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Accelerate Performance

Scaling the Outcome-Based Procurement Approach

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April 3, 2017

ALL NEW BUILDINGS

CODE-COMPLAINT

“SUSTAINABLE”
OR CERTIFIED

PERFORMANCE TARGET

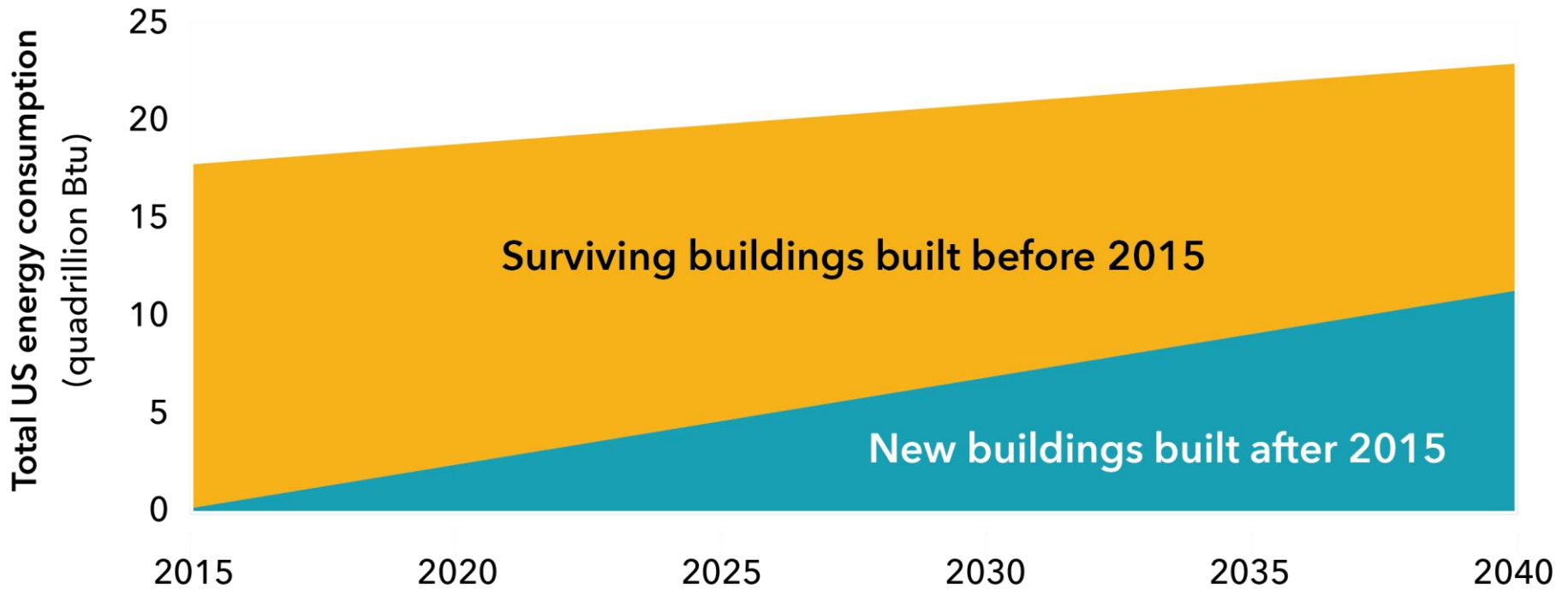
ZERO ENERGY

FUTURE
PROOF

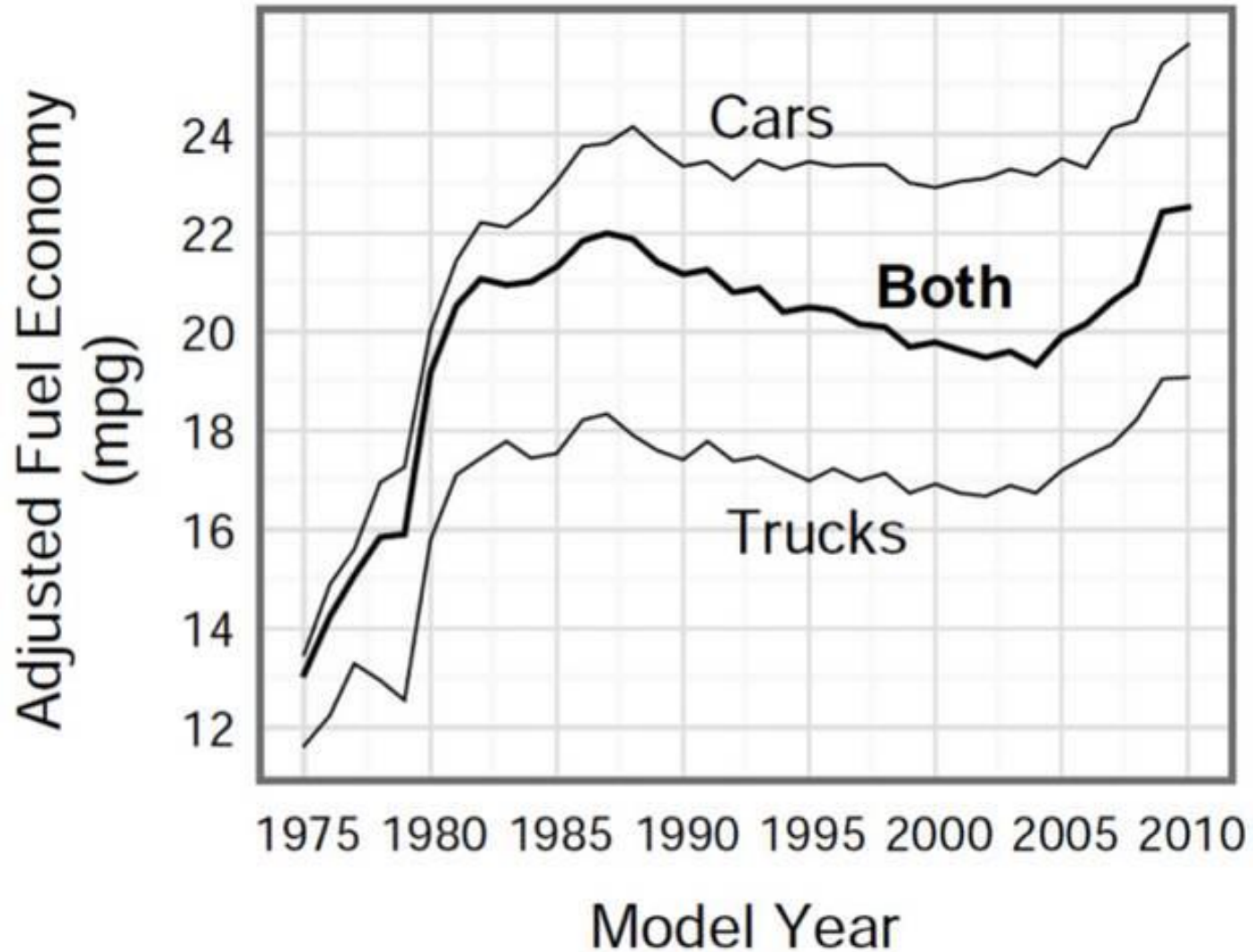


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| **ACCELERATE** PERFORMANCE



Corporate Average Fuel Economy (CAFE) Standards



"My truck runs for Only 2½¢ a mile"

says W. E. Worthen, Jr. of Highlands, Texas

"I've always used Ford Trucks because they can't be beat for all-round ranch and farm work," says W. E. Worthen, Jr.

"Mucky rice fields and rough pasture never stop my faithful Ford Pickup! It sure can take it! The records I kept during the Economy Run

show that it costs mighty little to run!

"In five months, my 1951 Ford F-1 covered 7,277 miles . . . much of it off-the-road. My total cost for gas, oil, maintenance and repairs was only \$175.94, which averages out to a running cost of less than 2½¢ cents a mile."



Rancher and rice farmer W. E. Worthen, Jr. bought his first Ford Truck in 1941, now uses two Fords.

The famous Ford Pickup is but one of many models available. There's a Ford Truck tailor-made for your job, from half-ton Pickups to 155-h.p. Big Jobs rated for 41,000 lbs. gross with a trailer.



Now! Up to 14% more Gas Savings

and more Speed Hauling power, too!



THIS new Ford 101-h.p. Cost Clipper Six passed, with flying colors, two years of economy and durability tests. One of the best-proved truck engines ever introduced, it had 50,000 dynamometer test-hours, over 500,000 vehicle test-miles.

New LOW-FRICTION design in three new high-compression Ford Truck engines slashes friction loss!

There are important savings in store for you in new Ford Low-Friction truck engine design. It cuts friction horsepower up to 30%! It saves gas! It gives you more Speed Hauling power!

New Ford Low-Friction design includes many new features. A new Short-Stroke principle cuts piston travel up to 20%, which makes for longer engine life. New OVERHEAD-VALVES give more efficient fuel-

feeding. New HIGH-COMPRESSION gives extra power on regular gas.

You can get new LOW-FRICTION design in three of the five great Ford Truck engines for '82. And you get more power than ever before in the famous 239 cu. in. TRUCK V-8 or 254 cu. in. Big Six. See what's new, at your Ford Dealer's.

NOW 5 GREAT TRUCK ENGINES

(New 101-h.p. Cost Clipper Six Proved 106-h.p. Truck V-8 Proved 112-h.p. Big Six New 145-h.p. Cargo King V-8 New 155-h.p. Cargo King V-8

FORD TRUCKING COSTS LESS and



Using latest registration data on 8,049,000 trucks, life insurance experts prove Ford Trucks last longer!

1952
10 mpg



1981
21 mpg

FORD ANNOUNCES THE 21 MPG PICKUP



Now... great gas mileage in a full-size truck!

Now in tough '81 Fords: the highest estimated MPG rating ever achieved by a 6-cylinder Ford Pickup. Delivered by Ford's husky 300 Six... available in F-100/F-150 models that take payloads up to 2,530 lbs.!

21 EPA EST. MPG **29** EST. HWY.

F-100/F-150 with 4.9L (300 CID) Six and 4-speed overdrive option. EPA EST. MPG with std. 3-speed: 20 MPG, 27 estimated HWY.

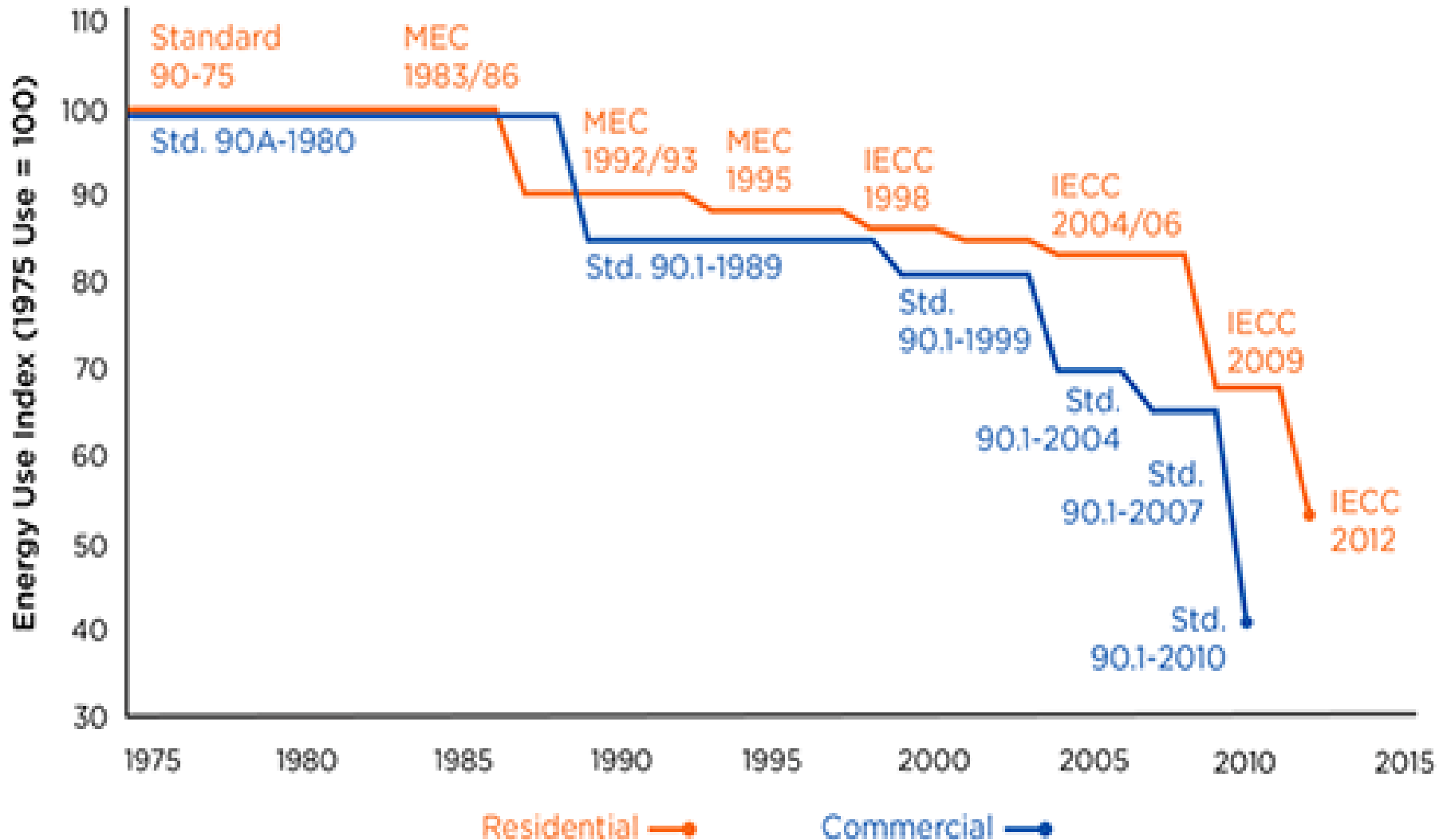
Tough new Fords... higher ratings for 1981.

 <p>New compact rating Even high-economy Ford Courier has improved highway mileage for '81</p> <p>27 EPA EST. MPG 39 EST. HWY.</p>	 <p>New Bronco rating Bronco with husky 4.9L (300 CID) Six shows 20% improvement in EPA est. MPG over last year.</p> <p>18 EPA EST. MPG 24 EST. HWY.</p>
 <p>New van mileage Ford's business van offers even better estimated MPG for '81: 4.9L (300 CID) Six Six</p> <p>19 EPA EST. MPG 26 EST. HWY.</p>	 <p>New V-8 mileage New truck 4.9L (295 CID) V-8 gives record-high estimated MPG for V-8 Ford Pickups.</p> <p>17 EPA EST. MPG 26 EST. HWY.</p>
 <p>New 4 x 4 mileage New... 20% boost over last year in estimated MPG. Just economy for tough Ford 4WD Pickups.</p> <p>18 EPA EST. MPG 24 EST. HWY.</p>	<p>More about mileage *Use for comparison. Your mileage may differ depending on speed, distance and weather. Actual highway mileage will probably be less than estimated. California motorists: lower. All comparisons are to 1980 Ford vehicles. See your dealer for the 1981 EPA Gas Mileage Guide. †With optional manual overdrive transmission.</p>

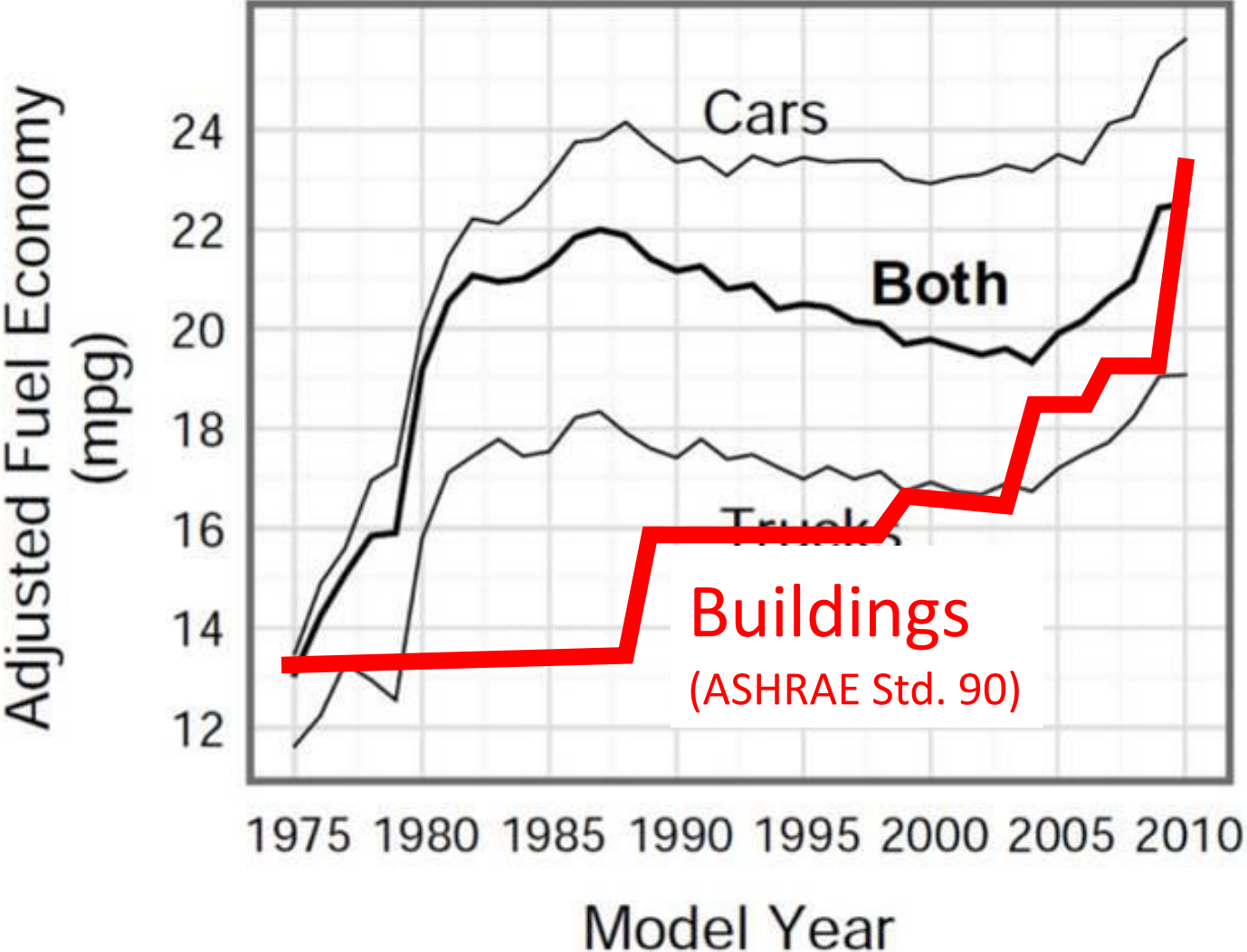
FINAL RESULTS
FORD TRUCK
ECONOMY RUN

DON'T GUESS! See how little it can cost to run a truck in your kind of work. See the cost figures in this 144-page book showing results from the 50-million-mile Ford Truck Economy Run. See it at your Ford Dealer's now!

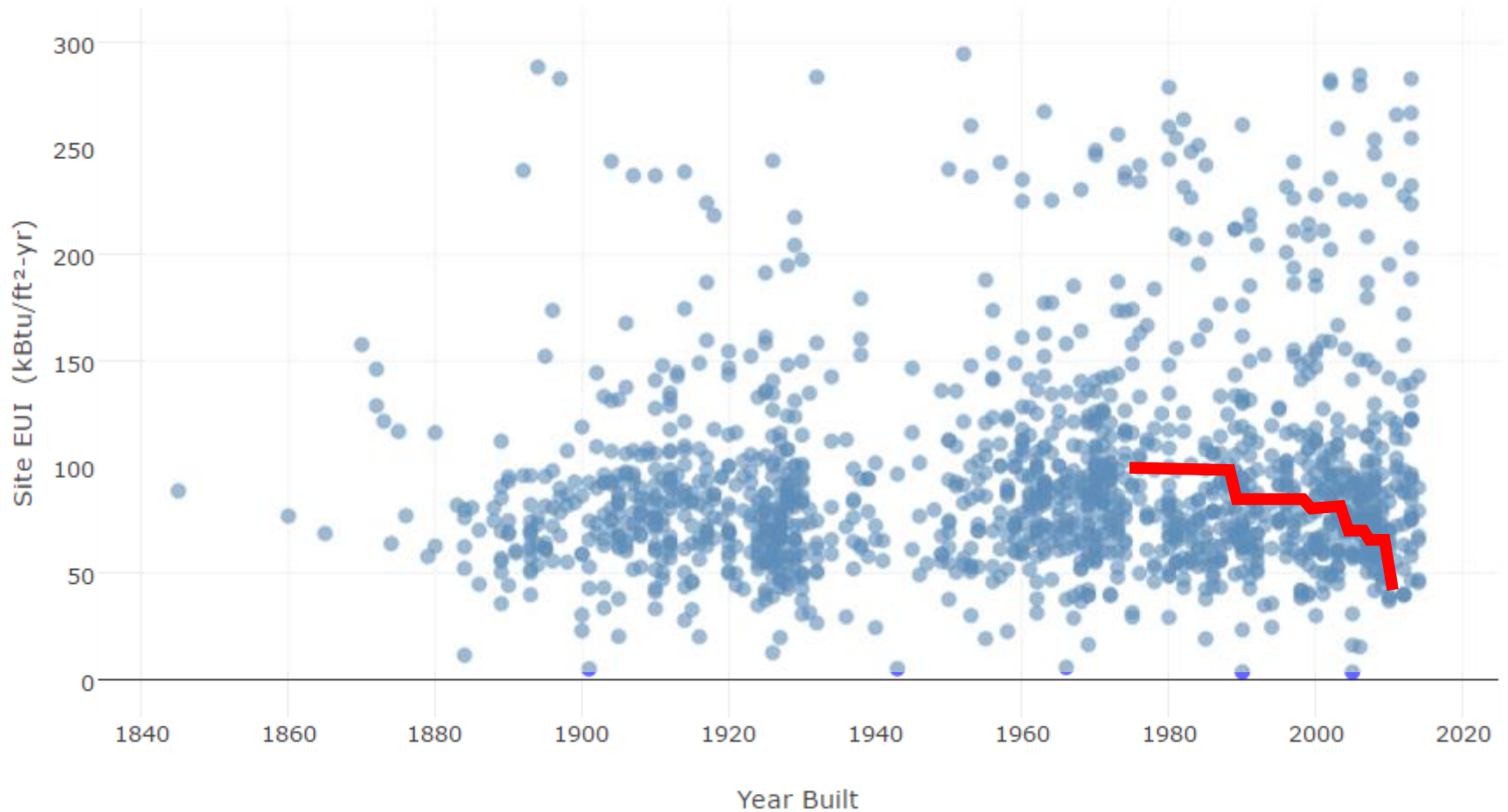
Energy Codes



Buildings Lag Automotive By 30 Years



Chicago Benchmarking Data



An aerial night view of a city skyline, likely Chicago, showing numerous skyscrapers and buildings illuminated with lights. The sky is dark blue, and the city lights create a vibrant, glowing effect. The text is overlaid on the lower portion of the image.

“The greatest opportunity to identify and influence deep savings is pre-schematic design, where the program supports quick early simulations and EUI targeting.”

—ACEEE New Horizons for Energy Efficiency: Major Opportunities to Reach Higher Electricity Savings by 2030; Dan York, Steven Nadel, Ethan Rogers, Rachel Cluett, Sameer Kwatra, Harvey Sachs, Jennifer Amann, and Meegan Kelly; September 2015.



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| **ACCELERATE PERFORMANCE**

**3 year Department of Energy initiative
to scale performance-based procurement**



TEAM

Seventhwave

National Renewable Energy Laboratory

Institute for Sustainable Energy

UTILITY PARTNERS

ComEd

Eversource

United Illuminating

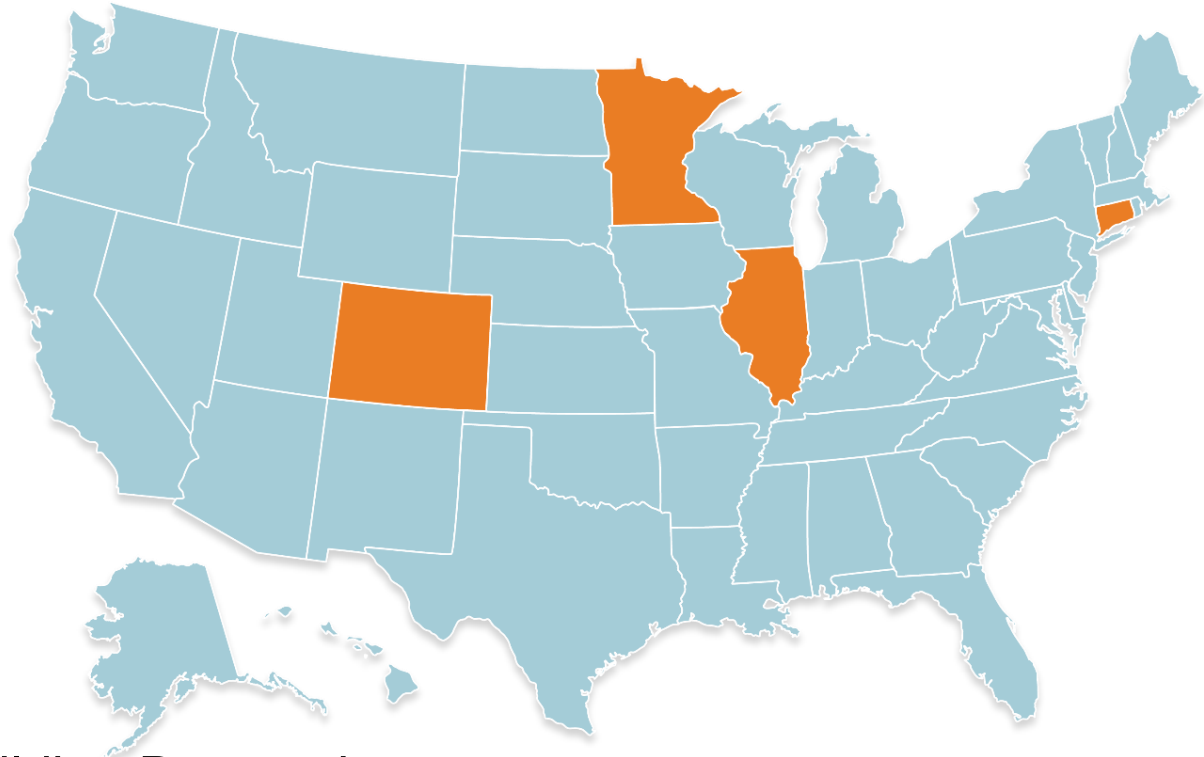
Xcel Energy

OWNER PARTNERS

University of Chicago

PARTNERS

Center for Sustainable Building Research



New Construction Program Benchmarking

PROGRAM DESIGN COMPARISON									
	ComEd	Xcel MN	Xcel CO	Focus on Energy	MidAm	NGrid	ETO	SBD	NYSERDA
Single TA provider									
Closed network									
Open network									
Multiple tracks	*								
Scaled incentives based on performance									
Scaled incentives based on technology									
Design firm incentive									
per kWh incentive									
per kW incentive									
per therm incentive									
per SF incentive									
EUI incentive									
Minimum savings threshold									
Incentive cap									
Post-construction support									
Net Zero support									
LEED support									

Motivators



OWNERS

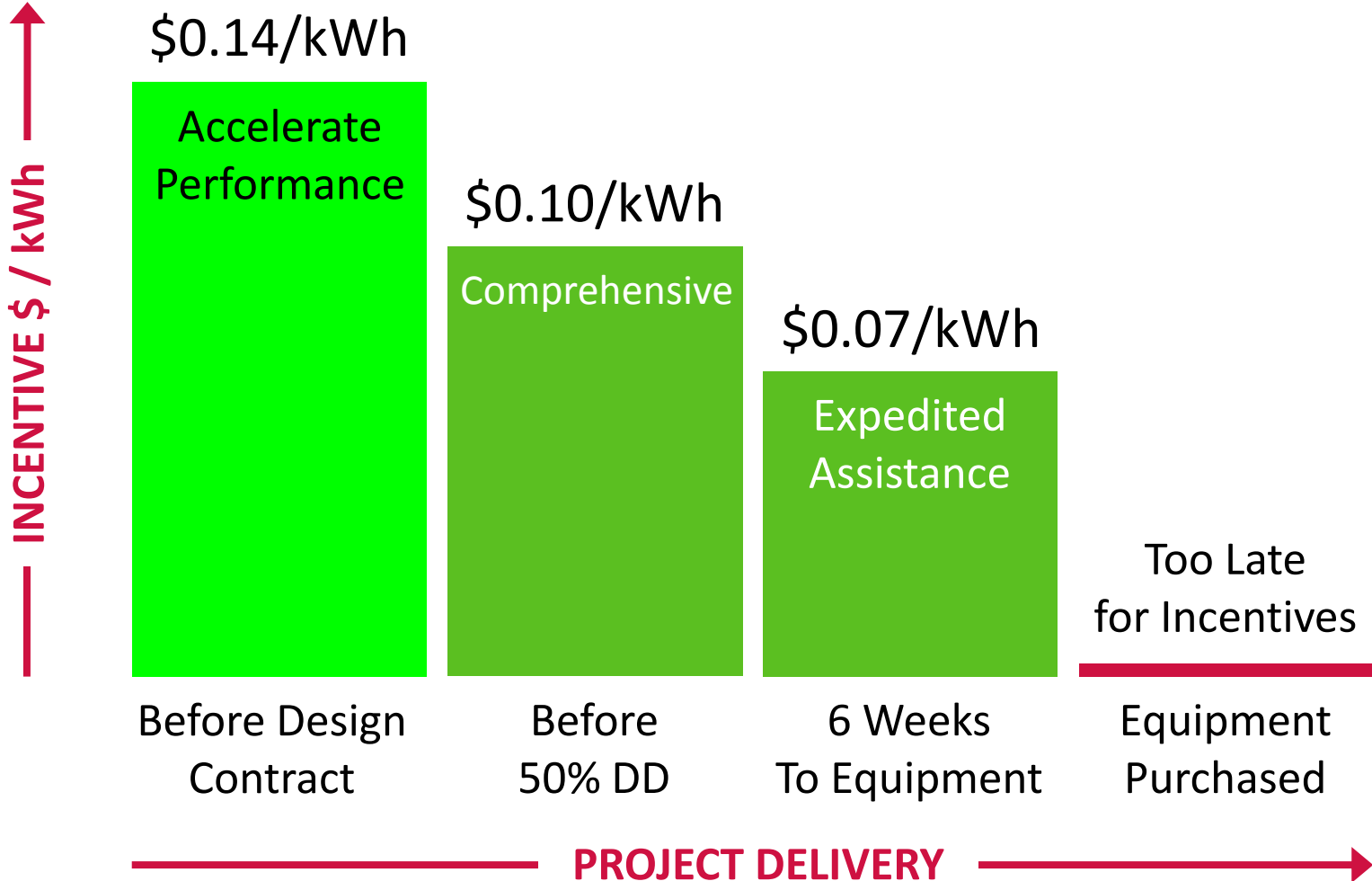
- Have campus/portfolio carbon goals
- Disappointed with new buildings
- Understand investment opportunity, need to manage risk
- Want zero energy, need a process
- Keep design and contractor team focused on measurable goals



UTILITIES

- Develop an industry leading program
- Premium customer service
- Support projects with aggressive goals
- Meet increasing savings goals despite advancing codes
- Prepare for outcome-based codes (and pay for performance)

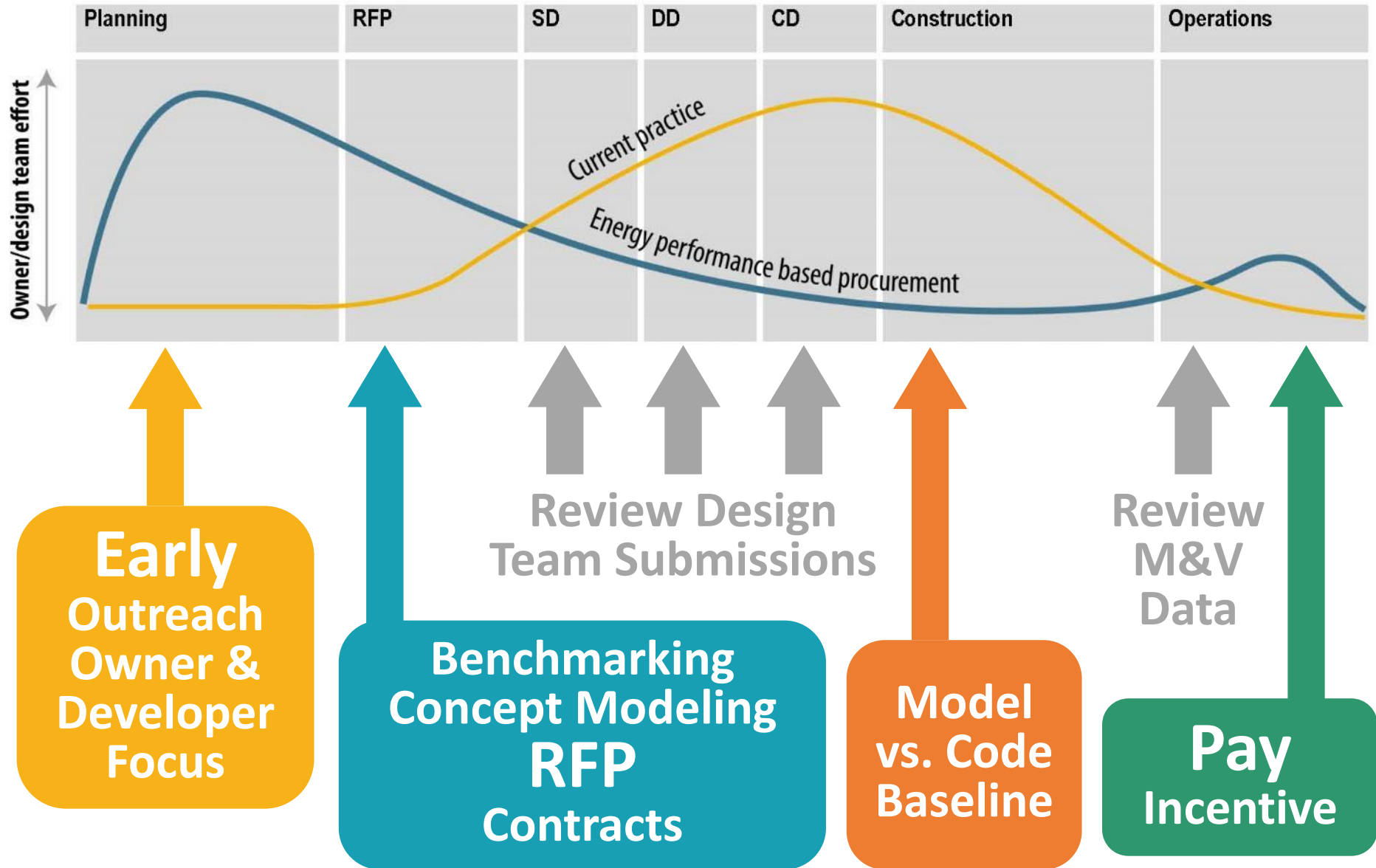
ComEd New Construction Incentives





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ACCELERATE PERFORMANCE





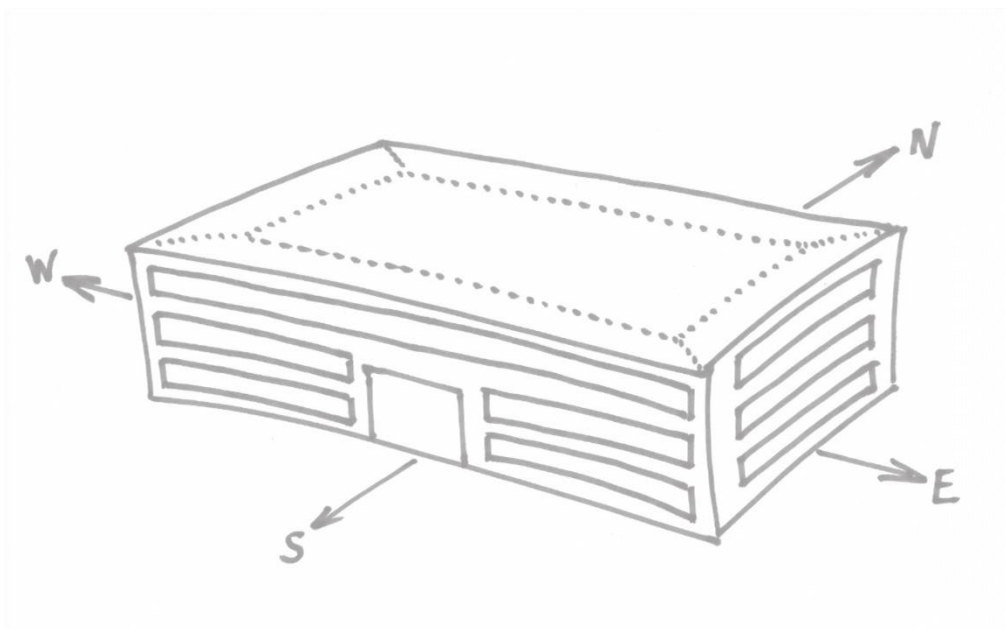
ECM #1 – Upgrade Wall Insulation		Disable Measure		
Baseline Wall U-Value: $0.064 \frac{\text{hr ft}^2 \text{ }^\circ\text{F}}{\text{BTU}}$	Better 0.043	Best 0.036	Custom <input type="text"/>	
ECM #2 – Improve Glazing U-Value		Disable Measure		
Baseline Glazing U-Value: $0.55 \frac{\text{hr ft}^2 \text{ }^\circ\text{F}}{\text{BTU}}$	Better 0.342	Best 0.3	Custom <input type="text"/>	
ECM #3 – Improve Glazing Solar Heat Gain Coefficient		Disable Measure		
Baseline Glazing Solar Heat Gain Coefficient: 0.4	Better 0.3	Best 0.25	Custom <input type="text"/>	
ECM #4 – Efficient Interior Lighting		Disable Measure		
Baseline Interior Lighting Power: $0.9 \frac{\text{W}}{\text{ft}^2}$	Better 0.73	Best 0.5	Custom <input type="text"/>	
ECM #5 – Upgrade Cooling Equipment		Disable Measure		
Baseline Average Cooling Equipment Efficiency: 9.8 EER	Better 11	Best 12	Custom <input type="text"/>	

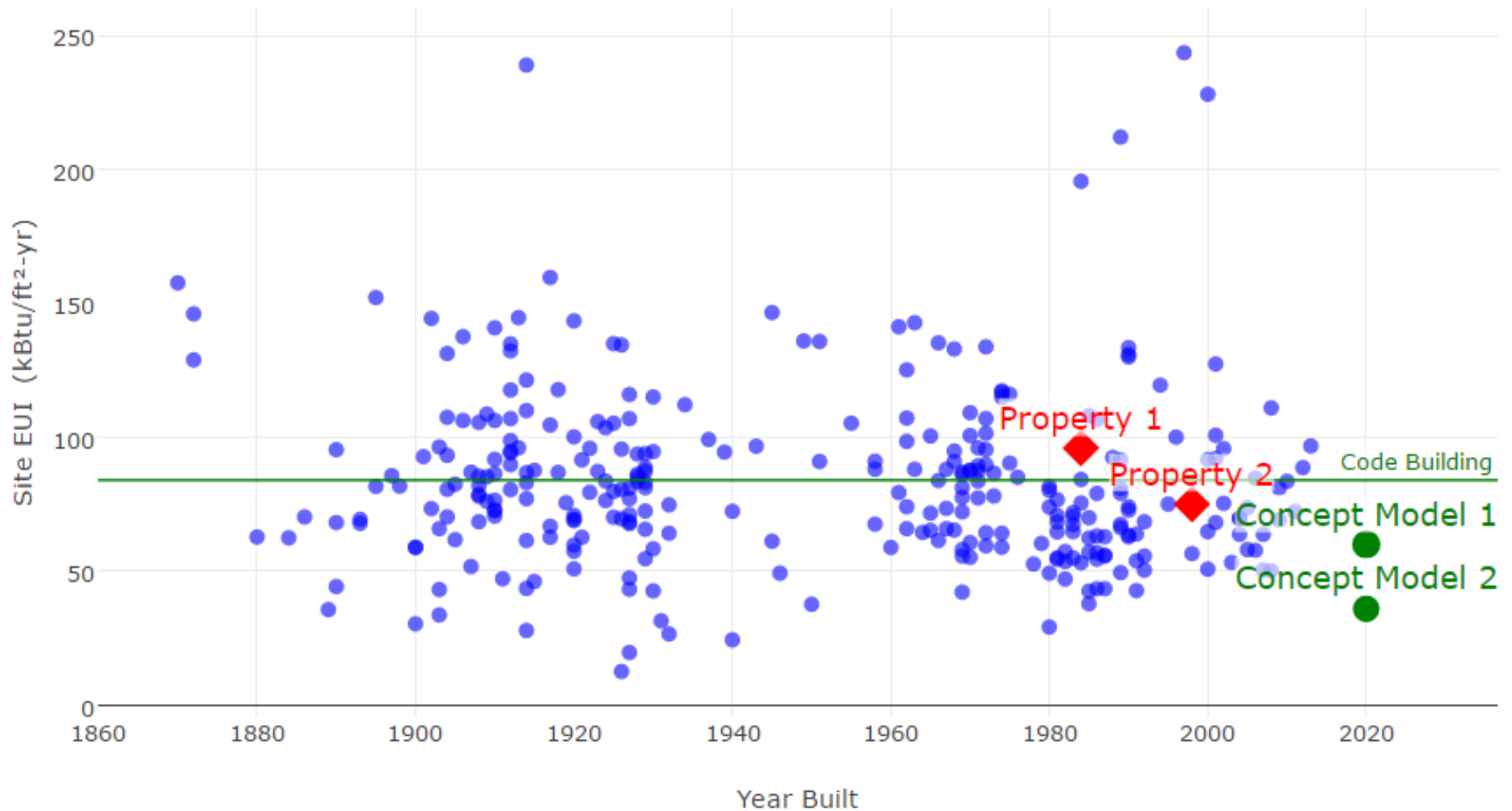


Energy Cost Savings ($\Delta\$/\text{ft}^2\cdot\text{yr}$)

0.00 0.05 0.10 0.15 0.20 0.25

- Lighting
- Plug Loads
- Cooling Efficiency
- Daylight Harvesting
- Glass U-Value
- Glass Area
- Glass SHGC
- HVAC Controls
- Infiltration
- Exterior Shading
- Heating Efficiency
- Wall Insulation
- Hot Water Efficiency
- Exterior Lighting
- Roof Insulation
- Demand Ventilation Controls

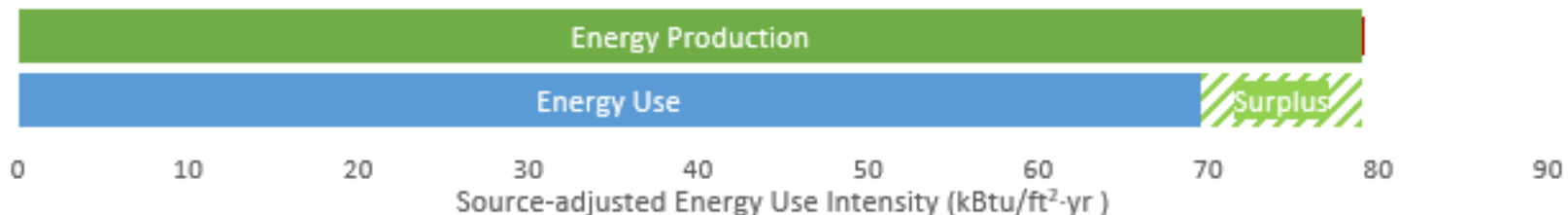






Zero Energy Feasibility Calculator

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Energy

<i>Parameter Description</i>	<i>Unit</i>	<i>Value</i>
Source Energy Import	kBtu/ft ² ·yr	69.5
Source Energy Export	kBtu/ft ² ·yr	79.1
Renewable Energy Surplus	kBtu/ft²·yr	9.6
Renewable Energy Shortage	kBtu/ft ² ·yr	-

Zero energy is physically...

feasible

Simple Cost Summary

<i>Parameter Description</i>	<i>Unit</i>	<i>Value</i>
Cost of building	\$	25,000,000
Cost of PV, installed	\$	2,378,318
Total construction cost	\$	27,378,318
Total construction cost	\$/sqft	274



Develop RFP Documents

Mission Critical:

Meet building program requirements

Standard of care for ventilation

Energy performance of 50 kBtu/gsf annually

Measurement and verification plan

Energy Star certified

Highly Desirable:

Energy performance of 40 kBtu/gsf annually

Natural ventilation

Provide high quality natural daylight

Automatic fault detection and diagnostics system

If Possible:

Zero energy ready

Zero energy building (DOE/EE-1247 definition)

An aerial photograph of the University of Chicago campus. In the foreground, there are several large, historic Gothic-style buildings with red-tiled roofs and stone facades. In the background, a large, modern building is under construction, with two red cranes visible against the sky. The city skyline of Chicago is visible in the far distance under a clear blue sky.

New hospital
\$600 million
Energy Star Score: 19

Energy Retrofits to
Historic Buildings

University of Chicago



EUI Target
75
kBtu/gsf·yr (site)



Campus North Residence Hall





Big Deahl

Mixed Use Development

EUI Target

36

kBtu/gsf·yr (site)

Image used with permission of
Structured Development



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Thank you

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www.seventhwave.org/accelerateperformance