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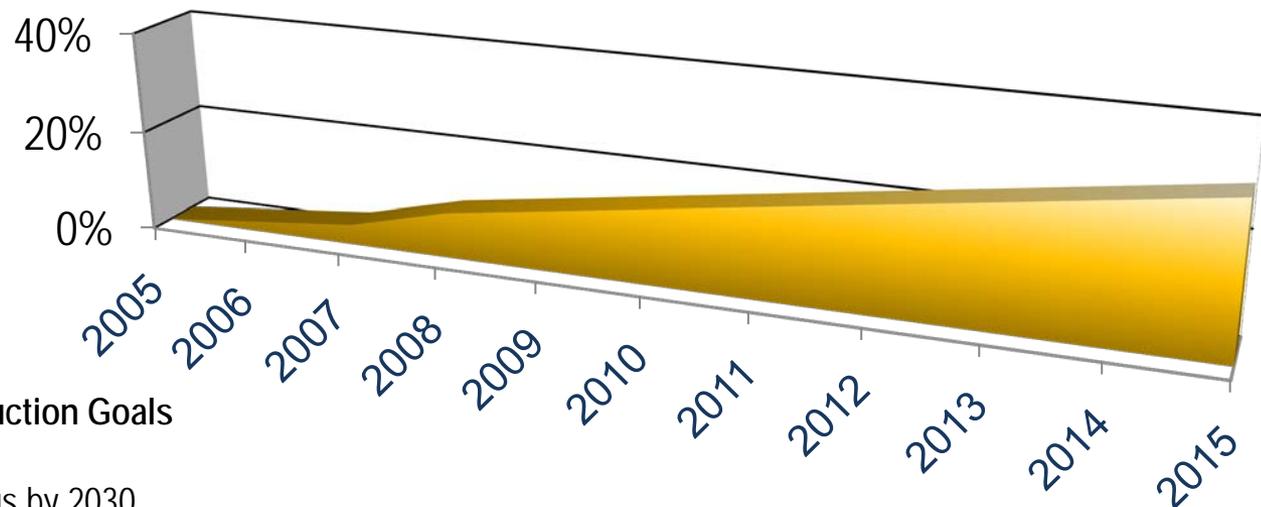
A River of Energy Solutions

Developing Energy Security Solutions for Facilities Owner/Operators

Barbara Heller/DCStrategies

What is Energy Security?

- A **resilient** energy system capable of withstanding threats through a combination of:
 - Active, direct measures (surveillance, guards)
 - Passive or more indirect measures (redundancy, diversity, efficiency)
- On the part of U.S. policy makers, Energy Security increasingly equates to **Energy Independence** (EISA - Energy Independence and Security Act of 2007)



Accelerating Energy Reduction Goals

- 30% Reduction by 2015
- Net Zero Energy Buildings by 2030

Physical Security Supports Energy Security

Why Buildings?

Buildings have been the traditional target of domestic and international terrorism

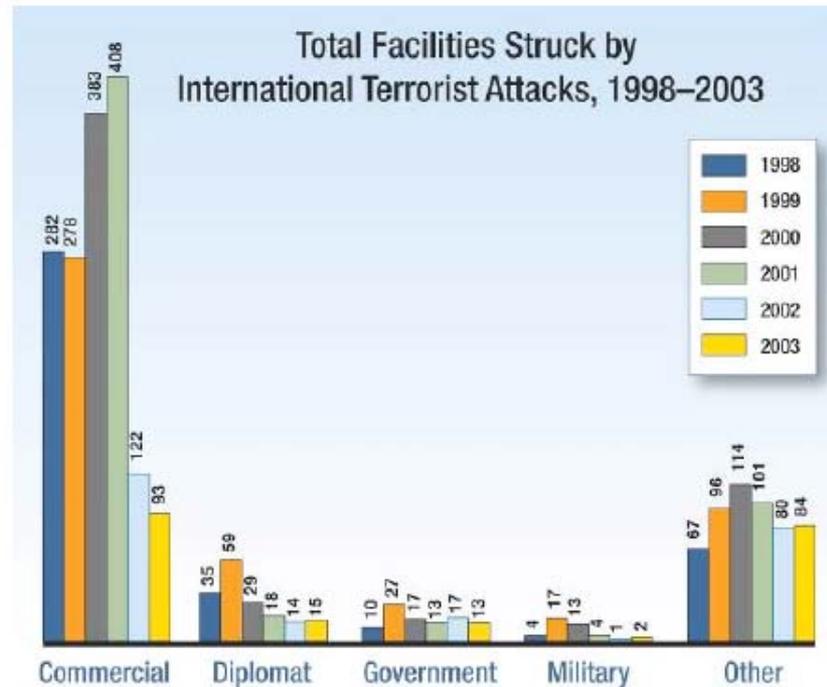
Between 1998 and 2003 incidents against buildings include:

- 1,566 commercial
- 170 diplomatic
- 97 governmental
- 41 military



Homeland Security

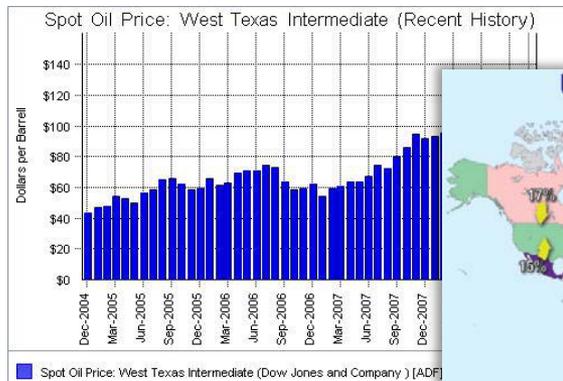
Science and Technology



Components of Energy Security

- Having adequate power to conduct critical missions for the duration of that mission (sufficiency)
- Leading to sufficiency, is ensuring resilient and redundant energy supplies are accessible when needed
- Energy supplies must present the lowest lifecycle cost while considering all mandated requirements

Drivers for Energy Insecurity:

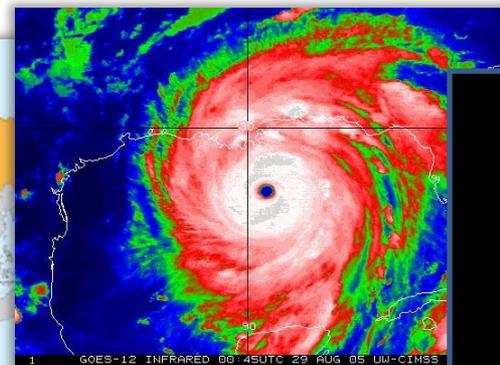


Price Fluctuations

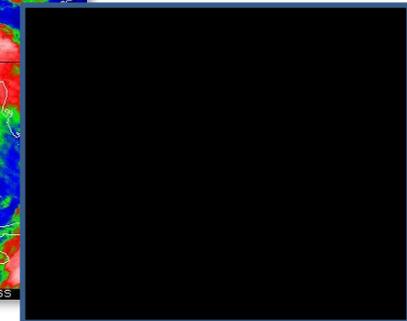
United States Oil Imports



Supply Shortages



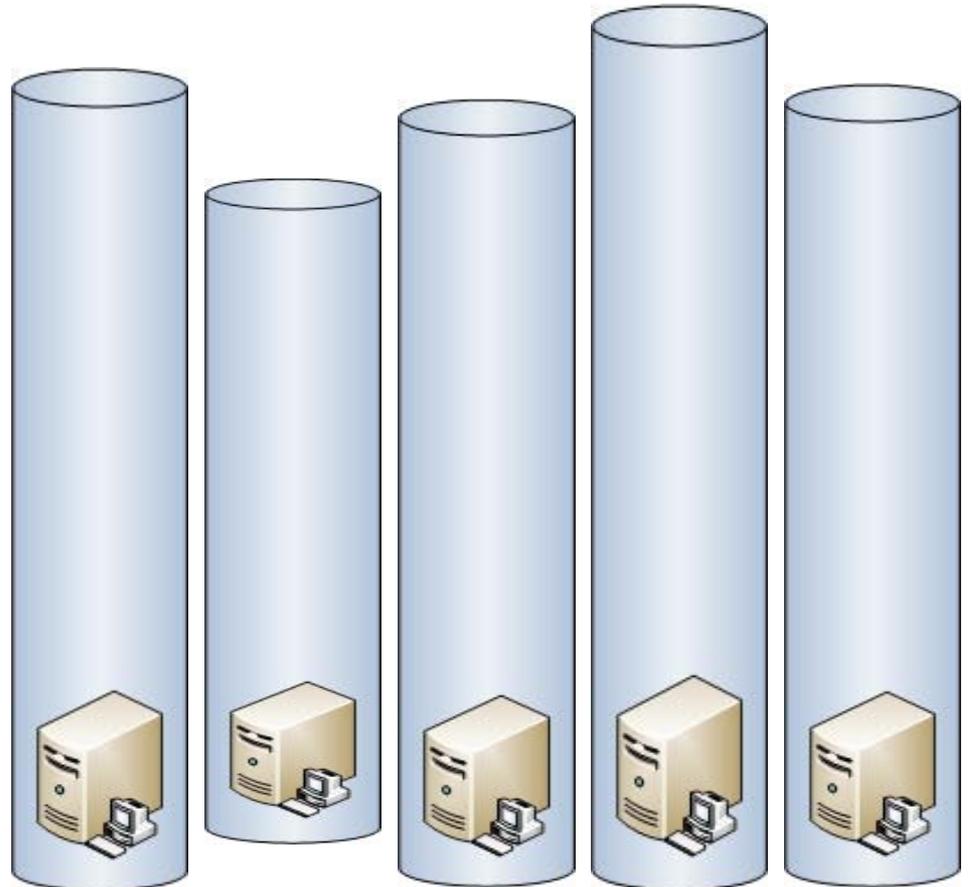
Threats



Opaque data

Challenges to Developing an Enterprise Energy Security Policy

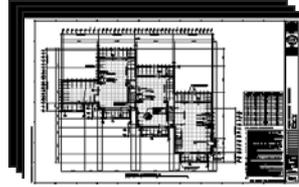
- No “one size fits all” policy
- Few benchmarks
- Existing data gaps, business process gaps and IT infrastructure gaps
- Siloes represent emotional boundaries



Data Management– No Common Platform

Original Design Drawings

- AutoCAD
- 2D drawings representing 3D
- Scale – marked on each drawing
- Coordinate System - Unknown



Utility Map Books

- ArcGIS
- 2D Maps
- Scale – 1" = 500'
- Coordinate System – CCS83



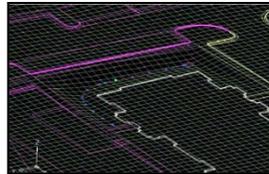
O&M Data

- Maximo CMMS
- Location based hierarchy
- System oriented use
- Coordinate System – Unknown



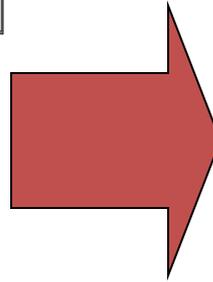
Land Development Data

- Autodesk Civil 3D or GIS
- 3D model based information
- Coordinate System – CCS83



Recent Design Documents

- BIM
- 3D model based information
- Coordinate System – Not stated



Different levels of detail

Different permissions

Different projections

Different timescales

Different priorities

Different versions

Different systems

Different formats

Different scales

Different data

Different types

Different

Different

Different

The Construction Industry Business Model

- Diffuse, project-based delivery model
- Regional standards
- Limited productivity data
- Ad hoc management



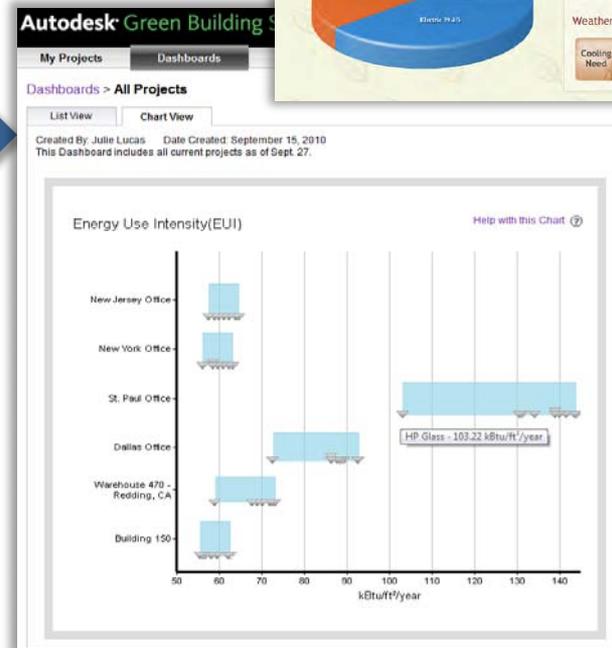
- It's the second largest economic sector in the country (after health care) and is essentially an agglomeration of cottage industries

Where to Start: Energy Survey

To know what to do, know where you are ...
 ... collect data and track performance

Report Items	No cost/low cost opportunities identified	Level 1	Level 2	Level 3	
	ECO energy saving (~% accuracy)	+/- 20%	+/- 20%	+/- 10%	
	ECO cost estimated (~% accuracy)	+/- 20%	+/- 20%	+/- 10%	
	Simple payback period (SPP)	X	X	X	
	ROI/NPV/IRR financial metrics	X	X	X	
	Lighting	X	X	X	
	HVAC		X	X	
	Compressed air		X	X	
	Steam system		X	X	
	Assessment Items/Work Scope	Architectural Considerations			
Building Envelope		<i>Efficiency Opportunity</i>		<i>Security Issue</i>	
		Airtight barrier	Sealing appropriate to resist chem./bio. penetration also provides weather-tight seal	Air	
		Insulation	Wall insulation may provide secondary barrier and provide thermal savings	Air, Ex	
		Impact absorbing walls	Innovative walls systems (multiple layers, openings, crumple zones) designed to absorb blast effects can also reduce envelope heat transfer and control solar gain	Ex	
		Thermal Mass	Earth berming for blast deflection can also provide thermal buffering	Ex	
			High-mass (concrete) construction allows active or passive use of thermal mass to reduce heating/cooling loads	Ex	
		Shading devices	Consider shading devices that can double as blast protection	Ex	
		Vestibules	Consider vestibules to help control building access while reducing infiltration of unconditioned outside air	Con, Air	
		Windows	Laminate films	Apply blast-damage resistant laminate films to interior surface of windows with appropriate emissivity and visible light transmittance	Air
			Operable windows	Analyze appropriate response to threat (http://securebuildings.lbl.gov/)	Air, RR
Protective screens			External protective screens may also control unwanted solar gain	Ex	
Storm Windows			Consider retrofit of storm window with efficient (low-e, solar control) films	Air, Ex	
Light shelves			Use light shelf integrated with blast wall	Ex	

Standardized Energy Facilities Surveys



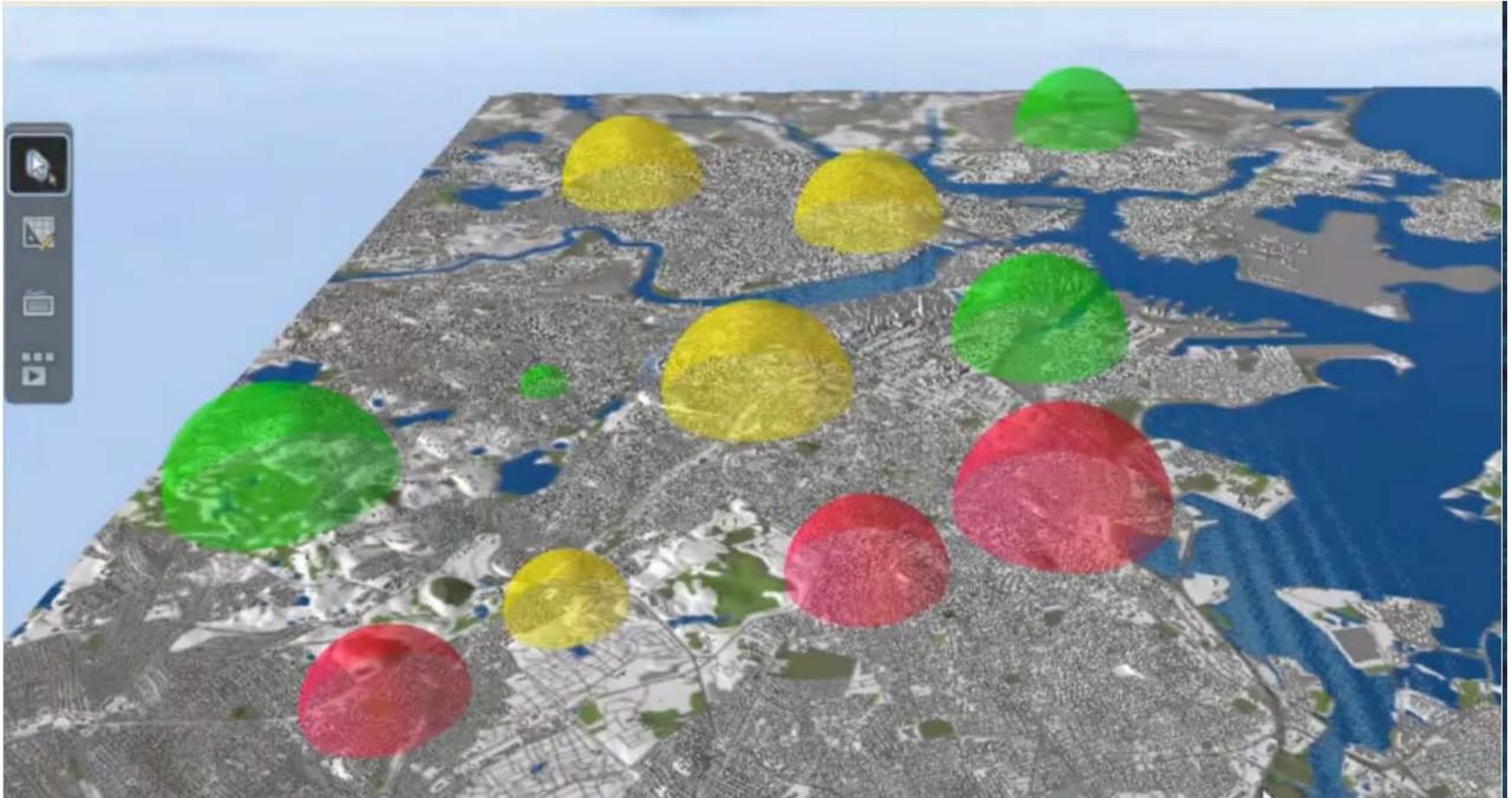
Dashboards and Standardized Reports

Energy Management Collaboration



Common Operating Portals

Facilitate Collaboration



Understand Context



Thank you!

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