ENVISION CHARLOTTE
UNITING FOR A SUSTAINABLE CITY

Envision Charlotte Project

2016 Building Technologies Office Peer Review

Acknowledgment:

This material is based upon work supported by the Department of Energy, Office of Energy Efficiency and Renewable Energy (EERE), under Award Number DE-EE0007066.

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Mac McCord
Project Manager - Envision Charlotte
mmccord@envisioncharlotte.org

Project Summary

Timeline:

Start date: July 15, 2015

Planned end date: July 14, 2018

Key Milestones

1. Execute contracts with sub-awardees (Dec '15)
2. Data Foundation & Energy Roundtable Programs – reach over 60 buildings; Building Re-Tuning Training – enroll 50 facilities managers (Dec '16)
3. Develop comprehensive behavioral change program – register over 1,000 new participants (June '17)

Budget:

Total Project $ as of *03/14/2016*: **$85,791**

- DOE: $75,010
- Cost Share: $10,781

Total Project $: **$1,076,783**

- DOE: $500,000
- Cost Share: $576,783

Key Partners:

UNC Charlotte SIBS	City of Charlotte
Center for Climate & Energy Solutions	Carolinas HealthCare System
Charlotte Center City Partners	Duke Energy

Project Goal:

- To realize a 20% aggregate energy savings across more than 200 buildings in the Greater Charlotte region.
- Develop and implement a comprehensive behavioral change component to ensure sustainable energy savings beyond the period of the project
- Utilize smart city initiatives to create a scalable, replicable model for market transformation

Purpose and Objectives

Problem Statement: Envision Charlotte was very successful during the Smart Energy Now pilot with support from Duke Energy – how do we continue and grow based on that success?

Target Market and Audience: Building Owners, Building Operators, Facility Managers, and Building Tenants across the following sectors:

1) Commercial, Real Estate & Hospitality;
2) Higher Education;
3) Healthcare; and
4) Retail

Impact of Project: By enabling building energy-use reductions in the Greater Charlotte Area, Envision Charlotte will:

- Reduce the cost of doing business in Charlotte, resulting in the creation of greater economic development and environmental benefits;
- Serve as a replicable model for other urban business cores; and
- Capitalize on current momentum to realize our mission to make Uptown Charlotte the most sustainable urban core in the nation.

Approach

Approach: ***Data Foundation & Energy Roundtable***

UNC Charlotte leads a two tiered approach:

- Identify *operational* energy savings opportunities
- Identify *capital* improvements

Key Issues:

- Coordination with Duke Energy's Smart Energy in Offices program
- Turnaround in property management
- Rapid adoption of analytics platforms

Distinctive Characteristics:

- Engaging UNC Charlotte students, to provide a real-world learning experience in the local community to support workforce development
- Providing a third-party, vendor-neutral set of recommendations for buildings to reduce energy use

Data Foundation & Energy Roundtable

Partnership with Duke Energy's SEIO Program:

SEIO uses various campaigns to focus upon two issues:

- Operator engagement
- Occupant engagement

How do we partner:

- Two students partnered with a building throughout the semester
- Student team works with the building operator to assist with various operator campaigns
  - Key campaigns:
    - Coasting Time
    - All about that BAS
    - Go with the Flow
    - Wiser Economizer
- Students work with both BAS & Interval data in ECAM; use BRT process to develop recommendations

Data Foundation & Energy Roundtable – Example

Coasting Time

- Focuses upon occupancy scheduling in buildings
- Students use ECAM and examine specific trends:
  - Duct static pressure
  - Supply fan status
  - OAT
  - OAD position signal
  - DAT
- Students provide report on potential opportunities

Reporting

- Students use the BRT process to provide specific insights at the appropriate campaign milestones
- Students provide final summary report

Approach

Approach: ***Building Re-Tuning Training***

UNC Charlotte offers a training course intended to help building operations staff learn how to operate buildings more efficiently, reduce operating cost and provide energy savings – based on materials developed by The Pacific Northwest National Laboratory (PNNL).

Key Issues:

- Determining the needs of the participant: number, size, and types of buildings in portfolio
- Adapting curriculum to the participant's needs

Distinctive Characteristics:

- The training course is offered for two general categories of buildings:
  1. Large buildings with building automation systems (BAS), and
  2. Small to Medium-sized buildings without BAS

BRT Training

What Have We Found?

- Two different types of operators in Charlotte:
  - Very sophisticated, trend toward use of analytics
  - Mininimal sophisication, poor understanding by operators of the relationships between occupant complaints and operational actions
- We discovered that a regional “needs assessment“ was required
- We’re looking at a blend of small building BRT offering & large building BRT offering
  - Development in process right now
  - First offering scheduled to begin in May 2016

Approach

Approach: ***Behavioral Change Program***

The project approach will include a comprehensive behavioral change component that offers a vehicle for broad sustainability messaging and engagement to ensure that investments achieve their full potential over the long-term.

Key Issues:

- Coordination of messaging and campaign scheduling with similar utility-led program to maintain separate branding and avoid audience confusion

Distinctive Characteristics:

- Collaboration with utility to develop and utilize Smart-Phone App
- App serves as the main platform for messaging and engagement around community-wide campaigns focused on smart and sustainable behavior

Progress and Accomplishments

Accomplishments:

First round of 15 buildings scheduled to complete the Energy Roundtable by May 2016, with over 60 buildings to be completed by December 2016.

Market Impact:

Total of 17.2% energy reduction across Envision Charlotte's existing 61 buildings as of September 2015.

Awards/Recognition:

In September 2015 Envision America, a program based on the success of Envision Charlotte, was announced and highlighted as part of the White House's Smart Cities Initiative.

Lessons Learned:

- Collaboration with local utility is essential.
- EM&V requirements & regulations can make coordinating with utility difficult.
- High degree of interest from multiple buildings wanting to participate can cause challenges in determining which buildings/properties have the most need in terms of energy efficiency gains.

Project Integration and Collaboration

Project Integration:

- *DOE*: Building Retuning Toolkit; Advanced Energy Retrofit Guidelines (AERG); Building Performance Database; Building Re-Tuning Training
- *Duke Energy*: Smart Energy in Offices; Business Energy Advisor

Partners, Subcontractors, and Collaborators:

University of North Carolina at Charlotte; Duke Energy;
City of Charlotte; Center for Climate and Energy Solutions (C2ES);
Charlotte Center City Partners; Carolinas HealthCare System

Communications:

- Led by Charlotte Center City Partners & the City of Charlotte's Smart Cities Council
- Charlotte's Smart Cities Council is the main platform for coordinating our Market Transformation and Deployment Plan

Next Steps and Future Plans

Data Foundation & Energy Roundtable

- Coordinate UNCC student energy audits with Duke Energy's Smart Energy in Offices and Business Energy Advisor.
- UNCC students to complete 60 audits by end of calendar year.

Building Re-Tuning Training

- First round of Carolinas HealthCare System trainees scheduled, May-June 2016.

Behavioral Change Program

- Soft launch events to begin, April 2016
- Official launch, July 2016

REFERENCE SLIDES

Project Budget

Project Budget: Total DOE Budget $500,000. Total Cost-Share $576,783.
Variances: None.
Cost to Date: DOE costs to date are 15% of the project's DOE Budget.
Additional Funding: None.

Budget History					
July 15, 2015 – FY 2015 (past)		FY 2016 (current)		FY 2017 – July 14, 2018 (planned)	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
$41,993	$600	$33,017	$10,181	$115,269	$193,073

Project Plan and Schedule