Arkansas Utility Baseline

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Agency Kick-off Meeting: December 14, 2010
AGENDA

- Project overview
- Introductions
- Cadmus team and expertise
- ENERGY STAR and benchmarking overview
- Status of Arkansas agency benchmarking
  - Objectives
  - Process and timeline
  - Data collection, what it involves for each agency
  - Benchmarking, what Cadmus will do and report
- Utility rate review
- Training & Support
- Questions and answers
- Closing thoughts
- Office hours
Cadmus Team and Expertise

- The Cadmus Group, Inc.
- Viridian
- PMC Group, LLC
- Ion Utilities, Inc.
What is ENERGY STAR?

- A government-backed, voluntary program that helps businesses and individuals protect the environment through superior energy performance by providing energy-efficient solutions for homes, businesses, and institutions.

- The national symbol for environmental protection through energy efficiency, recognized by more than 75% of all U.S. households.

- Known for products, homes and C&I facilities

Benchmarking with Portfolio Manager

Anything with a meter attached can be benchmarked

- Compare facility energy use against its own baseline
- Compare facilities of a similar type to each other
- Compare facilities of a similar type to national metrics
- Set priorities for use of limited staff time and/or investment capital
- Prepare reports, assist with ASHRAE audits, more.
- More detailed reports possible for select buildings using EPA Score

Meeting Act 1494 of 2009

- Benchmark the energy use of all of your facilities
  - Site and source energy use intensity (EUI), GHG emissions.
  - Many buildings, including office buildings can receive energy performance ratings on a 1-100 scale.
- Monitor changes in energy and water use over time in single buildings, groups of buildings, or entire portfolios.
- Report cost savings and CO₂ emissions.
- Get federal recognition with ENERGY STAR.
- More at www.energystar.gov/benchmark
Rating System for Buildings

Fuel Efficiency

**MPG**

Is 60 MPG high or low for an automobile?

Statement of Energy Performance

EPA Rating

Is 80 kBtu/SF/YR high or low for a building?

ENERGY STAR Score
Eligible Building Types

- Bank/Financial Institutions
- Courthouses
- Data Centers
- Dormitories
- Hospitals
- Hotels
- Houses of Worship
- K-12 Schools
- Medical Offices
- Office Buildings
- Retail Stores
- Supermarkets
- Warehouses
- Wastewater Treatment Plants

Possible Score Eligible Buildings in Arkansas State Government

- Courthouses
- Data Centers
- Hospitals
- Medical Offices
- Office Buildings
- Warehouses
- Wastewater Treatment Plants

Possible Score Eligible Buildings in AR State Government plus Education

Examples of Other Space Types

- Police Stations
- Fire Stations
- Assisted Living Facilities
- Convention Centers
- Laboratories
- Libraries
- Malls
- Movie Theatres
- Restaurants
- Stadiums and Arenas

Other Space Types Anticipated in AR

- Police Stations
- Fire Stations
- Assisted Living Facilities
- Convention Centers
- Laboratories
- Libraries
- Malls
- Movie Theatres
- Restaurants
- Stadiums and Arenas

Benchmarking with Portfolio Manager

Anything with a meter attached can be benchmarked

- Single building, single electricity, heating fuel and water meters
- Single building, multiple meters for each utility
- Multiple buildings, single meters (campus type)
- Multiple buildings, multiple meters (campus type)
- A-typical uses include: pumps, antennas, traffic signal controllers, and other non-facility applications.

Required Information for Benchmarking in Portfolio Manager

- **Building Identifiers**
  Name, street address, zip code for weather normalization

- **Space Type Data (depends on building type)**
  - Example for Offices: Square footage, hours of operation, Number of workers on main shift, # of PC’s, Percent of gross floor area that is air conditioned, heated

- **Utility Use (Energy and water)**
  - Bldg specific invoice information from all purchased energy. Begin with at least 11 consecutive months for each source and update with monthly usage data.

Assess Performance for Smart Energy Management

- Verify gains from upgrade efforts
- Require specific rating gains from service providers in select building types such as office or warehouse

Arkansas Utility Baseline

- Objectives
- Process and timeline
- Data collection, what it involves for each agency
- Benchmarking and QA
Understanding the Project

- Advance AR EE programs, lead by example
- Protect financial & environmental resources
- Comply with Act 1494 of 2009
  - Reduce water, electricity, and natural gas usage
    - 20% by 2014
    - 30% by 2017
Objectives

• Task 1
  – Establish ESPM accounts,
  – Verify account data in ESPM
  – Review rate tariffs;

• Task 2
  – Keep it Going! Train trainers!
  – Provide technical support
    • Arkansas@cadmusgroup.com
    • 1-855- 266-9773
    • Web portal where you can find documentation, instructions, FAQs, etc.
Kickoff

- **Startup: Initial analysis (Nov-Dec)**
- **Work with agencies (Jan-onward)**
- **Coordination: Hold monthly or other regular meetings and training sessions with stakeholders (Jan-Jun)**
Task 1

- Gather facility and utility data.
- Establish ESPM accounts.
  - Some need PM accounts: Group A
  - Others have PM accounts: Group B
- Proof all data, look for anomalies, and recommend corrective action.
- Review rate tariffs and recommend corrective action if necessary.
- Place data in AR ESPM accounts
Task 1 – Group A Process

• Objectives
  – Get all buildings not benchmarked yet accurately into ESPM
  – QA data in ESPM
  – Fix inaccuracies
  – Determine billing rates inaccurate
  – Submit status reports on completion
Task 1 - Benchmarking

- Group A: Buildings not benchmarked

<table>
<thead>
<tr>
<th>Task 1 Timeline-Not Benchmarked</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
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<tbody>
<tr>
<td>Meet with key contacts, get number and type of buildings</td>
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<td>Get a list of buildings, space types, and account numbers</td>
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<td>Explain data requirements to agency staff</td>
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<tr>
<td>Assess available data held by agencies</td>
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<td>Share data anomalies with agencies, fix them</td>
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<td>Final QA-Follow QA directions for Group B</td>
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<td>Submit final status report to AEO and agencies</td>
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</table>
Data QA Process - Group A

• Critical step in maximizing accuracy
• Improves analysis and decision making
• Includes checking for the following:
  – Gaps in utility bills
  – Overlapping dates
  – Double-billing
  – Consistency in building names
• Dynamic checklist in place
# Task 1 - Benchmarking

## Group B: Buildings benchmarked

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<th>Task 1 Timeline-Benchmarked</th>
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<tr>
<td>Compare data obtained with data in ESPM</td>
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<td>Share data anomalies with agencies, fix them</td>
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</table>
Data QA Process - Group B

• Very similar to Group A process except QA of data & spreadsheets in advance
• Critical step in maximizing accuracy
• Includes checking for the following:
  – Gaps in utility bills, overlapping dates
  – Double-billing
  – Consistency in building names
  – Make sure calculations make sense

• Dynamic checklist in place
Task 1-Utility Rate Analysis

- For ALL buildings
  - Gather additional information for analysis including detailed billing data, kWh, kW, rate schedules, rate codes per account, etc.
  - Determine anomalies in billing data, if any, and prepare a report to be submitted to each agency and AEO.
Task 1 – Utility Rate Analysis

• For ALL accounts

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<th>Task 1 Timeline-Utility Rate Analysis</th>
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<th>Mar</th>
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<tbody>
<tr>
<td>Meet with key contacts (agencies and utilities)</td>
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<tr>
<td>Assess data held by agencies (Advantage IQ, bills, etc.)</td>
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<td>Determine billing determinants (Electric, Gas, Water)</td>
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<td>Verify a sample of bill calculations</td>
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<td>Review potential tariffs to minimize utility cost</td>
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<td>Verify appropriate tariff</td>
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</tbody>
</table>
Process: Utility Rate Analysis

- Determine billing determinants
  - Electric: Demand (kW or kVA); Energy (kWh)
  - Gas: Capacity Demand “CD” (MMBtu); Peak daily use; Annual volume limits; consumption (MMBtu)
  - Water: Consumption (1000 gallons)
- Verify appropriate tariff
- Verify a sample of bill calculations
- Review potential tariffs to minimize utility cost
Billing Determinants - Electric

- Customer charge ($/month)
  - May include a monthly minimum
- Demand charge ($/kW)
- Energy charge ($/kWh)
- Seasonality
- Time of Use
- Tariff riders
  - Generally $/kWh
  - Used to fund specifically identified items such as franchise taxes
Billing Determinants - Gas

- Customer charge ($/month)
- Distribution Demand charge ($/CD/Month)
- Distribution rate ($/MMBtu)
- Supply ($/MMBtu)
- Tariff riders
  - Generally $/MMBtu
  - Used to fund specifically identified items such as franchise taxes
Billing Determinants - Water

- Customer charge ($/month)
- Consumption charge ($/1000 gallons)
- Tariff riders
  - Not as prevalent as in electric and gas
Verify Tariff

- Identify building type and size
- Identify customer usage information
- Compare usage information and building characteristics to tariff applicability criteria
- Flag for follow-up if building does not appear to qualify for service under the tariff
Verify Sample Calculations

• It is unlikely that automated billing systems produce mathematically incorrect bills...however

• Select an appropriate sample of bills and verify the calculations.
  - Flag any bills that appear to be incorrect for follow-up
  - Bills may be incorrect due to:
    • Systematic errors
    • Adjustments
    • Mechanical errors (addressing)
Verify Optimal Tariff Schedule

- Many utilities offer multiple tariffs
  - Standard
  - Time of Use
  - Interruptible
- Based on building usage and characteristics
  - Calculate annual bill under all applicable tariffs
  - Review cost differential to assure building is served under lowest cost option considering
    - Risk (economic, physical)
    - Service upgrades
Task 1-Accounts Completed

- Expected completion of 60% of accounts: 6/30/11 or about 3,600 accounts
- A completed account will require AEO approval.
- Cadmus prepared a “completed accounts checklist” including steps that indicate progress towards completing each account.
- Agency prioritization to be determined with work with agencies and AEO, if needed
# Accounts Completed Checklist

## Accounts Completed Checklist

<table>
<thead>
<tr>
<th>Agency Name (from PM)</th>
<th>Building Name (from PM)</th>
<th>Account Name</th>
<th>Fuel Type</th>
<th>Percent Completed</th>
<th>Utility Data</th>
<th>Building Attributes</th>
<th>Operating Attributes</th>
<th>Utility Rates Analyzed</th>
<th>Pre-upload Review</th>
<th>Data Uploaded</th>
<th>Post Upload Review</th>
<th>Errors Corrected</th>
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<tbody>
<tr>
<td>AR0350_BUILDING_AUTHORITY 100-04 - Justice Building East Wing</td>
<td>1231213 Electricity - Grid P</td>
<td>65%</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
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<td>AR0350_BUILDING_AUTHORITY 100-04 - Justice Building East Wing</td>
<td>Gas Meter ID</td>
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<td>AR0350_BUILDING_AUTHORITY 100-04 - Justice Building East Wing</td>
<td>Water ID #</td>
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<tr>
<td>AR0350_BUILDING_AUTHORITY 100-05 - C&amp;F &amp; a Admin Building</td>
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<tr>
<td>AR0350_BUILDING_AUTHORITY 100-09 - Multi Agency Complex/Big Mac</td>
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<td>AR0350_BUILDING_AUTHORITY 100-19 - Office - 410 Battery</td>
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**Input Value**
Enter "x" if step completed.
Task 2 - Training

- Sustainability is the goal!

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<thead>
<tr>
<th>Task 2 Timeline - Training</th>
<th>Dec</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
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<tbody>
<tr>
<td>Meet with key contacts, assess training needs</td>
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<tr>
<td>Scheduled/conduct Level 101 sessions (6 onsite)*</td>
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<tr>
<td>Scheduled/conduct Level 102 sessions (6 onsite)*</td>
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<tr>
<td>Scheduled/conduct level 101 Q&amp;A sessions (3 online)</td>
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<tr>
<td>Scheduled/conduct Level 102 Q&amp;A sessions (3 online)</td>
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<tr>
<td>Distribute slides and supporting materials</td>
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<td>Submit final status report to AEO and agencies</td>
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* Train-the-trainer sessions
Task 2 – Technical Support

- Create support lines for agencies to contact when they have questions
  - Toll-free support line - 1-855-266-9773 (open line 8 am – 5 pm Central time weekdays)

- Added value: Arkansas@cadmusgroup.com
  Cadmus also created this e-mail hotline to answer questions to keep a written record of communications which will be used for factsheets, instructions, FAQs, etc.

- Added value: Cadmus will discuss with AEO the possibility of creating a Web portal where we can post documentation, instructions, FAQs, etc. for agencies
## Task 2 – Technical Support

- Technical Support available now!

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<thead>
<tr>
<th>Task 1 Timeline – Technical Support</th>
<th>Dec</th>
<th>Jan</th>
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<tbody>
<tr>
<td>Create a toll-free support line: 1-855-266-9773</td>
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<tr>
<td>Create an e-mail hotline: <a href="mailto:Arkansas@cadmusgroup.com">Arkansas@cadmusgroup.com</a></td>
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<td>Provide continuous technical support</td>
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<td>Prepare documentation (FAQs, factsheets, etc.)</td>
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<td>Submit status report to AEO</td>
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Revised Plan

- **December 17:** Draft detailed timeline revision due. Timeline will be dynamic and will be updated to benefit the State of Arkansas.
- Final plan to be completed **5 business days** after comments and feedback received from AEO. This timeline will also be dynamic and will be updated per direction from AEO.
- In addition to what is presented here, revised plan will include:
  - Final metrics to be used for energy performance besides source EUI;
  - Strategy for approaching agencies and utilities (to be determined by AEO)
Pilot (December and January)

- Meet with agency key staff
- Work with ABA or other lead agency to:
  - improve processes and find out what works best for AR
  - Perform utility rate analysis
  - Review space characteristic, energy and water data for inaccuracies and missing information.
  - Collect missing information and fix errors in ESPM, if needed.
  - Revise overarching “completed account checklist” used for the project, if applicable.
- Check data transfer algorithms with select agencies
  - Connect to data management software such as Advantage IQ, Avista or UM Pro
- Ensure coordination with utilities
  - Harmonize data process, release forms or other procedures
  - Complete hand shake on utility tariffs
Reporting

• Monthly Reporting
  – Complete ARRA template plus any additional AEO data required to assess progress.

• Quarterly Reporting
  – All reports will provide AEO with data required to assess progress.
  – AEO to provide Cadmus with report templates (December 2010).
Reporting

- Reporting to ensure
  - Project plan is followed
  - Goals met

<table>
<thead>
<tr>
<th>Reporting Timeline</th>
<th>Dec</th>
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<tbody>
<tr>
<td>Monthly Reporting</td>
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<td>Quarterly Reporting</td>
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<td>Other reports as needed</td>
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</table>
## Contacts & Support

**Toll-free support line: 1-855-266-9773**
(9 am – 6 pm weekdays)

**Arkansas@cadmusgroup.com**
(24 hour turn around time)

<table>
<thead>
<tr>
<th>Name</th>
<th>Title/Office</th>
<th>Phone Number</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ed Ellis, CEM</td>
<td>Arkansas Energy Office</td>
<td>(501) 682-7694</td>
<td><a href="mailto:eellis@arkansasedc.com">eellis@arkansasedc.com</a></td>
</tr>
<tr>
<td>Julio Rovi</td>
<td>The Cadmus Group, Inc.</td>
<td>703-247-6128</td>
<td><a href="mailto:Julio.Rovi@cadmusgroup.com">Julio.Rovi@cadmusgroup.com</a></td>
</tr>
<tr>
<td>Kudret Utebay</td>
<td>The Cadmus Group, Inc.</td>
<td>703-247-6138</td>
<td><a href="mailto:Kudret.Utebay@cadmusgroup.com">Kudret.Utebay@cadmusgroup.com</a></td>
</tr>
<tr>
<td>Shubhada Kambli</td>
<td>The Cadmus Group, Inc.</td>
<td></td>
<td><a href="mailto:Shubhada.Kambli@cadmusgroup.com">Shubhada.Kambli@cadmusgroup.com</a></td>
</tr>
</tbody>
</table>
We are looking forward to start working with you!

Thank you!
Select Cadmus Tech Support Team

Name, Role, Phone, email@cadmusgroup.com

Kudret Utebay, Project Manager, 703-247-6138, kudret.utebay
Shubhada Kambli, Deputy PM, (203) 770-3714, shubhada.kambli

Colin Dunn, (703) 247-6121, Data QA Lead, colin.dunn
Jake Demann, Data entry, 503-575-4575, jake.demann
John Burningham, Utilities Lead, (801) 641-3915, john.burningham
Matthew Tenney, (703) 247-6164, Rate Analysis, matthew.tenney
Rik Banerjee, Upload template specialist, 703-247-6142, rik.banerjee
Brian Hedman, Utility Rate Advisor, (503) 467-7125, brian.hedman

Julio Rovi, Practice Leader, 703-247-6128, julio.rovi