



**CAREY GERSTEN**

Director of Market Development

[carey.gersten@de-mgmt.com](mailto:carey.gersten@de-mgmt.com)

(206) 792-9044

**DISTRIBUTED ENERGY MANAGEMENT**

[www.de-mgmt.com](http://www.de-mgmt.com)

# THE CHIEF UTILITY OFFICER

A Strategic and Collaborative Approach

to

**Utility** Management

PPRC Regional Roundtable – October 2016

Suquamish, WA



# TODAY

- Why am I here?
- Utility “management” as usual is DOA
- Why and what’s a CUO?
- Unified utility management
- Strength through collaboration

ME



# 400 PPM

## HIGH FIRE DANGER

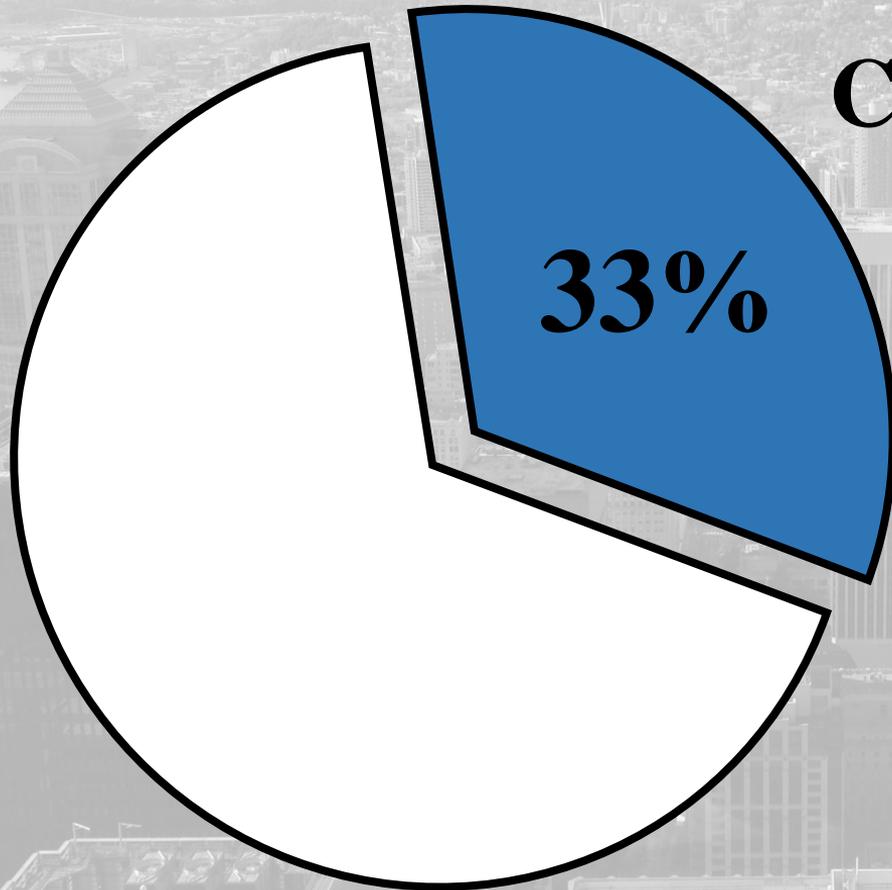
This Week

- Very low humidity
- Isolated dry lightning
- Gusty in places



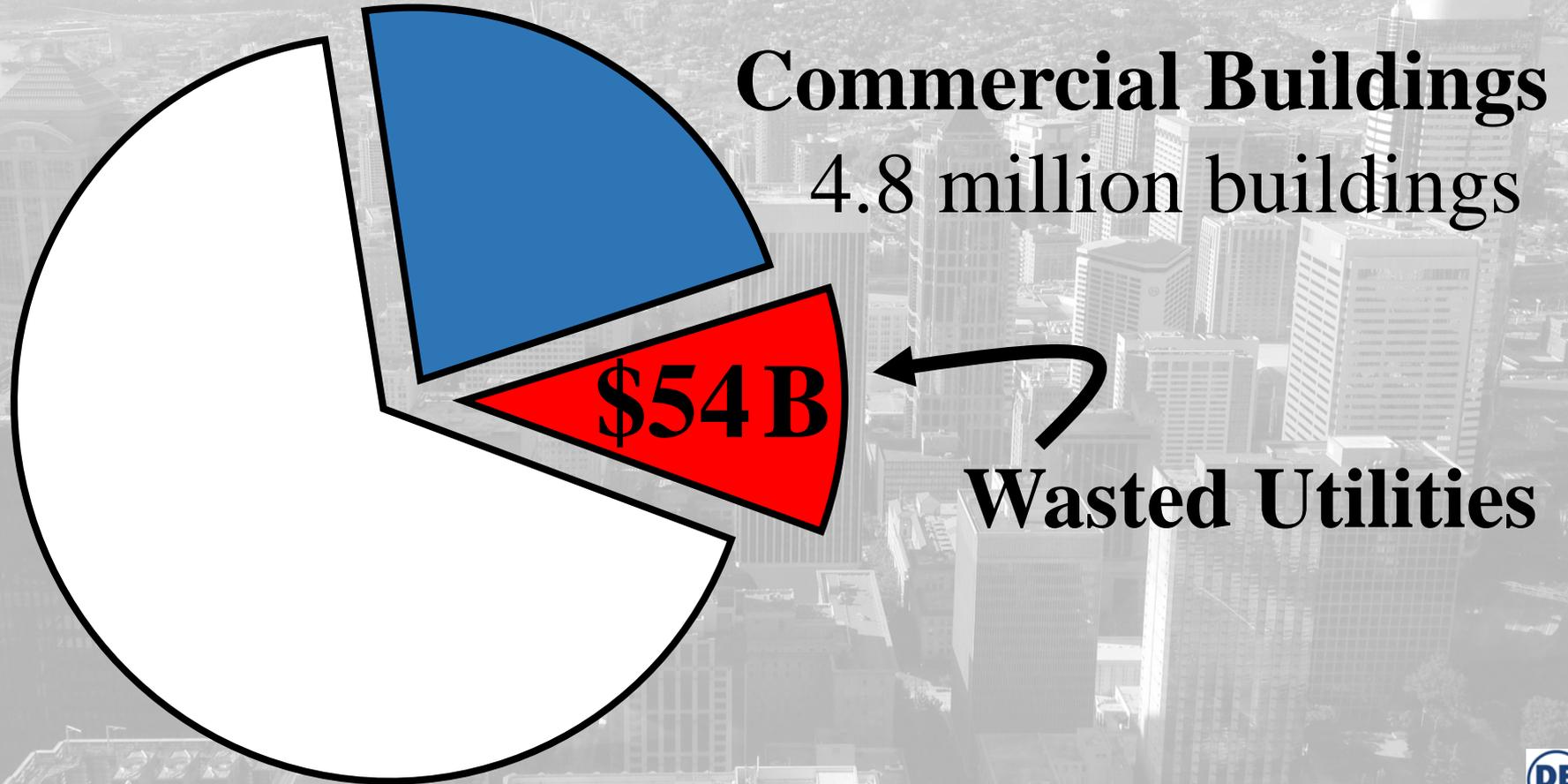
AccuWeather

# US ENERGY CONSUMPTION

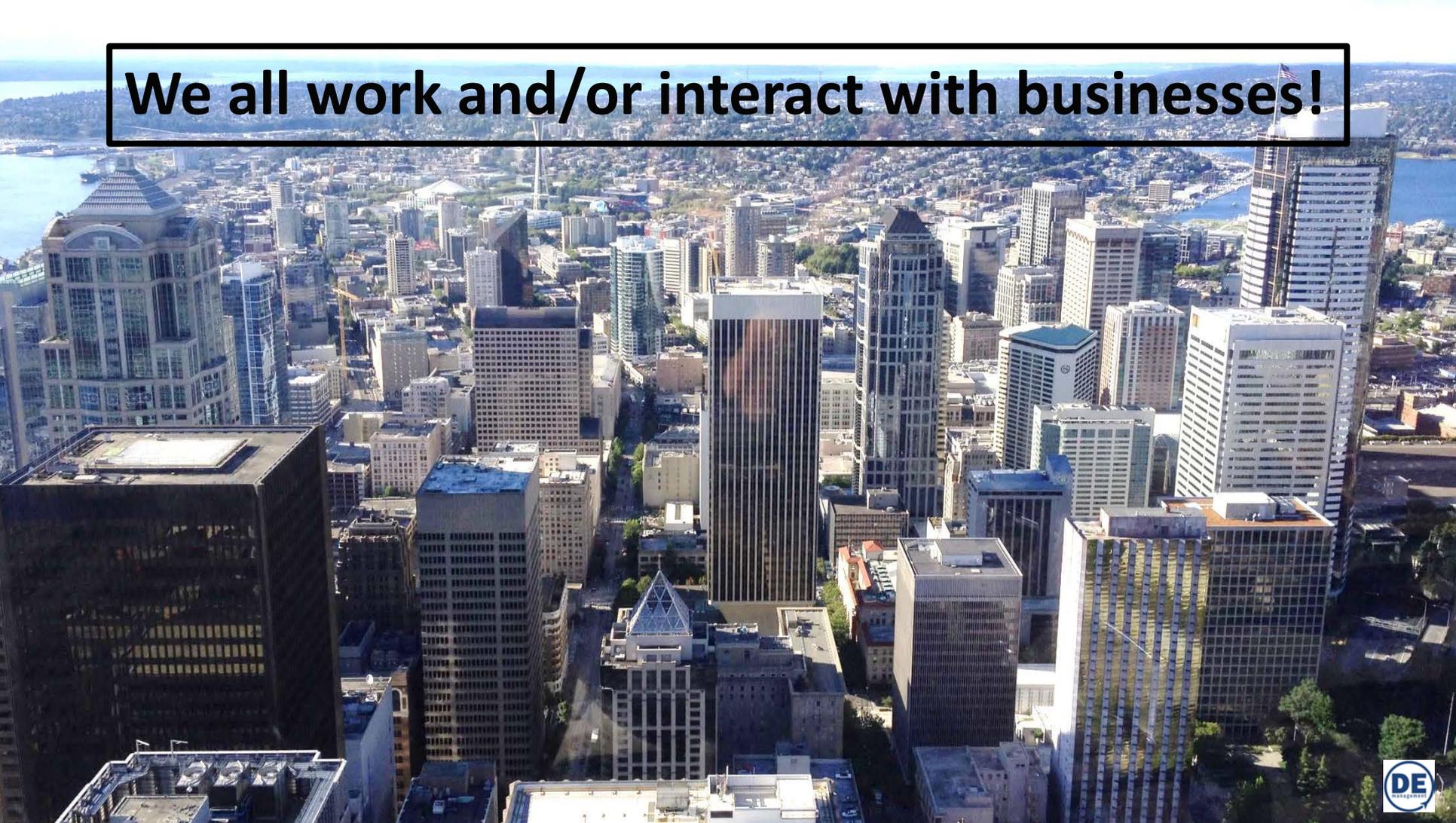


**Commercial Buildings**  
4.8 million buildings

# US ENERGY CONSUMPTION



**We all work and/or interact with businesses!**



# DO ALL BUSINESSES NEED AND USE ENERGY?

**Absolutely!**

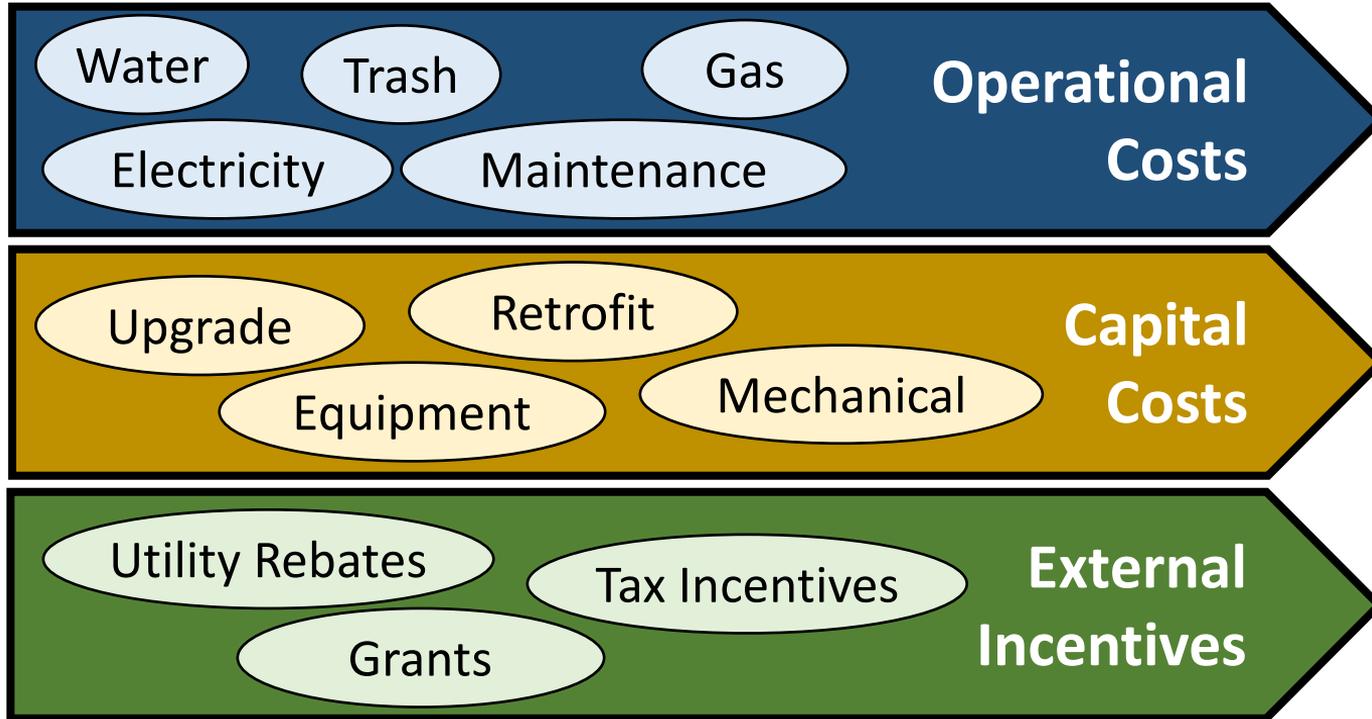
## Complexity Creep



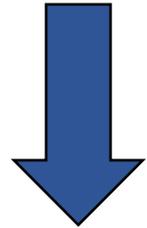
- Technology disruptions and choices
- Sourcing of evolving energy delivery
- Financing, incentives, taxes, grants
- Regulations and compliance requirements
- Consumer scrutiny and demand
- Environmental monitoring and health factors
- Changing business delivery models

# ENERGY MANAGEMENT AS USUAL: FUNCTIONAL

*30% of all utilities are wasted because costs are in silos*



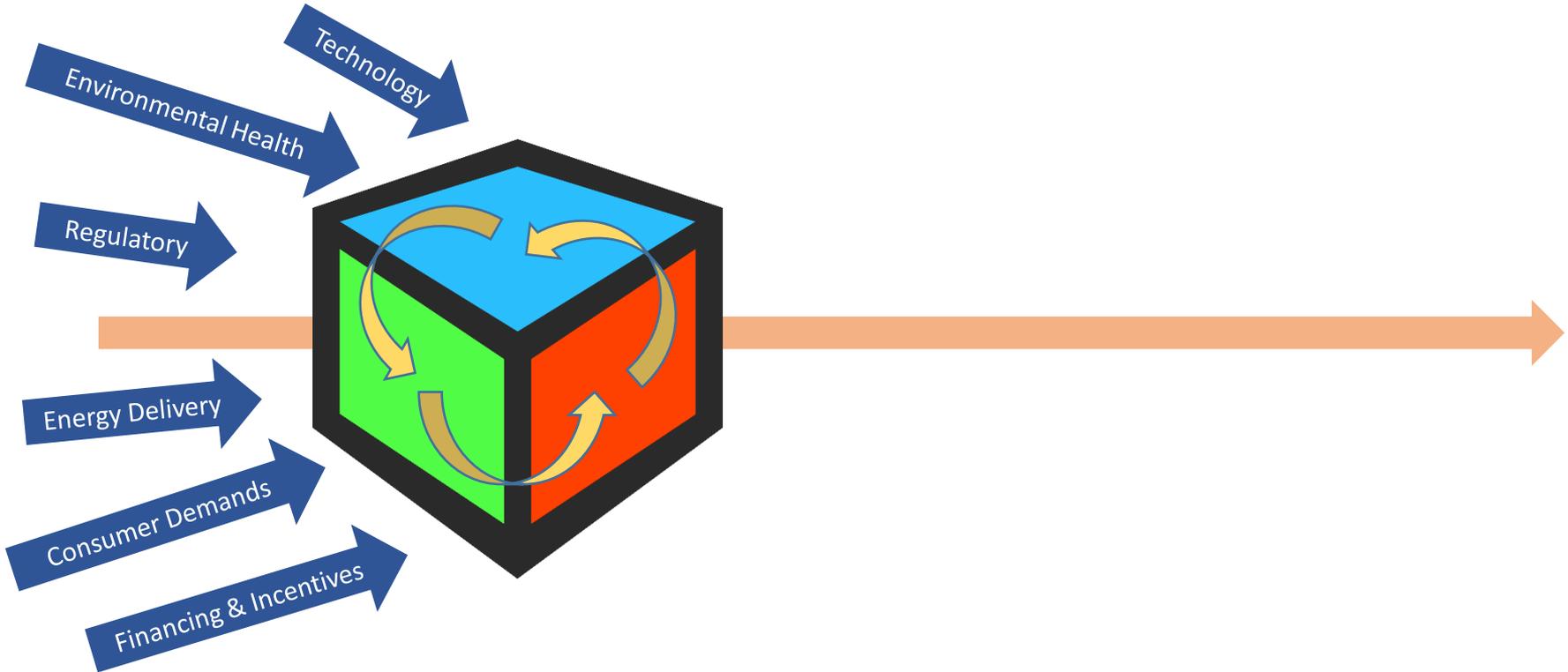
**4.8 Million  
Commercial  
Buildings**



***Managing  
in Siloes!***

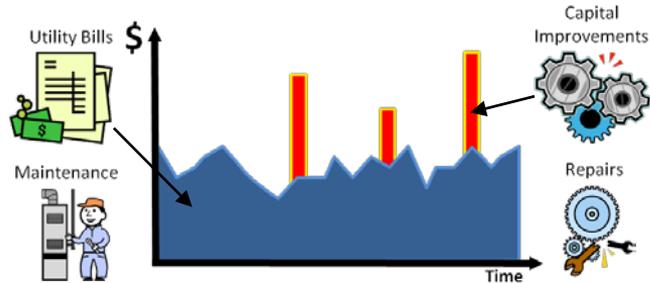
3D → 4D → 5D

Complexity is banging into siloed management in a dynamic world!



# PROBLEM VS. SOLUTION

## Unplanned Expenses and Unexpected Results



- Utilities seen as overhead expense
- Missed efficiency opportunities
- Cost uncertainty
- Cash flow unpredictable

# BASIC BUSINESS MANAGEMENT



# WHY IS A CUO NECESSARY?

- Technology disruptions and choices
- Sourcing of evolving energy delivery
- Financing, incentives, taxes, grants
- Regulations and compliance requirements
- Consumer scrutiny and demand
- Environmental monitoring and health factors
- Changing business delivery models

Complexity



***Strategic Planning: Aligned with Outcomes***

***Collaboration: Internal and External***

***Think CIO (Chief Information Officer)***

# CUO RESPONSIBILITIES

- Strategic oversight with goals aligned to mission
- Central coordinated decision making
- Resource allocation company-wide
- Unified management with clarity
- Greater coordinated management of utilities
- Focus on maximizing resource deployment

# CUO SKILL SET





TOUR OF  
**ChocMo**  
chocolate bistro

○ Champagne Amaretto Orphan Girl  
△ Peanut bark Blueberry bark  
○ MILK TO COUP L-O-V-E Caramel



Client Study: Green River College Foundation  
**College Foundation Gains Control of Their Utility**  
Strategic budget and operations approach brings control to expenses

**The Challenge**

When the Green River College Foundation (GRCF) hired DEM, they already knew that they had an energy problem.

"We knew we were wasting energy and utilities," said George Frasier, the Executive Director of the foundation that owns and operates 87 apartments in the 12 building student housing campus. Every year, they increased their utility budget forecast by 3% to meet the growing need of the students. "However, serving our student population took top priority."

It wasn't for a lack of interest. They had performed a wireless thermostat pilot the year before, wanted to improve the heating equipment and evaluate smart meters. In fact, the problem was that there were too many ideas to know where to start.

**The Solution**

Distributed Energy Management (DEM) brought a much-needed strategic, budgetary and operational approach to gain control over what was considered an unmanageable expense.

- **Set a budget:** DEM created a utility revolving fund that uses on-budget line-items for bills, operations and capital needs and captured achieved savings
- **Create a Strategy:** The foundation's mission is to support the education of students. Technologies that helped students learn about independent living were attractive.
- **Align Projects with Strategy:** Projects and retrofits were evaluated for cost and effectiveness of providing better comfort.
- **Implement Projects:** DEM worked with vendors, utilities and organizations to bring new technologies, partners and funding.

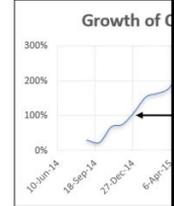
**The Result**

After 3 years, the foundation no longer annually increases their utility budget forecast. In fact, DEM recommended lowering the budget by 15% after year. Even with this reduction in budget there was still enough in savings from projects to reinvested in better equipment that continuously improve their housing need to annually raise their forecast.

At long last, their utility costs are under control.

*"The comprehensive, disciplined approach with lower, predictable utility costs more of our resources to student services."*  
- George Frasier, Executive Director

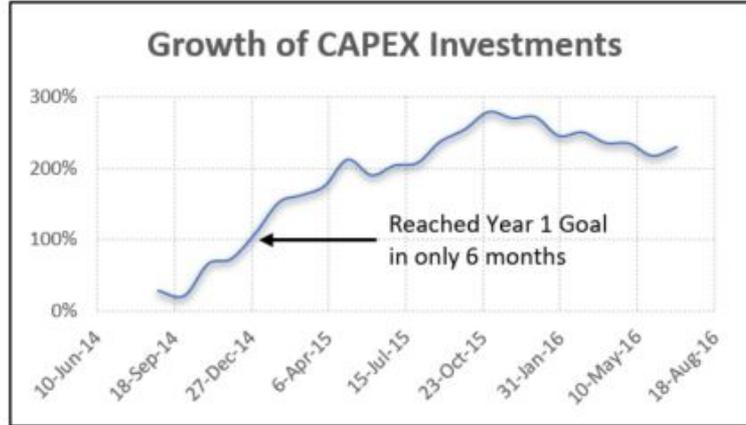
**Financial Summary**



**Project Summary**

- Utility budget reduced by 15%
- Equipment investment doubled
- Lowered heating costs while improving resident control of comfort
- Student orientation check-in and awareness program of best living practices

**Financial Summary**



**Project Summary**

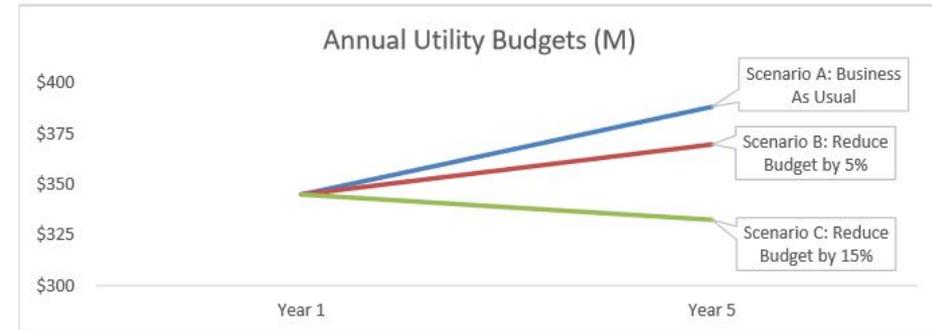
- Utility budget reduced by 15% between Year 1 and Year 2
- Equipment investment doubled due to savings in energy
- Lowered heating costs while improving resident control of comfort
- Student orientation check-in and awareness program of best living practices

# EXAMPLE: GROCERY

Sample Values For ABC Corporation Inc.

CLIENT INFORMATION			
Client Type		Financial Information	
Primary Building Type:	Grocery	Annual Revenue:	\$ 29,000,000,000
		Profit Margin:	1.7000%
Estimated Utility Budget		Additional Information (if known)	
Est. Annual Utility Bills:	\$ 300,000,000	Total Square Footage:	-
Est. CapEx for Utilities:	\$ 45,000,000	Number of Buildings:	-

BENEFIT ALLOCATIONS		
Sample benefits for a business with a \$345 million dollar annual utility budget		
DIRECT BENEFITS		
Reducing Overspending	EPA estimates that businesses waste 30 percent of their utilities.	\$103.5 M
Utility Incentives	Utility programs may contribute 30 to 70 percent of a project costs.	\$13.5 M
INDIRECT BENEFITS		
Operational Efficiency and Staff Augmentation	Improved operational efficiency frees up valuable staff time to focus on other critical components of your business.	\$0.7 M
Estimated Total Value:		<b>\$117.7 M</b>



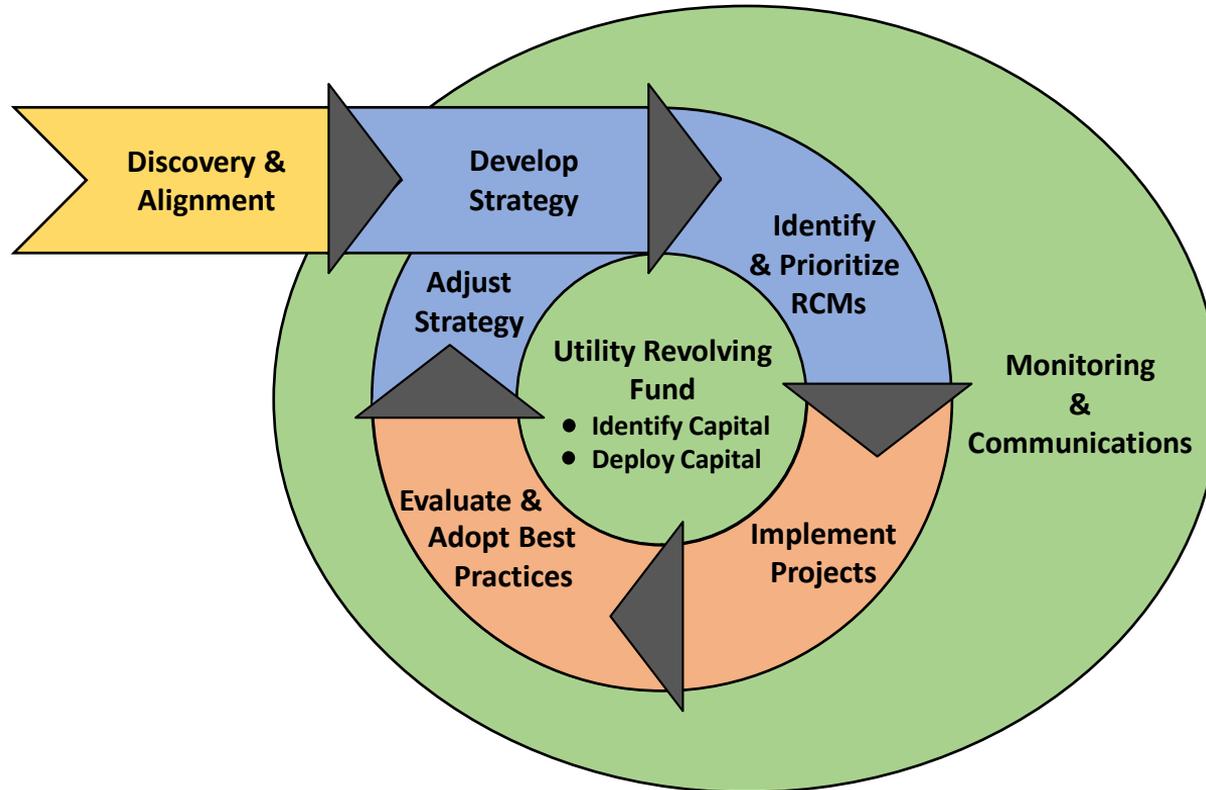
# UNIFIED UTILITY MANAGEMENT

Discover

Plan

Implement

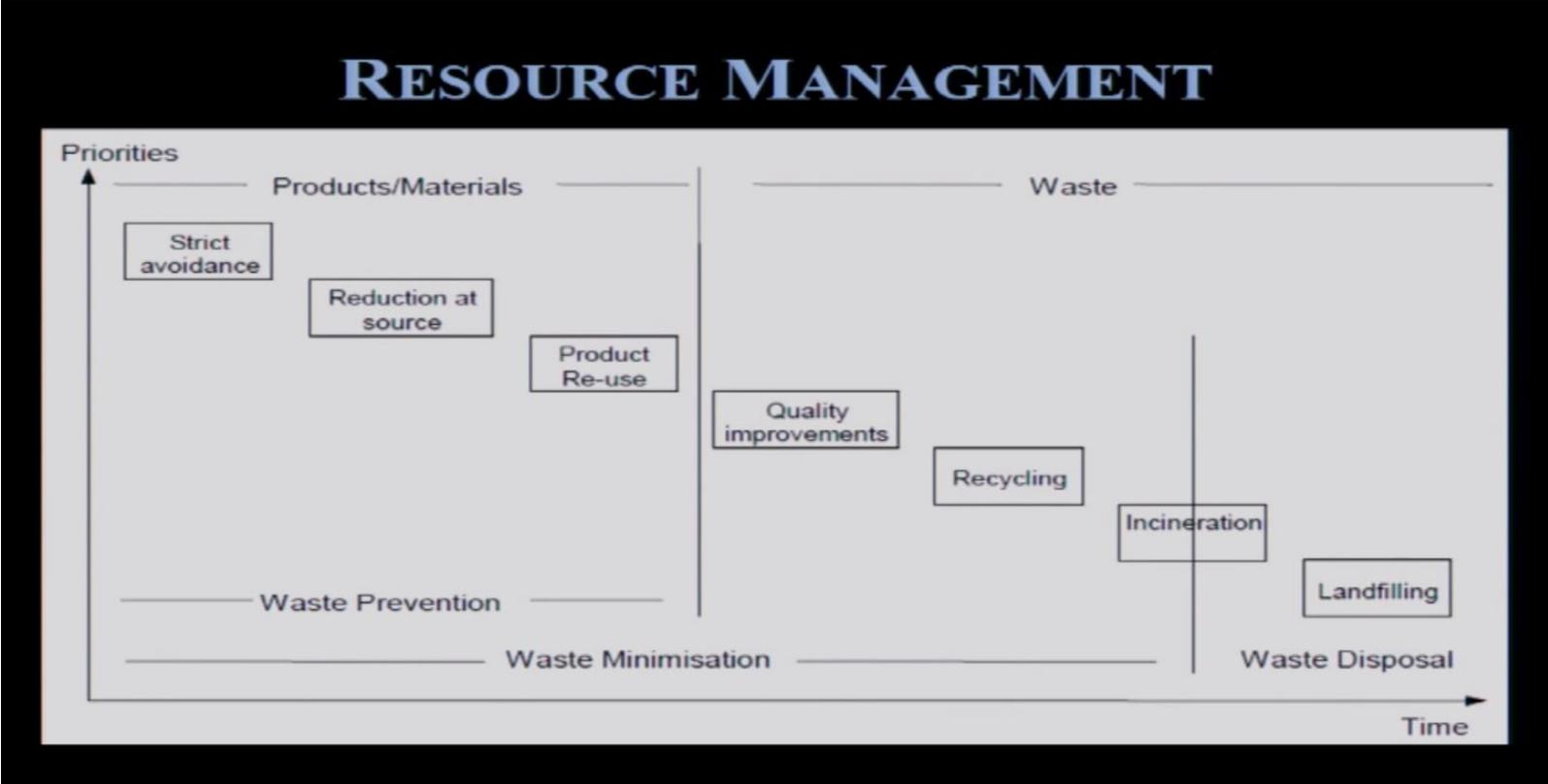
Monitor



## Benefits

- ❑ Centralized and unified utility management planning, forecasting and budgeting.
- ❑ Aligned team, plan and dollars to business goals.
- ❑ More time on analysis, less time on data gathering.
- ❑ Plan strategically and resiliently for your future business.

# Germany's Perspective



# Outcomes

	<b>1990's</b>	<b>2010</b>	
<b>Germany</b>	MSW Generation	50.9 M Tons	49.2 M Tons
	Composting	13 %	17 %
	Recycling	26 %	46 %
	Waste-to-Energy	18 %	37 %
	Landfill	43 %	0.4 %
	<b>USA</b>	MSW Generation	208 M Tons
Composting		2 %	8.1 %
Recycling		14 %	26 %
Waste-to-Energy		14 %	12 %
Landfill		70 %	54 %

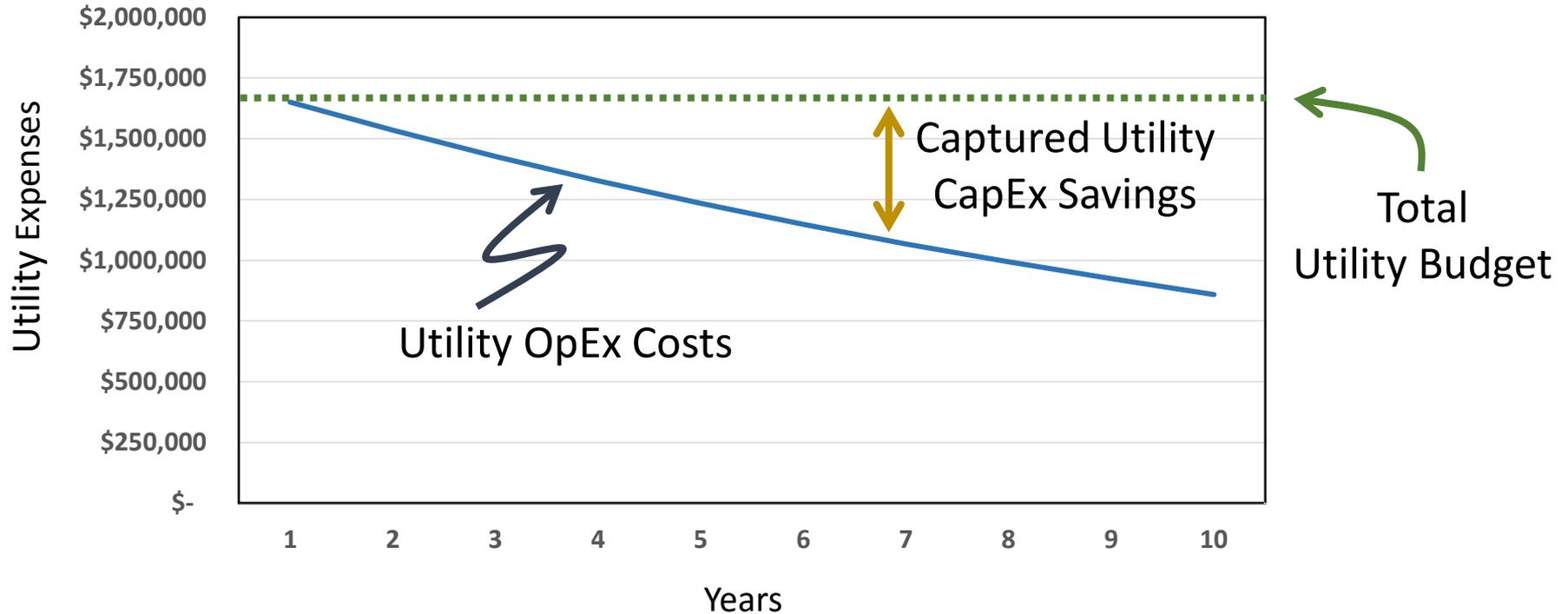
# INTERSECTING INFRASTRUCTURE

## OUTCOMES

- |            |                                  |
|------------|----------------------------------|
| Electric   | 1) Selling Power as a Product    |
| + Heat     | 2) Improving Resiliency          |
| + Waste    | 3) Managing Resources            |
| + Internet | 4) Lowering Costs                |
| + Finance  | 5) Optimizing Energy-as-an-Asset |

# LONG-TERM STRATEGY

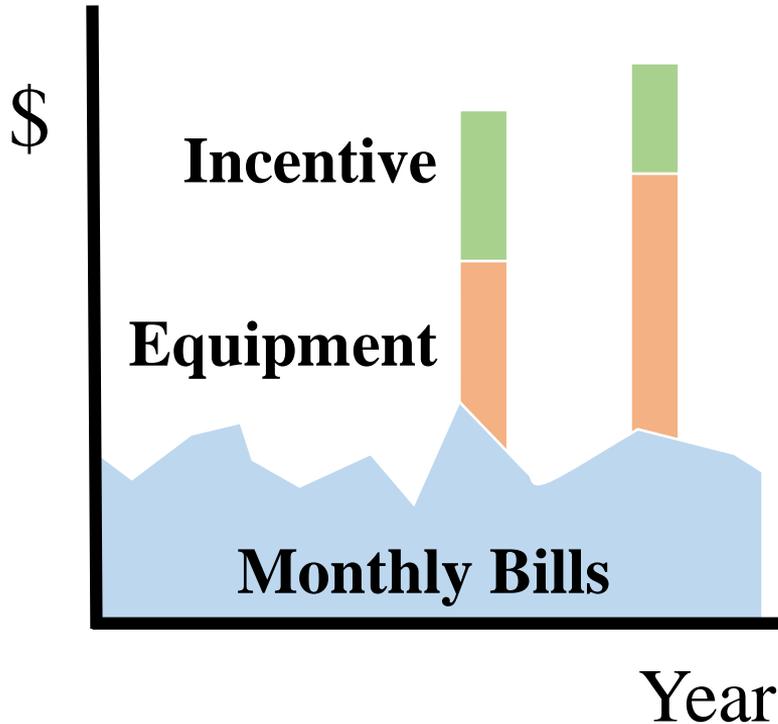
*Shifting wasted utility payments into capital projects*



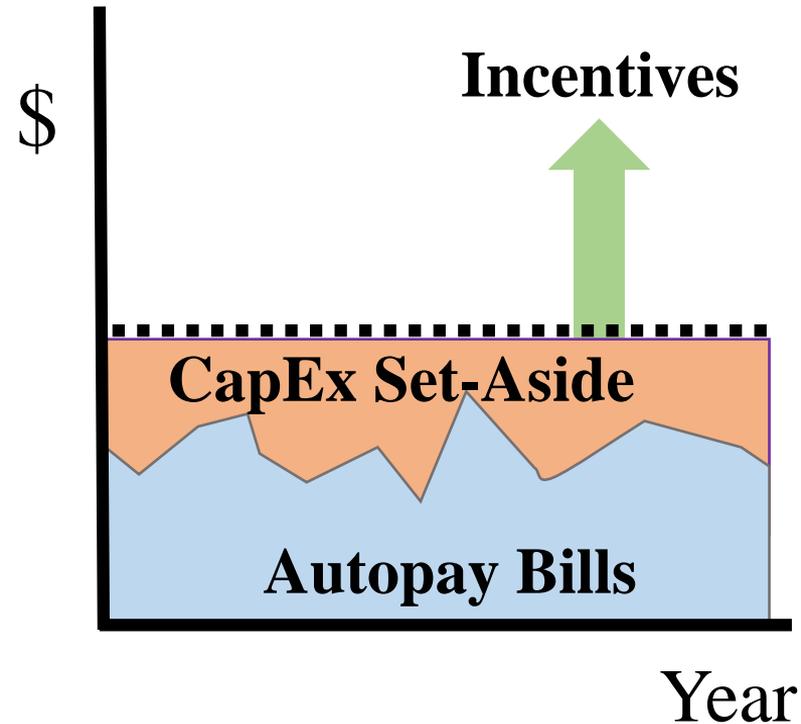
# COST CERTAINTY

*Making total costs predictable*

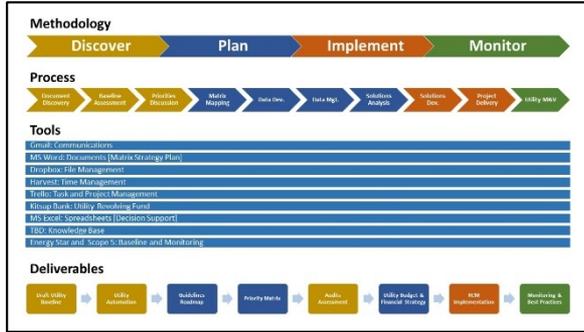
## Before



## After



# CUO Process and Tools



DEM Management

Dashboard: DASHBOARD UTILITIES PROJECTS EQUIPMENT INTERNAL PARTNER FULFILLMENT

Account	Location	Name	Description	Status	Type	Cost	Performance	Details	Est.
Small Business Organization	Small Business Customer Location 1	Small Business Project HVAC	Roof top unit has a very large maintenance need	In Progress	Heating	2500.00	Not Met	View	Est.
Small Business Organization	Small Business Customer Location 1	Small Business Project: lights	Small Business Account: lights	Pending Approval	Heating	6000.00	Not Met	View	Est.
Small Business Organization	Business Customer Location 1	Business Account: Boiler replacement	Business Account: Boiler replacement	In Progress	Heating	1200.00	Not Met	View	Est.

## Guidelines – Company ABC

- Background
- Vision
- Overview
- Approach

Service	Workstream	Tasks

- Timeline

Milestone	Target Dates

- Critical to Success

Success Factor	Delivery Strategy

- Communication

Type	Frequency	Location	Participants

- Risk

Potential Factors	Mitigation

- Change Requests
- Team Members

Vision: For every dollar spent we have to raise 5 dollars. Every dollar we save in efficiency better serves our community.

Location: Main Street, Seattle

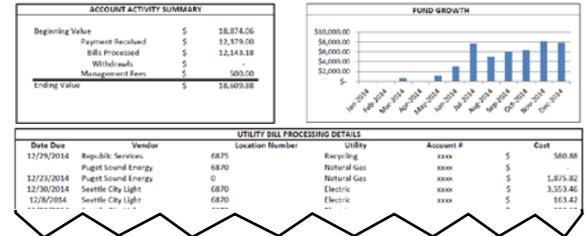
Company ABC

- Admin
- Waste
- O&M
- Appliances
- Energy
- Alternative Energy
- Solar
- Water
- Envelope
- Metrics

- Audits
- Set Points
- Maintenance
- Replacement
- Vacant re-set
- Window open re-set
- Plug loads
- Recurring work orders
- Baseline Monitoring, i.e. Scope 5
- Wifi based water sub-metering
- Systems Study

- Stakeholder Reporting
- Kitchen Layout
- Entry Layout
- Kitchen – Cooler, Ovens
- Washer/Dryer
- Cadet Heaters
- Thermostats
- Hot Water
- Low Flow
- Laundry
- Monitor Usage
- Flat Roof no insulation
- Slab – no insulation
- Windows

## Company ABC – Monthly Report



# PROJECTS AS A WHOLE SYSTEM

DEM: Management Manag... x +

demlift.elasticbeanstalk.com/project/manage

Trello OneLogin Facebook xFit Op-ed Ideas DEM Confluence Repayment Estimator Timesheet Updates to ENERGY ST...

DISTRIBUTED ENERGY MANAGEMENT INTERNAL ADMINIST...

DASHBOARD UTILITIES PROJECTS EQUIPMENT INTERNAL PARTNER FULFILLMENT

Account	Location	Name	Description	Status	Type	Cost	Performance	Details	Edit
Small Business Organization	Small Business Customer Location 1	Small Business Project HVAC	Roof top unit has a very large maintenance need.	In Progress	Heating	25000.00	Performance	View	Edit
Small Business Organization	Small Business Customer Location 1	Small Business Project - Lights	Small Business Account - lights	Pending Approval	Heating	6000.00	Performance	View	Edit
Small Business Organization	Business Customer Location 1	Business Account - Boiler replacement	Business Account - Boiler Replacement	In Progress	Heating	1200.00	Performance	View	Edit

# MONTHLY REPORTS

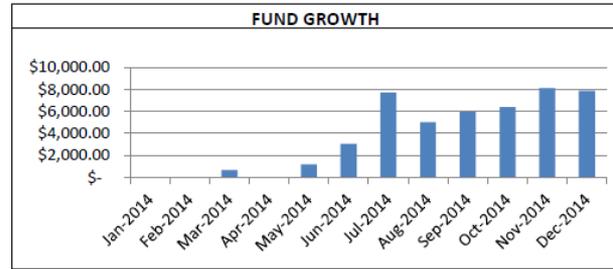
*Transparency for confident decision making*

Account Summary



ACCOUNT ACTIVITY SUMMARY		
Beginning Value	\$	18,874.06
Payment Received	\$	12,379.00
Bills Processed	\$	12,143.18
Withdrawals	\$	-
Management Fees	\$	500.00
<b>Ending Value</b>	<b>\$</b>	<b>18,609.88</b>

Growth of Set-Aside Fund



UTILITY BILL PROCESSING DETAILS						
Date Due	Vendor	Location Number	Utility	Account #	Cost	
12/29/2014	Republic Services	6875	Recycling	xxxx	\$	580.88
	Puget Sound Energy	6870	Natural Gas	xxxx	\$	-
12/23/2014	Puget Sound Energy	0	Natural Gas	xxxx	\$	1,875.82
12/30/2014	Seattle City Light	6870	Electric	xxxx	\$	3,553.46
12/8/2014	Seattle City Light	6870	Electric	xxxx	\$	163.42



Itemized Bills

Other Financial Information ↓

# BENEFITS OF ENERGY MANAGEMENT

- **Competitive advantage** (30% is a lot to waste)
- **Staff focused on delivery** (maintenance and productivity)
- **Improved brand awareness** (consumer recognition)
- **Resilience in the face of emergencies** (less downtime)
- **Cost containment** (mission aligned and total cost assessment)
- **Profit protection** (leverage to the bottom-line)
- **Revenue generation** (efficient delivery and consumer demand)

COLLABORATION

**PPRC**

# COMMUNITY: LOCAL TO GLOBAL

We can work together for a better business community that serves the greater community!

## REDUCED CARBON FOOTPRINT

### 30% Reduction Equals 1997 Levels

Global warming (n.d.). *Just Facts*. Retrieved May 30, 2016

[http://www.justfacts.com/globalwarming.asp#\\_ftn20](http://www.justfacts.com/globalwarming.asp#_ftn20)



# GROWING OPPORTUNITY

## **Energy Efficiency Retrofits for Small and Medium Commercial Buildings – Report by Navigant Research**

“Going forward, the importance of energy savings in building management will increase dramatically. Thus, the energy efficiency retrofit market is expected to grow steadily for SMCBs, which represent the majority of buildings worldwide. Most service and technology providers have already focused their marketing and sales on the larger buildings due to the ability to generate more revenue and a shorter return on investment period. However, with the largest commercial buildings already engaged, SMCBs are the next step. According to Navigant Research ...

**Revenue in the global SMCB energy efficiency retrofits market is expected to grow from \$24.1 billion in 2016 to \$38.6 billion in 2025.”**

# Press: HBR and PBS

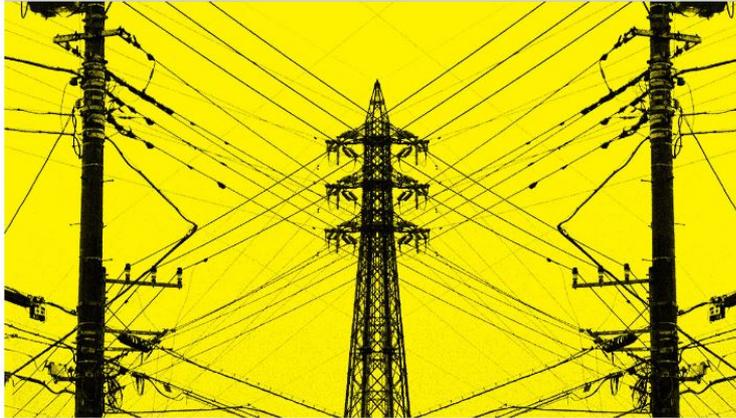
SUSTAINABILITY

## Companies That Don't Manage Utilities Strategically Are Throwing Money Away

by Jimmy Jia

MARCH 22, 2016

SAVE SHARE COMMENT TEXT SIZE PRINT \$8.95 BUY COPIES



<https://hbr.org/2016/03/companies-that-dont-manage-utilities-strategically-are-throwing-money-away>

## Voices in America

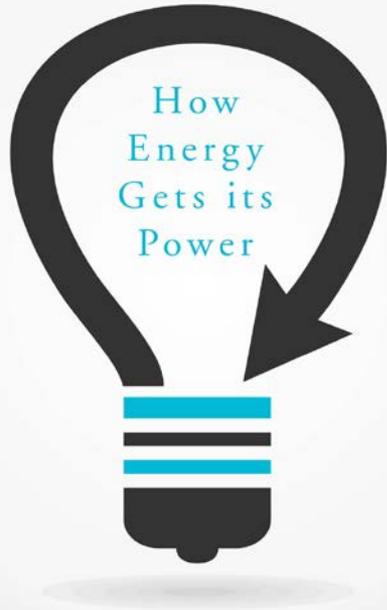
Short form documentary to begin airing in July 2016 nationwide on independent PBS stations. Part of a series on building a sustainable future.



Energy Management : The \$50B Problem

<https://www.youtube.com/user/DistEnergyManagement>

# Driven by Demand



Jimmy Y. Jia and Jason Crabtree

20% Discount  
Code: DEMAND2015  
Or this link:

[www.cambridge.org/DEMAND2016](http://www.cambridge.org/DEMAND2016)

*(offer expires August 31<sup>th</sup>)*  
Also available on Amazon





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