

Change from Within? Carbon Management in Commercial Real Estate



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Laura S.

How do we understand the “non-domestic sector”?

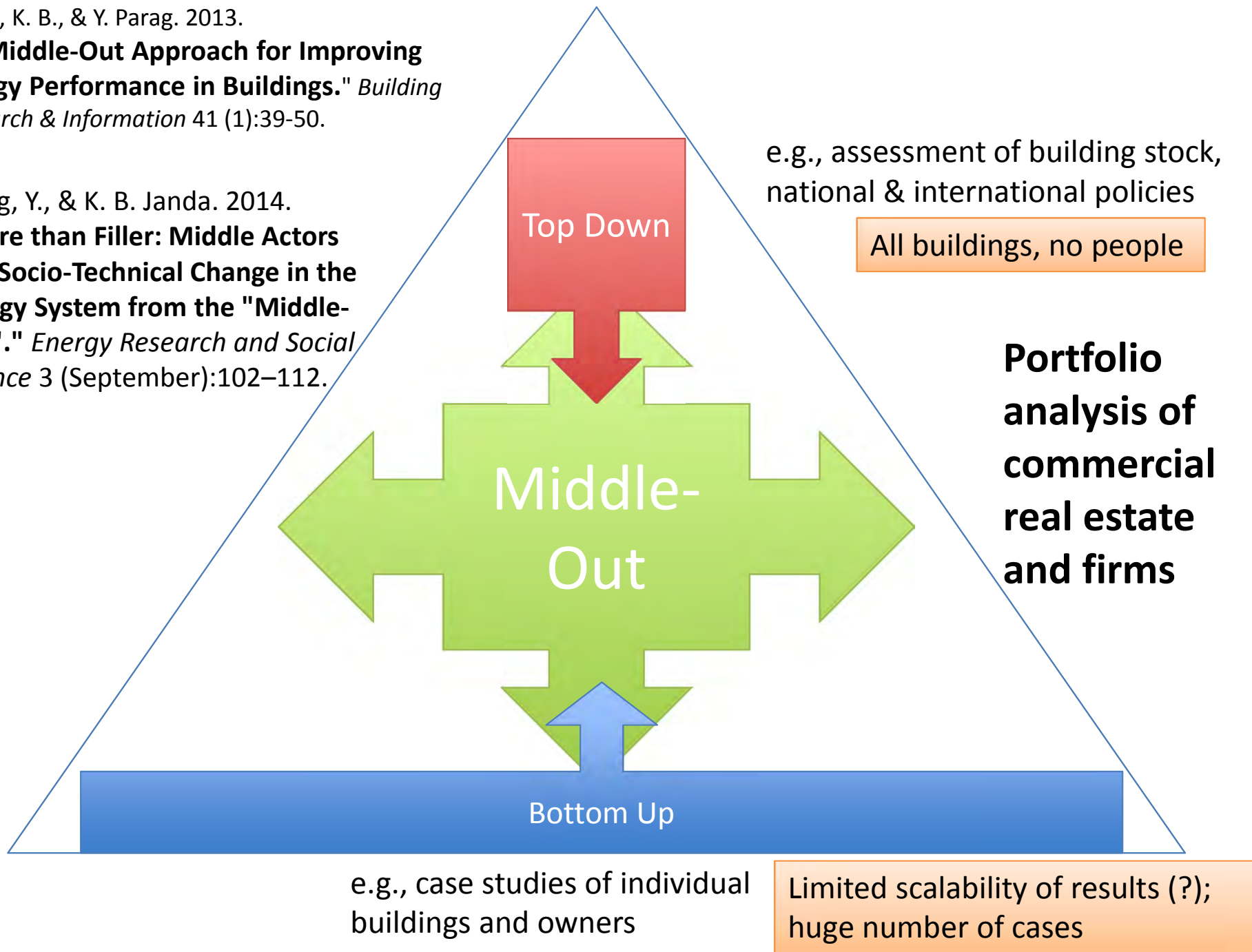


Janda, K. B., & Y. Parag. 2013.

"A Middle-Out Approach for Improving Energy Performance in Buildings." *Building Research & Information* 41 (1):39-50.

Parag, Y., & K. B. Janda. 2014.

"More than Filler: Middle Actors and Socio-Technical Change in the Energy System from the "Middle-Out"." *Energy Research and Social Science* 3 (September):102–112.



What is energy efficiency?



BEMS

EPCs

DECs

FITs

MEPS

Voltage Optimisation

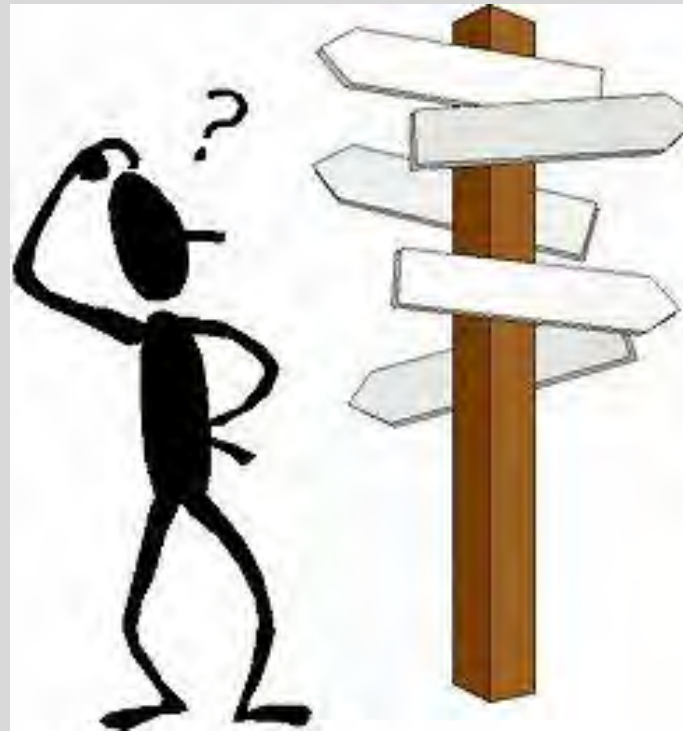
Demand response

LED lights

Quick wins

PVs

Feedback



Better billing

ESOs

Behaviour Change

Staff Engagement

Rate negotiation



Are all mice created equal, or are some more equal than others?





Ownership Structure

Private

REIT

BIG

> 20 Msf



**CUSHMAN &
WAKEFIELD®**

Hines



Equity Office



Portfolio Size

SMALL

< 20 Msf



**HARWOOD
INTERNATIONAL**

Yesterday we planned for today, today we plan for tomorrow.



Janda, K. B., & S. Brodsky. 2000. "Implications of Ownership: An Exploration of the Class of 1999 ENERGY STAR Buildings." *Proceedings of the ACEEE 2000 Summer Study on Energy Efficiency in Buildings.*

Three Cs Model for Organizational Action: concern, capacity + conditions

- Are organizations concerned about energy?
- Do they have the capacity to address their concerns?
- What are the technical challenges that they face based on *their* portfolio?



3Cs in 2002

Concern Concern about energy	Conditions Opportunities for conservation	Capacity Ability to act on opportunities	Policy approach to increasing energy efficiency (EE)	Speculation about whether price increases might encourage (+) or discourage (-) conservation action
Yes	Yes	Yes	Recognize/Encourage EE	+
Yes	No	Yes	Recognize past EE, create future opportunities	+
Yes	Yes	No	Technical assistance, incentives, peer support, education	+
Yes	No	No	Technical assistance, peer support, education, create future opportunities	+/-
No	Yes	Yes	Incentives, non-energy benefits, recognize past EE	+/-
No	No	Yes	Support continuous improvement, identify non-energy benefits, recognize past EE	-
No	Yes	No	Technology assistance, incentives, peer support	-
No	No	No	Mandatory efficiency standards	-

Janda, K. B., C. Payne, R. Kunkle, et al. 2002. "What Organizations Did (and Didn't) Do: Three Factors that Shaped Conservation Responses to California's 2001 'Crisis'." In *Proceedings of American Council for an Energy-Efficient Economy 2002 Summer Study*, (Asilomar, CA). Vol. 8, pp. 8.117-8.128. ACEEE.

Lutzenhiser, L., K. B. Janda, R. Kunkle, et al. 2002. *Understanding the Response of Commercial and Institutional Organizations to the California Energy Crisis 400-02-018C Consultant Report*. California Energy Commission: Sacramento, CA. www.osti.gov/servlets/purl/832751-6WN6Z0/native/

The state of the field in 2013...

- A Major Energy Users Council (MEUC) survey asked if members had:
 - At least one staff member responsible for energy?
 - 75% yes (25% no!)
 - Clearly defined energy reduction strategy for business?
 - 62% yes (38% no!)
- Observations:
 - Energy management is STILL understaffed
 - Energy is not yet fully recognized as a core business concern

CAPACITY

The energy manager

800 buildings

800 facility managers

Manual readings

Some half hour data +
software

Excel - widely used



Meters

CONDITIONS

Gas, electricity, water

Fiscal meter, sub-meters

Smart meter roll-out

Possibility for retrofit

Real time meters

½ hour

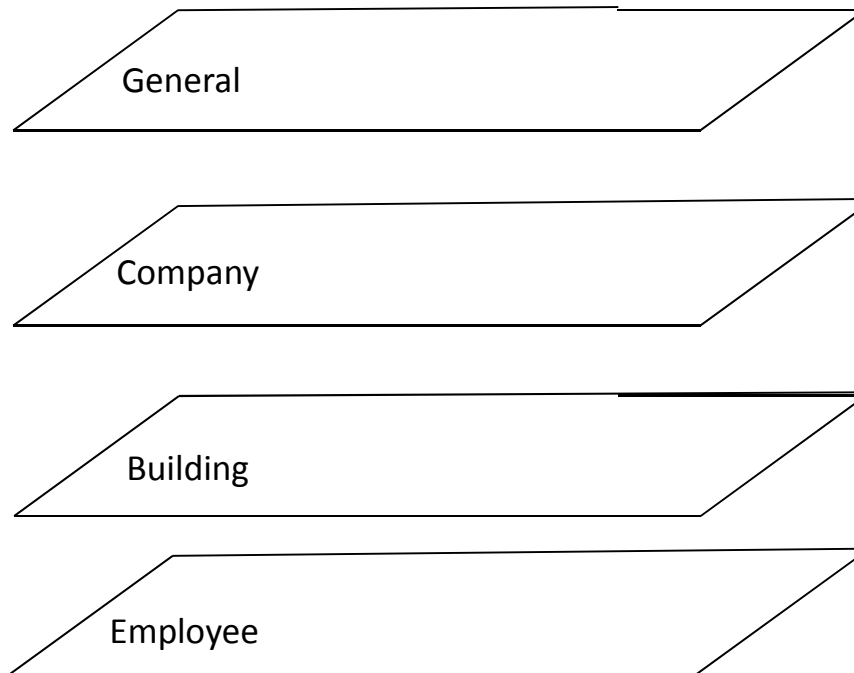
Real time

Communications,
databases and software



How else have we grown?

Multi-level frameworks (e.g., transitions theory)



- **General Context**
 - Recognizes markets, economic trends, policy goals
- **Company**
 - Core business goals, internal processes & policies, property portfolio
- **Building**
 - Specific physical & social context
- **Employee**

3C's through a multi-level perspective

		3Cs		
	Analytical Level	Concern (factors that shape attention to energy)	Conditions (factors that shape where energy actions occur)	Capacity (factors that moderate abilities to take energy actions)
Building Communities (grey area, neither organizational nor individual)				
	Organization	Legislative requirements, leases	Building retrofit opportunities, thermostat setpoints, standard operational hours, provision of space & equipment	Energy management structure; job titles & responsibilities; feedback & data availability; granularity of data
		Workstyles	Clothing choices, activities outside “normal” hours	Peer pressure & social practices; workgroup dynamics
	Individual	Attitudes, beliefs, habits, values	Use of task lights, computers, auxiliary heating/cooling devices; extra plug loads; operation of blinds / windows	Presence or absence of champions; expertise & understanding of systems; interest in and ability to act on feedback

Janda, K. B. 2014. "Building Communities and Social Potential: Between and Beyond Organisations and Individuals in Commercial Properties." *Energy Policy* 67 (April):48-55.

The Challenge: There is No Free Lunch



- Energy use is a **WICKED** problem:
 - The non-domestic sector is diverse and complex.
 - One size will *not* fit all.
- A ‘wicked’ problem is:
 - Complex and interdependent
 - Difficult to solve (may be difficult to recognize)
 - Addressing one aspect of a wicked problem may reveal (or create) other problems

One size will not fit all.

What about 6 sizes...?

WICKED Market segments	Owner occupiers	Leased Space	
		Landlords	Tenants
Data Rich	Type A	Type B	Type C
Data Poor	Type D	Type E	Type F

DRIP: data-rich,
information poor

WICKED solutions for the retail sector:

WORKING with Infrastructure Creation of Knowledge and Energy strategy Development

An EPSRC-funded project on Energy Management in Non-Domestic Buildings



EPSRC

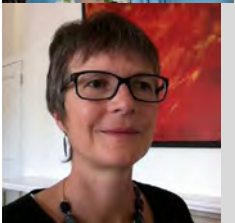
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Current partners:



In advanced discussion:



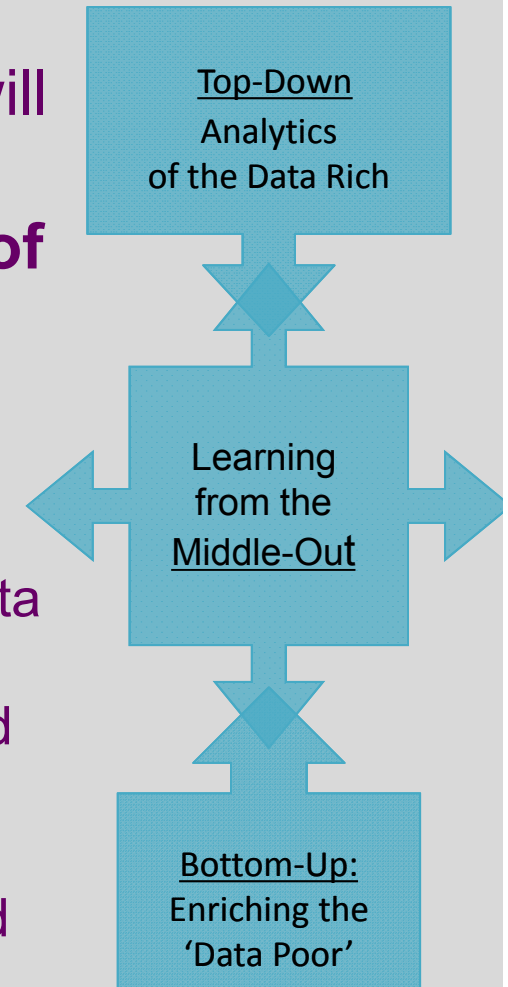


WICKED solutions

Researchers and retail sector partners will use information from within and between these workstreams to **measure effects of existing initiatives** and co-produce WICKED solutions for the retail sector

For example:

- online energy advisors backed up by large data sets,
- low-tech “smart-er” retrofits for legacy gas and electric meters,
- new forms of leasing agreements,
- effective energy management procedures and staff engagement practices.



icked/

Cooperative Organisational and Academic Learning through Empirical Scholarship with CO₂ Estates (COALESCE)



Enabling Commercial Real Estate Investors to

harness the value of energy efficiency



106,663,272 kg
CO₂ Managed



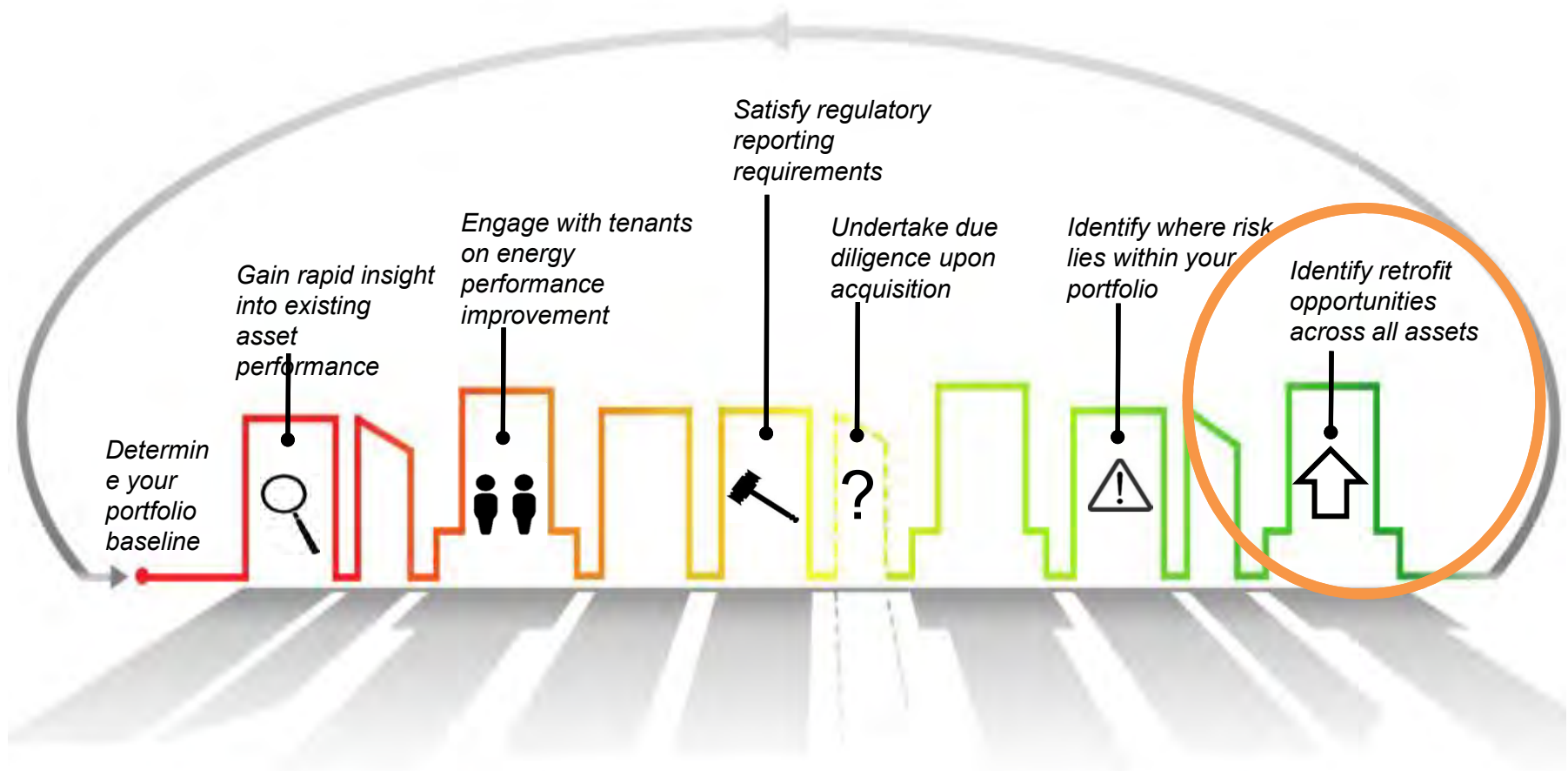
15,151,593 ft²
Modelled Data



Over **13,712**
Retrofit Options

Turnkey Solution

*A **software-driven solution** can enable CRE to continuously improve energy performance and manage risk across large, dynamic property portfolios*



When are you working with Mickey, Mighty or Jerry? And how do you know who is who?



TAKE AWAYs...

- “Best” practice depends on how well EE fits
 - Within different organizations
 - Operating in heterogeneous markets
 - With different levels personnel/staffing
- Unlikely that the solution set = 1
 - Market segmentation approaches WITHIN organizational types may be necessary for policies achieve better results

Thank You

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- <http://www.co2estates.com>
- <http://www.energy.ox.ac.uk/wicked/>

