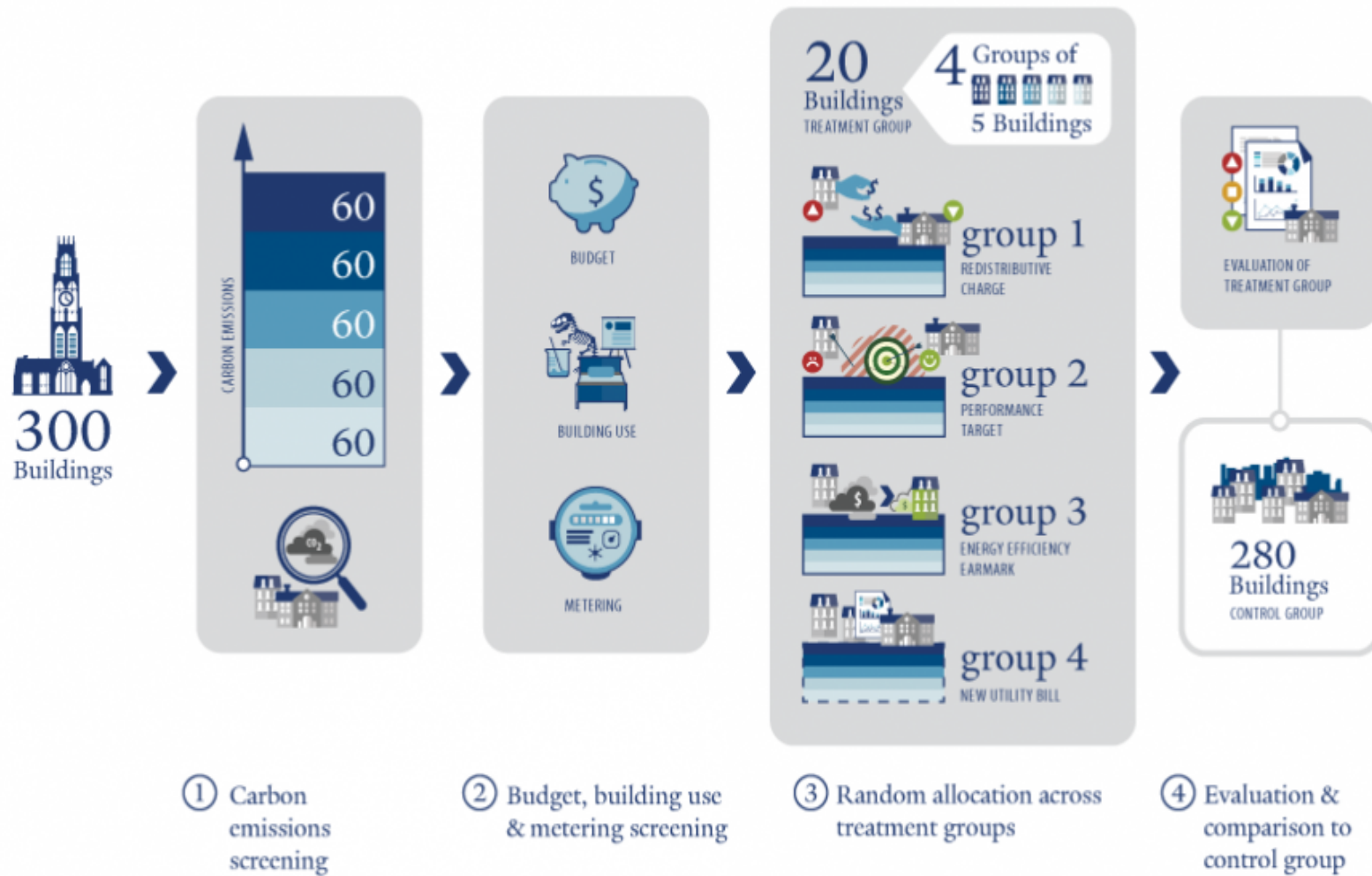


# Carbon Charge Pilot Case Study Handout 1

**Figure 1.** Selection and assignment of 20 buildings to 4 carbon pricing schemes.



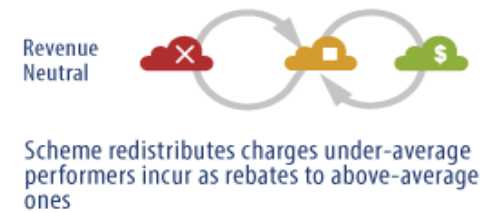
**Figure 2:** Diagram demonstrating the mechanics of the redistribution scheme. Buildings that performed worse than their counterparts received a net charge while those that performed relatively better received a net rebate.

# 1. Redistributive Charge

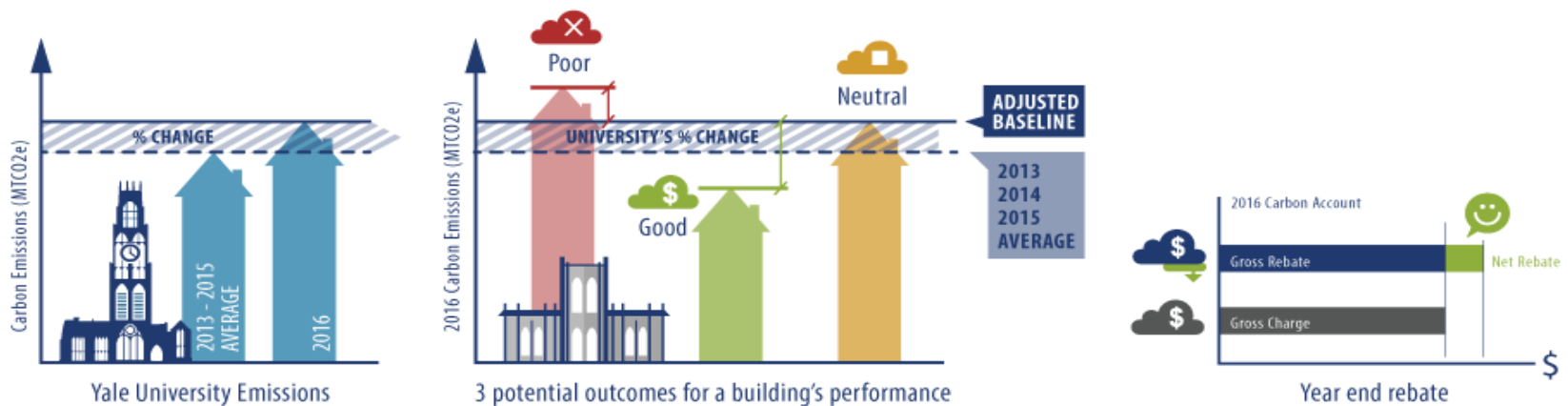
POOR PERFORMERS PAY GOOD ONES



**BUDGET IMPACT**



**MECHANICS**



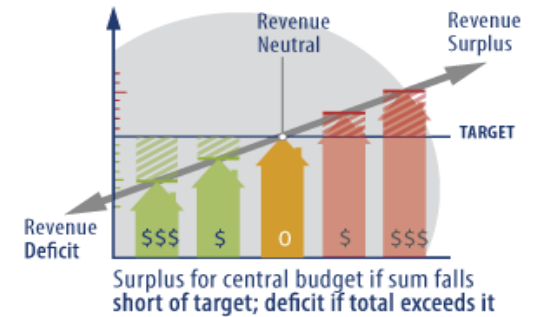
**Figure 3.** Diagram demonstrating the mechanics of the target scheme. Buildings received net charges or rebates depending on their performance relative to a predetermined target.

## 2. Performance Target

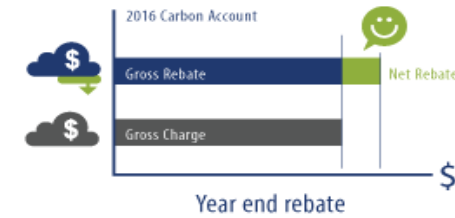
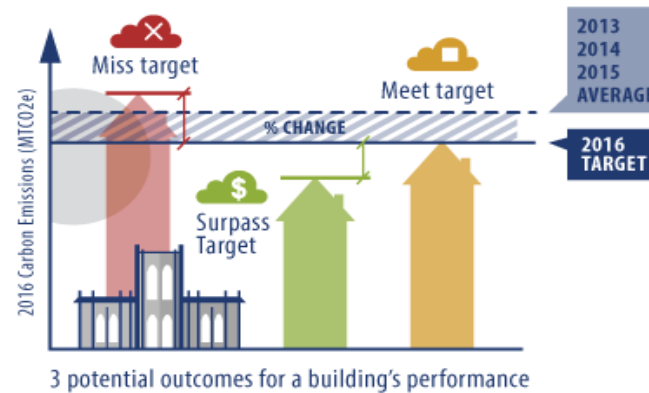
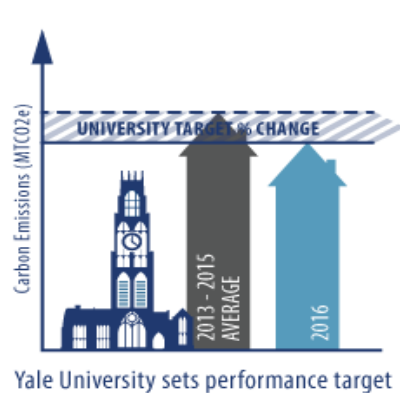
### MISS AND LOSE, BEAT AND WIN



**BUDGET IMPACT**



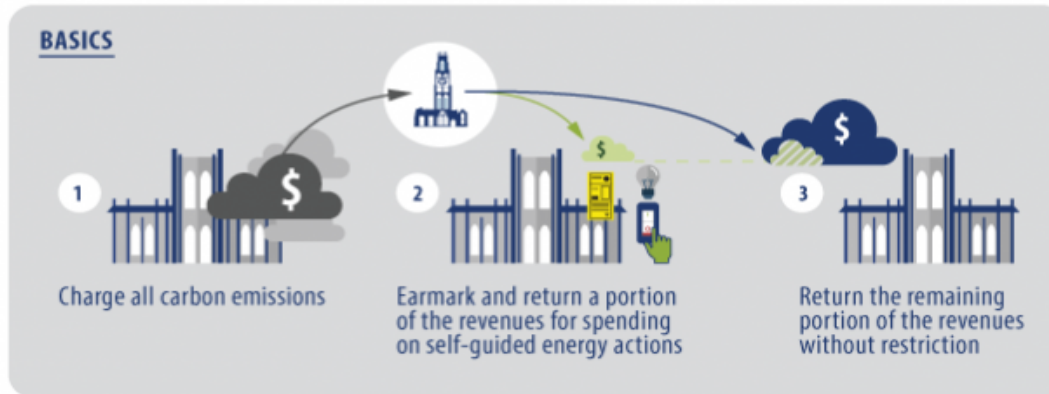
**MECHANICS**



**Figure 4.** Diagram demonstrating the mechanics of the Investment scheme. A monthly carbon charge is applied and all revenues are then rebated at the end of the fiscal year, with a portion earmarked for energy efficiency investments.

# 3. Energy Efficiency Earmark

## SET ASIDE FUNDS FOR ENERGY ACTIONS



**BUDGET IMPACT**

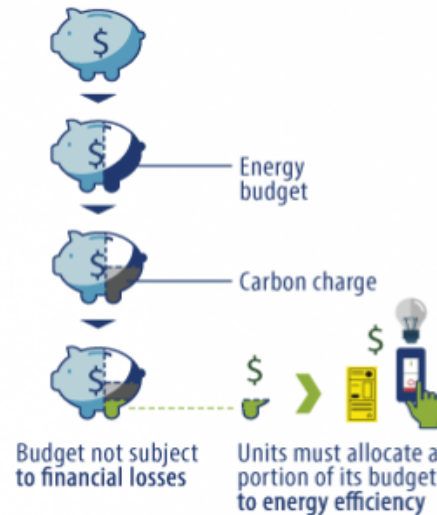
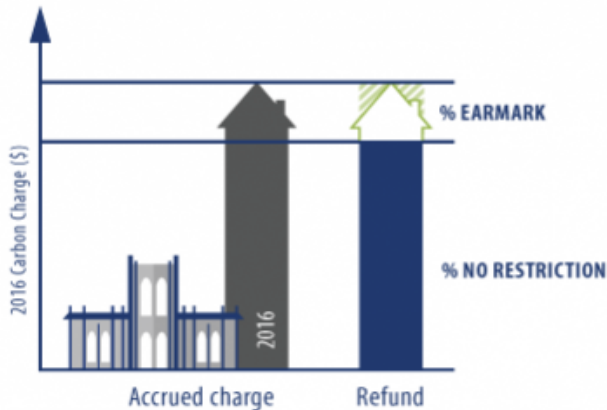


Requires participating units to invest a portion of their budget to reduce energy consumption and emissions



Scheme can be revenue neutral at university level if units achieve energy cost savings equal to expenditures

**MECHANICS**



**Figure 5.** Diagram demonstrating the mechanics of Scheme 4. Units received a new utility bill with information about their energy use, carbon emissions and indicative carbon charges, with no financial consequences.

# 4. New Utility Bill

## BETTER INFORMATION, MORE INFORMED DECISIONS



**BASICS**

1

Buildings receive a new utility bill

2

The bill shows information about their energy consumption, emissions, and costs - including a carbon price and figurative charge

3

Building managers make informed decisions about energy use

**BUDGET IMPACT**

Carbon prices and charges are figurative only - buildings incur no financial gains or losses associated with their emissions

Buildings may reduce energy costs and thus emissions by using the bill to make more informed decisions

**MECHANICS**

20  
Buildings  
TREATMENT GROUPS

All 20 treatment buildings receive the new utility bill

5 Buildings

But buildings in this group receive the new bill only with no carbon pricing scheme

Goal is to test the effectiveness of information in isolation of carbon pricing

Examples of the building energy reports sent to the pilot units. Above is May 2016 data for Betts House (Scheme 3). Below is February 2016 data for Pierson College (Scheme 2). Note that the two reports are reflective of the month, building, and scheme.

## Yale Building Energy Report

**Betts House**  
May 2016

### Performance Summary

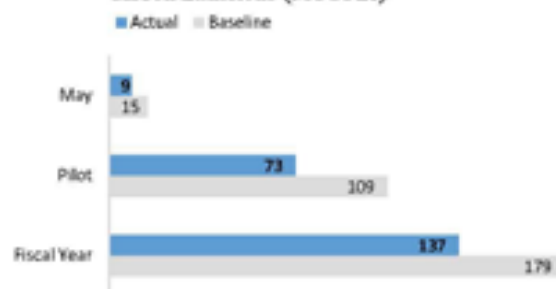
	You	Average	Rebate
May	-40%	+12%	\$ 309.57
Pilot	-33%	-0%	\$ 1,433.64
Fiscal Year	-23%	+9%	\$ 2,308.97

Note: Based on percent change from 3-year baseline

### How You're Doing

May	GREAT	☺☺
Pilot	GREAT	☺☺
Fiscal Year	GREAT	☺☺

### Carbon Emissions (MTCO<sub>2</sub>e)



### Utility Breakdown for May

	Energy		Carbon		% Change (Carbon)	Cost
	Actual	Baseline	Actual	Baseline		
Electric	10,655	17,468	4	6	-39%	\$ 1,714.41
Heating	40,705	71,103	3	5	-43%	\$ 391.09
Cooling	62,578	98,569	2	4	-37%	\$ 1,880.16
<b>Total</b>			<b>9</b>	<b>15</b>	<b>-40%</b>	<b>\$ 3,985.66</b>

Units: Electric (kWh), Heating/Cooling (MMBTU), Gas (CCF), Carbon (MTCO<sub>2</sub>e)

### May Temperature & Total

	Actual	Baseline
Avg Temp	↓ 58	60
Total Use	↓ 140	229

Units: Temp (°F), Use (MMBTU)

### Monthly Energy Saving Tips

- (1) Avoid cooling unoccupied spaces. Talk to your Facilities Superintendent about adjusting your cooling setpoints to reflect summer occupancy.
- (2) Shut down electronics when possible. Underused AV equipment and office electronics should be shut down for summer. Devices still use energy in standby, so adopt the policy "off is off."

### Carbon Charge Leaderboard for May

Building	Point of Contact
Betts House	Ted Wittenstein
30 Hillhouse	Sue Maher
Woodbridge Hall	Pilar Montalvo

Note: Based on percent change and activity level

### Want more details?

Visit Yale's Energy Explorer tool » [yva.facilities.yale.edu/energy/](http://yva.facilities.yale.edu/energy/).

### Understanding Your Footprint



**16** Betts House's energy use in May is equal to the sum of 16 Connecticut homes.



**112** You would have to plant 112 trees to sequester the carbon dioxide Betts House emitted during May.

# Yale Building Energy Report

## Pierson College

February 2016

### Performance Summary

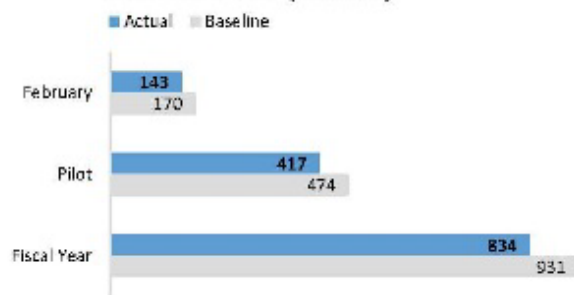
	You	Target	Rebate
February	-16%	-1%	\$ 1,020.17
Pilot	-12%	-1%	\$ 2,122.84
Fiscal Year	-10%	-1%	\$ 3,501.42

Note: Based on percent change from 3-year baseline

### How You're Doing

February	GREAT	😊😊
Pilot	GREAT	😊😊
Fiscal Year	GREAT	😊😊

### Carbon Emissions (MTCO<sub>2</sub>e)



### Utility Breakdown for February

	Energy		Carbon		% Change (Carbon)	Cost
	Actual	Baseline	Actual	Baseline		
Electric	102,109	106,898	34	35	-4%	\$ 14,138.71
Heating	1,355,473	1,679,344	104	129	-19%	\$ 35,865.82
Cooling	79,234	60,303	3	2	+31%	\$ 5,473.09
Gas	410	682	2	4	-40%	\$ 436.06
			143	170	-16%	\$ 55,913.68

Units: Electric (kWh), Heating/Cooling (MMBTU), Gas (CCF), Carbon (MTCO<sub>2</sub>e)

### February Temperature & Total

	Actual	Baseline
Avg Temp	↑ 33	26
Total Use	↓ 1,825	2,174

Units: Temp (°F), Use (MMBTU)

### Monthly Energy Saving Tips

1. With spring in swing, [adjust your setpoints](#) and use window treatments to regulate temperature.
2. As the academic year wraps up, get creative by consolidating night-time work areas and reorganizing term-time space for summer use.

### Carbon Charge Leaderboard for February

Building	Point of Contact
Betts House	Ted Wittenstein
Kroon Hall	Sue Wells
Pierson College	Tanya Wiedeking

Note: Based on percent change and activity level

### Want more details?

Visit Yale's Energy Explorer tool » [java.facilities.yale.edu/energy/](http://java.facilities.yale.edu/energy/).

### Understanding Your Footprint



**203** Pierson College's energy use in February is equal to the sum of 203 Connecticut homes.



**1,784** You would have to plant 1,784 trees to sequester the carbon dioxide Pierson College emitted during February.