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DISTRIBUTED ENERGY MANAGEMENT
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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

33%
US Energy Consumption

Commercial Buildings
4.8 million buildings

$54B
Wasted Utilities
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

- **Operational Costs**
  - Water
  - Trash
  - Gas
  - Electricity
  - Maintenance

- **Capital Costs**
  - Upgrade
  - Retrofit
  - Equipment
  - Mechanical

- **External Incentives**
  - Utility Rebates
  - Tax Incentives
  - Grants

4.8 Million Commercial Buildings

Managing in Siloes!
3D → 4D → 5D

Complexity is banging into siloed management in a dynamic world!
Unplanned Expenses and Unexpected Results

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

Business Goals

Culture & Behavior

Site & Facilities

FOCUS

CUO
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

Strategic Planning: Aligned with Outcomes

Collaboration: Internal and External

Think CIO (Chief Information Officer)
CUO Responsibilities

• Strategic oversite 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

- Leader
- Systems Thinker
- Strategic Thinker-Doer
- Trusted
- Technically Savvy
- Change Maker and Manager
- Team Builder
- Communicator
Client Study: Green River College Foundation  

**College Foundation Gains Control of Their Utility Costs**

Strategic budget and operations approach bring control to expenses.

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**The Challenge**

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

"We knew we were wasting energy and money," said George Prater, Executive Director of the foundation that owns and operates 67 apartments in the 12 building student housing campus. Every year, they increased their utility budget forecast by 2% 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 vanilla thermostat pilot the year before, wanted to improve the heating equipment and evaluate cost metrics. In fact, the problem was that there were too many ideas to know where to start.

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**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 reduction fund that uses on-budget incentives 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.

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**Financial Summary**

- **Growth of CAPEX Investments**
  - Reached Year 1 Goal in only 6 months

- **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

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For more information about Distributed Energy Management visit de-angent.com or email info@de-angent.com
Sample Values For ABC Corporation Inc.

**CLIENT INFORMATION**

<table>
<thead>
<tr>
<th>Client Type</th>
<th>Financial Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Building Type:</td>
<td>Grocery</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Estimated Utility Budget</th>
<th>Additional Information (if known)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Est. Annual Utility Bills:</td>
<td>$300,000,000</td>
</tr>
<tr>
<td>Est. CapEx for Utilities:</td>
<td>$45,000,000</td>
</tr>
</tbody>
</table>

**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**: $117.7 M

**SCENARIOS TO CONSIDER**

Improving net margins and net revenue through eliminating wasted utilities

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Net Margins</th>
<th>Net Revenue (M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Business As Usual</td>
<td>1.70%</td>
<td>$493.00</td>
</tr>
<tr>
<td>B: Reduce Budget by 5%</td>
<td>1.76%</td>
<td>$550.25</td>
</tr>
<tr>
<td>C: Reduce Budget by 15%</td>
<td>1.88%</td>
<td>$544.75</td>
</tr>
<tr>
<td>D: Eliminate Waste</td>
<td>2.06%</td>
<td>$596.50</td>
</tr>
</tbody>
</table>

**Annual Utility Budgets (M)**

- Scenario A: Business As Usual
- Scenario B: Reduce Budget by 5%
- Scenario C: Reduce Budget by 15%
- Scenario D: Eliminate Waste

Year 1 vs Year 5
Unified Utility Management

Discover
- Discovery & Alignment
- Develop Strategy
- Adjust Strategy
- Evaluate & Adopt Best Practices

Plan
- Utility Revolving Fund
  - Identify Capital
  - Deploy Capital
- Identify Prioritize RCMs
- Implement Projects
- Monitoring & Communications

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

Resource Management

Priorities
- Strict avoidance
- Reduction at source
- Product Re-use

Products/Materials

Waste
- Quality improvements
- Recycling
- Incineration
- Landfilling

Waste Prevention

Waste Minimisation

Waste Disposal

Time
<table>
<thead>
<tr>
<th></th>
<th>1990’s</th>
<th>2010</th>
</tr>
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<tbody>
<tr>
<td><strong>Germany</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSW Generation</td>
<td>50.9 M Tons</td>
<td>49.2 M Tons</td>
</tr>
<tr>
<td>Composting</td>
<td>13 %</td>
<td>17 %</td>
</tr>
<tr>
<td>Recycling</td>
<td>26 %</td>
<td>46 %</td>
</tr>
<tr>
<td>Waste-to-Energy</td>
<td>18 %</td>
<td>37 %</td>
</tr>
<tr>
<td>Landfill</td>
<td>43 %</td>
<td>0.4 %</td>
</tr>
<tr>
<td><strong>USA</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSW Generation</td>
<td>208 M Tons</td>
<td>250 M Tons</td>
</tr>
<tr>
<td>Composting</td>
<td>2 %</td>
<td>8.1 %</td>
</tr>
<tr>
<td>Recycling</td>
<td>14 %</td>
<td>26 %</td>
</tr>
<tr>
<td>Waste-to-Energy</td>
<td>14 %</td>
<td>12 %</td>
</tr>
<tr>
<td>Landfill</td>
<td>70 %</td>
<td>54 %</td>
</tr>
</tbody>
</table>
**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

Utility Budget

Captured Utility

CapEx Savings

Total Utility Budget

Utility OpEx Costs

Years

Utility Expenses

LONG-TERM STRATEGY

Shifting wasted utility payments into capital projects
**Cost Certainty**  
*Making total costs predictable*

**Before**

- **Equipment**
- **Incentive**
- **Monthly Bills**

**After**

- **CapEx Set-Aside**
- **Autopay Bills**
- **Incentives**
CUO Process and Tools

Guidelines – Company ABC

- Background
- Vision
- Overview
- Approach

<table>
<thead>
<tr>
<th>Service</th>
<th>Workstream</th>
<th>Tasks</th>
</tr>
</thead>
</table>

- Timeline
- Milestone
- Target Dates

- Critical to Success
- Success Factor
- Delivery Strategy

- Communication
- Type
- Frequency
- Location
- Participants

- Risk
- Potential Factors
- Mitigation

- Change Requests
- Team Members

Company ABC – Monthly Report

- Location: Main Street, Seattle
- Company ABC

- Metrics
- KPIs
- Performance metrics
- Financial metrics
- Operations metrics

- Diagrams:
  - Process flowcharts
  - Gantt charts
  - Stakeholder matrices
  - Risk assessment matrices

- Tables:
  - Project tasks
  - Risk factors
  - Change requests

- Data analysis
  - Dashboard
  - Reports

- Context:
  - Contextual information relevant to the project's environment
  - Stakeholder analysis
  - SWOT analysis

- Actions:
  - Action items
  - Task assignments
  - Milestone tracking

- Next steps:
  - Immediate next steps
  - Long-term goals

- Feedback:
  - Stakeholder feedback
  - Team feedback
  - Management feedback

- Appendices:
  - Supporting documents
  - Legal agreements
  - Contact information
# Projects as a Whole System

The image shows a screenshot of a management system interface for distributed energy management. The table displays various projects categorized under different accounts and locations, along with details such as name, description, status, type, cost, and performance. Each project is editable with options to view details or edit the record.

<table>
<thead>
<tr>
<th>Account</th>
<th>Location</th>
<th>Name</th>
<th>Description</th>
<th>Status</th>
<th>Type</th>
<th>Cost</th>
<th>Performance</th>
<th>Details</th>
<th>Edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Business Organization</td>
<td>Small Business Customer Location 1</td>
<td>Small Business Project HVAC</td>
<td>Roof top unit has a very large maintenance need.</td>
<td>In Progress</td>
<td>Heating</td>
<td>25000.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small Business Organization</td>
<td>Small Business Customer Location 1</td>
<td>Small Business Project - Lights</td>
<td></td>
<td>Pending Approval</td>
<td>Heating</td>
<td>6000.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Small Business Organization</td>
<td>Business Customer Location 1</td>
<td>Business Account - Boiler replacement</td>
<td></td>
<td>In Progress</td>
<td>Heating</td>
<td>1200.00</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MONTHLY REPORTS

Account Summary

Growth of Set-Aside Fund

Itemized Bills

Other Financial Information

Transparency for confident decision making
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


http://www.justfacts.com/globalwarming.asp#ftn20
“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

Companies That Don’t Manage Utilities Strategically Are Throwing Money Away
by Jimmy Jia
MARCH 22, 2016

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.

https://www.youtube.com/user/DistEnergyManagement
Driven by Demand

How Energy Gets its Power

Jimmy Y. Jia and Jason Crabtree

20% Discount
Code: DEMAND2015
Or this link:
www.cambridge.org/DEMAND2016

(offer expires August 31th)
Also available on Amazon