ENERGY DEMAND
MID SEMESTER REPORT

Team 01-07
Team Members:
JM Tameta, Matt Sacco, Matt Shea, Meghan McConnell,
Sarah Phung, Val Roberts

PROJECT UPDATES

INITIAL APPROACH

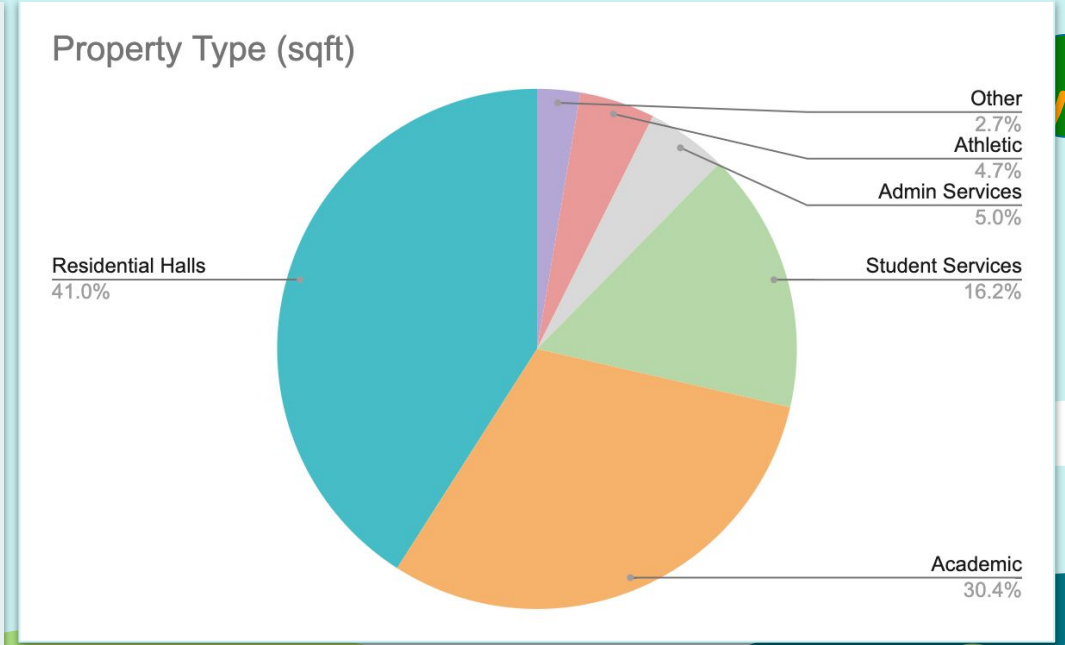
- Find a relationship between each specific **building & energy records** of its usage to chart & visualize
- Unable to do so due to lack of connecting information between individual building and records of energy usage.
- Information collected, cleaned & analyze to address our current solution

Property Name	Portfolio Manager ID	Property Use Name	Detail Name	Detail Current as of Date	Detail Value	Units
The College of New Jersey	5984875	Parking Use	Open Parking Lot Size	1/1/2010	0	Sq. Ft.
The College of New Jersey	5984875	Parking Use	Partially Enclosed Parking Garage Size	1/1/2010	803684	Sq. Ft.
The College of New Jersey	5984875	Parking Use	Completely Enclosed Parking Garage	1/1/1901	0	Sq. Ft.
The College of New Jersey	5984875	Parking Use	Supplemental Heating	1/1/1901	No	Not Available
The College of New Jersey	5984875	Building Use	Gross Floor Area	1/1/2018	2824573	Sq. Ft.
The College of New Jersey	5984875	Building Use	Gross Floor Area	1/1/2016	2622872	Sq. Ft.
The College of New Jersey	5984875	Building Use	Weekly Operating Hours	1/1/2017	60	Not Available
The College of New Jersey	5984875	Building Use	Enrollment	1/1/2017	7400	Not Available

Property Name	Meter Name	Meter Type	Start Date	End Date	Usage/Quantity	Usage Units
he College of New Jersey	EL1	Electric - Grid	7/1/2009	7/31/2009	58233	kWh (thousand Watt-hours
he College of New Jersey	NG1	Natural Gas	7/1/2009	7/31/2009	11668.61	therms
he College of New Jersey	NG16	Natural Gas	7/1/2009	7/31/2009	0	therms
he College of New Jersey	NG2	Natural Gas	7/1/2009	7/31/2009	475082.63	therms
he College of New Jersey	NG3	Natural Gas	7/1/2009	7/31/2009	0	therms
he College of New Jersey	EL1	Electric - Grid	8/1/2009	8/31/2009	282323	kWh (thousand Watt-hours
he College of New Jersey	NG1	Natural Gas	8/1/2009	8/31/2009	45471.29	therms
he College of New Jersey	NG16	Natural Gas	8/1/2009	8/31/2009	0	therms
he College of New Jersey	NG2	Natural Gas	8/1/2009	8/31/2009	501545.6	therms
he College of New Jersey	NG3	Natural Gas	8/1/2009	8/31/2009	0	therms
he College of New Jersey	EL1	Electric - Grid	9/1/2009	9/30/2009	405601	kWh (thousand Watt-hours
he College of New Jersey	NG1	Natural Gas	9/1/2009	9/30/2009	6168.88	therms
he College of New Jersey	NG16	Natural Gas	9/1/2009	9/30/2009	0	therms
he College of New Jersey	NG2	Natural Gas	9/1/2009	9/30/2009	490264.94	therms
he College of New Jersey	NG3	Natural Gas	9/1/2009	9/30/2009	0	therms
he College of New Jersey	EL1	Electric - Grid	10/1/2009	10/31/2009	387746	kWh (thousand Watt-hours
he College of New Jersey	NG1	Natural Gas	10/1/2009	10/31/2009	1417.45	therms
he College of New Jersey	NG16	Natural Gas	10/1/2009	10/31/2009	0	therms

APPROACHED SOLUTION (I)

- Focusing on the **square footage** of the buildings based on their property type
- **Property Type Categories**
  - Academic
  - Residential Halls
  - Admin Services
  - Student Services
  - Athletic
  - Other
- Totaling the square footage based on the property tag



APPROACHED SOLUTION (II)

1

PROPERTY TYPE

Select & categorize specific property type

2

CALCULATE SQFT

Based on property type calculate total square feet for property type

3

APPLY PERCENTAGE

Calculate & apply percentage to each energy consumption (electricity/ natural gas)

4

COST PERCENTAGE

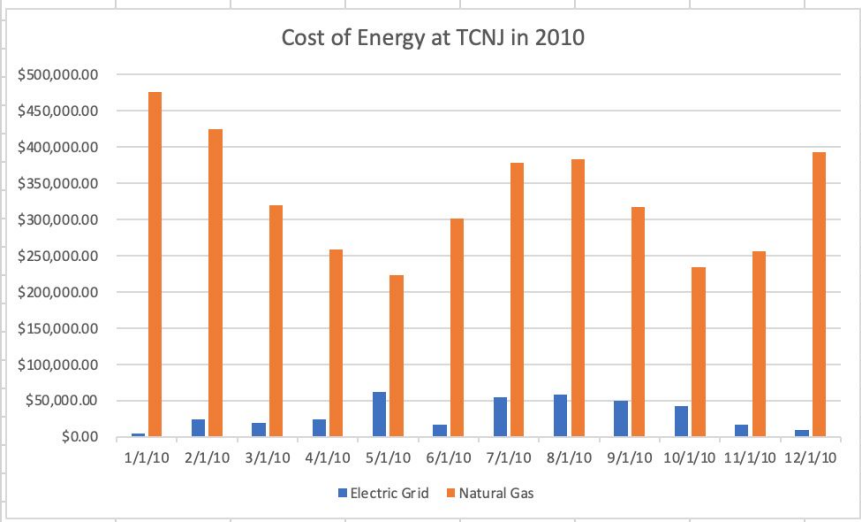
With calculated percentage apply to desired data range

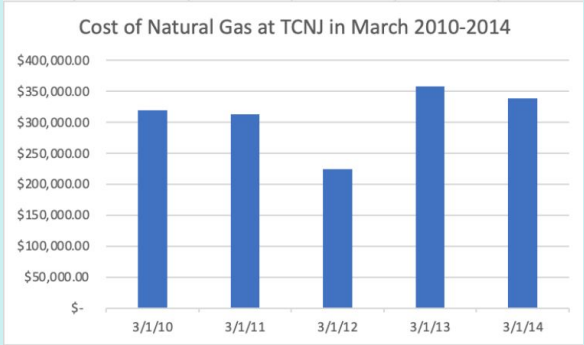
TOTAL USAGE & COST PER MONTH

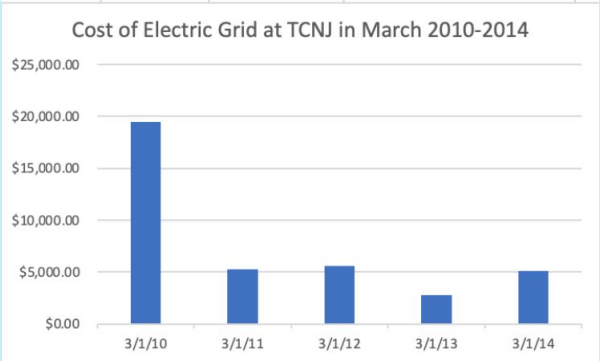
Property Name	Meter Name	Meter Type	Start Date	End Date	Usage/Quantity	Usage Units	Cost ($)
The College of New Jersey	EL1	Electric - Grid	7/1/2009	7/31/2009	58233	kWh (thousand Watt-hours)	$3,661.37
		NG Total	7/1/2009	7/31/2009	486751.24	therms	$276,686.17
The College of New Jersey	EL1	Electric - Grid	8/1/2009	8/31/2009	282323	kWh (thousand Watt-hours)	$17,949.02
		NG Total	8/1/2009	8/31/2009	547016.89	therms	$285,015.12
The College of New Jersey	EL1	Electric - Grid	9/1/2009	9/30/2009	405601	kWh (thousand Watt-hours)	$23,876.63
		NG Total	9/1/2009	9/30/2009	496433.82	therms	$225,990.45
The College of New Jersey	EL1	Electric - Grid	10/1/2009	10/31/2009	387746	kWh (thousand Watt-hours)	$21,179.26
		NG Total	10/1/2009	10/31/2009	466607.18	therms	$258,897.42
The College of New Jersey	EL1	Electric - Grid	11/1/2009	11/30/2009	769449	kWh (thousand Watt-hours)	$38,578.81
		NG Total	11/1/2009	11/30/2009	385494	therms	$239,082.42
The College of New Jersey	EL1	Electric - Grid	12/1/2009	12/31/2009	109448	kWh (thousand Watt-hours)	$7,305.06
		NG Total	12/1/2009	12/31/2009	577924.92	therms	$368,884.41
The College of New Jersey	EL1	Electric - Grid	1/1/2010	1/31/2010	79997	kWh (thousand Watt-hours)	$4,709.21
		NG Total	1/1/2010	1/31/2010	594725.89	therms	$475,546.97
The College of New Jersey	EL1	Electric - Grid	2/1/2010	2/28/2010	295623	kWh (thousand Watt-hours)	$23,907.27
		NG Total	2/1/2010	2/28/2010	566524.83	therms	$424,355.95
The College of New Jersey	EL1	Electric - Grid	3/1/2010	3/31/2010	345094	kWh (thousand Watt-hours)	$19,442.98
		NG Total	3/1/2010	3/31/2010	465343.4	therms	$319,295.96
The College of New Jersey	EL1	Electric - Grid	4/1/2010	4/30/2010	433231	kWh (thousand Watt-hours)	$23,955.68
		NG Total	4/1/2010	4/30/2010	458586.11	therms	$259,029.55
The College of New Jersey	EL1	Electric - Grid	5/1/2010	5/31/2010	970260	kWh (thousand Watt-hours)	$62,157.90
		NG Total	5/1/2010	5/31/2010	354833.76	therms	$222,633.79

Cleaned data (visual/organization) of measurements. (Note name is similar for all entries)

ENERGY COST ANALYSIS AT TCNJ



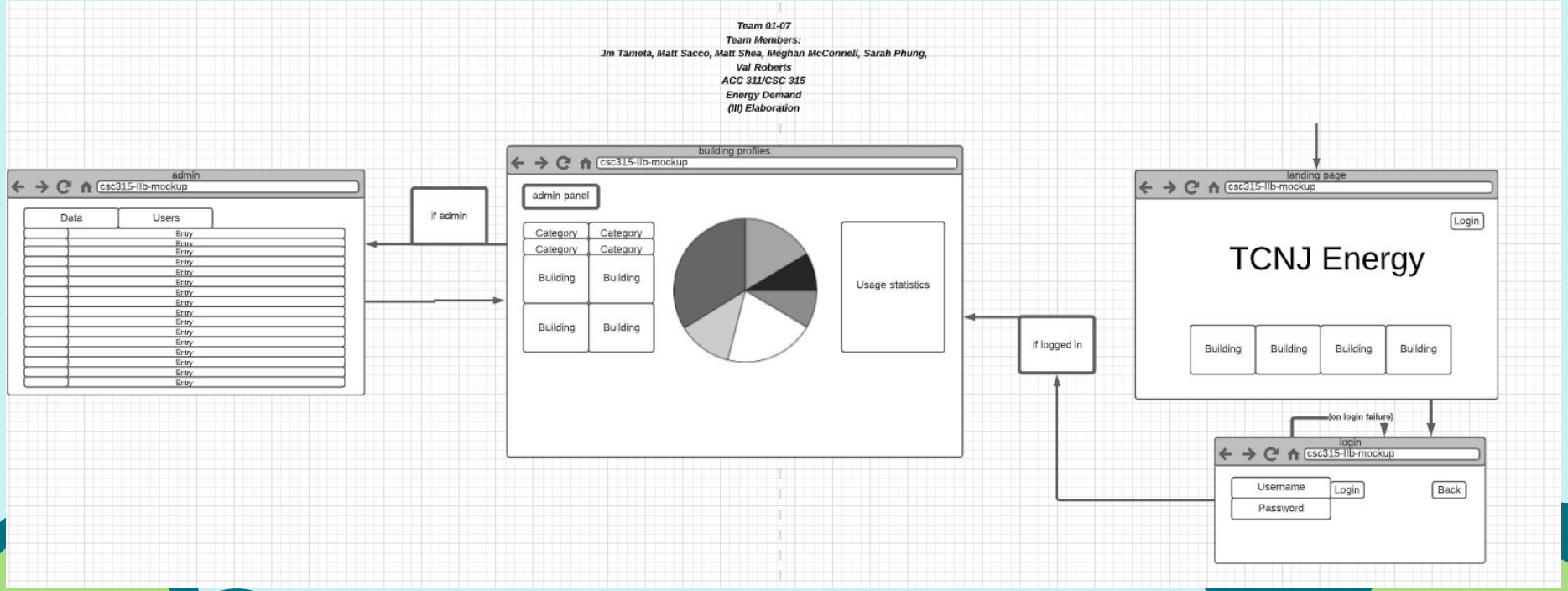




The above graph shows the costs associated with each type of energy in 2010

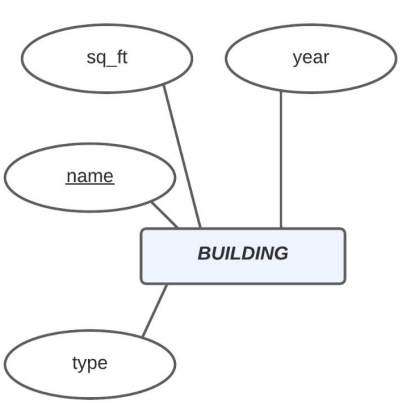
The charts on the right graph the costs of natural gas and electricity at TCNJ in March 2010-2014

WEB INTERFACE

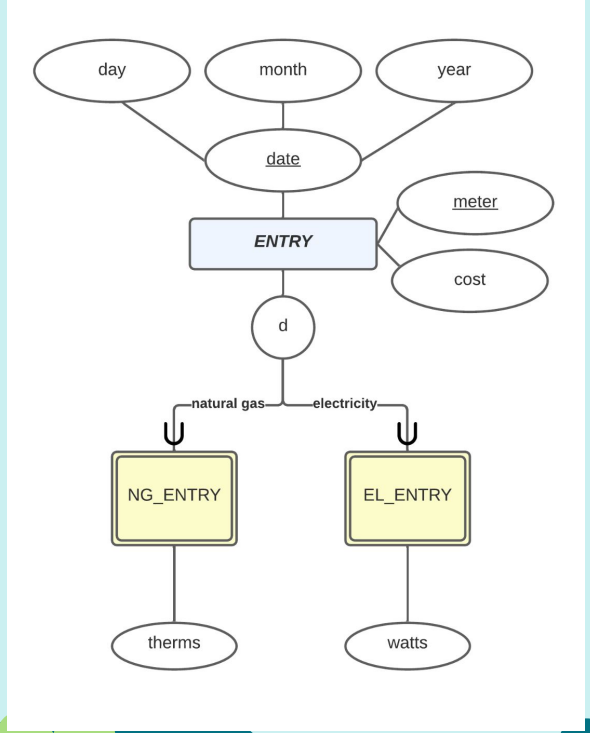


DIAGRAMS

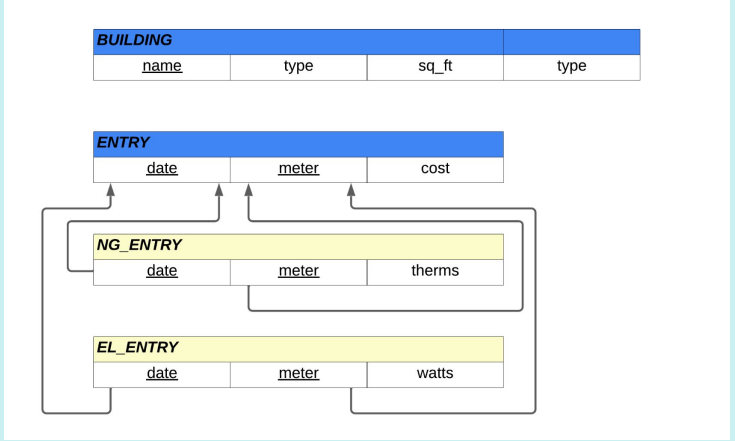
ER Diagram I



ER Diagram II



Relational Schema



USE CASES

USER PERSONA - ARCHITECT

1. If you are an architect planning to build a new building on campus, you could analyze how much energy cost is being used amongst the other building, before building.

USER PERSONA - STUDENT RESEARCH

1. A student can look at the distribution of energy across different building types in order to see what buildings contain the most energy.

USER PERSONA - ADMIN

1. A database admin can insert and modify information of each building according to architecture changes in each building, causing the website's calculations to respond dynamically.

THANK YOU!

Questions, Comments, Concerns