Chicago Green Healthcare Initiative

Leaner Energy Challenge

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Leaner Energy Challenge

Advocate Health Care

Advocate Health Care, based in Oak Brook, Illinois, is the largest fully integrated health care delivery system in the state of Illinois.

Advocate has More than 200 sites offering inpatient, outpatient services, home health services, hospice, counseling, physician services, skilled nursing care and health care education programs.

There are 10 hospitals, including 2 children's hospitals and specialty hospital for extended care; more than 3,500 beds and 3.1 million patient visits annually.

Advocate has 25,000 employees, 4,600 primary care and specialty physicians and 7,000 nurses throughout the system with 300,000 emergency and 6,100 trauma patients seen annually.

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Hospital Energy Usage Overview

- Hospitals use 2.5 times more energy than a commercial office building
- Average U. S. hospital consumes about 260,000 btu's per square foot (DOE)
- Each dollar saved in energy is equivalent to $50 in revenue (based upon 2% margin)
- 21% of hospitals do not measure/monitor energy performance
- Only 23% have a designated energy manager
- 45% have annual energy targets and an energy budget
- 50% conduct energy audits
- Source ComEd Smart Ideas

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ASHE Energy Survey

- **Changes in Healthcare since 1997**

- Supersizing of hospitals
- Greater use of energy intensive medical equipment
- Higher use of electronic records
- Increased adoption of sustainability goals

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Advocate Energy Usage Overview

- Energy consumption at Advocate Health Care is expected to increase with added facilities, medical and office equipment, associates and patients contributing to our growing use of hospital facilities.
  - Bed Tower completed in 2011 and 2012
  - Under Construction Now
    - Two Parking Structures
    - One Ambulatory Center
    - Three Bed Towers
    - Over 1 Million additional square feet
- Technology and other types of equipment are also being added to the infrastructure reflecting a further increase in overall energy needs and consumption.

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ACUTE CARE HOSPITALS' ANNUAL ENERGY COSTS* PER SQUARE FOOT

*Advocate Average $2.94

**Average U. S. hospital $5.70

** U.S Dept of Energy

Less than $2.50 . . . . . **12%**

$2.51 to $3.00 . . . . . ***17%**

$3.01 to $4.00 . . . . . **28%**

$4.01 to $5.00 . . . . . **21%**

$5.01 to $6.00 . . . . . **11%**

$6.01 to $7.00 . . . . . **5%**

$7.01 to $8.00 . . . . . **3%**

More than $8.00 . . . . . **3%**

Energy costs include electrical, natural gas, steam, oil, cogeneration, solar, etc., except water

SOURCE: *HEALTH FACILITIES MANAGEMENT/ASHE 2011 HOSPITAL ENERGY MANAGEMENT SURVEY*

Leaner Energy Challenge

Developing a Program

- Make Commitment
- Assess Performance
  - Benchmark
- Set Goals
  - 20% reduction by 2015
  - Energy Star Rating of 75
  - Construction & Renovation Standards
- Create/Update Action Plan
  - Energy Audits - Identify Upgrades and Improvements
  - Implement Action Plan
  - Retro-commission for optimum system performance – Capital Expenditures
- Evaluate Progress
- Recognize Achievements

Leaner Energy Challenge
Developing a Program

- Establishing Baseline Consumption
- Performing an Energy Audit
- Identifying Upgrades and Improvements
  - Retro-commission for optimum system performance
- Performing Financial Analysis
    - Capital Expenditures
- Prioritizing Activities
- Implementing Activities
- Confirming Performance
- Performing Necessary Maintenance
- Re-establishing Baseline Consumption

Leaner Energy Challenge

Leadership – Commitment for Change

- *We recognize that sustaining the health of the environment is critical to preserving human health. We consider conservation of resources, both natural and monetary, as fundamental to our mission of delivering quality health care to the communities we are privileged to serve."*

- **Jim Skogsbergh**
- President & CEO
- Advocate Health Care

Leaner Energy Challenge

Leadership – Commitment for Change

The Team:

- Facility Directors & Managers
- Facility Associates
- Construction Directors & Managers
- Environmental Stewardship Manager
- Energy Solutions Manager
- All Associates
- Administration

It's all about Culture not equipment or big projects!

Find the Energy Champion! - Finding the energy site champion is crucial to continuous energy improvement.

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Construction & Renovation Standards

Sustainability goals apply to new stand alone buildings and major additions

New Construction

- Design to achieve USGBC LEED™ Gold Certification based on LEED for Healthcare. Decision to submit for LEED Gold Certification shall be made on a project-by-project basis.
- Building energy consumption savings greater than 30% that is required by ASHRAE Standard 90.1-2007,
- Water use reduction greater than 20% as compared to the water use baseline calculated for the building after meeting the Energy Policy Act of 1992.

Renovations

- Building energy consumption savings greater than 20% that is required by ASHRAE Standard 90.1-2007,
- Water use reduction greater than 10% as compared to the water use baseline calculated for the building after meeting the Energy Policy Act of 1992.

Leaner Energy Challenge

Strategy to combat the rising usage and energy cost

Three Tier Approach in our strategy to maintain reliability, plan for the future and contain energy cost

Procurement of energy such as Electricity and Natural Gas

- Dependent on external factors with some control
- Regulatory Environment

Reliability and Efficient use or Transfer of Energy

- Facility and System Assessments - Identify Energy Conservation Measures (ECM's) requiring capital expenditures
- Operational Procedures – Preventive Maintenance – Check List

Energy Conservation and Sustainability

- Commissioning and Retro-Commissioning
- Economic Demand Response
- Metering & Monitoring
- Promoting the Energy Message

Energy Procurement
Goals and Strategy

Goal - Secure Advocate from potential price and market fluctuations

- Strategy
  - **Electricity** - Our strategy moving beyond 2012 is to take advantage of the current low rates which are historically low and well below the rates of 2008. Fixing the electrical charge will help to secure ourselves from potential price or market fluctuations.

  - **Natural Gas** - Adapt a managed diversification strategy to help smooth out the peaks and valleys of the price volatility of natural gas. Use the combination of storage capacity, price hedging (the old way) and spot market pricing. All these methods have been available in the past; however, the utilization of all three helps Advocate achieve the objective of minimizing the effects of price volatility.

Energy Procurement

Expected Energy Growth

- **U.S. Electricity Use Is Expected To Grow Slowly**

Electricity demand fluctuates in the short term in response to business cycles, weather conditions, and prices. Over the long term, electricity consumption increases. However, electricity demand growth has slowed progressively by decade since 1950, from 9% per year in the 1950s to less than 2.5% per year in the 1990s. From 2000 to 2009, increases in electricity demand averaged 0.5% per year. Demand growth is projected to continue at about 1% per year through 2035.

- **International Electricity Use Will Grow Faster**

Electricity is expected to remain the fastest growing form of end-use energy worldwide through 2030, as it has been over the past several decades. The highest demand growth is expected in China and India, plus smaller developing countries in Asia.

Source: Energy Information Administration (EIA)

Energy Procurement

Trends in Energy Markets

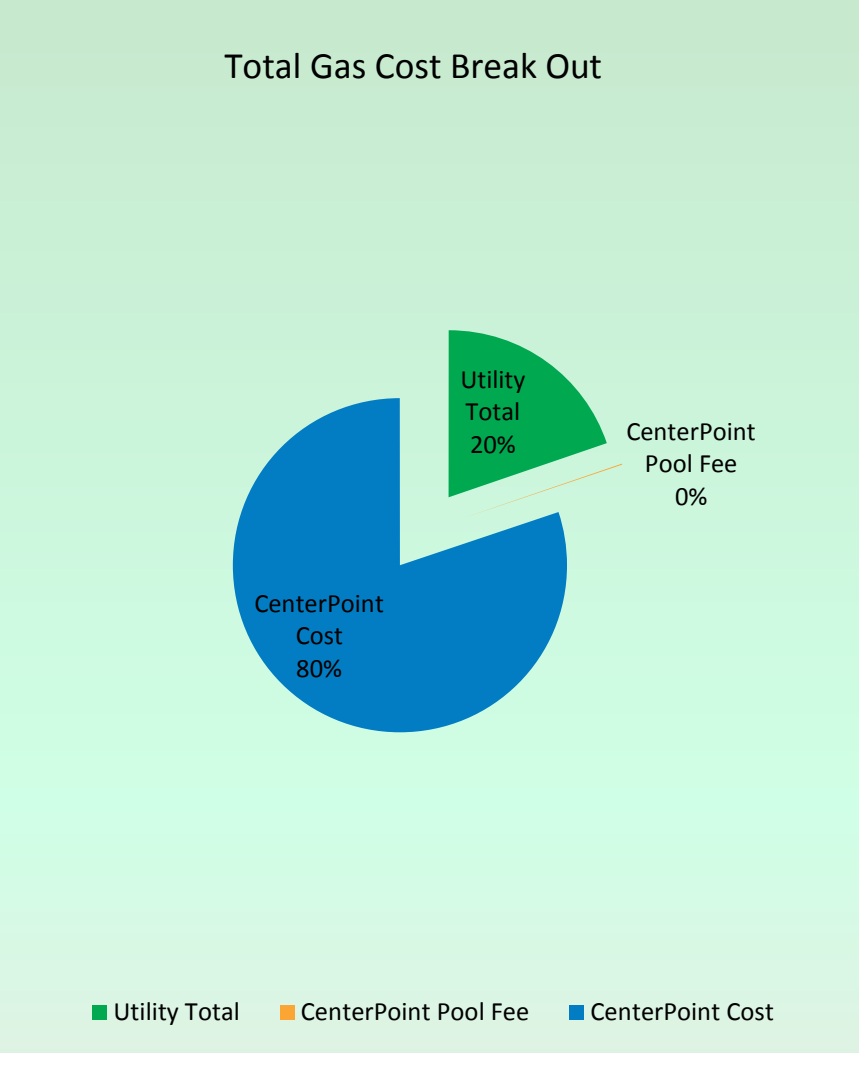
Energy Information Administration (EIA) reported that due to increased demand in China and India, worldwide energy consumption could increase by 53% by 2035.

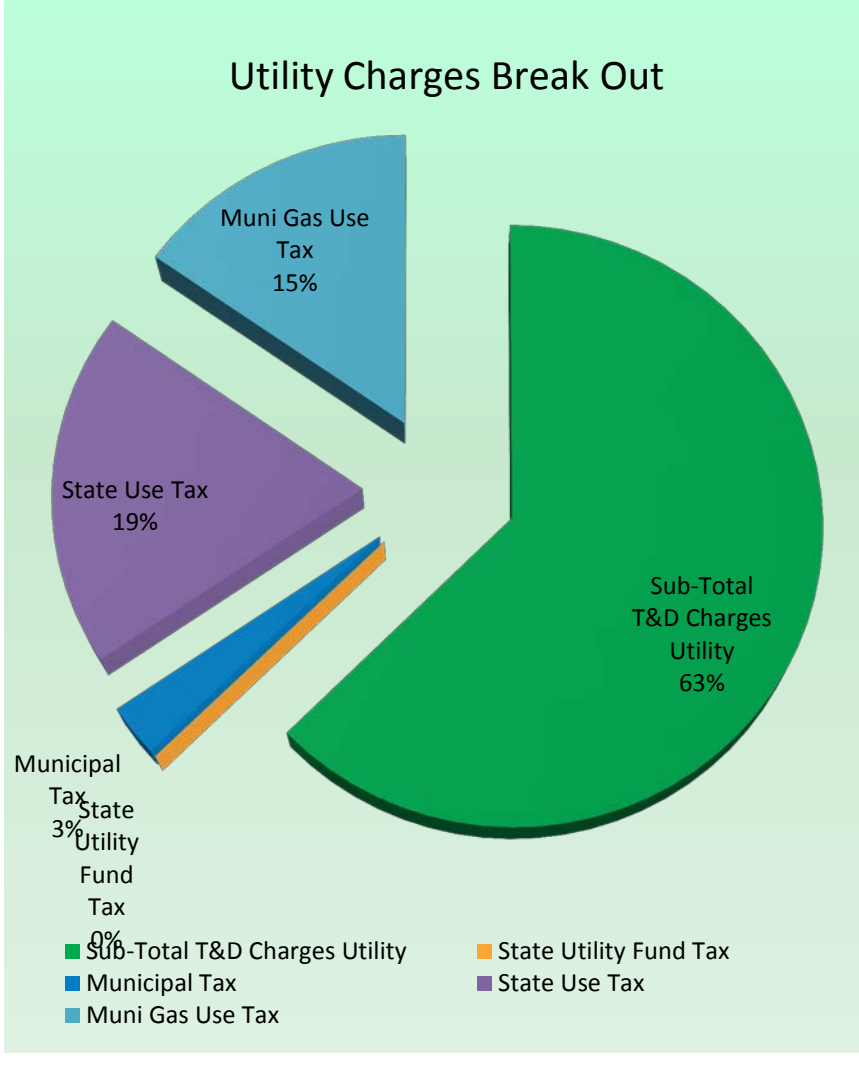
New Regulations from EPA proposed

- Coal-fired generators to conform to industry reduction levels for mercury and other air pollutants or cease operations by 2016.
- Power plants in 28 states including Illinois will need to reduce emissions of sulfur dioxide and nitrogen oxide by 2014 which is expected to reduce total US emissions of sulfur dioxide and nitrogen oxide by 73% and 54%, respectively, from 2005 levels.
- **Gas demand could rise as much as 3.5 Bcf/d by 2014 if approved**

Energy Procurement

Impact of Regulatory Environment





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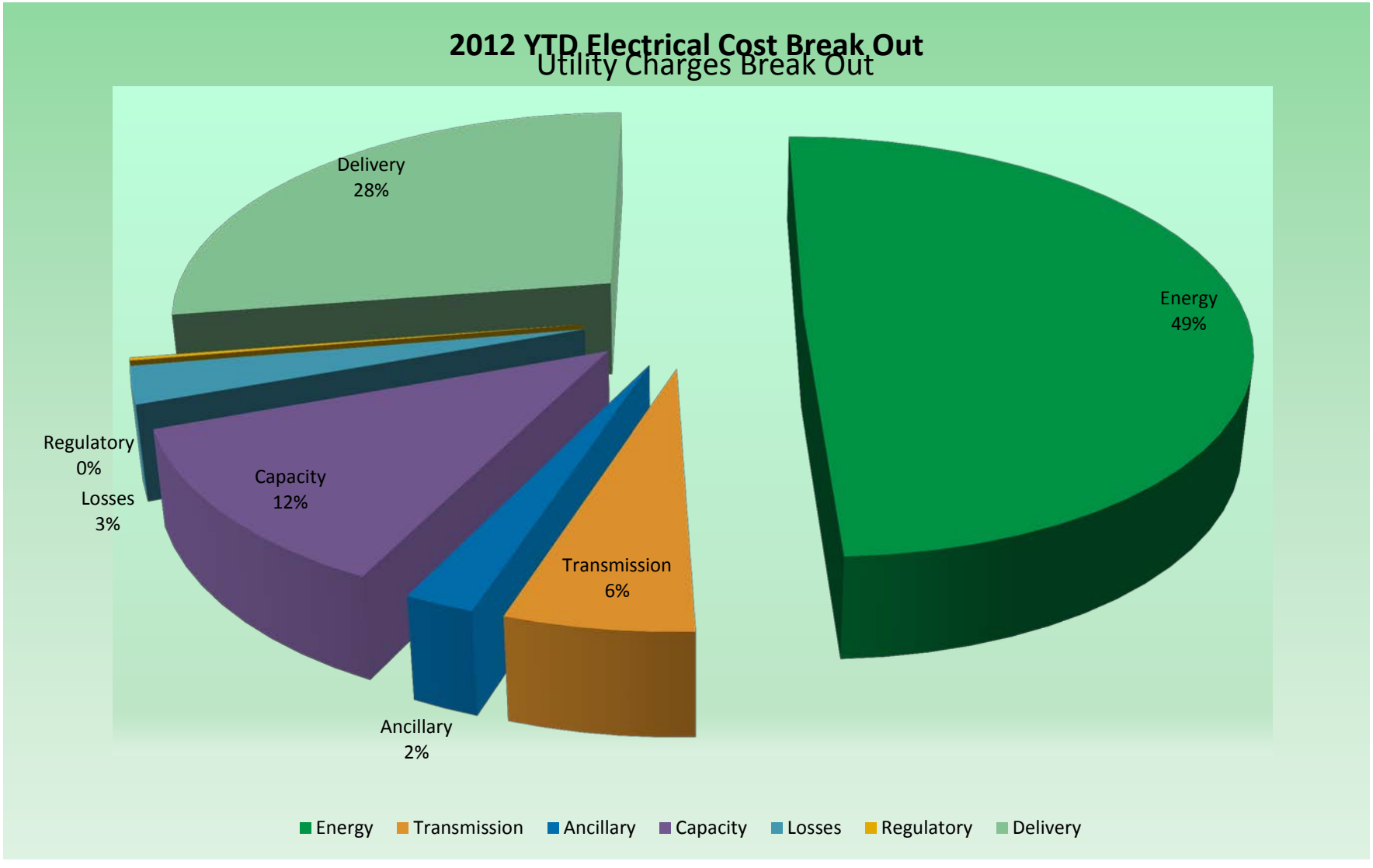
Energy Procurement

Impact of Regulatory Environment



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Reliability and Efficient use or Transfer of Energy

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- Operational Procedures – Preventive Maintenance – Check List

Energy Conservation and Sustainability

- Commissioning and Retro-Commissioning
- Economic Demand Response
- Metering & Monitoring
- Promoting the Energy Message

Leaner Energy Challenge
Reliability and Efficient use or transfer of energy

- **Reliability, Efficiency & Conservation management strategies taken**
- Chiller operations
- H.W. reset schedules
- Run schedules (occ./unocc., day/night, summer/winter)
- D.A. temperature reset schedules
- Steam pressures
- Installation of variable speed drives
- Isolation dampers for unoccupied areas
- Steam trap survey
- Shutting off air handling units in unoccupied areas.
- Maintaining modified space temperatures
- Promoting the energy message at department meetings

Leaner Energy Challenge
Reliability and Efficient use or transfer of energy

- **FACILITIES CHECKLIST**
- 200 Item Operational Checklist
- Chiller Plant Operations
- Boiler Plant Operations
- HVAC Systems
- Building Envelope
- Lighting
- Cooling Towers
- Exhaust Systems

Advocate Condell Medical Center

ENERGY AUDITOR CHECKLIST

	Does This Problem Exist?		Recommended		N/A
A. BUILDING ENVELOPE					
1. Improper alignment and operation of windows and doors allows excessive infiltration. Suggested O & Ms: a. Realign or re-hang windows or doors that do not close properly. In extreme cases, consider permanent sealing of windows. b. Make sure automatic door closing mechanisms work properly. c. Replace or repair faulty gaskets in garage or on other overhead doors. Suggested ECMs: a. Resize exterior doors; i.e., delivery doors, making them smaller to reduce excessive infiltration.* b. Add expandable separate enclosures, where practical. c. Install self-closing doors on openings to unconditioned spaces. d. Install a switch on overhead doors that prevents activation of heating and cooling units when doors are open. e. Install vestibule doors at major entrances.*	YES { }	NO { }	YES { }	NO { }	

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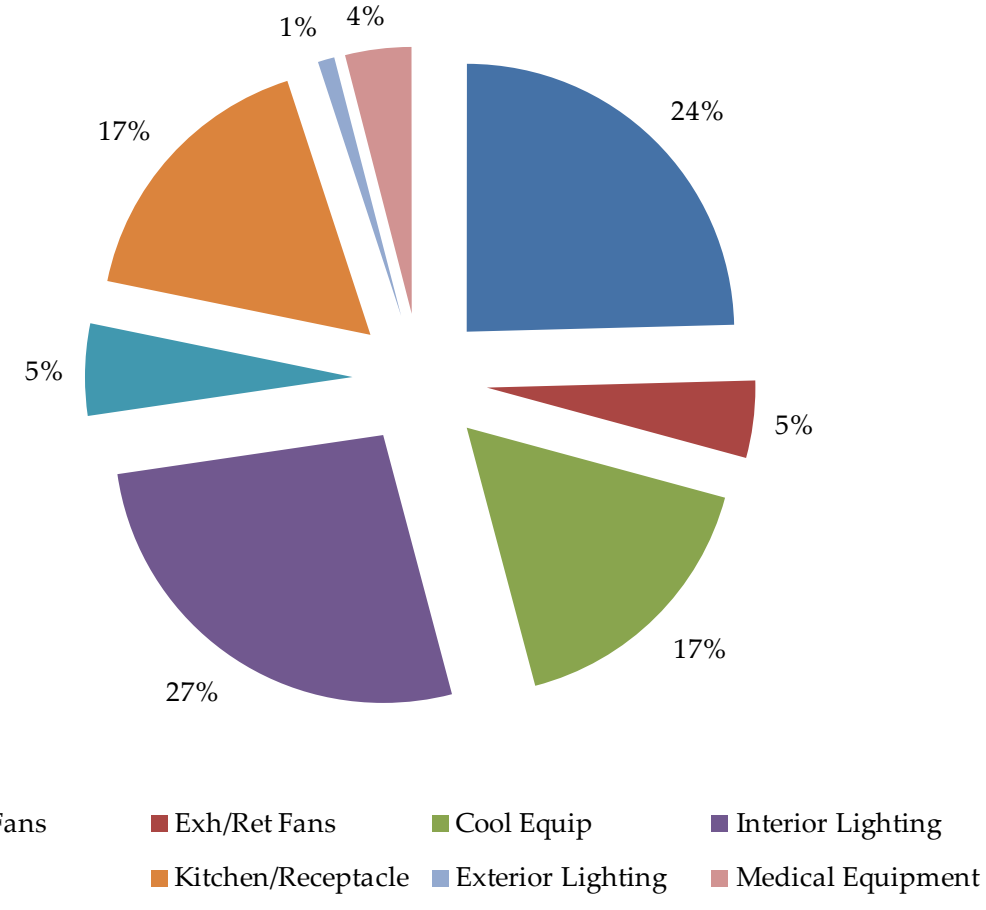
Leaner Energy Challenge
Where does our Energy Go?

Electricity End-Use Breakdown



Source: 2011 G/BA Report
Advocate Condell Medical Center

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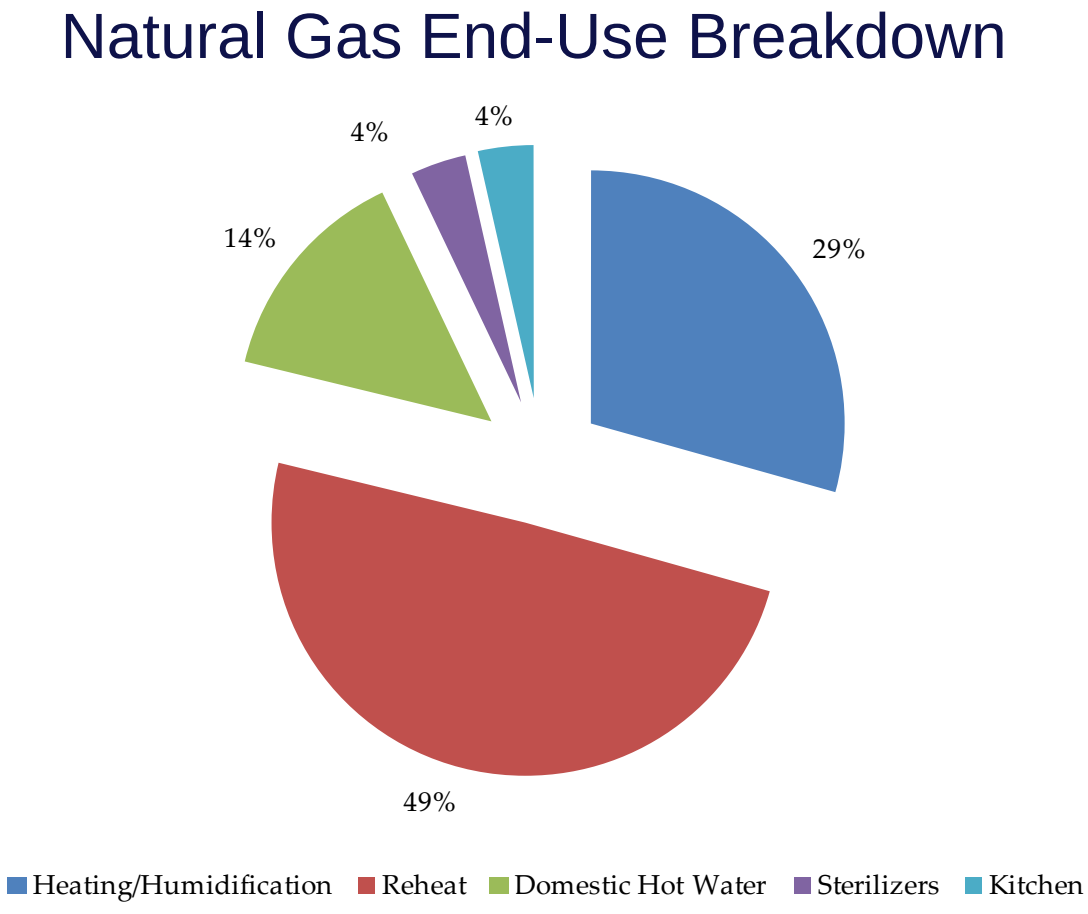

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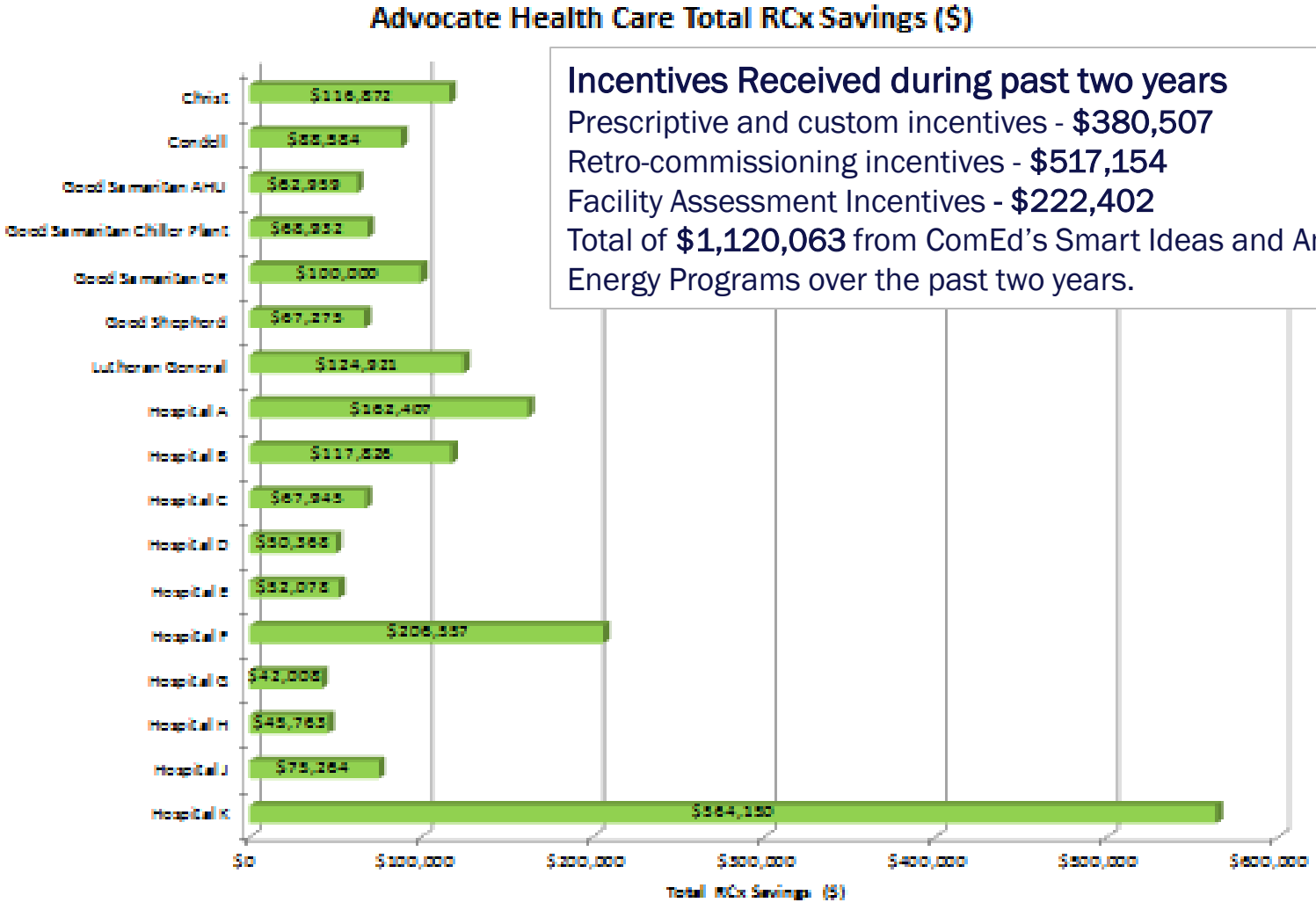
Reliability and Efficient use or transfer of energy



Incentives Received during past two years

Prescriptive and custom incentives - **$380,507**

Retro-commissioning incentives - **$517,154**

Facility Assessment Incentives - **$222,402**

Total of **$1,120,063** from ComEd's Smart Ideas and Ameren Act On Energy Programs over the past two years.

Source: 2012 G/BA Report

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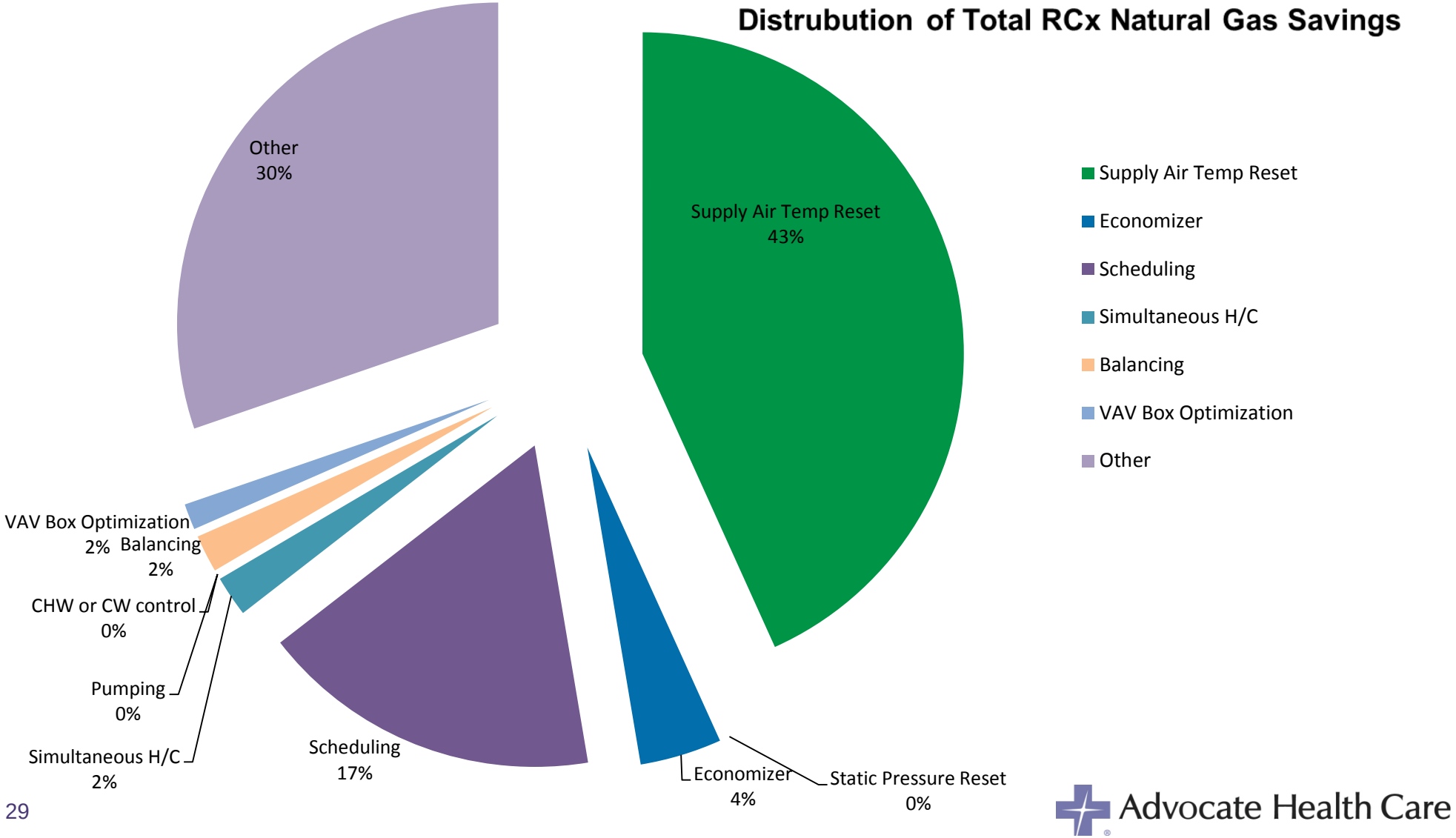
Reliability and Efficient use or transfer of energy



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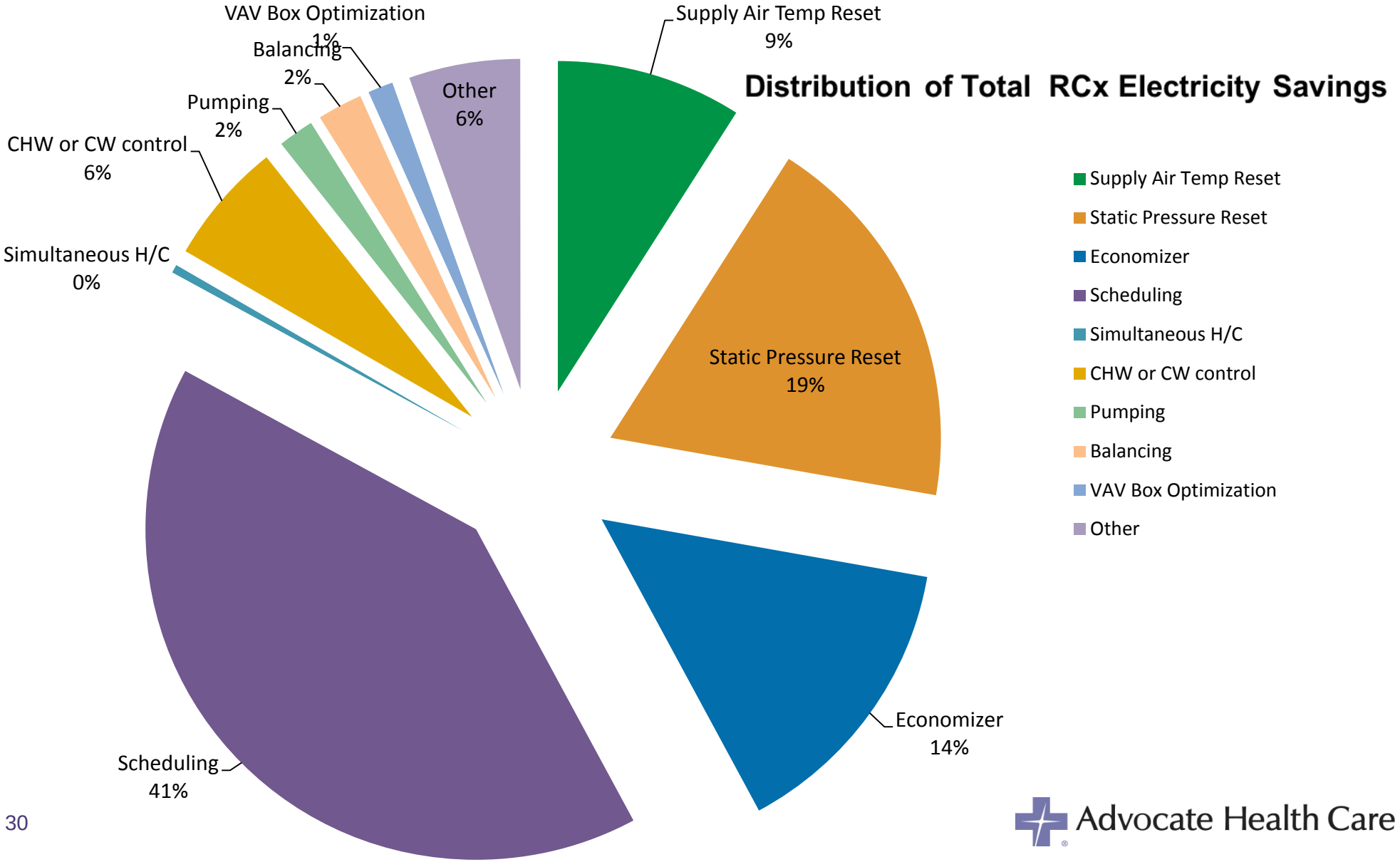
Reliability and Efficient use or transfer of energy



Advocate Health Care

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Evaluate Progress and Promote

- **Hospital Energy Usage Quick Facts**
  June 2011 through June 2012
  (12 month's ending data)

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Energy Used at Advocate Hospitals

- 225.5 Million KWh of Electricity
- 9.3 Million Therms of Natural Gas

Energy Reduced at Advocate Hospitals in Past Year

- 1,915,000 KWh of Electricity
- 627,000 Therms of Natural Gas
- 6.17 KBtu's per square foot
- 5,557 Metric Tons of Carbon Dioxide Equivalent Reduced

Emission Reduction and Equivalents

- Since June of last year our energy efficiency program at Advocate Health Care is equivalent to reducing 5,557 Metric Tons of Carbon Dioxide (CO2).
- That is equivalent to reducing greenhouse gases from 1,090 passenger vehicles
- Or the CO2 emissions from the electricity use of 693 homes for a year.
- Greenhouse gas emissions avoided by recycling 1,936 tons of waste in place of sending to a landfill
- Advocate used electricity during the past year that equates to 17,655 homes.
- The reduction of electricity by 1.9 Million KWh equates to 150 homes this past year.

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Recognize Achievements

- **ENERGY STAR Label: An ENERGY STAR Label can be attained when the hospital's rating reaches 75**
  - Advocate Illinois Masonic Medical Center
  - Advocate Eureka Hospital
  - Advocate Good Samaritan Hospital – July 2012
  - Touhy Support Center
  - Kensington Support Center

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Recognize Achievements

American Society for Healthcare Engineering (ASHE)

E2C Energy Award for 10% or 15% improvement

- Advocate BroMenn
- Advocate Condell
- Advocate Eureka
- Advocate Good Samaritan
- Advocate Illinois Masonic
- Advocate Lutheran General
- Advocate Trinity
- Advocate System

Leaner Energy Challenge

Recognize Achievements

- Advocate Health Care: Environmental Stewardship

Associate Engagement

Safer Chemicals

Energy & Waste Reduction

Smarter Purchasing

Healthier Foods

2011 Environmental Stewardship Award winners

Discussion/Questions

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Resources and information at the following links:

http://www.advocatehealth.com/environmentalstewardship