



2016 National Symposium on Market Transformation

Rebecca Craft
Chief Customer Officer, Essess
rebecca.craft@essess.com

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| Company Overview

Essex is the only company that can identify building envelope and HVAC issues at large scale and at very low cost.

Founded in 2012 at MIT, Essex has invested \$15M in mobile thermal imaging vehicle systems that enable the company to identify improvements across 5,000 to 10,000 buildings per vehicle per day.

We believe this technology has the potential to radically transform the economics of building audit, retrofit, weatherization, and HVAC programs.



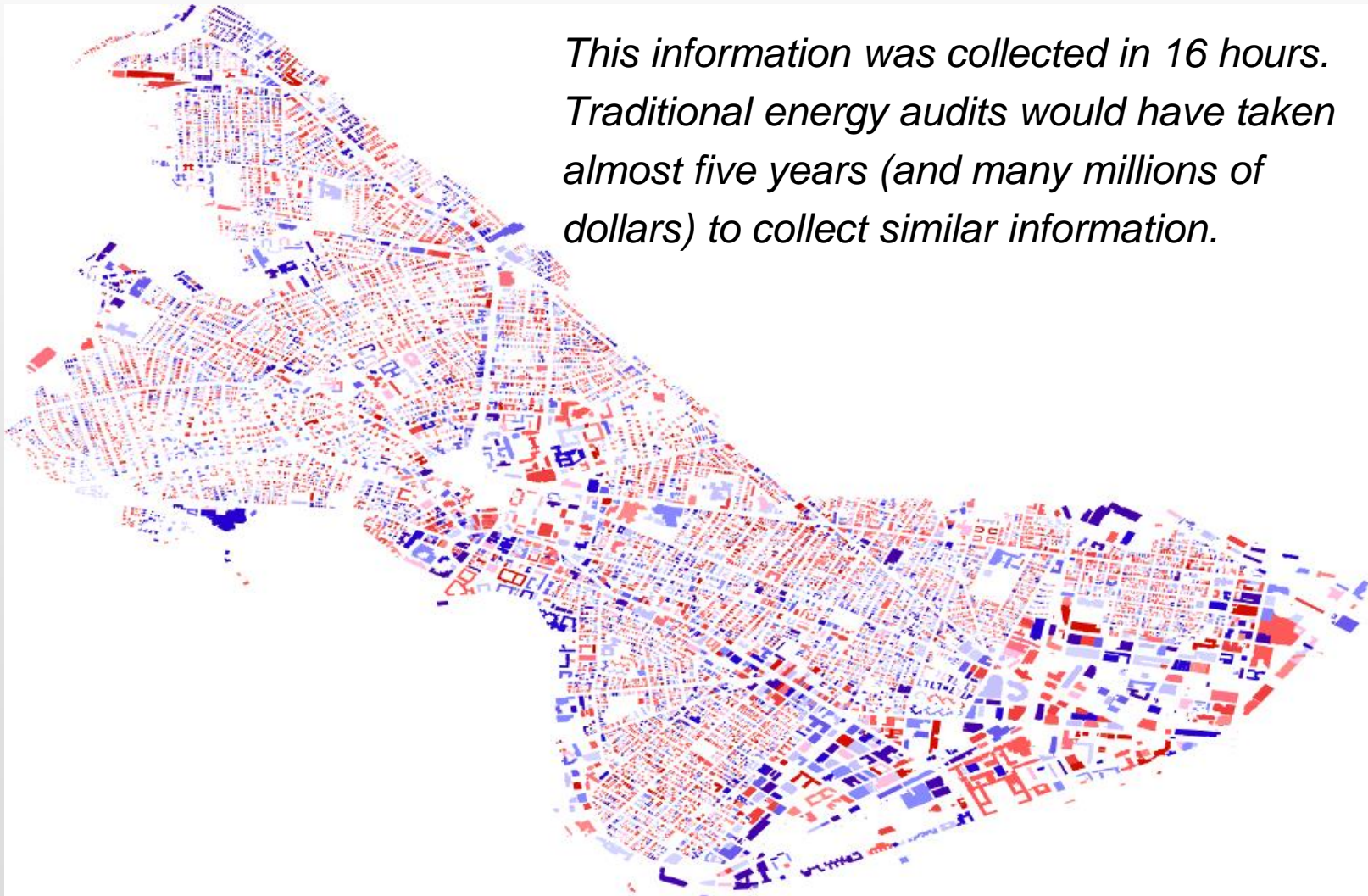
| Data Collection

Meet Jupiter. She is the first mobile data acquisition system to combine long wave infrared, near infrared, 3D LIDAR and a variety of other sensors to capture geospatially precise, thermal data from objects and structures across large regions.



Identifying Actionable Issues at Large Scale

Energy leakage map of over 17,000 buildings in Cambridge, MA using Essess' technology. Buildings in red have a cost-effective envelope issue with a 5 year or less payback!



| Data Analysis



We deploy the leading machine vision and deep learning techniques to automatically process, identify and analyze objects as diverse as buildings, windows, doors, walls, soffits, roofing, transformers, poles, wires, street lights, and road network assets.

Our machine vision capabilities enable us to turn over 6TB of data collected by each vehicle each night into actionable intelligence that transforms the economics and scale of our clients' businesses.



Building Efficiency

Wall insulation would save \$119/yr and payback in 3.7yrs

Air sealing would save \$80/yr and payback in 1.8yrs

Spray foam would save \$70/yr and payback in 2.8yrs

Essex Buildings™ is the world's most scalable and cost effective mobile building shell assessment service. We offer a number of data, software and marketing subscription services that enable large energy consumers, electric and gas utilities, building material providers and others to identify actionable and financially reliable investments in measures like wall insulation, attic insulation, air sealing, foundation gaps, inferior roofing or siding, HVAC performance, and other issues that needlessly waste energy and decrease insurability and property value in residential and commercial buildings.


Case Study: PECO

PECO Energy Company serves 1.6M electric and 500K gas customers in the Philadelphia area. State mandates require PECO to design and implement energy efficiency programs to reduce overall energy sales to customers. Among the worst performing programs are those that require significant updates to the building's envelope or HVAC systems.

Essess has scanned over 250,000 buildings in the PECO service territory in an effort to identify high value targets for three of PECO's energy efficiency programs that span residential and commercial customers.

Essess is delivering a suite of data and marketing products to PECO, including reports delivered directly to customers, as exemplified in the image to the right. **This report generated a 3.8% conversion rate into an energy audit!**

Thermal Reports



PECO
An Exelon Company

THERMAL ANALYSIS PROGRAM

0001

SAMPLE A. SAMPLE
123 ANY STREET
ANYTOWN, USA 12345-6789


Installing attic insulation could save you \$250 on your energy bills this year.



Thermal imaging helps you identify energy leaks in your home that result in wasted air conditioning in the summer and heating in the winter. Please review the thermal image of your home on the left. The bright areas indicate where your home is leaking energy. The pin identifies the most significant leak in your home.

Our analysis shows that your home's envelope has more leaks than 72% of your neighbors' homes. These leaks could result in increased summer cooling and winter heating costs. By fixing the most serious leaks in your home, you could **save up to \$250 each year**.

Not your home? Please notify us at peco@essess.com.



IMPROVE YOUR ATTIC INSULATION. Warm air rises, and a lot of it escapes through poorly insulated attics. Adding attic insulation is easy to do and can save you big on your air conditioning costs this summer.

How Your Energy Leaks Stack Up Against Neighbors:
Your neighbors are the single-family homes closest to you.

The amount of energy leaking out of the home measured in the number of extra days a window is open each year.

Category	Value
Efficient Home (Top 10%)	12
Average Home	18
Your Home	23

The energy leaking from your home is equivalent to **leaving a window open for 23 days out of the year**. That is **5 more days** than the average home in your neighborhood!

smart ideas

Start saving energy and money today, find a qualified professional contractor with the Electrical Association of Philadelphia (EAP) by visiting EAP.org.

Please see reverse side of this report for more ways to save energy and money.

Case Study: Duke Energy

Duke Energy is one of the largest utilities in North America serving over 7M customers. We are currently assisting Duke in Charlotte, NC to increase participation in energy efficiency programs by engaging over 50,000 residential customers around their energy waste.

In addition to customer reports, we are delivering our Driveby Application, which provides a comprehensive map of the territory showing high value targets along with thermal videos. In an initial phase 1 campaign, thermal reports resulted in **2.5% call-in rate from thermal reports** and a **4.6% opt-in rate from opt-in reports**. No customer privacy concerns were reported.



Smart \$aver®

Ruth,

Did you know the average home leaks air throughout the year - so much that it seems as if a 2-foot-square window is continuously open?

Thanks to a new test program offered by Duke Energy, you can now see your home's largest energy inefficiencies (and where repairs can be made) with this FREE, personalized Thermal Report.

Sincerely,

Bill Strickland
Smart \$aver Program Manager

Is your home as energy efficient as you think? Here's a Thermal Report of your home's inefficiencies. FREE.



2304 Dundeen St Charlotte, NC 28216

- A thermal image of your home shows where you can insulate and seal or make additional repairs to improve your home's comfort.
- The bright areas indicate where your home is leaking energy.
- The pin identifies the most significant leak in your home.
- By fixing the most serious leaks in your home, you could save up to \$135 each year.

RECOMMENDED FIX - IMPROVE YOUR WALL INSULATION



A lot of heat escapes through poorly insulated walls. Adding wall insulation is easy and could save you up to \$135 on your energy bills this year.

These temperature swings also affect your HVAC system, causing longer run times to heat or cool your home as well as added stress on the system, both of which may result in additional maintenance expenses or even replacement of the unit.

Contact us now to speak with a Smart Energy Specialist who can help you find the right contractor to provide solutions for your recommended fix.

Call us at 888.324.4022 or email us at thermal@duke-energy.com today!

This Thermal Report test program is offered by Duke Energy until Dec. 1, 2015.

| Deep Intelligence

Add 25+ data points about each customer to supercharge segmentation, targeting, analysis

- Retrofit conversion likelihood
- Leak type, quantity and financial profile
- Abnormal HVAC indicator for HVAC tune-up/replacement targeting
- Insulatable attic area
- Insulatable wall area
- R-value estimates pre/post remediation
- Emissivity percentile of walls compared to similar buildings
- Emissivity percentile of window/door frames compared to similar buildings
- HVAC savings from envelope improvements
- Setpoint issue identification – determine if high temperature is from envelope or thermostat setpoint
- Number of stories and estimated number of rooms
- Exterior surface material
- Annual heating and cooling load / loss due to envelope
- ...
- ...
- And much more!

Infrastructure

Essest Grid™ is the first infrastructure asset detection service that can incorporate analytics from thermal signatures into a highly reliable geospatial inventory and intelligence platform.

Assets include transformers, primary and secondary wires, telephone poles, street lights, reactors, furnaces, pipelines and other critical infrastructure based on their expected and observed heat values. This information is critical to predict and avoid safety hazards, anticipate the effects of and respond to damage assessments from inclement weather, and identify opportunities for increased efficiency.

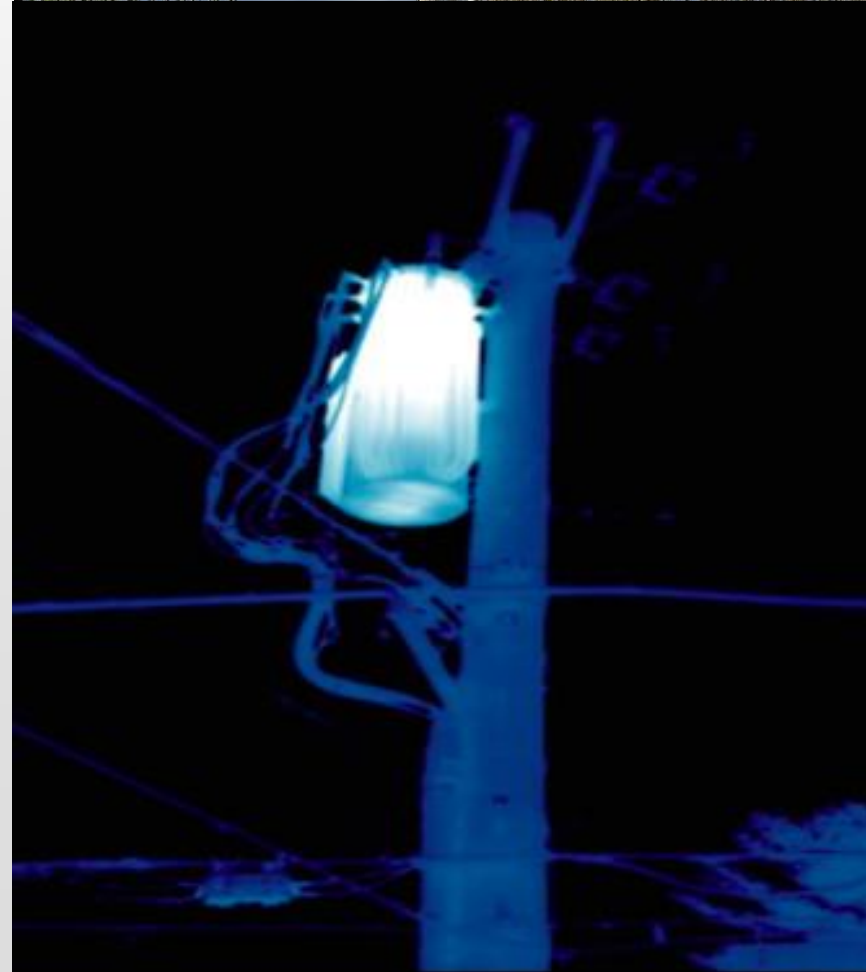


| Case Study: Utility Equipment

We are also working with a large utility on an infrastructure demonstration project to geospatially map and classify thermally using machine vision the following grid assets: poles, streetlights, terminators, transformers, service wires, primary wires, secondary wires, risers, and non-company interest cables.

Utilities across the country often face multiple major storm events each year. Increasing the automation and reliability of utility grid asset classification and utility analytics capabilities is critical to the ongoing resiliency and responsiveness of utility operations.

The technology being developed by us in this demonstration project will enable us to provide the most advanced automated grid asset detection and thermal classification capability to help large utilities predict and avoid potential safety and grid failure events, as well as address grid damage much more efficiently after inclement weather events.





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