EN ability to accept a challenging task and work hard at it, even when it is difficult and time consuming. Engages in thoughtful problem-solving.

- Communication: Ability to communicate ideas clearly and effectively, both verbally and in writing, and to listen actively to others.

- Teamwork: Ability to work collaboratively with others, including diversity, and to contribute to the success of the team.

- Adaptability: Ability to adapt to changing situations and new technologies, and to learn and incorporate new knowledge and skills.

- Leadership: Ability to lead by example and inspire others, and to motivate and guide individuals towards achieving common goals.

- Professionalism: Ability to maintain high standards of integrity, ethics, and professionalism, and to conduct oneself in a responsible and trustworthy manner.

- Continual Learning: Commitment to ongoing learning and professional development, and to keep up-to-date with the latest developments in the field.

- Innovation: Ability to think creatively and innovatively, and to develop new and effective solutions to problems.

- Decisiveness: Ability to make tough decisions and take calculated risks, and to act on those decisions with confidence and determination.

- Emotional Intelligence: Ability to understand and manage emotions, and to effectively communicate and work with others.
WHO SEDAC IS

The Illinois Energy Now - Smart Energy Design Assistance Center (SEDAC)

A Public/Private Partnership

- DCEO
- University of Illinois
  - Professional staff, faculty, students
- 360 Energy Group
  - Private sector energy specialists
- Energy Resources Center
  - Professional staff, students
WHAT SEDAC DOES

SEDAC Services

- Outreach and Training
- Energy Assistance and Assessments
- New Construction Design Assistance
- Retro-Commissioning (Public Sector)
- Pilot Projects
  - Dashboards
  - Mini-RCx
OUR MISSION

To help reduce the energy footprint of the State of Illinois

Cumulative Implemented MBtu Savings from Energy Assessments

High School - Natural Gas Consumption

Natural Gas Consumption

Heating Degree Days

[Graph showing natural gas consumption and heating degree days]

[Bar chart showing cumulative implemented MBtu savings from energy assessments]

[Additional pie chart showing energy consumption distribution]
ENERGY EFFICIENCY PORTFOLIO STANDARD

ComEd
Ameren Illinois

Electric Efficiency (75% of $)

DCEO

Electric Efficiency
Gas Efficiency (25% of $)

Nicor Gas
Peoples/North Shore Ameren Illinois

Gas Efficiency (75% of $)

Private Sector
Businesses
Residential
Non-profits

Public Sector
Governments
K-12 Schools
Community Colleges
Public Universities

Low-Income
Residential
Affordable Housing
PHAs
Implementation Agencies

Private Sector
Businesses
Residential
Non-profits

SEDAC
Illinois Department of Commerce and Economic Opportunity (DCEO) created the Illinois Energy Now program to assist public sector entities conserve energy.
Who are the players that affect the process of designing an energy efficient building?
QUESTIONS TO THINK ABOUT

Who do we have here today?
**QUESTIONS TO THINK ABOUT**

From your experiences, what are some of the objectives of these players that may **promote** or **hinder** energy efficiency?

<table>
<thead>
<tr>
<th>Players</th>
</tr>
</thead>
<tbody>
<tr>
<td>Owners</td>
</tr>
<tr>
<td>Developers</td>
</tr>
<tr>
<td>Users</td>
</tr>
<tr>
<td>Designers</td>
</tr>
<tr>
<td>Engineers</td>
</tr>
<tr>
<td>Contractors</td>
</tr>
<tr>
<td>Material &amp; equip. suppliers</td>
</tr>
<tr>
<td>Green building raters</td>
</tr>
<tr>
<td>Capital providers/Bankers</td>
</tr>
<tr>
<td>Incentive providers</td>
</tr>
<tr>
<td>Who else?</td>
</tr>
</tbody>
</table>
Building a case
Understanding Motivation(s) and Deterrent(s)
The Drivers Behind High Performance/Green Design

Reported *Motivators for undergoing a green project*,

Study by Deloitte & Lockwood 2008, *The Dollars & Sense of Green Retrofits*
UNDERSTANDING MOTIVATION(S)

The Drivers Behind High Performance/Green Design

Reported *Impacts of green design*

- corporate
- workforce
- business

<table>
<thead>
<tr>
<th>Impact</th>
<th>Significantly Increased</th>
<th>Slightly Increased</th>
<th>Decreased Slightly</th>
<th>Decreased Significantly</th>
<th>No Change</th>
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</thead>
<tbody>
<tr>
<td>Goodwill/brand equity</td>
<td>69%</td>
<td></td>
<td>31%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employee comfort</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to attract talent</td>
<td>40%</td>
<td></td>
<td>53%</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Employee well-being</td>
<td>38%</td>
<td></td>
<td>49%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Employee health</td>
<td>37%</td>
<td></td>
<td>38%</td>
<td>25%</td>
<td></td>
</tr>
<tr>
<td>Ability to retain talent</td>
<td>31%</td>
<td></td>
<td>50%</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>Workforce productivity</td>
<td>31%</td>
<td></td>
<td>56%</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>Occupancy levels</td>
<td>19%</td>
<td></td>
<td>19%</td>
<td>62%</td>
<td></td>
</tr>
<tr>
<td>Property value</td>
<td>13%</td>
<td></td>
<td>38%</td>
<td>49%</td>
<td></td>
</tr>
<tr>
<td>Total renovation time</td>
<td>29%</td>
<td></td>
<td>57%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Permit processing time</td>
<td>7%</td>
<td></td>
<td>86%</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>Insurance rates</td>
<td>7%</td>
<td></td>
<td>93%</td>
<td>7%</td>
<td></td>
</tr>
</tbody>
</table>

75% also reported achieving cost reductions

Study by Deloitte & Lockwood 2008,
*The Dollars & Sense of Green Retrofits*
**Understanding Deterrent(s)**

*Perceptions* of green building cost increases from a survey of professionals

Actual expected costs increase is 0-5% of project (in developed countries)

Energy Efficiency in Buildings, by World Business Council for Sustainable Development
UNDERSTANDING MOTIVATION(S)

High cost? Low cost?

**Cost per SF**
- 138 LEED and non-LEED: libraries, laboratories, academic building
- Only difference was the intent to incorporate sustainable design for LEED.

![Bar chart showing cost per SF for different LEED certifications](chart.png)

- **Non-LEED**
- **Certified**
- **Silver**
- **Gold or Platinum**

High cost buildings are not necessarily high performing (and vice-versa)!

Costing Green: A Comprehensive Cost Database and Budgeting Methodology, July 2004, by Davis Langdon
Building a case
Understanding the Energy Picture
UNDERSTANDING ENERGY

Are stakeholders motivated by these images?

http://climatecommunication.org

http://thinkprogress.org

Animal savers.com
UNDERSTANDING ENERGY

Are stakeholders motivated by these images?

400 ppm: May 2013
WORLD ENERGY PRODUCTION BY FUEL (TRILLION KWH)

Figure ES-5. Electricity generation by fuel in the Reference case, 1990-2040

trillion kilowatthours

<table>
<thead>
<tr>
<th></th>
<th>History</th>
<th>2012</th>
<th>Projections</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2030</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2040</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Natural gas
Renewables
Nuclear
Petroleum liquids and other
Coal
TOTAL WORLD CONSUMPTION BY REGION (QUAD BTU)

World Total Primary Energy Consumption by Region, Reference Case, 1990-2030

From: Key World Energy Statistics, International Energy Agency

OECD1
Australia, Austria, Belgium, Canada, Chile, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, the Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the United Kingdom and the United States.
TOTAL WORLD CONSUMPTION PER CAPITA

Looking at use per capita tells a different story.

Primary energy use (before transformation to other end-use fuels) in kilograms of oil equivalent, per capita

Source: Worldbank.org
“The biggest bang for the buck is efficiency”
US EPA

“By implementing greater demand-side and end-of-use energy efficiency, the U.S. could reduce CO2 emissions 26% by 2030 compared to 2012 levels”
American Council for an Energy-Efficient Economy
LEVELIZED COST OF ENERGY SOURCES

From: ACEEE, Change Is in the Air, April 2014
Building a case

Presenting to Clients
Motivations and Marketing Strategies

- Terminology choices
- Framing decisions
- Minimizing hassle
- Understanding mindset
Motivations and Marketing Strategies

It may be better to talk about

“Avoiding Costs” (aka “the cost of doing nothing”)
rather than

“Realizing Savings”

From: Bay Efficiency
The Cost of Doing Nothing

Ten Year Lifecycle Cost for a Lightbulb
(Typical Hours of Operation)

Incentives
Not eligible

Equipment Cost
9 Burntout Bulbs

$0.00

$17

$110

$146

Standard Incandescent
(50 Watt MR-16)
Initial Cost: $1.50
Total Cost: $255

Labor Cost
9 Extra Replacements

$1.50

$23

$60

$15.00

CFL
(15 Watt GU10 35 W equiv)
Initial Cost: $6 ea
Total Cost $122

Incentives
One time eligibility

Equipment Cost
1 Burntout LED

$28

$30

$15.00

LED
(8 Watt MR-16 equiv)
Initial Cost: $25
Total Cost: $100

Energy Cost
Normal Utility Payment

$44

$30

Energy Cost
80% Reduction

$23

27
Ideas/ Questions to Think About

1. Learn the business culture
2. Remember that each client is unique!
3. Meet them where they are now or lead them further?
4. Who is(are) the key stakeholder(s)?
5. Are all stakeholders in the same room?
6. What is the motivation for choosing high performance?
7. If their motivation doesn’t exist yet can you cultivate it?
MARKETING
Finding/ Becoming an Advocate

- One person can make a world of difference!
- Most successful projects have a single source of contact (and pushing) for their energy project.
- The Champion can vary
  - Student group
  - Maintenance staff
  - Board Member
  - CEO
  - Green team
  - Anyone else!
Building a case

Best Practices
BEST PRACTICES

Ideas/ Approaches

- Cost effective measures
- Understanding and stating the owner’s project requirements (OPR)
- Continual reassessment/ improvement
- Good communication
  - Integrated project approach
  - Recognizing goals of the key players
When to do Integrated design

- Early work on building performance has high positive impact
- Late work on building performance has a high negative impact
WORST PRACTICES?
Building a case

Financial Analysis
Choosing appropriate projects / strategies

Methods for Evaluating Energy Cost Reduction Projects:
- Simple Payback
- Internal Rate of Return (IRR)
- Return on Investment (ROI)
- Net Present Value (NPV)
### Making energy efficiency economically viable

- Bundle projects to achieve desired economics

<table>
<thead>
<tr>
<th>Quick Returns</th>
<th>Medium Returns</th>
<th>Long Returns</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation</td>
<td>More Insulation</td>
<td>Max. Insulation</td>
</tr>
<tr>
<td>Efficient Lighting</td>
<td>LED Lighting</td>
<td>Solar Shading</td>
</tr>
<tr>
<td>Beyond-Code Lighting Controls</td>
<td>High Performance Windows</td>
<td>High Eff. Boiler/Chiller</td>
</tr>
<tr>
<td>Advanced HVAC Controls</td>
<td>Energy Recovery Equipment</td>
<td></td>
</tr>
</tbody>
</table>

**FINANCIAL ANALYSIS**