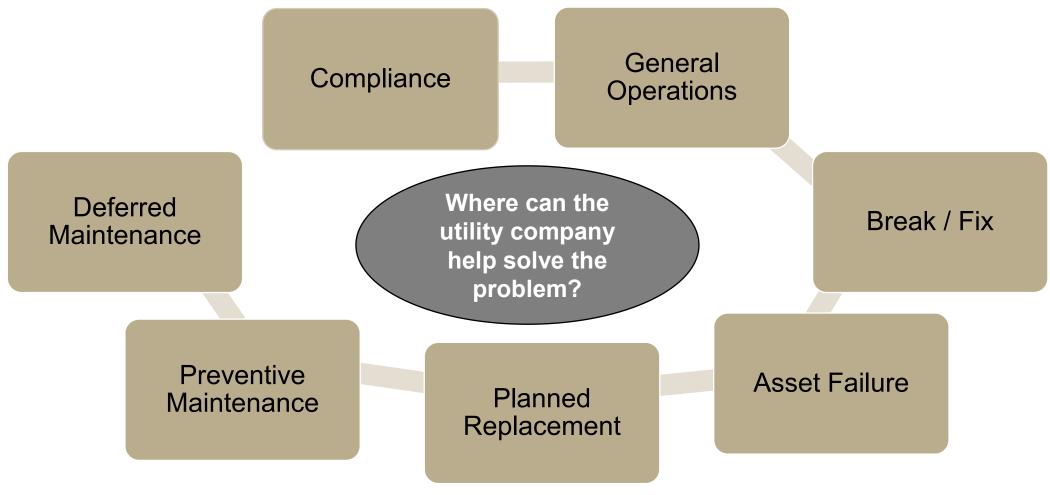




#### **Supporting the Mission + the Bottom Line**

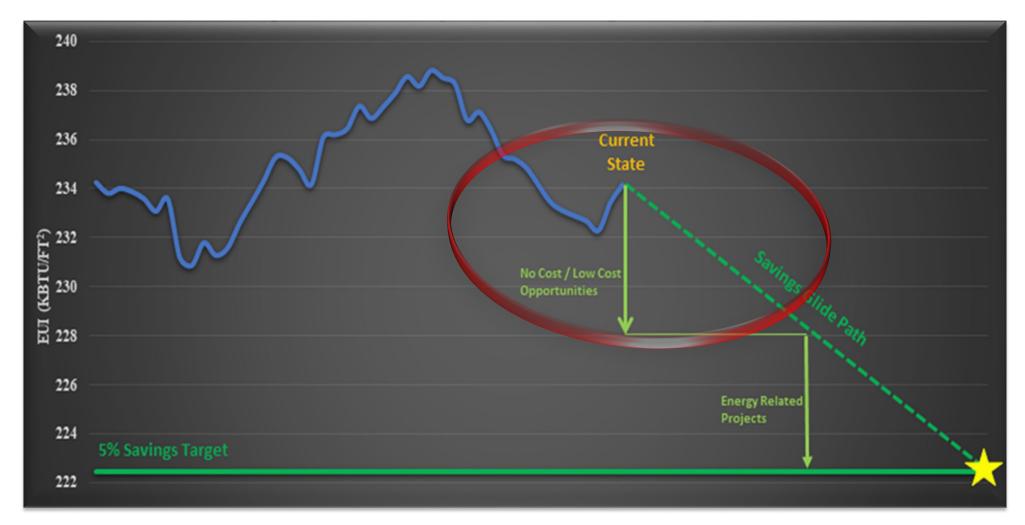


#### Categorizing and Managing Various Infrastructure Needs





#### **Developing a Plan and Starting Small**





## Technologies & Innovations





#### **Technologies: Solar Renewables**

Solar Paybacks Chart									
Ins	talled kW	15	45	100					
		Estimate	d Paybac	k (Years)					
	\$0.05	30	27	26					
	\$0.06	25	22	22					
	\$0.07	21	19	19					
F-66 4:	\$0.08	19	17	16					
Effective Electric	\$0.09	17	15	15					
Rate (\$/kWh)	\$0.10	15	13	13					
(4/10011)	\$0.11	14	12	12					
	\$0.12	12	11	11					
	\$0.13	11	10	10					
	\$0.14	11	10	9					

Chart generated using 2021 materials and labor pricing as a basis for cost and energy production projections as modeled by NREL's PVWatts for central KY location.

**15 kW**: A small array consisting of ~40 solar panels; perfect for a smaller facility that consumes at least 100,000 kWh/yr.

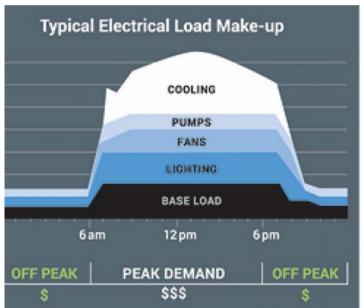
**45 kW**: The Net Metering maximum limit in KY. ~120 solar panels; will produce around 56,000 kWh/yr in KY/Southern IN.

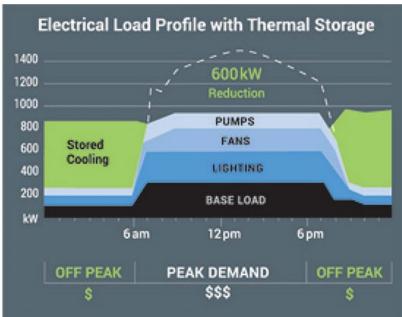
100 kW: Surpasses the Net Metering limit for KY but appropriate for "big users". In IN, the Net Metering limit goes all the way up to 1 MW.

Favorable Electric Rates for Solar in KY/Southern IN								
Utility	Rate	Effective \$/kWh						
Duke Energy - IN	LLF - Secondary	\$0.09500						
KY Power	Large GS - Secondary	\$0.09600						
Vectren/CenterPoint	DGS - < 15,000 kWh/month	\$0.09776						
KU	AES - 3Ph.	\$0.09954						
KY Power	GS - Secondary	\$0.11000						
TVA Reg. Utility	< 50 kW	\$0.11330						
KU	GS - 3Ph.	\$0.12242						
LG&E	GS - 3Ph.	\$0.12275						
TVA Reg. Utility	< 15,000 kWh/month	\$0.12566						



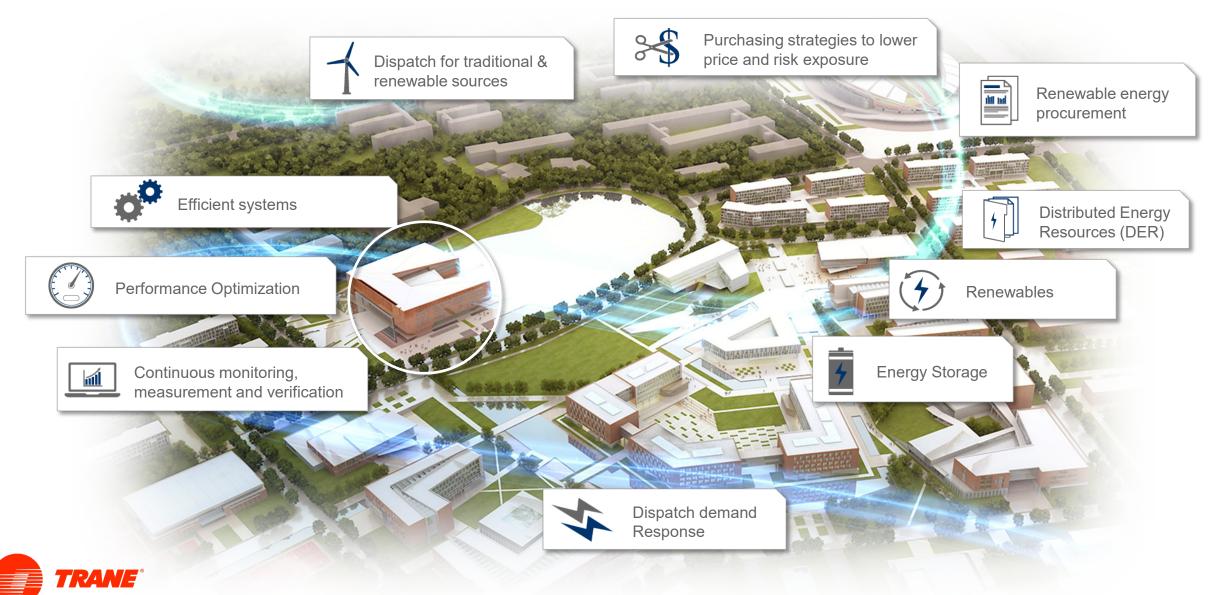






### Technology: Thermal Energy Storage

#### **Achieving Savings through Building Assets**



## **Building the Business Case**





#### Hospital Modernization Project Concepts

Alternative Energy Source and Renewable Energy Source Options

Situation – Carilion currently pays premium demand and electrical charges for their Hospital site. The facility is operated 24/7 limiting the options available to reduce energy consumption. Site challenges and space also limit expansion options.

Background - \$4.2 million spent annually on electrical cost associated with Hospital. Currently at capacity for central chilled water facility and electrical load. Gas re-evaluating current electrical plan and future electrical plan for new construction.

Assessment – Trane conducted a preliminary energy assessment to outline and quantify alternative energy strategies/sources and options to reduce energy costs and improve current and future infrastructure challenges in consideration of business drivers. In addition, outlined third party ownership model collaborating with SPE.

Results – Identified on-site cogeneration as option for alternative energy source, solar energy as renewable energy source for new construction, thermal energy storage as technical/business option with retrofit of current central plant, and relocation of central plant as long-term solutions with financial considerations for each concept.

#### Impact Considerations-

Patient Satisfaction
Safety, Resiliency & Sustainability
Modern & Flexible
Long-Term Solution
Ever changing Healthcare Economic Drivers
Renewable Energy Source
Capital Costs Avoidance Option



Combined Heat and Power (CHP), also known as Cogeneration 3.3 MW Engine shown above



Solar array as renewable energy source for new construction



Thermal Energy Storage - Addition to Central Plant

#### **Executive Summary Example**

Trane is proposing to assist Customer in increasing patient satisfaction through a comprehensive turnkey LED Lighting retrofit for the customer. The scope of work includes the following:

- Remove and recycle existing fluorescent lamps and ballasts. Address 13,519 existing fluorescent and incandescent fixtures and retrofitireplace with LED lamps with integral driver.
- Existing LED fixtures will remain 'as-is' and are not addressed
- LED lamps are proposed 12.5W linear type with 4,000K color temperature
- 5 year warranty on all new lamps
- Provide energy savings analysis
- Provide finance option (capital lease). Base scope of work is based on a 7-year capital lease.
- All work will be performed around Carillon's preferred scheduling (weekdays, weekinghts, weekends, or combination)
- ▶ NOTE we will comply with standard ICRA requirements on all replacement fixtures

#### Financial Summary

Energy Savings (Annually): \$231,340 Maintenance Savings (Annually): \$21,249

TOTAL SAVINGS (10 years): \$2,895,650 TOTAL CASH FLOW (10 years): \$1,200,650

 Project Cost:
 \$1,695,000

 Simple Payback:
 6.7 Years

 Net Present Value\*:
 \$114,649

 Eased on discount rate of PN and 2% annual increase in utility rates and maintenance costs over 10 years

		PROJECT TIMELINE	and purchase c-up' of a small ate color						
		Upon acceptance of proposal and purchase order, Trane will create a 'mock-up' of a small area within the hospital to validate color temperature of new LED lamps.							
Ì	-	Mobilization to occur within 30 days of final lamp							

Installation duration expected to be between 5 and 6 months.

Month		Lease Payment		Intelled Pri		Motpal	-	Balance	Energy Savings Per Month		ence Savin		881	tenance ings Per fonth		Cash Flow r Month
. 1.	\$	24,679	5	8,394	5	16,347	\$	1,678,663	5	19,278	\$.	1,771	\$	(3,630)		
13	\$	24,679	\$	7,343	\$	17,338	\$	1,476,111	\$	19,857	\$	1,824	\$	(2,998)		
25	\$	24,679	5	6,292	\$	18,389	\$	1,261,291	5	20,452	\$	1,879	5	(2,348)		
37	5	24,679	\$	5,177	\$	19,503	5	1,083,447	\$	21,066	5	1,935	\$	(1,678)		
40	\$	24,679	\$	3,905	\$	20,686	5	791,791	5	21,608	\$	1,993	5	(968)		
- 61	5	24,679	5	2,741	5	21,940	5	535,486	5	22,340	\$	2,053	5	(277		
73	5	24,679	\$	1,411	8	23,270	8	263,643	5	23,019	5	2,114	\$	455		
84	\$	24,679	5	121	5	24,560	5			-						

#### Notes

- Payments are projected and not guaranteed
- Capital Lease Term: 64 months with 81 buy-out
- Monthly lease payment of 824,679

Page 1 of 1

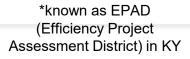
#### Goal:

Create strong business cases that connect infrastructure, sustainability, and efficiency to the financial and strategic objectives of your organization.



#### **Funding Solutions**

	Cash	Service Agreement Funding Option	Traditional Capital Lease	PACE (Property Assessed Clean Energy)*	Structured Finance Offerings (3rd Party Owner/Private)
Ownership of Project Assets	Customer	Customer	Customer/ Lessor	Customer	3 <sup>rd</sup> Party
Cash Upfront	Yes	No	No	No	No
Term (Years)	N/A	2-5	5-20	20	5-20
Operation and Maintenance	N/A	Flexible	Flexible	Flexible	3 <sup>rd</sup> party owner decides
Performance Guarantee Required	No	No	No	No	Yes
Minimum Deal Size (\$\$)	N/A	\$5K+	\$5K+	\$10K+	\$1.5M+
Primary Vertical Markets	All	All	All	CRE, Hospitality, Healthcare	MUSH, Industrial, Tech/Data Centers









A&Q

Thanks for your time.

