FACILITIES & SERVICES

Illinois Energy Success Story

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University of Illinois at Urbana-Champaign

The University of Illinois at Urbana-Champaign


Production
Conservation
Utilities & Energy
Services
Business Operations
Distribution
100
02/18 00:00:00
02/19 00:00:00
02/20 00:00:00
X (time)
Systems & Controls

Utilities & Energy Services Video

Reduce Building Energy Consumption By:

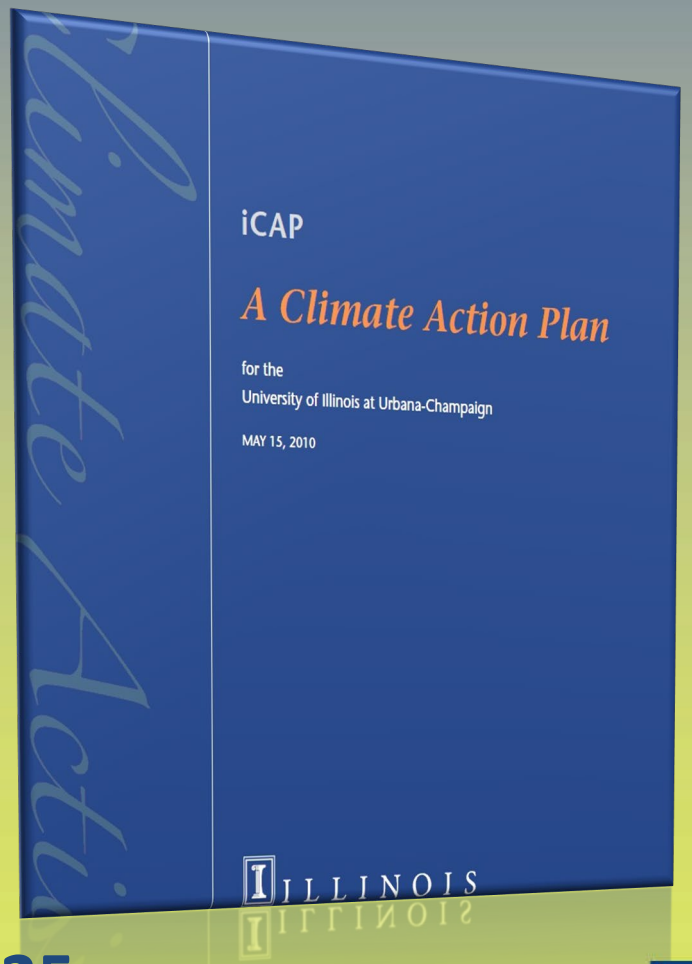
20% by FY15

30% by FY20

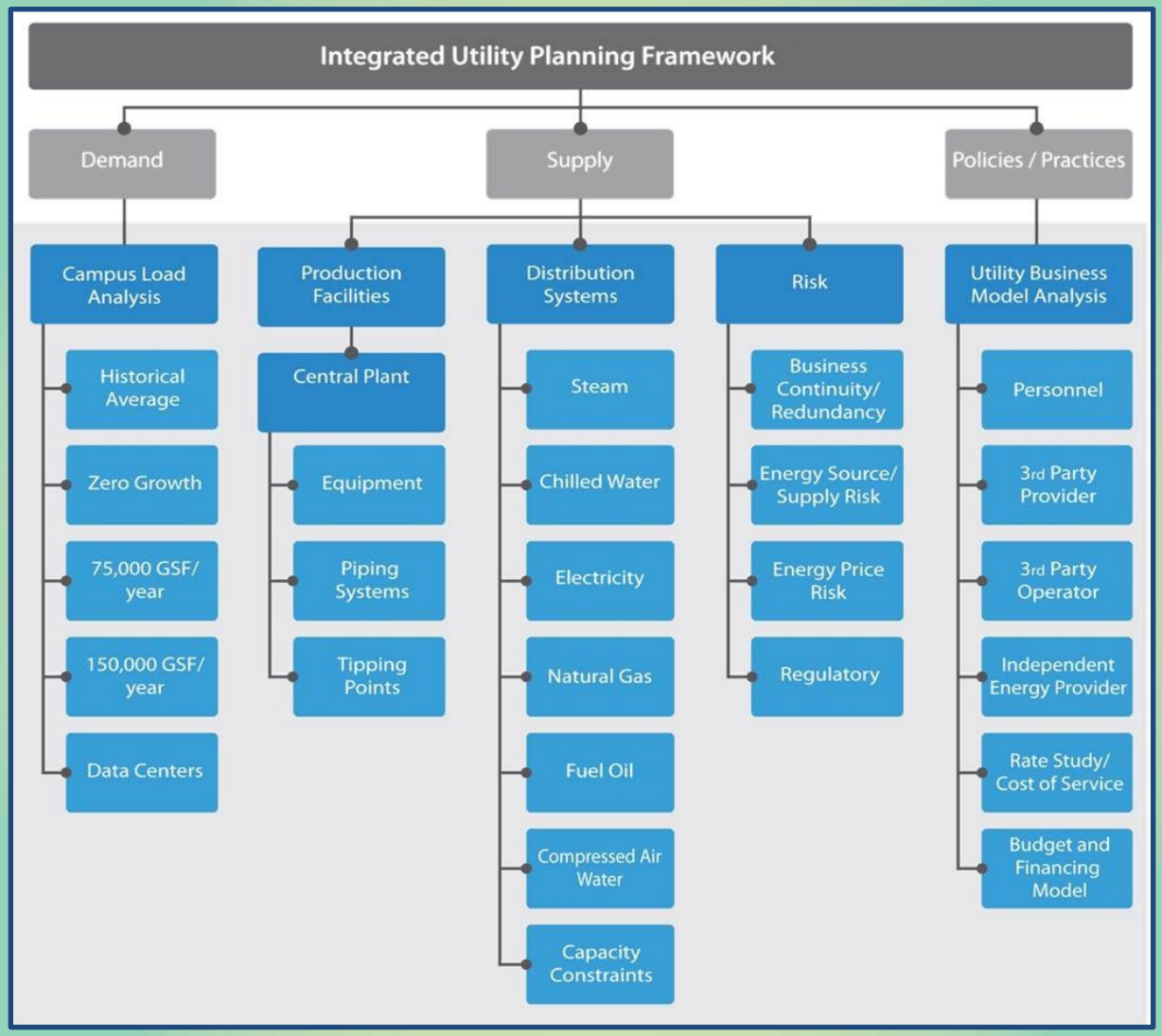
40% by FY25

Evaluate No Coal By 2017

25% Renewable Electricity by 2025



Infrastructure/Load Analysis



Utility Rate Components

- Fuel and purchased utility costs
- Chemicals
- Cost to distribute to the buildings
- Administrative labor costs
- Operations labor costs
- Maintenance costs
- Major repair/replacement costs
- Debt service
- Pre-FY09 Deficit (revision to annual payment)

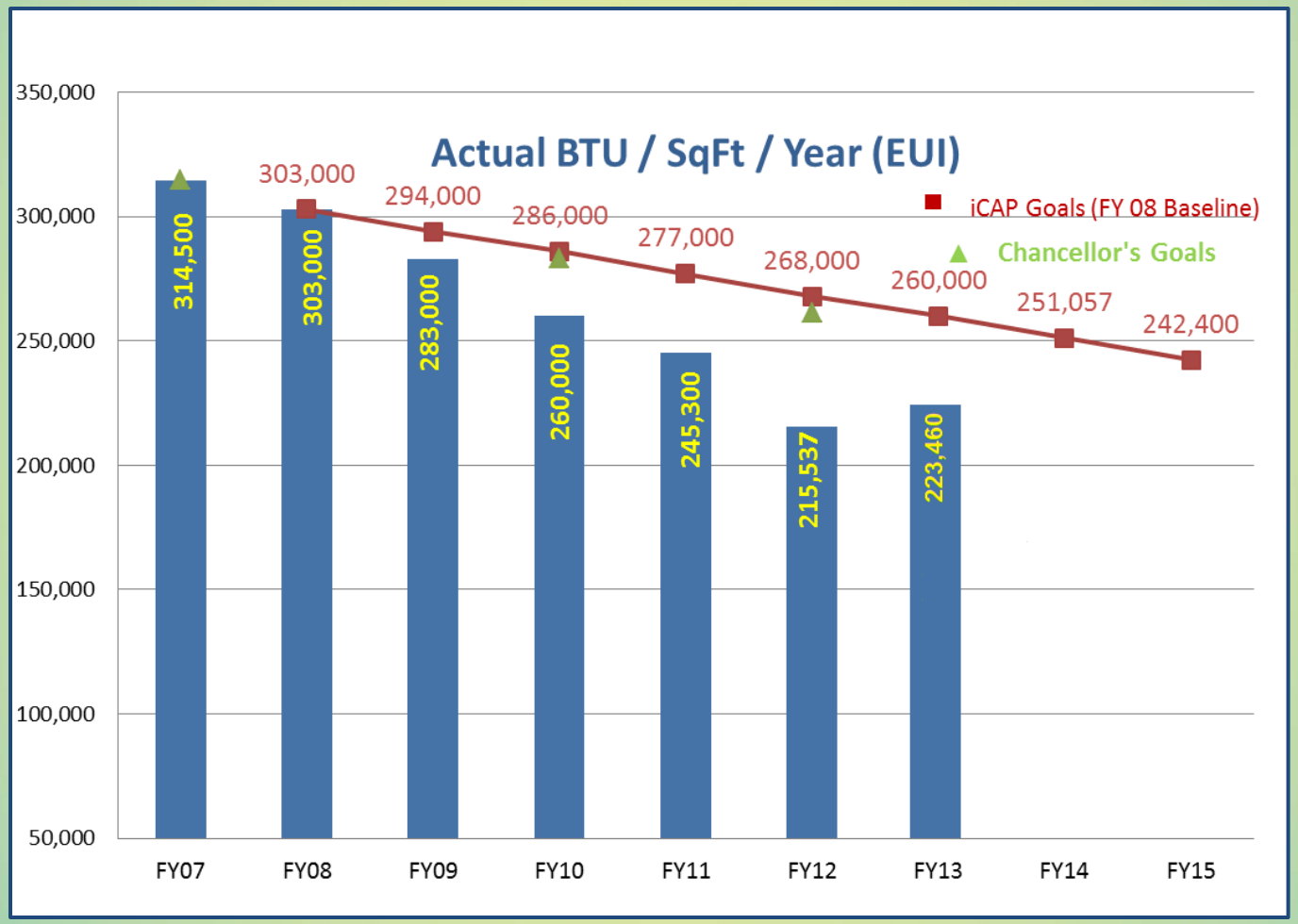
Utility Rate Development

- Reconcile Budget vs. Actual
- Not for Profit / Not for Loss
- No Subsidies
- Rate Adjustment – Over / Under Component

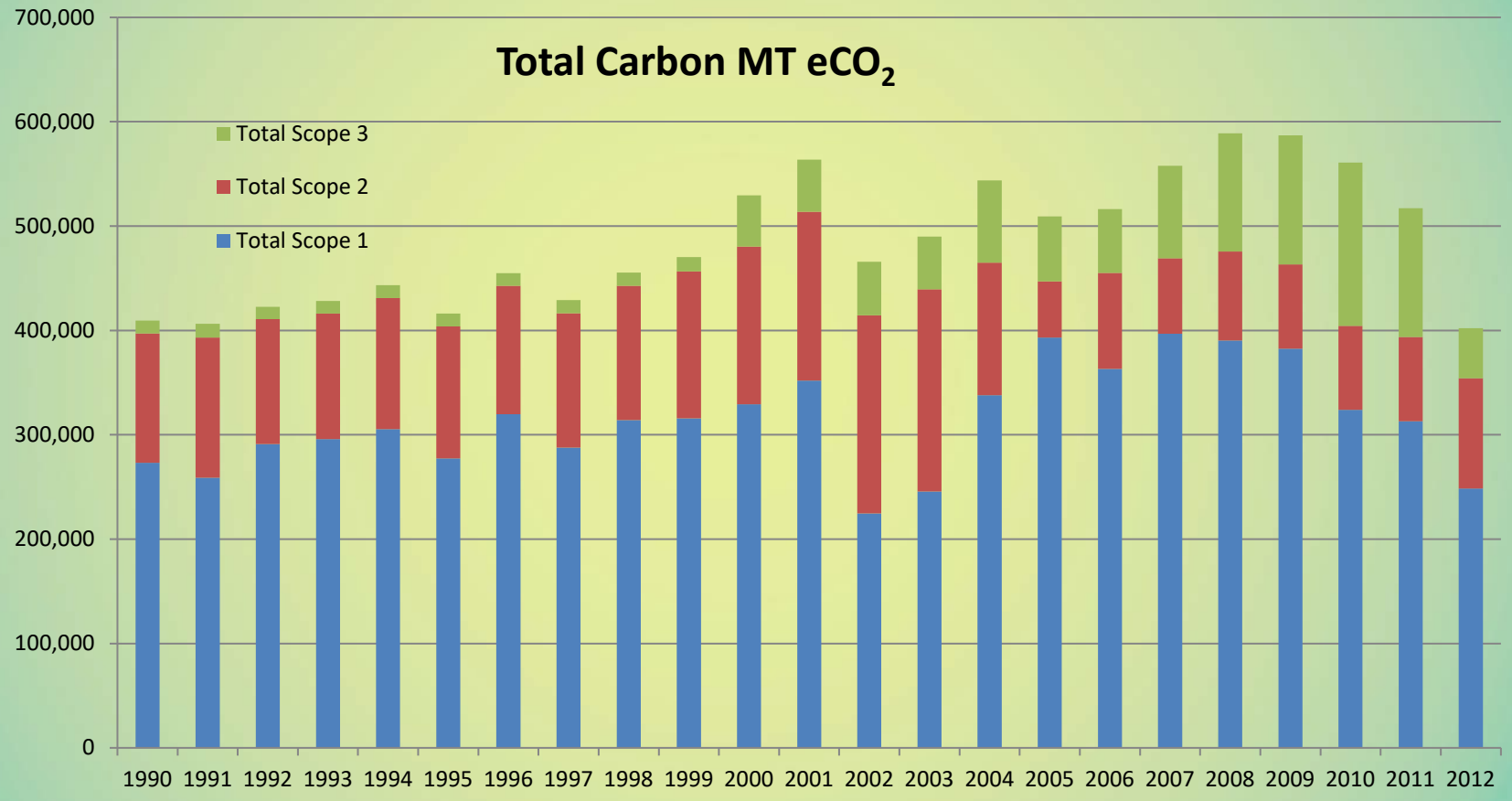
Utility Rate Development

- Budget Rate – Prior to Fiscal Year start
  - Estimate consumption by commodity
  - Market information to estimate prices
  - Compare purchase/generate/fuel source
  - Include fixed costs(debt, labor, capital, operations, deficit)
  - Previous year's – Budget vs. Actual
- Anticipated Fuel / Hedge Process
  - "Must Run" Nat Gas
  - Electric Block Purchase
- Operational Purchase – Gas / Elec (RTP)

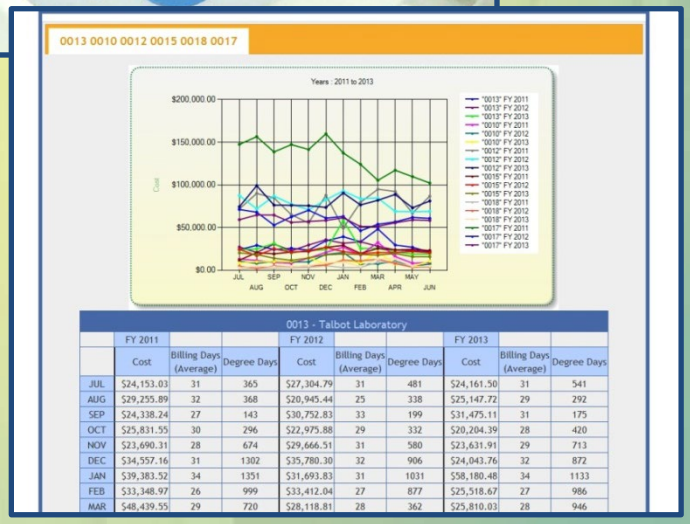
Energy Use Intensity Reduction



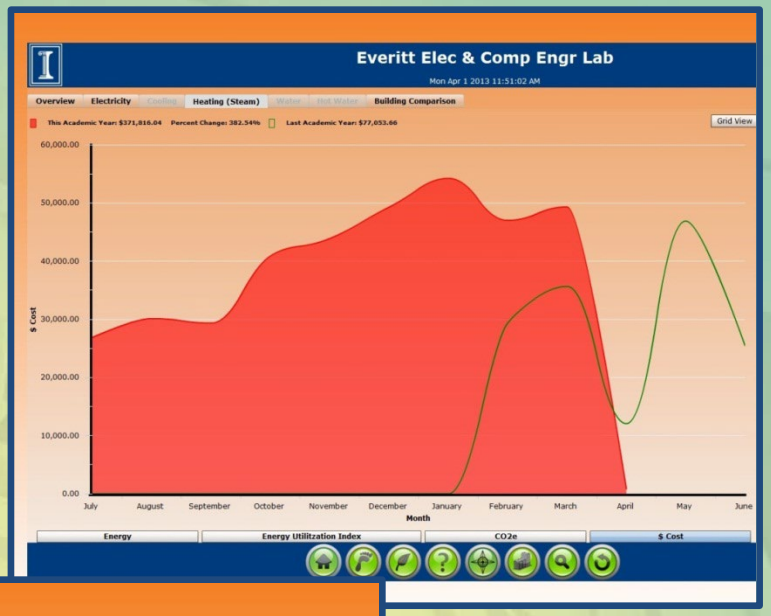
ACUPCC Carbon Reporting



Improved Data



Metering & Energy Billing System (EBS)



Energy Dashboard

Improved Data

Funding Sources

Academic Facilities Maintenance
Fund Assessment (AFMFA)
Third Party Financing
Illinois Department of Commerce and Economic Opportunity (DCEO)
American Recovery and Reinvestment Act
Illinois Clean Energy Community Foundation (ICECF)

Research

Conservation Work

Campus Involvement

Current Activities

- Utilities Master Planning
- Expanded Conservation & PM
- Campus Energy Incentive Program
- Consolidate / Virtualize Servers
- Solar Farm / Anaerobic Digester
- System Integration / Optimization

INCORPORATING NEW TECHNOLOGIES TO EFFECTIVELY REDESIGN STATE OF THE ART FACILITIES


Academi
Recommissioning (RCx)
Cost Av
Buildings

RCx Process

- Composite Crew
  - Service Mechanics / Engineering / DDC Programmer
- Parallel Process
  - Input / Evaluate / Troubleshoot / Repair/ Sequence / Schedule / Commission / Document
- Coordinate with other projects
  - Control Upgrade/ Deferred Maintenance / Energy Performance Contracting / Space Planning / Zone Maintenance

- Air Handling Units (AHU)
- Pneumatic Controls
- DDC Controls
- Fume Hoods
- Energy Recovery Systems
- CO2 Sensors
- Occupancy Sensors
- Heating Valves
- Outdoor Air Louver
- Perimeter Radiation Valves
- Discharge Air Temperature Sensors
- Variable Air Volume Boxes
- Variable Frequency Drives
- Building Pressurization Sensors
- Cross-Flow Sensors
- Dampers
- Steam Meters
- Chilled Water Meters

Top Five RCx Buildings

Top Five % Energy Avoided

Spurlock Museum	49.3%
Wohlers Hall	44.7%
Siebel Center	43.3%
ACES Library	41.6%
Campbell Hall	40.6%

Top Five Cumulative Cost Avoidance*

*based on variable utility rates

Krannert Center	$1.5M
Siebel Center	$1.0M
Madigan Laboratory	$827K
Mechanical Engineering	$679K
Digital Computer Lab	$629K

Spurlock Museum

Krannert Center For the Performing Arts


Payback
VETERINARY MEDICINE
oject
Project life
Avoidan

Vet Med ESCO Project Process

- **Audit explanation**

Vet Med ESCO Project Process

- Preliminary Technical Audit
- Investment Grade Audit
- Energy Service Agreement
- M & V - (~ 40 % Vet Med)


Energy Performance
Contracting

Oak Street Chiller ESCO Project

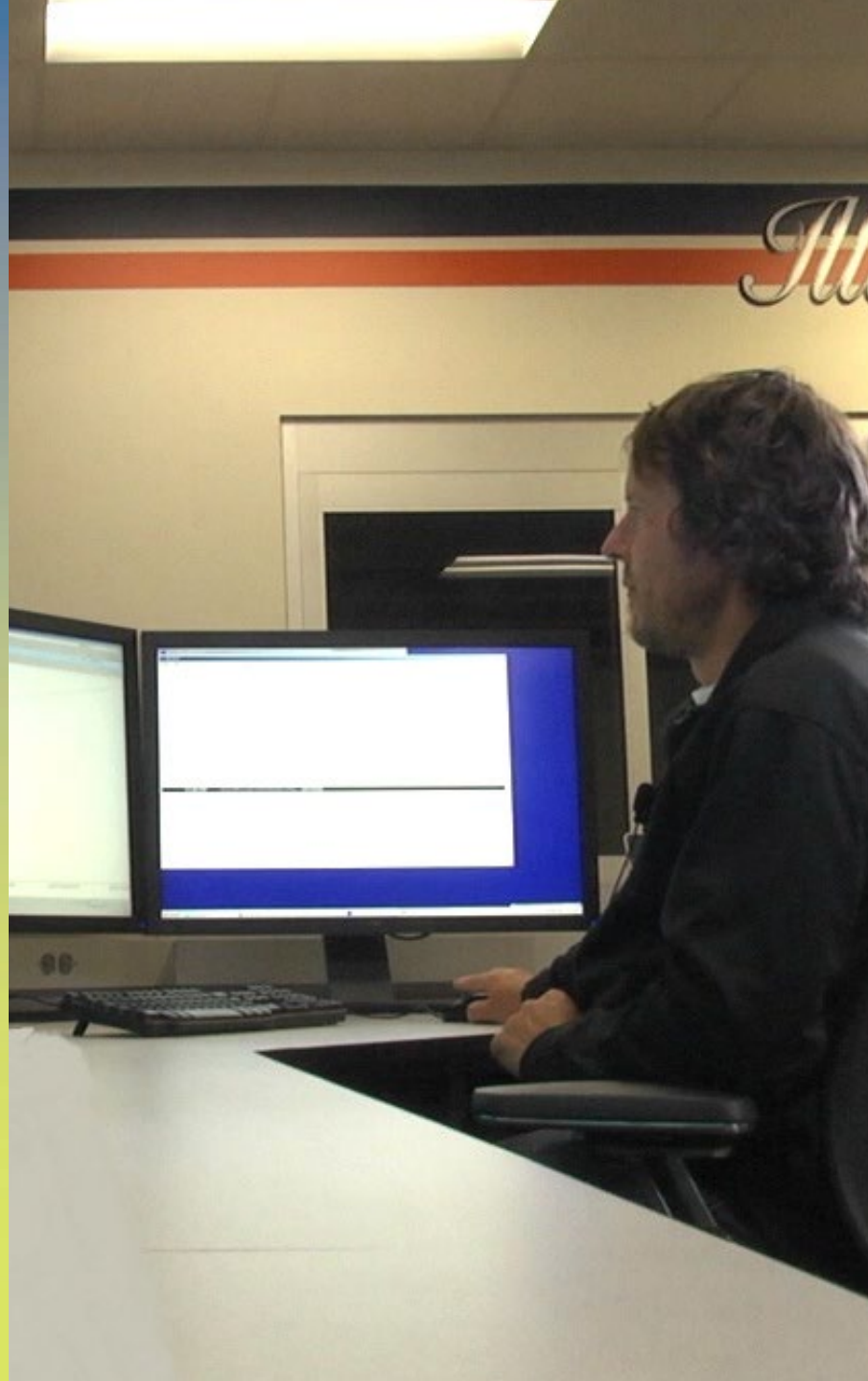
Water-Cooled Chillers

Refrigerant Storage

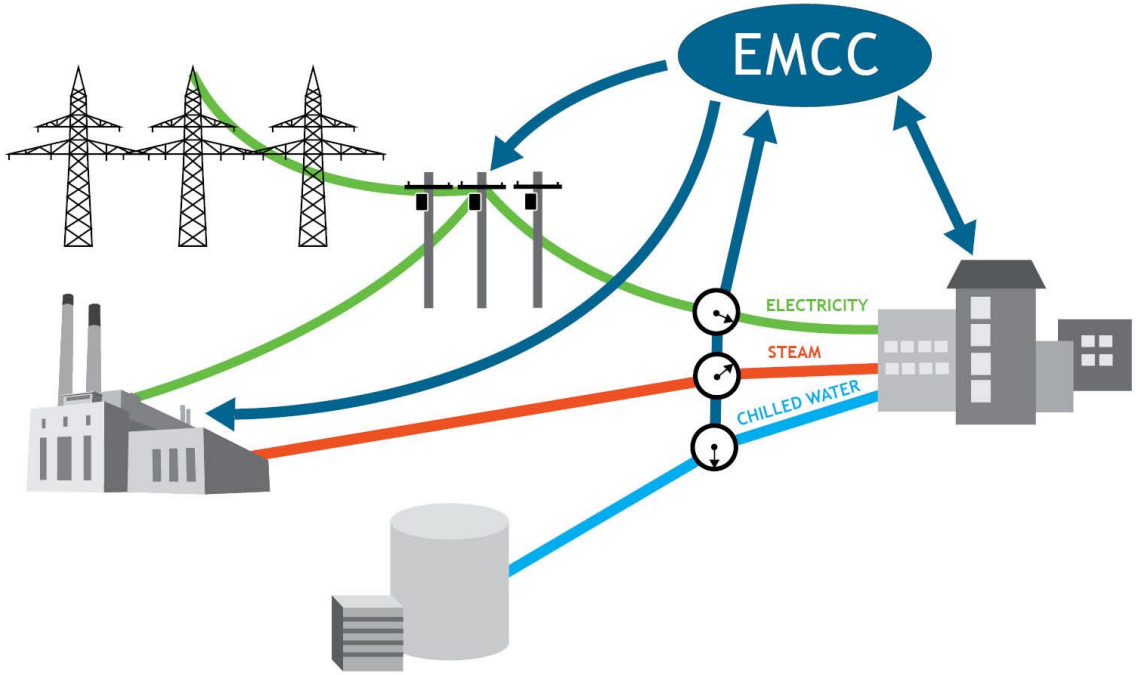
Cooling Towers

Future Energy Performance Contracting

INTEGRATING HIGHLY PROPRIETARY PRODUCT CONTROLS IN A MULTIPLE VENDOR ENVIRONMENT



Illinois Energy Enterprise



IMPLEMENTING AN EFFECTIVE ENERGY MANAGEMENT PROGRAM VIA IMPROVED MONITORING AND CONTROL CAPABILITIES

Energy Management Control Center

- Unplanned Event Operations
- Increased Security / Virtualization Reliability
- Systems Integration
- Optimization – Efficiency Buildings and Plants
- Market Interface – Load / Purchase / Production

Market Opportunities

- Coal – Annual Contract (w/ min)
- Nat Gas – Budget / Hedge vs. Daily Operations
- Electric – MISO - Real Time Market
  - Hedge Purchase
  - Day Ahead Purchase
  - Hourly Purchase (RTP)
  - Demand Response – Energy Storage
  - Frequency Control (short term)

FACILITIES & SERVICES

QUESTIONS?

Illinois Energy Success Story

CoPs and Robbers: Musings of An Old Outlaw

Presenter: **Jack Dempsey**

Room: Greenway D

Time: Saturday, August 3; 3:15-4:15 p.m.