

Engaging the Private Sector in State Climate/Energy Planning Processes

Robert Jackson, Michigan Agency for Energy

Clay Nesler, Johnson Controls

Cisco DeVries, Renew Financial





Michigan-Northeastern Ohio Regional Roadmap Project DOE State Energy Program Competitive Grant Award

Project Objective

The Michigan-Northeastern Ohio Regional Roadmap Project (Regional Roadmap Project) will create **regional economic development strategies** and action plans and will identify and map strategic interventions to foster more competitive private-sector **clean energy manufacturing** and **energy efficiency clusters** in Michigan and Ohio.

Michigan-Northeastern Ohio Regional Economic Development Strategies

Stakeholder Engagement Strategy:

- Identified business sectors and demographics, technologies with high energy efficiency value and greatest economic development potential and return of investment in the region.
- Engaged technology end-users in "Listening Sessions" in Michigan and Ohio and social media to solicit input and support on objectives, scope of work, benefits, etc.
- Listened and revised workplans to create regional economical development strategies based feedback.

Michigan-Northeastern Ohio Regional Economic Development Strategies

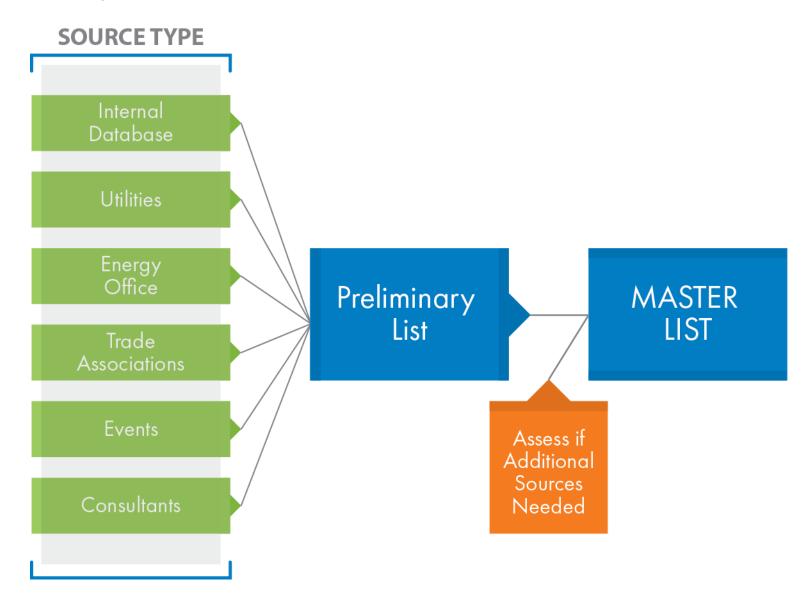
Stakeholder Engagement Strategy:

- Used plan to identify and map strategic opportunities to facilitate competitive private-sector clean energy manufacturing and implementation of energy efficiency clusters in Michigan and Ohio.
- Our intent was to engage end users early in the process to influence manufacturing habits, product designs, technology adoption, access to capital, etc. and uptake in the market place.
- Create a Roadmap that reflects manufacturing in Michigan and Ohio.

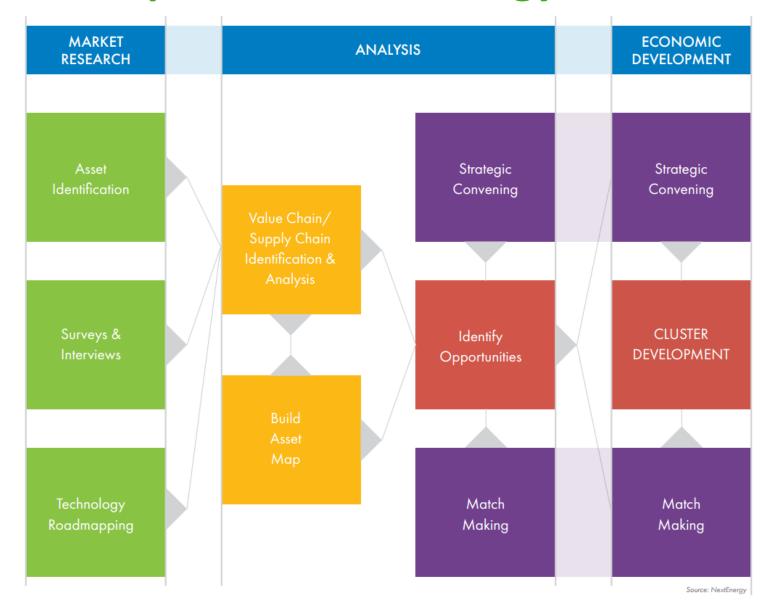
Research Overview

Research Overview – Asset mapping methodology

List development



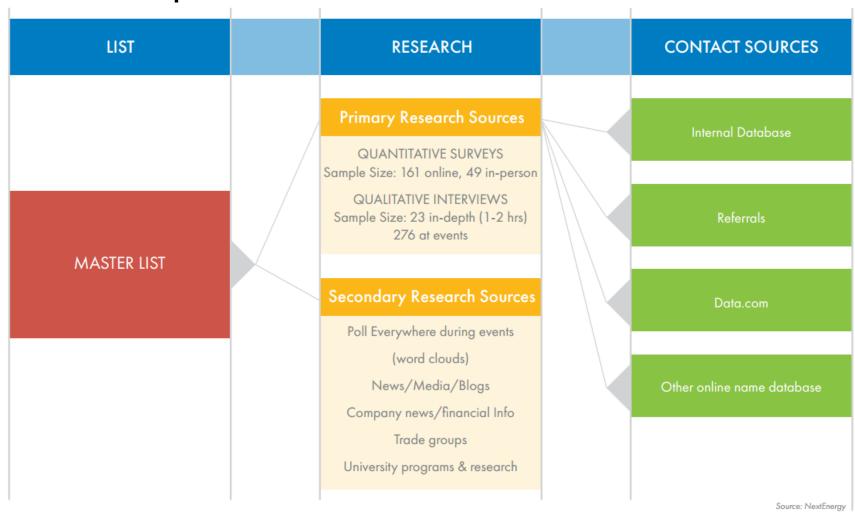
Cluster Development Methodology



Research Overview - Methodology

Surveys & Interview

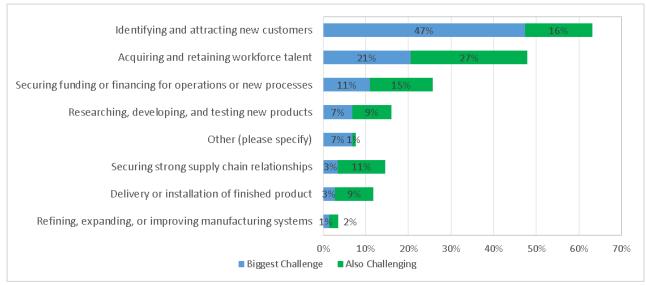
Data collection process



Research Overview - Survey Highlights

- The Energy Efficiency market is optimistic with 63% expecting to add employees in the next 12 months (only 1% reducing head count)
- Michigan has strong intellectual property and R&D with 11,267 patents claimed to have been identified by EEBT companies and
- Biggest challenges are identifying new customers and acquiring and retaining talent

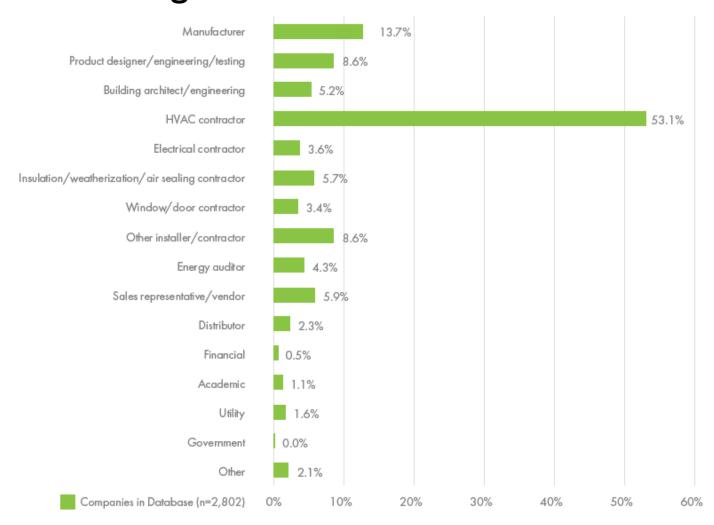




Sample Size: 144
Source: NextEnergy

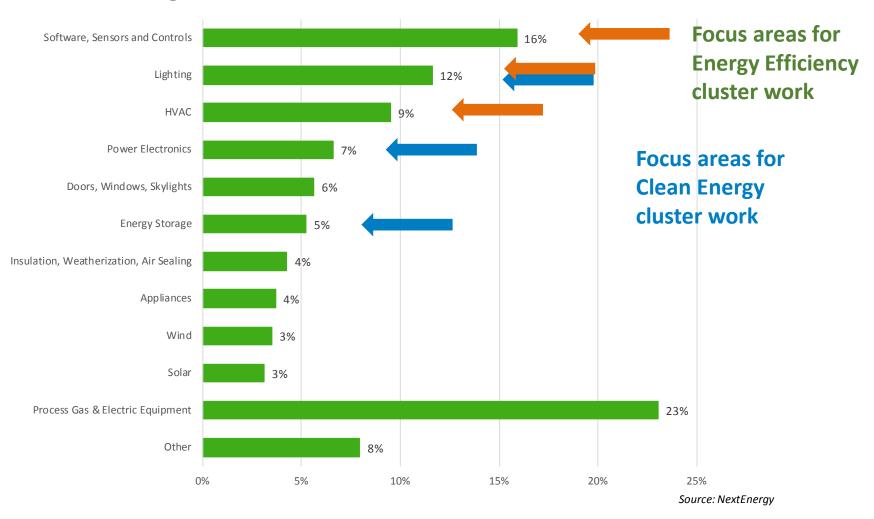
Research Overview - Energy Efficiency Value Chain

Companies identified as part of the EEBT Value Chain in Michigan



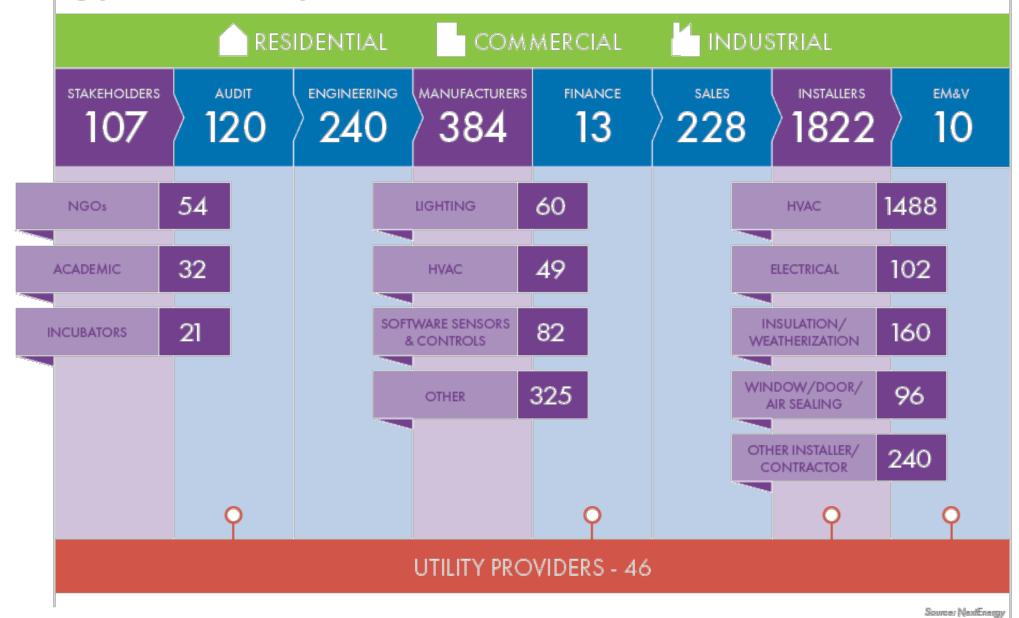
Research Overview - Manufacturers in Energy Efficient Building Technology

Product Offerings of Energy Efficiency Manufacturers in Michigan



Energy Efficiency Building -Roadmap Technologies

Energy Efficiency Value Chain



Energy Efficiency Value Chain

STRENGTHS	WEAKNESSES	OPPORTUNITIES	THREATS
 PA 295 has driven adoption of energy efficiency Utility EO programs push energy efficiency market Michigan Saves and PACE provide path to financing Strong contractor networks Diverse ecosystem of energy efficiency assets in MI Robust manufacturing, research, and engineering base Strong supply chain has developed from automotive technology developers Emerging IT and software ecosystem Many Tier 1 auto suppliers have energy efficiency in their product portfolios, providing opportunity for global markets Strong IP development channels Solid education programs 	 Energy efficiency programs fluctuation makes availability uncertain (on/off/on, etc.) Disparate, uncoordinated public programs and processes are difficult for contractors and others to navigate Customer awareness of energy efficiency technology, benefits, and financing options Contractors often sell the status quo, in order to not lose or complicate a sale Silos for energy efficiency, renewable energy efficiency and demand response leads to inefficient programs Major national and global energy efficiency brands are not located in MI, particularly in HVAC and renewable energy markets IP development in MI, yet sales in MI are challenging 	 Stronger/revised building codes could push energy efficiency EPA Clean Power Plan provides opportunity to push new technologies (integrated energy efficiency, renewable energy, automated demand response, storage) Incentivize and grow the contractor "army" of energy efficiency advocates Sales training for contractors Energy efficiency sales tools Business model training and development support Streamlined EO program and processes Leverage partnership opportunities with innovators and manufacturers Better Buy/Sell/Deploy financing options 	State EO and renewable energy policies and legislation are in flux and difficult to plan for Energy efficiency improvements compete with other capital expenditures Low energy prices mean energy efficiency ROI is less compelling on its own

Lighting Supply Chain Michigan

- · Plastics BASF
- · Si Dow Coming
- · SiC Dow Corning
- . Epoxy Dow Chemical
- . Phosphors Dow Chemical

ELECTRICAL COMPONENTS

CHIP DIODE EMS

. . .

PCB

- Adco Circuits
- Amptech
- . Debron Industrial Electronics
- EBW Electronics
- * Lumosmart
- Malibu
- Saline Lectronics
- Saturn Electronics

POWER DRIVER

- Bosch
- * Flextronics
- Infineon
- Landmark Energy Davelopment

LIGHT ENGINE

- * BGM
- · EBW Electronics
- Innoted
- WIRING ASSEMBLY
- NewTech3
- SpecialTree

SMART LIGHTING

SENSORS

- AMF Nano
- Electro-Matic

CONTROLS/SOFTWARE

- AMF Nano
- Arborlight
- Arrow Electronics
- * Electro-Matic
- . Illuminating Concepts
- Kanepi
- Light Corp.
- Linelight
- Nextek Power Solutions
- Qualite Sports Lighting, LLC
- Relume



- Arborlight
- · Best Lights, Inc.
- · Duo-Gard
- · EBW Electronics
- Everlast Lighting
- High Q Lighting
- Innoted
- · Kimberly Lighting
- Ledos
- · Light Corp
- Lumerica
- · Lumecon
- Midwest Circuits
- · Paramount
- · Relume
- · Solar Street Lights
- · Solartonia
- . The Straights Lighting Company
- Venntis Technologies



- · Estrakon

- Kirlin
- · Lumecon
- · Light-Speed USA

- TOGGLED

- · Intertek
- * TUV

PRODUCT LIGHT DESIGN

- Arborlight
- Best lights
- Bluecolt Lighting
- · Bratic Enterprises
- * Duo-Gard
- · Earthtronics
- EBW Electronics
- Estrakon
- Everlast lighting
- High Q Lighting
- Illuminating Concepts
- Innoted
- Landscape Forms
- . LEoDer Lights, LLC
- . LED Optical Solutions
- . Light-Speed USA
- * Magwerks
- Midwest Circuits
- * Paramount
- . Solar Street Lights USA.
- Solartonia
- · The Straights Lighting Company
- Yenn's Technologies

COMPONENTS

OPTICALLENSES

- ConlED
- Lexa-Lite * Lunenflow

THERMAL MGT

- Century Foundry ACTIVE COOLING
- . . .

HOUSINGS

- · Port City Group
- MOUNTS Flash Bridge Co. Inc.

. General Structures Inc.

- POLES
- · Lyte Poles Qualite

· · · No companies present

Janes Hardings

Lighting Supply Chain NORTHEAST OHIO

MATERIALS

- · Graftech
- Momentive Performance Materials
- OhVations
- · Polyone
- · Shin-Etsu Silicones

ELECTRICAL COMPONENTS

CHIP DIODE

. . .

- Arrow Electronics
- Libro Industries
- · RBB Systems
- · RPC Electronics
- . Techtron Systems, Inc.
- Valtronic Technologies USA. Inc.

POWER DRIVER

- Delta Systems
- Valtronic Technologies USA,
- Venture Lighting Int'l.
- · Wireless Environment

LIGHT ENGINE

. . .

WIRING ASSEMBLY

- SpecialTree
- . Thermirol, Inc.
- Tip Products
- Western Reserve Wire Products

PRODUCT LIGHT DESIGN

- Advanced Lighting Technologies, Inc.
- Arrow Electronics
- AVID Technologies Inc.
- · Bluetronix
- . Essential Research, Inc.
- Eye Lighting
- · GE Lighting Solutions, LLC
- Lighting Innovations
- . Lighting Services, Inc.
- · Nottingham Spirk
- Smart Shape
- Valtronic Technologies USA,
- · Vincent Lighting Systems



BUILT ENVIRONMENT

- . Bock Lighting
- · Cleanlife LED
- · Energy Focus
- . ETI Solid State Lighting
- . Eye Lighting (hwasaki Electric)
- . GE Lighting Solutions LLC
- · Global Lighting Technologies
- · Green Rock Lighting
- Hinkley Lighting
- . King Luminaire/StressCrete
- . Lumination, Inc.
- . Megalight, Inc.
- · Rambus
- . Starbright Lighting USA
- · STERIS Inc.
- . Technical Consumer Products,
- . The L.D. Kichler Co.
- . US Lighting Group
- · Valtronic Technologies USA
- . Wireless Environment LLC

TESTING/VALIDATION

· Lighting Innovations . Tech Belt Energy Innovation

· CSA Group

OPTICAL LENSES · Global Lighting Technologies Kent Displays · Lumitex

MECHANICAL

COMPONENTS

- · Rambus Lighting
- . Venture Lighting Int'l.

THERMAL MANAGEMENT

- Graftech
- ACTIVE COOLING
- GE Lighting

HOUSINGS

- Aerolite Extrusion Company
- · Astro Manufacturing
- · Astro Shapes Inc.
- Automation Plastics
- · Extrudex Aluminum
- · General Extrusions Inc.
- · GSH Industries
- · J and O Plastics J&M Costings
- Jaco Manufacturing
- . Lemer & Associates
- Magnode Corporation
- · Mercury Plastics
- Middlefield Plastics
- · Plastic Extrusion Technologies
- · Steere Enterprises
- · Technology House
- Thogus

SMART LIGHTING

SENSORS

- GE Lighting
- · Greenrock Lighting
- · Philips Lighting
- · Rambus
- · TCP Lighting

CONTROLS/SOFTWARE

Arrow Electronics

COMMUNICATIONS/CAMERAS

. Green Rock Lighting

· · · No companies present

Key Findings – Lighting Supply Chain

- A significant portion of the Value Chain is comprised of contractors
- EE programs in Michigan and Ohio are disparate
- Financing for R&D is a challenge and lack of awareness of capital
- EE is still a tough sell
- Strong innovation, engineering, manufacturing base strong from auto industry
- Limited opportunities for product deployment in Michigan
- Strong need for concise legislation and policies to drive adoption
- Michigan has both "upstream" R+D, "downstream "deployment"
- Sub component manufacturing occurs overseas

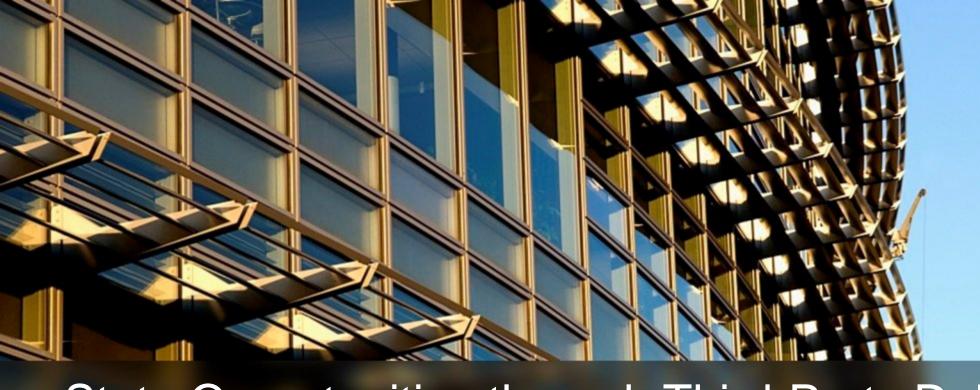
Outreach Event - Informing the Marketplace

CLEAN ENERGY ROADMAP PROJECT EVENT METRICS					
EVENT		SECTOR (Industrial, Residential, Commercial)	# of attendees	ACTION	
PCOMING EVENTS					
Michigan Advanced Lighting Conference		ALL	300	Plan and host	
Ohio lighting event (TBD)		ALL	TBD	Plan and host	
V2B Mashup		ALL	100	Plan and host	
AST EVENTS					
LED Lighting in Northeast Ohio: Exploring Mutual Opportunities for Success	2015	ALL	40	Plan and host	
DTE Energy / ESD Energy Conference & Exhibition		ALL	800	Networking	
MI Commercial & Industrial Conference - Upper Peninsula		ALL	150	Presentation	
MI Commercial & Industrial Conference - Lower Peninsula		I/C	250	Networking	
MI CHP Conference		I/C	100	Networking	
MEEA Annual Meeting		ALL	100	Presentation	
Midwest Energy Solutions Conference		ALL	630	Presentation	
Michigan Advanced Lighting Community Event		ALL	80	Plan and host	
Smart Energy Summit		С	250	Matchmaking	
Manufacturing in America		I	2300	Networking	
MI Commercial & Industrial Conference - Upper Peninsula		ALL	150	Presentation	
MI Commercial & Industrial Conference - Lower Peninsula		I/C	250	Presentation	
DTE Energy / ESD Energy Conference & Exhibition	2014	ALL	800	Networking	
Michigan Energy Efficiency Expo		ALL	200	Exhibited & Sponsored	
Michigan Advanced Lighting Conference	2014	I/C	219	Plan and host	
Energy Innovation Business Council Networking Event	2014	ALL	75	Presentation	
OTALS CONTRACTOR OF THE PROPERTY OF THE PROPER					
Total number of project events to date	16				
Total number of future planned events	3				
Total number of event attendees	11,848				



ACCELERATING CLEAN ENERGY GROWTH IN MICHIGAN AND OHIO

Robert Jackson, Director
Regional and National Response Division
Michigan Agency for Energy



State Opportunities through Third-Party Delivered Energy Efficiency

Leveraging Energy Savings Performance Contracting to cost effectively meet regulatory requirements

Clay Nesler VP, Global Energy and Sustainability clay.g.nesler@jci.com



Energy Service Company Coalition





















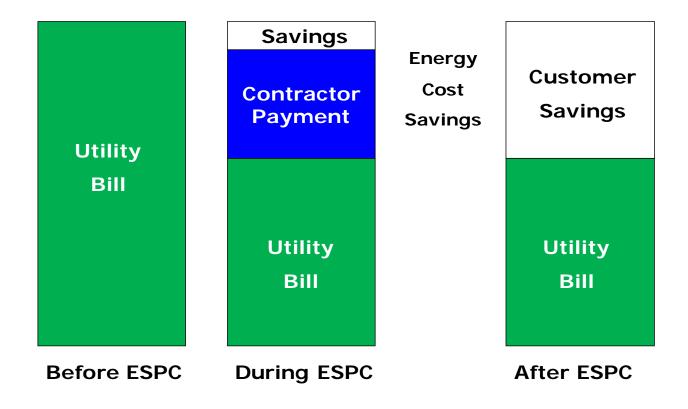


State Opportunities

- Optimize State CPP Implementation Plans
- Collaborate on EM&V and EE Registry Development
- State NAAQS Implementation Plans
- Regional GHG Programs (AB 32 / RGGI)
- Utility Performance-Based Retrofit Programs
- State Executive Orders



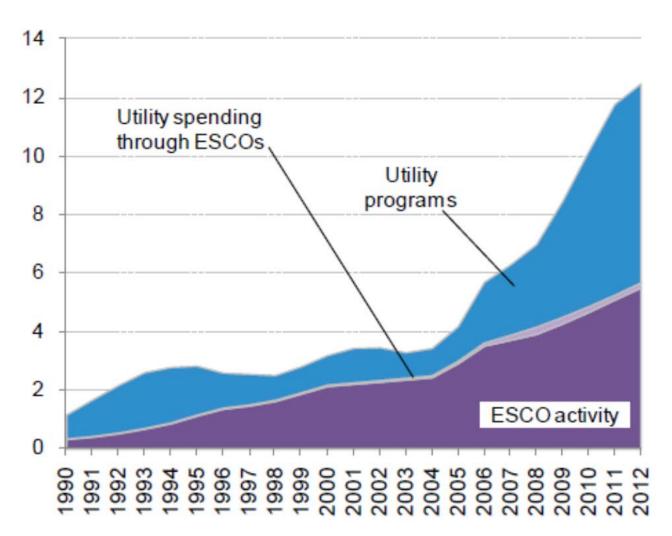
Energy Savings Performance Contracting (ESPC)



- Realigns utility expenses towards improvements which save energy
 - Bundles multiple solutions (lighting, HVAC, controls, building envelope, renewables, etc.)
- Typical project energy reduction ranges between 15% to 30%
 - Contract term typically ranges between 10 to 17 years
 - Typical per project investment can range from \$1M to \$45M+
- Budget-neutral approach
 - Cost savings sufficient to repay project cost



ESPC Market Investment (1990 – 2012)



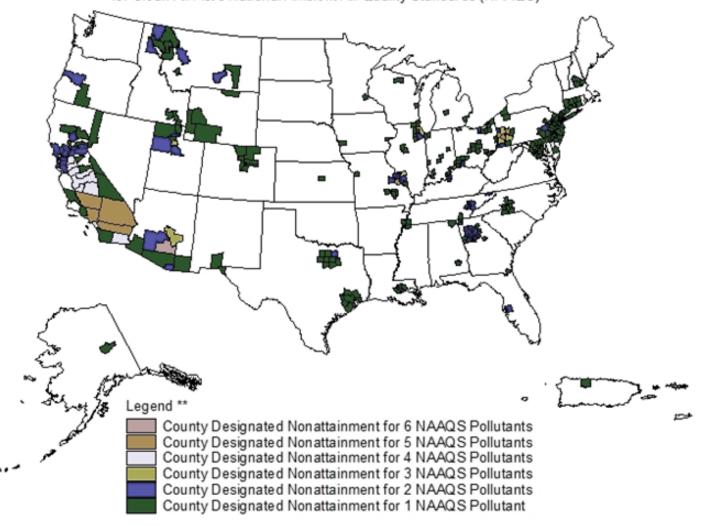
- \$7B+ U.S. investment annually through financing which is repaid through energy cost savings
 - Projected to grow to \$10 billion to \$15 billion annually by 2020
 - Scalable for 111(d) compliance
- Does not rely on state or utility investment
- Can incorporate other program incentives, rebates and credits



State Implementation Plans for NO_x/SO_x Reductions

Counties Designated "Nonattainment"

for Clean Air Act's National Ambient Air Quality Standards (NAAQS) *



36 STATES

Designated Nonattainment must further \downarrow NO_x and SO_x emissions to meet federal standards



State NAAQS Implementation Plans – Shreveport, LA

City of Shreveport, Louisiana

- Shreveport's Early Action Compact (EAC) submission to US EPA for the 8-Hour Ozone Standard under the National Ambient Air Quality (NAAQS) Standards
- 20-year ESPC contract utilized for State Implementation Plan
- 33 Municipal Buildings Energy Savings of 9,121,335 kWh/Yr
- Measurement & Verification (M&V) consistent with EPA Roadmap for Incorporating EERE Policies and Programs into State and Tribal Implementation Plans
 - IPMVP Option A Retrofit Isolation (pre-retrofit/postretrofit/ annual sampled inspections)
 - IPMVP Option C Whole Building (utility bill/ meterbased analysis)
 - Monthly Tracking/Quarterly Reporting/Annual Reconciliation

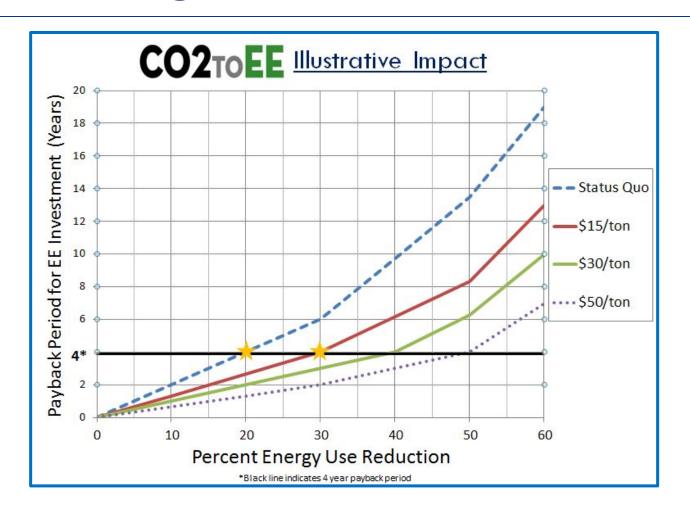


Scope of Improvements

- Lighting Systems
- Mechanical Systems
- Control Systems
- Water Conservation



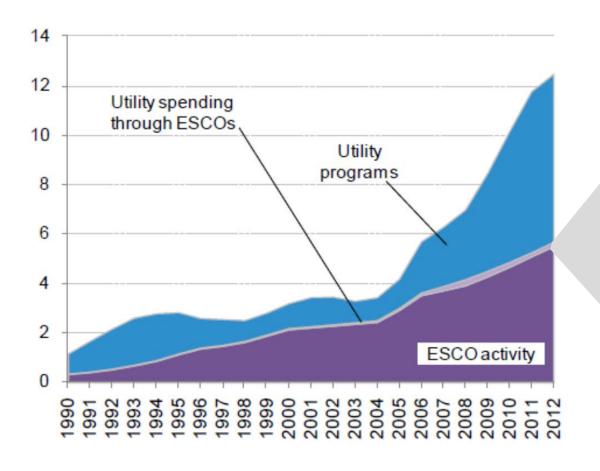
Regional GHG Programs - AB 32 / RGGI

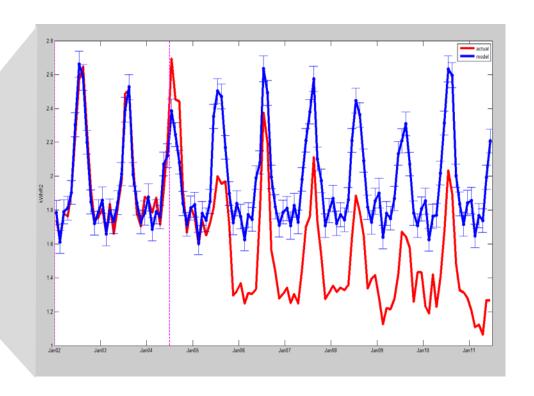


Expanding Energy Efficiency Financing for California Businesses, Schools, and Real Estate Owners



Utility Programs (Performance-based System Retrofits)



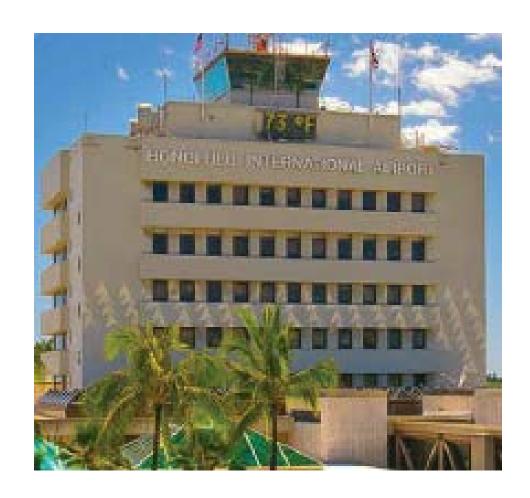




State Executive Orders – Hawaii DOT

Hawaii Department of Transportation

- 12 Airports
- Lighting, HVAC, Controls, Water (75,000 fixtures)
- Renewable energy (9,100 solar panels/2.6 MW)
- 20 year Energy Savings
 Performance Contact
- 400 local jobs, while adding more than \$670 million in economic development
- 43,000 metric tons of CO2 saved annually.(equivalent to 100,000 barrels of oil)
- \$518M savings over 20 years









Renew Financial: On the Move







HEADQUARTERED IN OAKLAND, CA

250+ Employees 35,000+ Projects Financed to Date





It All Started with Public Policy



Berkeley Measure G:Should the People of the City of Berkeley have a goal of 80% reduction in greenhouse gas emissions by 2050 and advise the Mayor to work with the community to develop a plan for Council adoption in 2007, which sets a ten year emissions reduction target and identifies actions by the City and residents to achieve both the ten year target and the ultimate goal of 80% emissions reduction?

Passed with 81% of the vote in November 2006



28% of U.S. residential

energy use could be cut by pursuing cost-effective energy efficiency measures

McKinsey, 2009



\$1.2 Trillion:

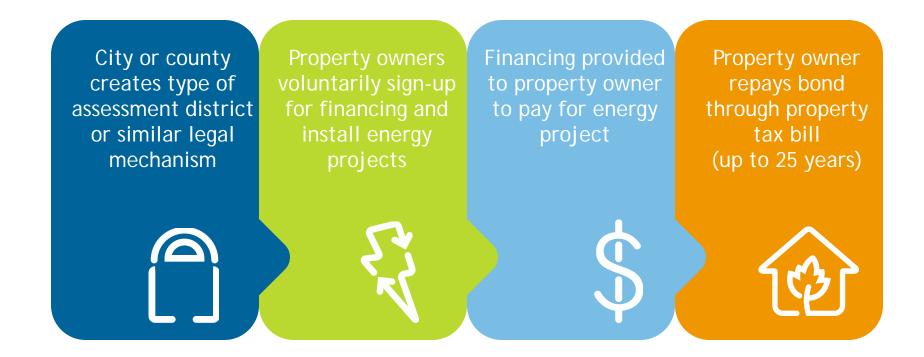
what the U.S. would save by investing \$512 billion in energy improvements.... while reducing 1.1 gigatons of carbon emissions.

McKinsey, 2009



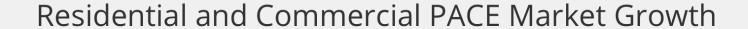
How PACE Works

PACE = Property Assessed Clean Energy





PACE: Nearing \$2 Billion Industry



82,000

Number of Home Upgrades

Energy efficiency

14%

Renewable Energy
19%

Mixed

\$1,697

million

14,000

Jobs Created

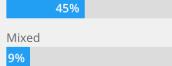
734

Number of Commercial Buildings

Energy efficiency



Renewable Energy



\$230

million

2,700

Jobs Created

Source: PACE Nation



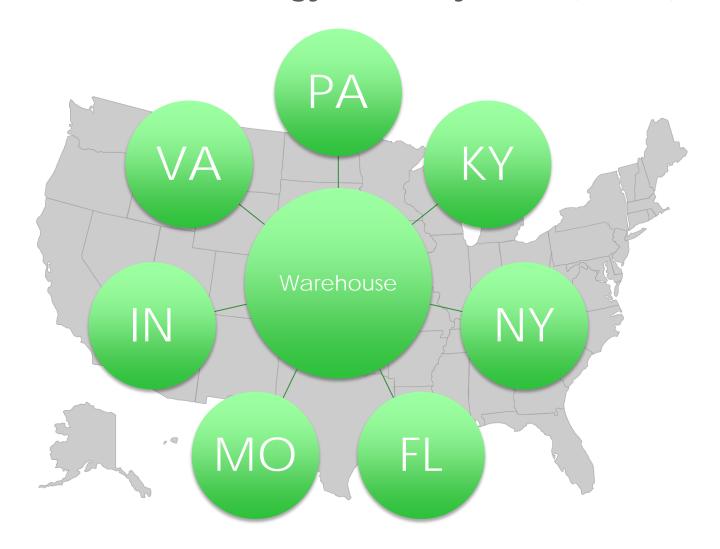
How WHEEL Works

- WHEEL Leverages Public Capital 5:1
- No Net Subsidy





Warehouse For Home Energy Efficiency Loans (WHEEL)





Lesson: Three Private Sector Partners Needed

Homeowner



Contractor



Banker



Lesson: Talk to Them First!



Lessons:

- Keep it simple
- Don't create new market, intersect with existing market
- The perfect is enemy of the good





ENERGY IMPROVEMENT FINANCING MADE SIMPLE



