aeon®

Homes for Generations

Aeon's Vision:

that every person has a home and is interconnected within community.

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Sustainability…

Translation:

conservation,
high- performance,
sound business
principles

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Aeon and University of Minnesota Center for Sustainable Building Research –

New Const.

Subst. Rehab

Mod. Rehab

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Pilot Projects - 2006

LIVING BUILDING CHALLENGE™ 2.0

A VISIONARY PATH TO A RESTORATIVE FUTURE

www.ilbi.org

INTERNATIONAL
LIVING BUILDING
INSTITUTE™

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Imagine…

"What if every single act of design and construction made the world a better place?“

- The Living Building Challenge™

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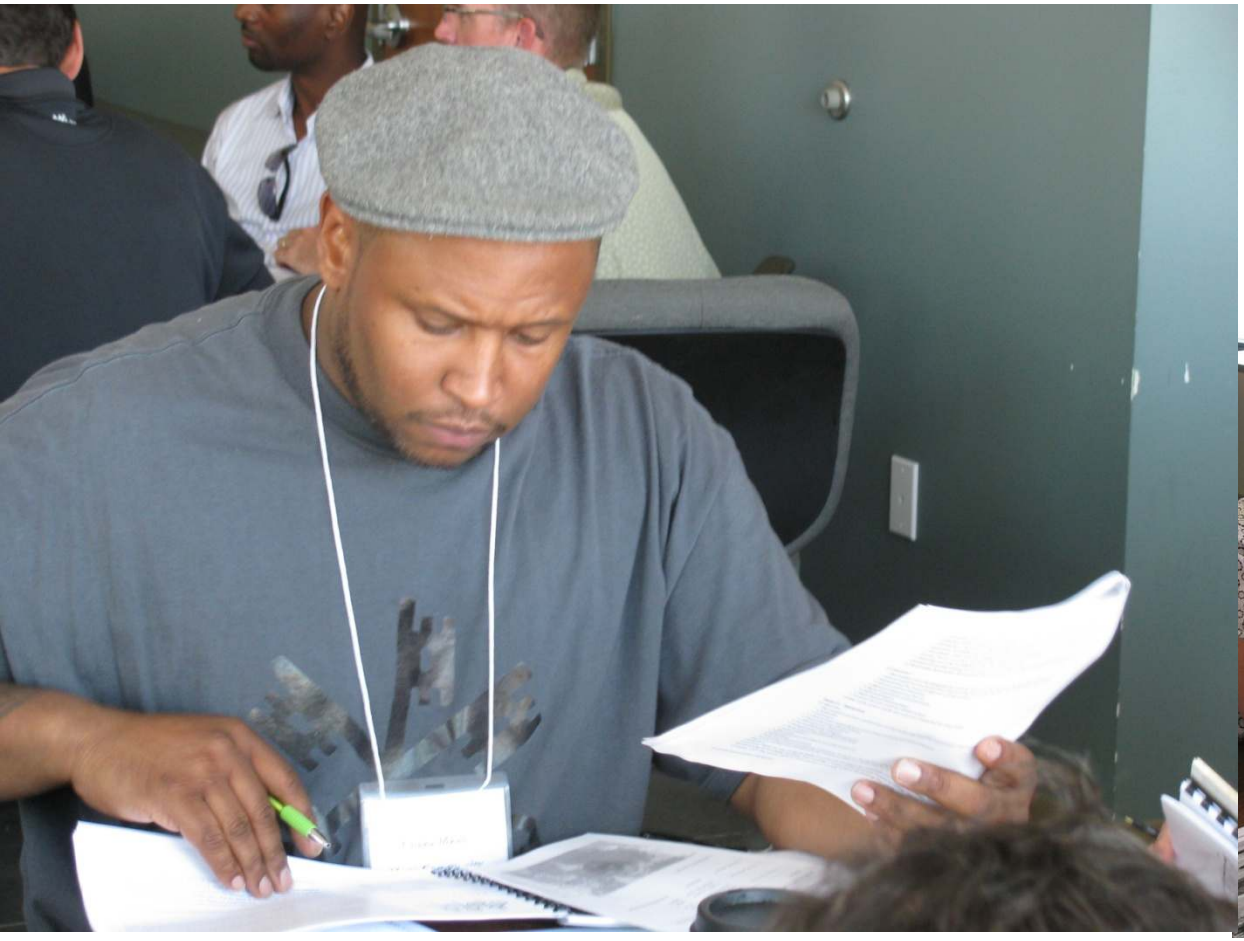
Community Workshops



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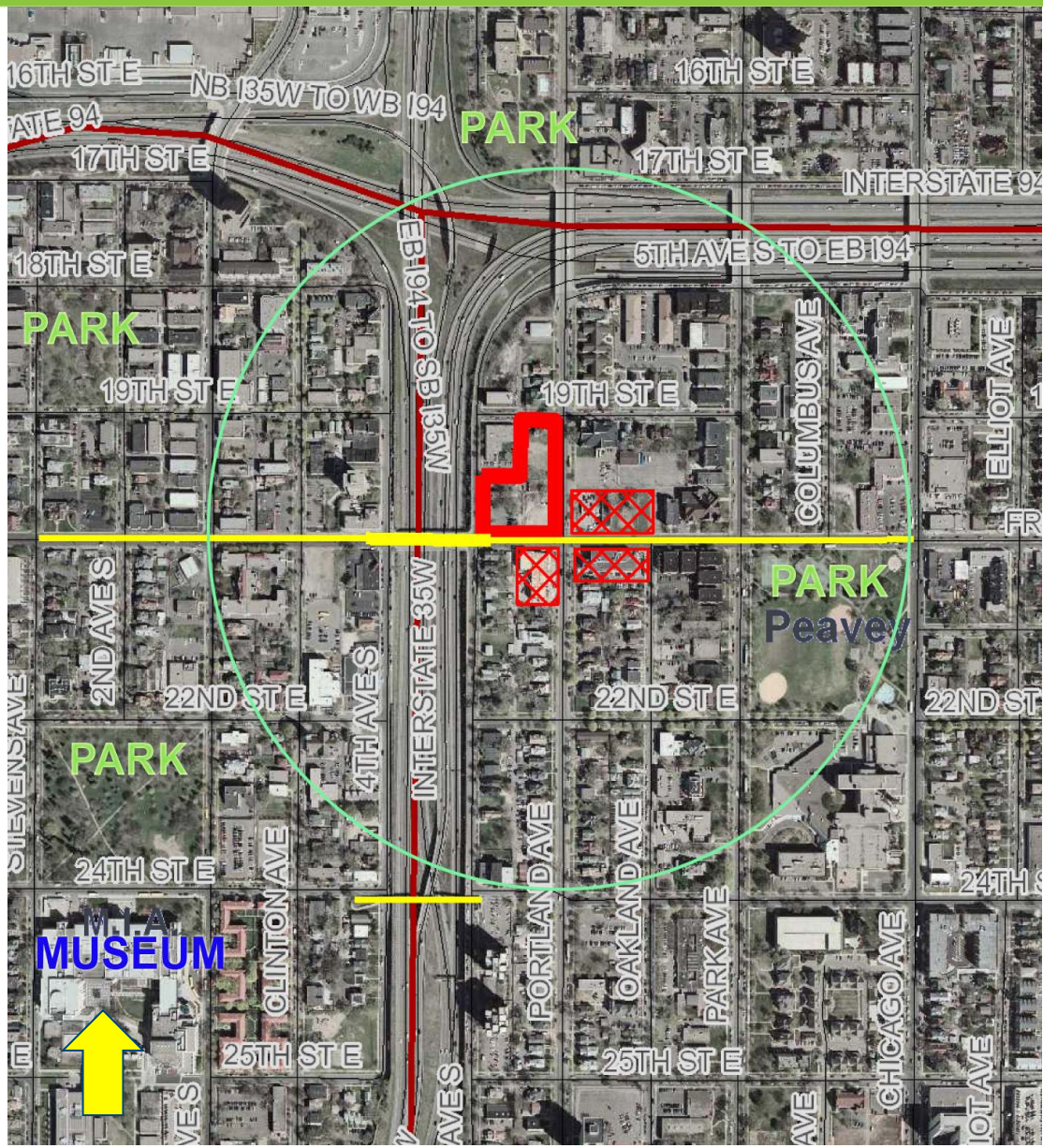
Community Impact

What we build… "cannot be built in isolation, but must also repair the world around it, and within it, so that the larger world at that one place becomes more coherent, and more whole…"

- Christopher Alexander



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Before

Homes for Generations

South Quarter = 240+ homes

Sustainable Living

Resident Engagement Pilot Project

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The Wellstone

- Opened in late 2008
- Near downtown Minneapolis
- 49 units
  - 36 affordable
  - 13 market-rate
- 142 residents
- 75 are children
- 2/3 from East Africa

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For Geeks

103,359 SF – Bldg size
3,760,463 kBtu - energy
45.6 kBtu/sf - EUI
10.3 lbs CO2 – Carbon Intensity
3,581,856 gal H2O
105.3 gal/BR/day

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Storm Water Management

HOPE Community

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Solar Thermal

Team

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Hope Community

U of MN – Housing

U of MN - CSBR

Cummins Power

Financial Partners

Enterprise Community Partners

In – Kind &Volunteers

Target Foundation

City of Mpls – Climate Change

Mississippi Watershed Management Org.

Metro CERT

Sustainable Living - Phases

Goals and Values

Benchmarks/Metrics/Data

Resident Survey

Cultivation of Resident Leaders

Installation of Feedback Meters

Sustainable Living - Phases

Curriculum and Tool Development

Informal Info Sessions

Workshops

House Calls and Community Event

Listening/Voice of the Customer

Evaluation

Values

1. Respect for People – Residents and Staff
2. Clear Communication /Transparency
3. Build Community Capacity
4. Simplicity, Manageable, Easy to Replicate, Bring to Scale, & Sustain!!
5. Impactful – Data Driven

Goals

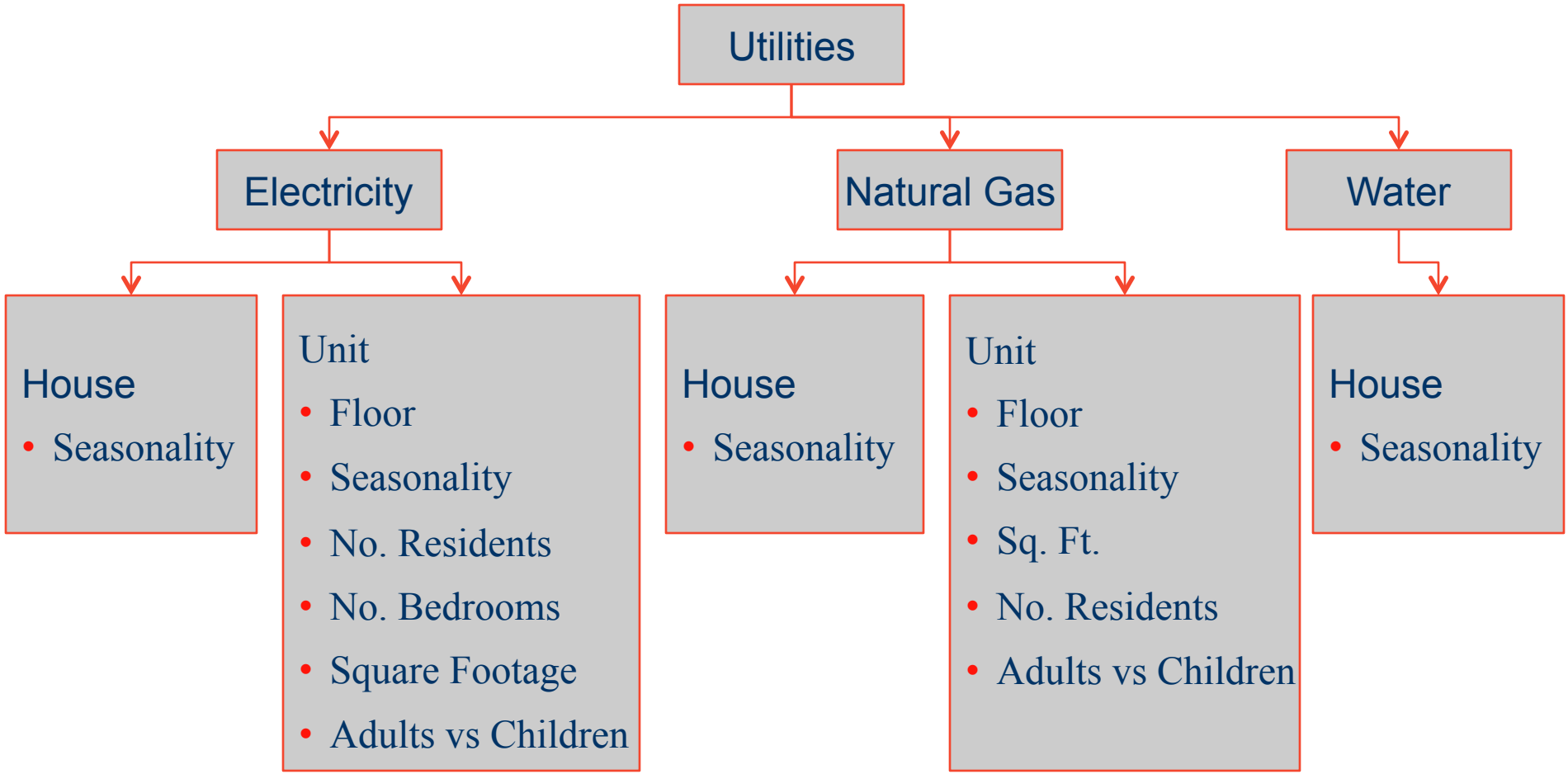
1. Reduce Water Use by 15%
2. Decrease Energy use by 10%
3. Diminish Waste & Increase Recycling
4. Improve Resident Knowledge
5. Advance Resident Engagement

Future Goals

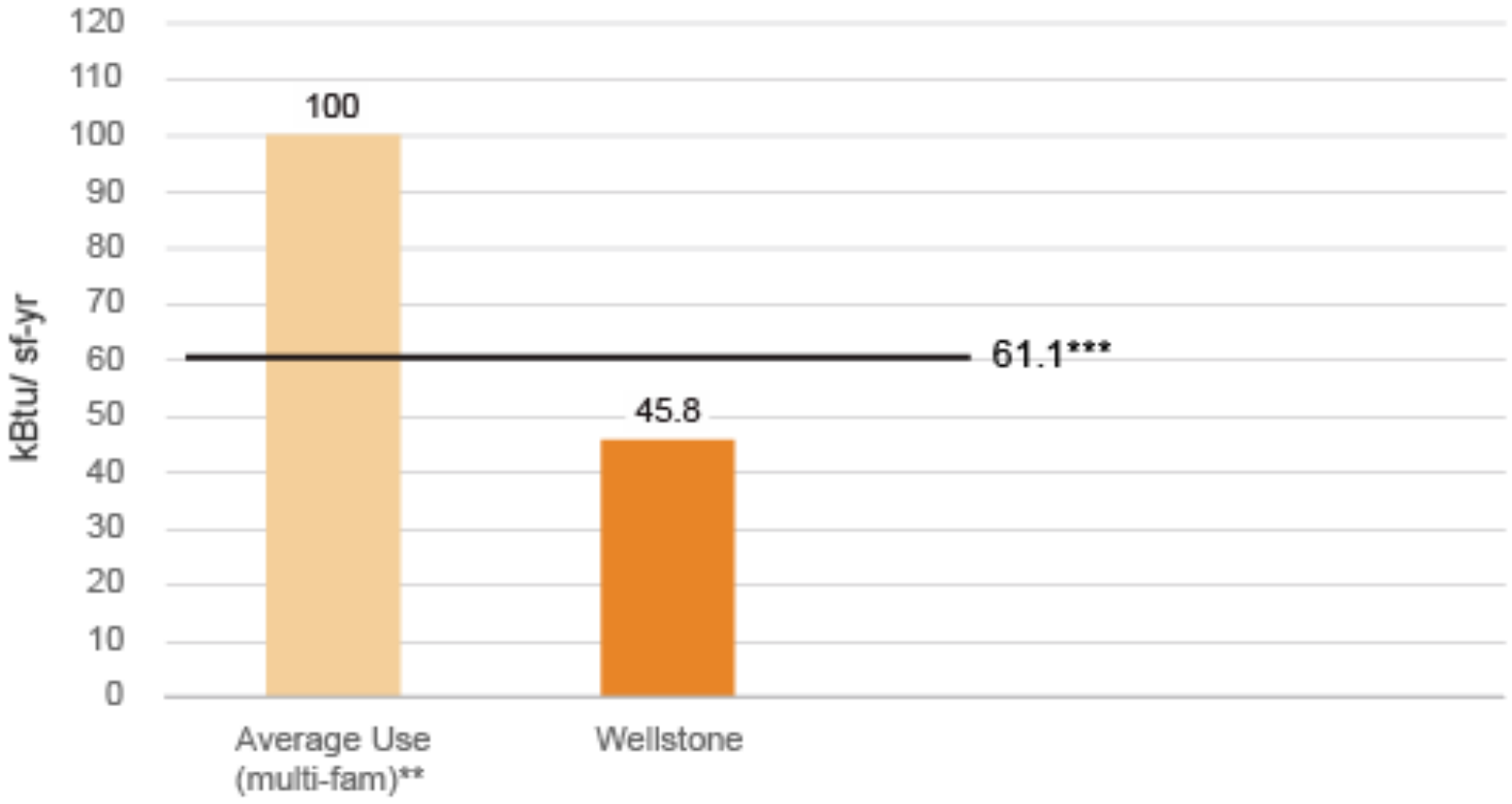
Improve Resident Health and Quality of Life

Increase Use of Public and Alternative Transportation

Data Analysis Approach



Annual Energy Intensity*
Wellstone



** Weather normalized*
***Average energy intensity (multi-family) - 100 kBtu/ sf-yr*
Based on The Weidt Group multi-family housing modeling code estimate.
****MN 2030 Challenge Target for 2005-2009*

Electricity Summary

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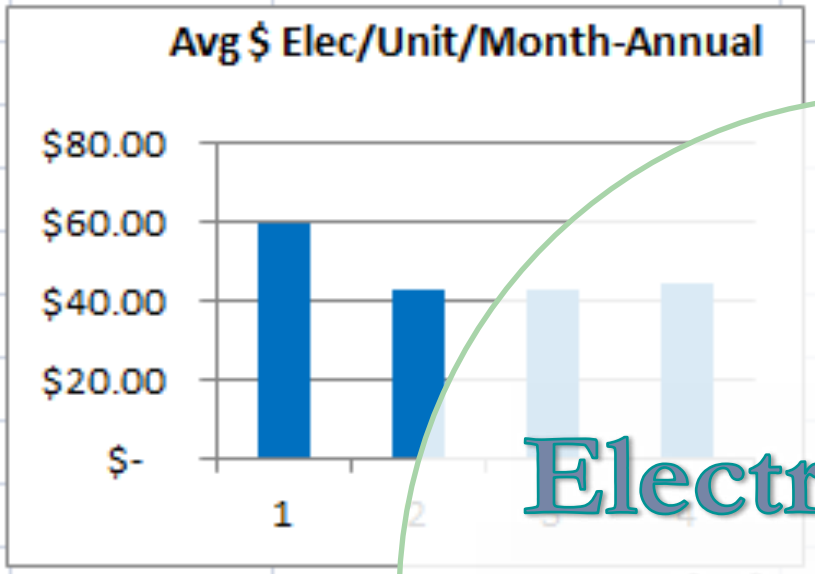
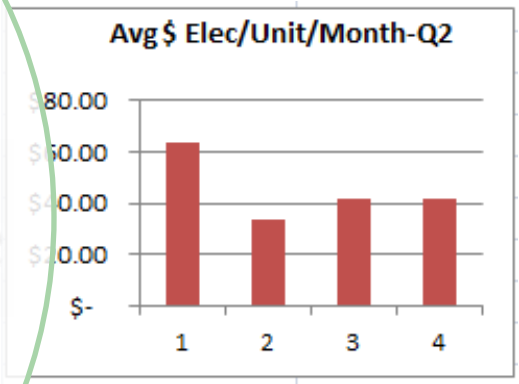
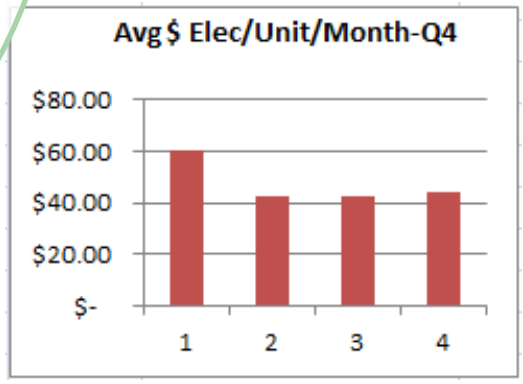


Floor	1	
Q1	$ 53.26	$ 5
Q2	$ 63.60	$ 3
Q3	$ 86.20	$ 45
Q4	$ 58.53	$ 52.6
Annual	$ 60.03	$ 42.89

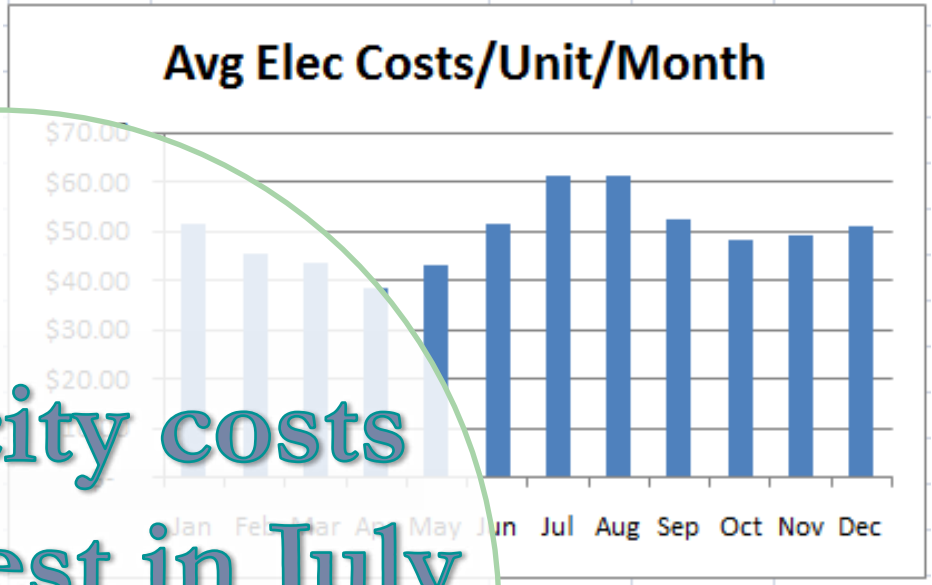
Electricity costs are highest in the units on Floor 1

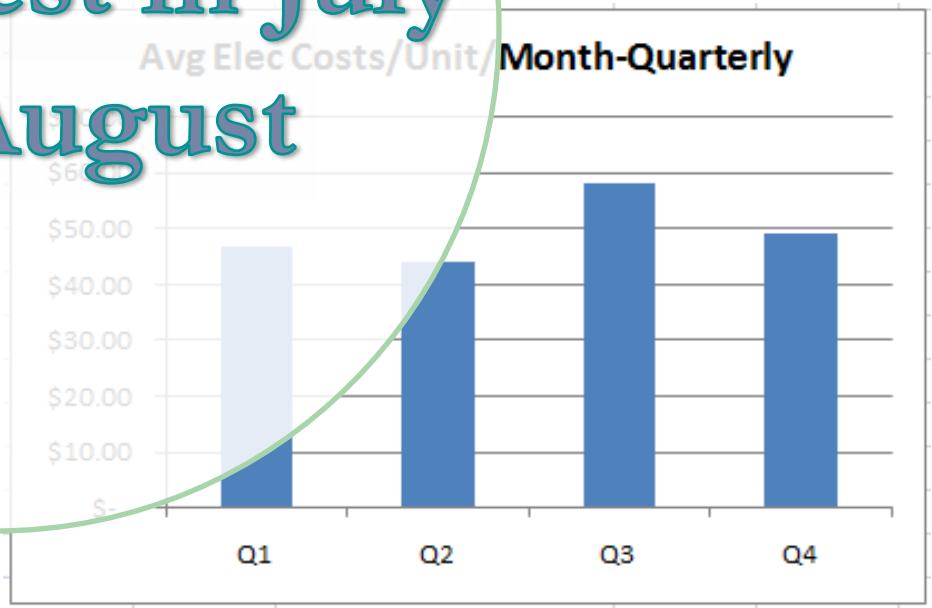




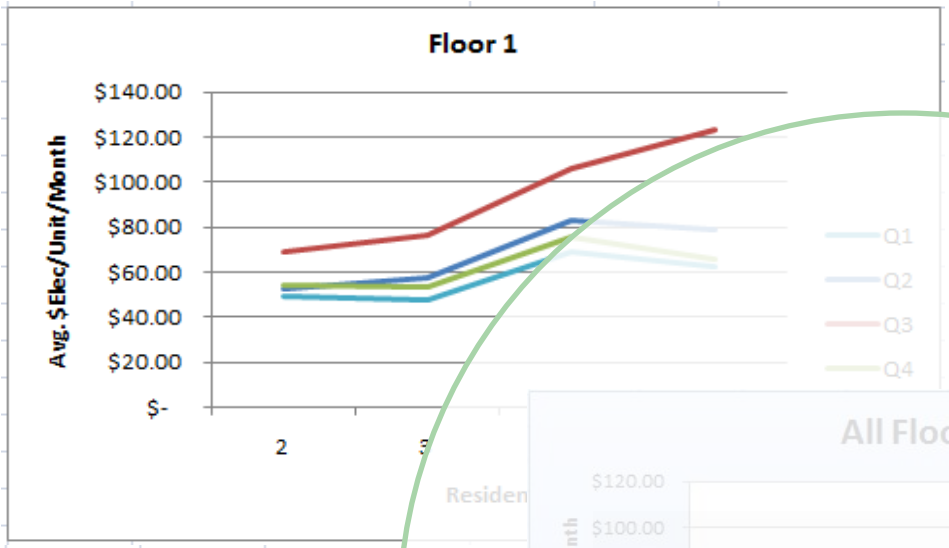
Month	Avg Elec Costs/Unit/Month
Jan	$ 51.43
Feb	$
Mar	$
Apr	$
May	$
Jun	$
Jul	$
Aug	$
Sep	$
Oct	$
Nov	$
Dec	$

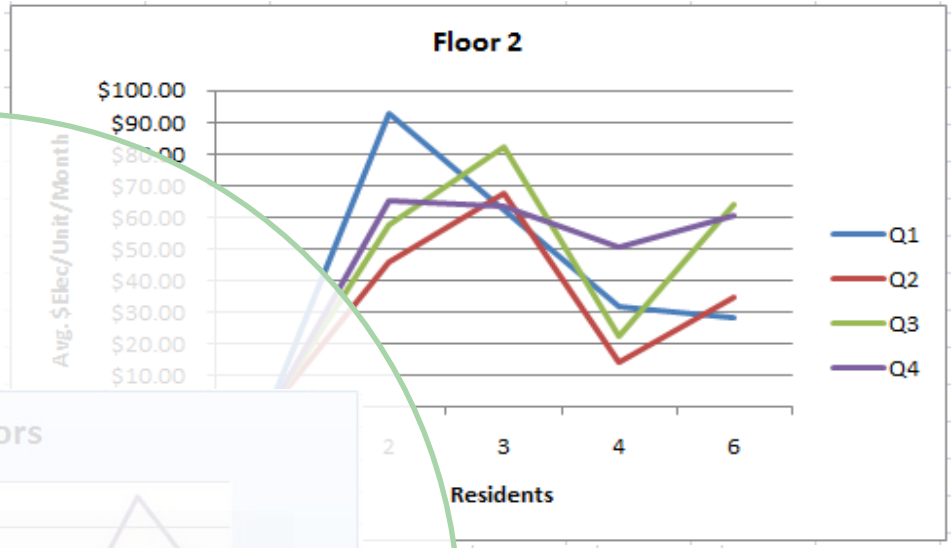
Qtr	Avg Elec Costs/Unit/Month
Q1	$
Q2	$
Q3	$
Q4	$ 49.30

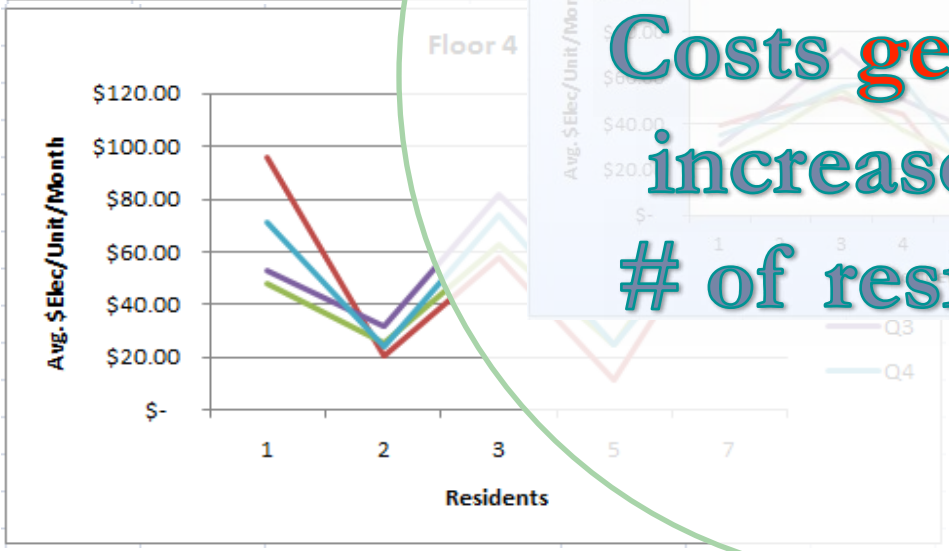


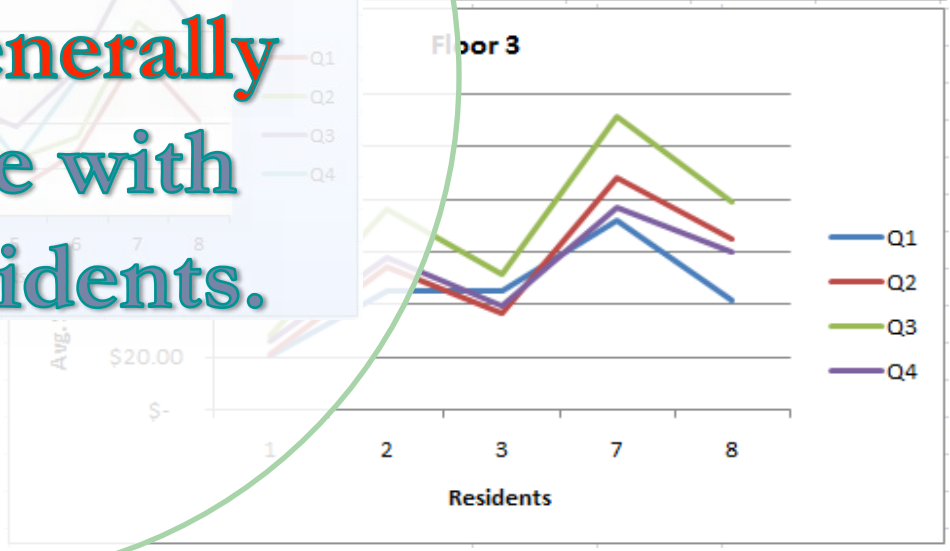


Electricity costs are highest in July and August









Costs generally increase with # of residents.

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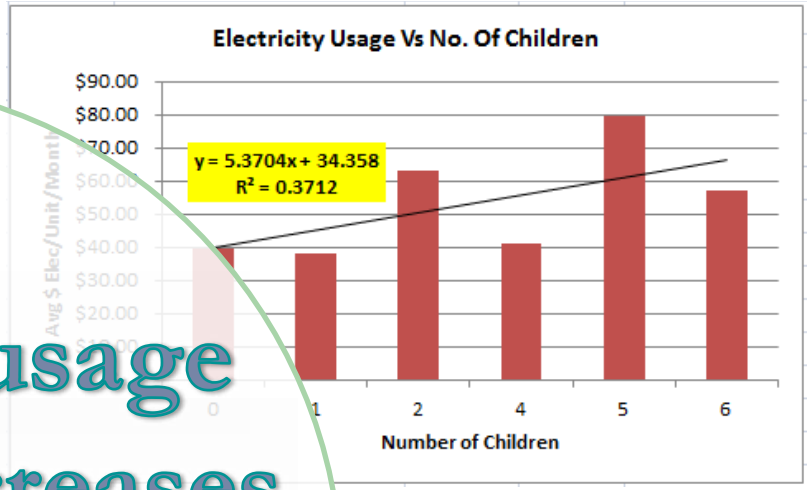
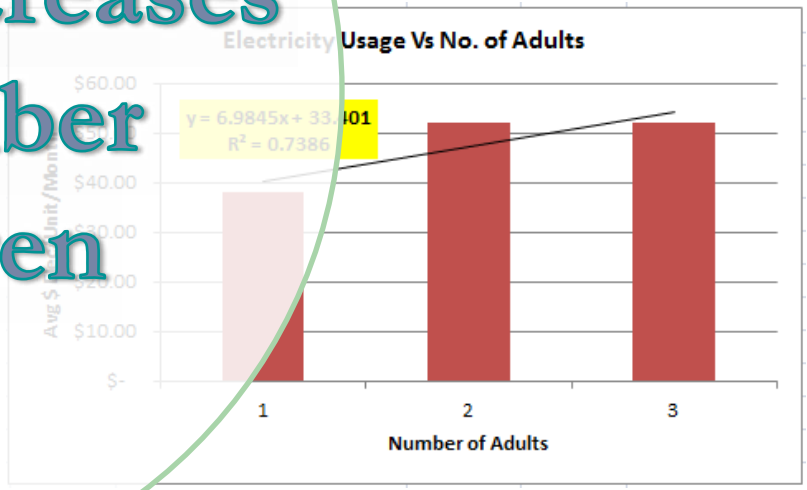
Unit: Number of Residents

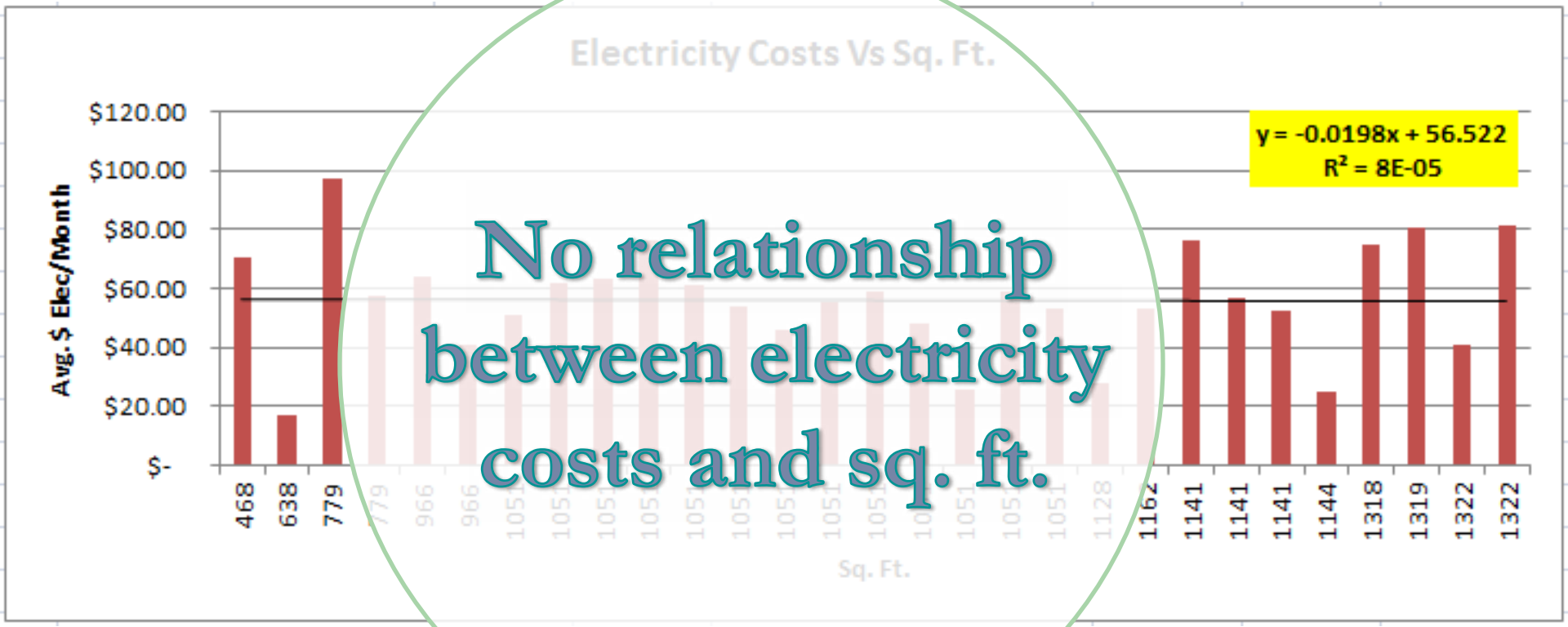
# Children	$ Elec/Unit/Month
0	$ 39.83
1	$ 38.18
2	$ [illegible]
4	$ [illegible]
5	$ [illegible]
6	$ [illegible]

# Adults	$ Elec/Unit/Month
1	$ 37.99
2	$ 52.17
3	$ 51.96

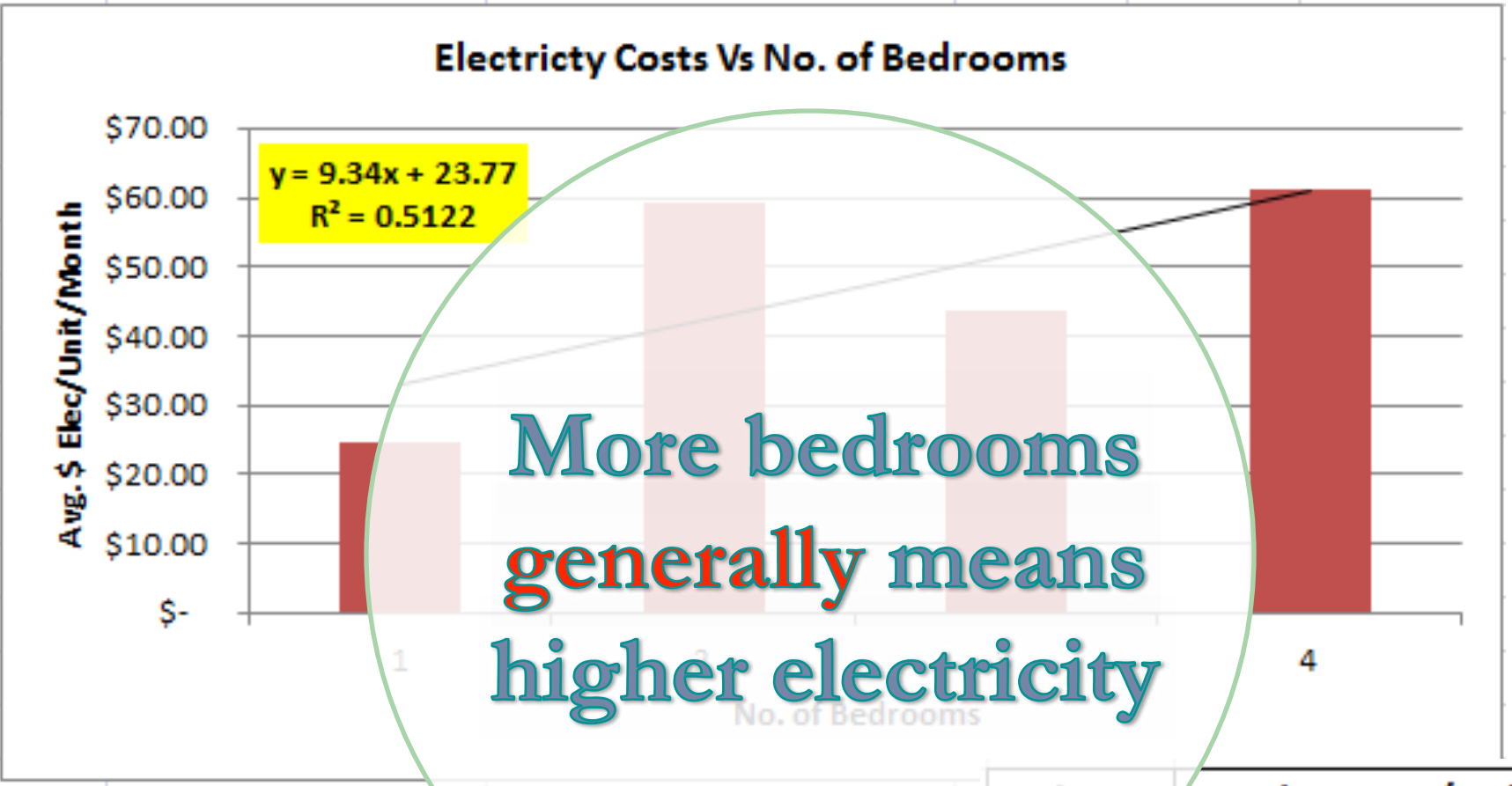




Electricity usage generally increases with number of children



No relationship between electricity costs and sq. ft.



More bedrooms generally means higher electricity

Bed	Avg Elec Costs/Unit/Month
0	24.77
1	59.1
2	43.51
3	61.1

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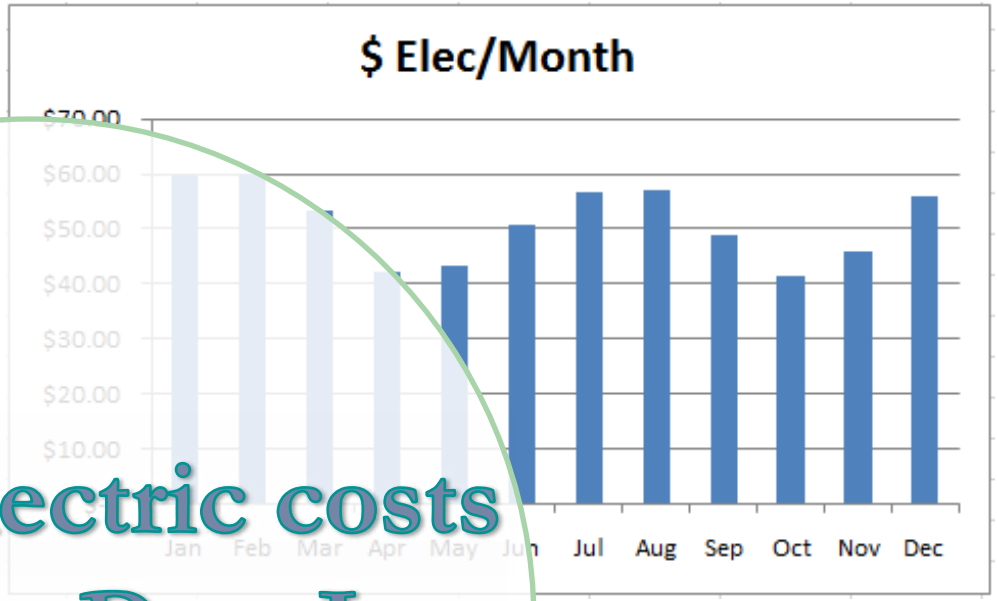
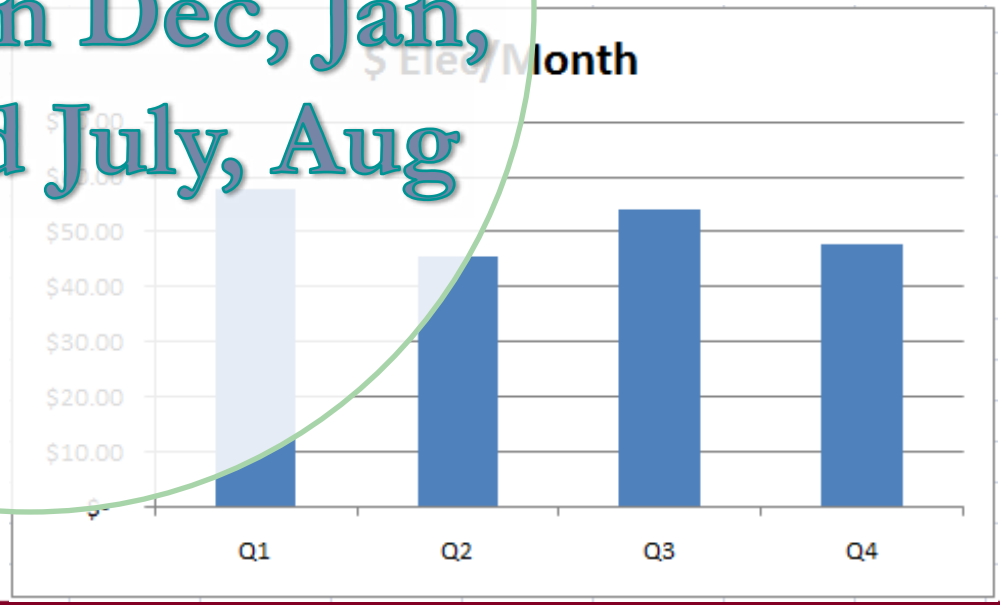
Unit: Number of Bedrooms

Month	$ Elec/Month
Jan	$ 59.77
Feb	$ 60.04
Mar	$ 53.37
Apr	$ 42.33
May	$ 43.34
Jun	$ 50.81
Jul	$ [illegible]
Aug	$ 57.06
Sep	$ [illegible]
Oct	$ 41.29
Nov	$ [illegible]
Dec	$ 56.01

Quarter	$ Elec/Month
Q1	$ 57.65
Q2	$ 45.47
Q3	$ 54.26
Q4	$ 47.73





House electric costs highest in Dec, Jan, Feb, and July, Aug

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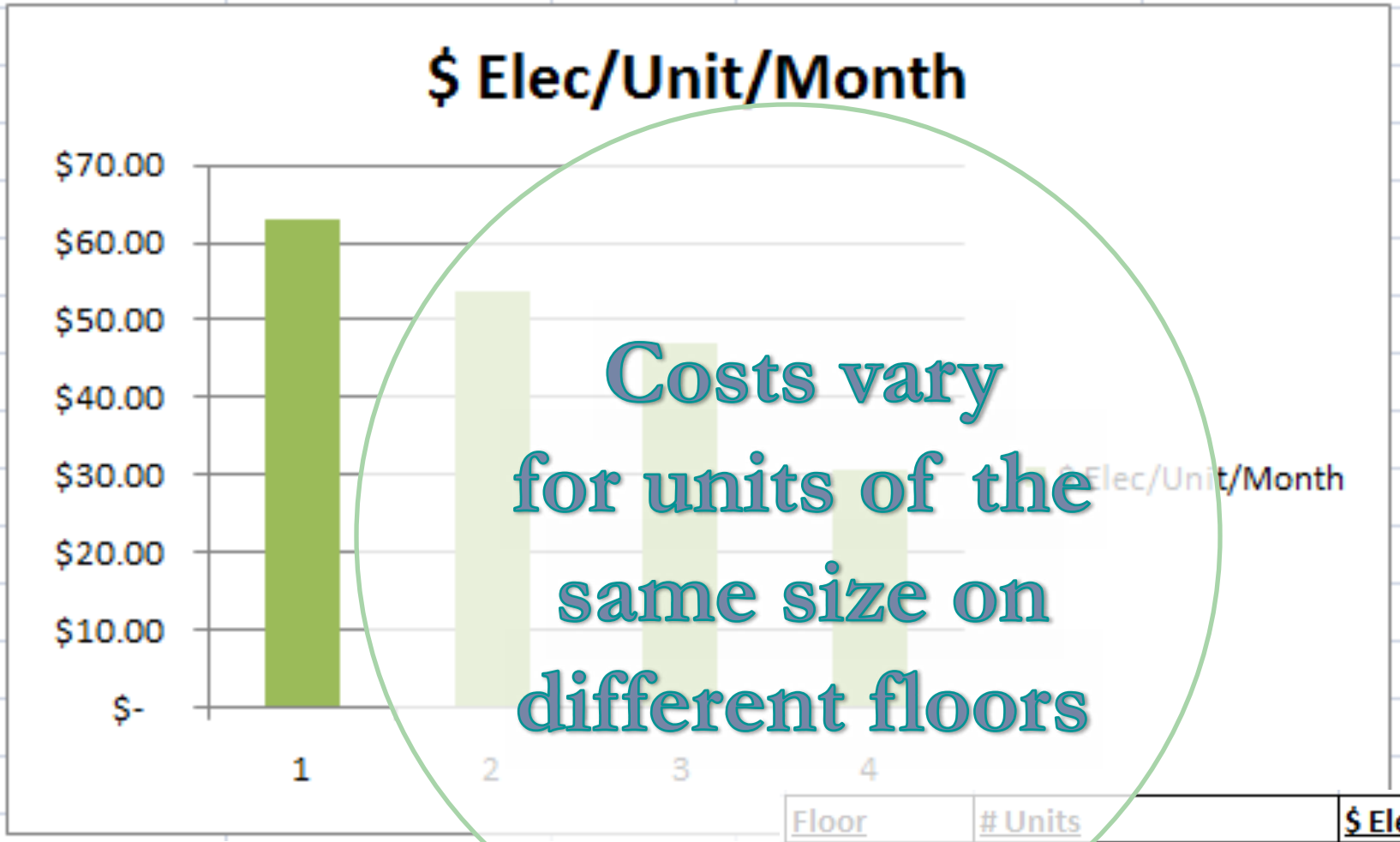
House: Seasonality



Costs vary for units of the same size on different floors

Floor	# Units	$ Elec/Unit/Month
1	4	$ 63.08
2	3	$ 53.76
3	4	$ 47.21
4	4	$ 30.82

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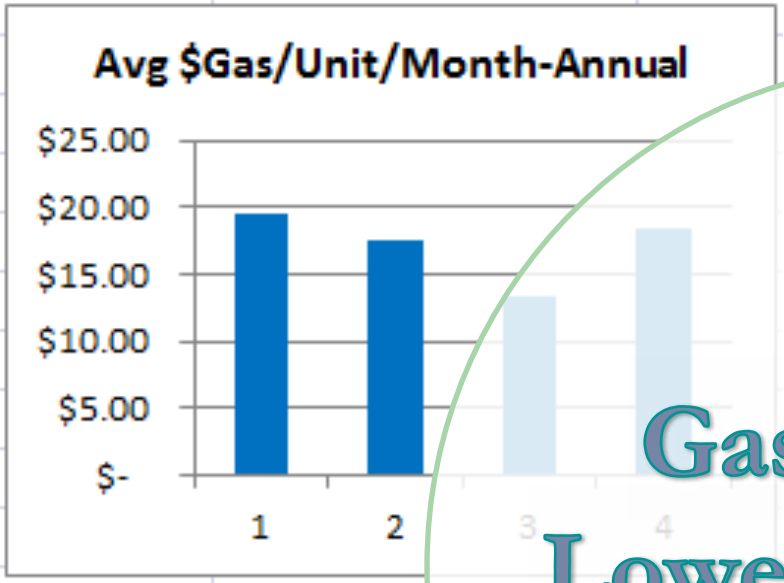
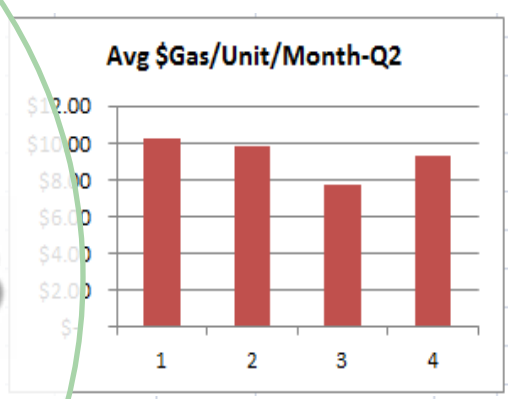
Differences: similar size units

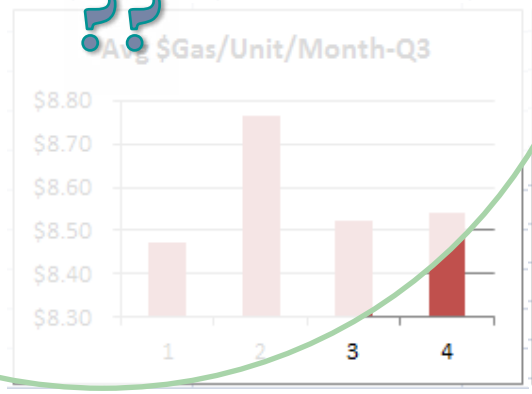
Natural Gas Summary

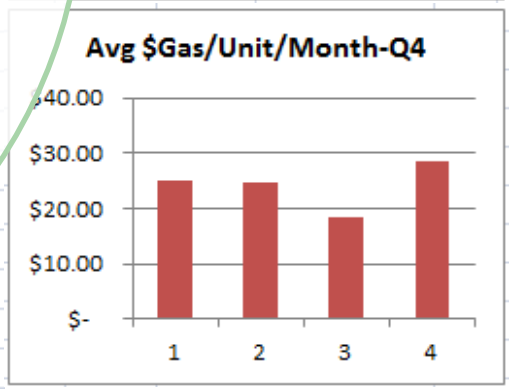


Floor	Avg $Gas/Unit/Month
1	$ 19.55
2	$ 17.64
3	$ 13.30
4	$ 18.35

Gas Costs are Lowest on Floor 3 ??

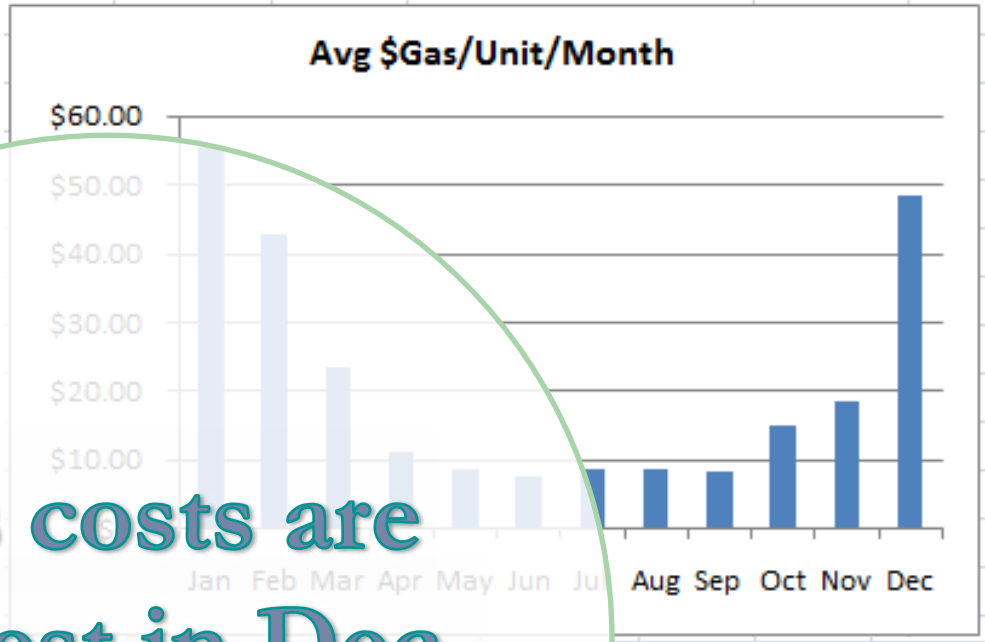


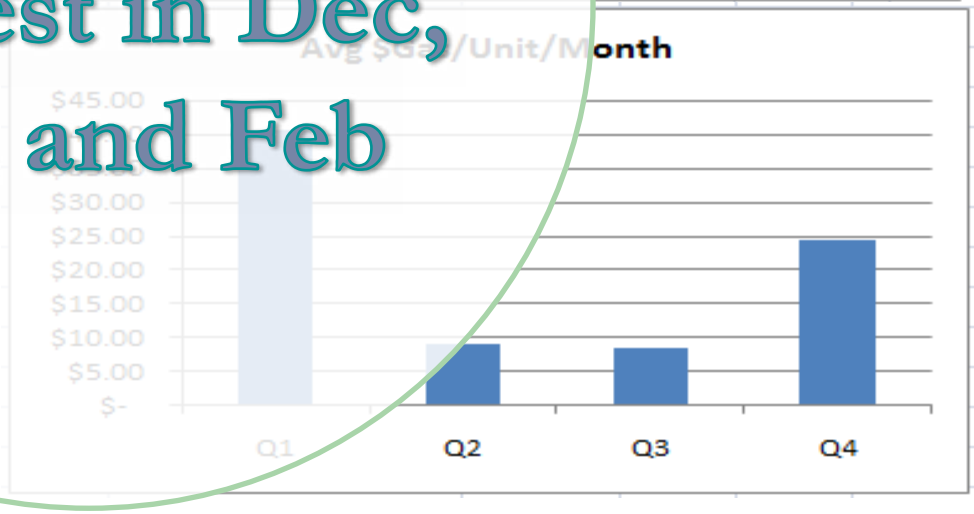




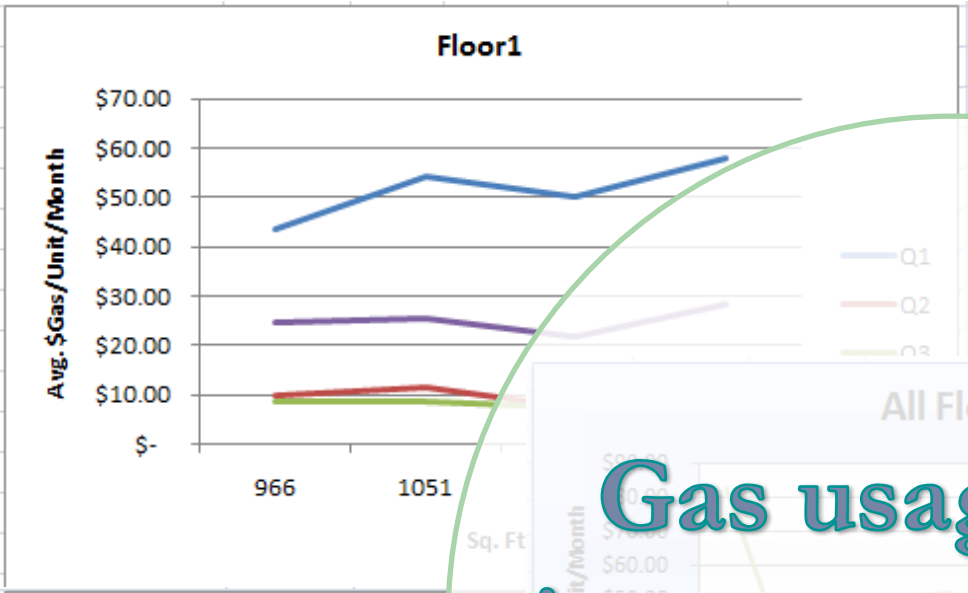
Month	Avg $Gas/Unit/Month
Jan	$ 55.46
Feb	$ 42.94
Mar	$ 23.37
Apr	$ 11.26
May	$ 8.71
Jun	$ 7.67
Jul	$ 8.65
Aug	$ 8.84
Sep	$ 8.26
Oct	$ 15.21
Nov	$ [illegible]
Dec	$ 48.43

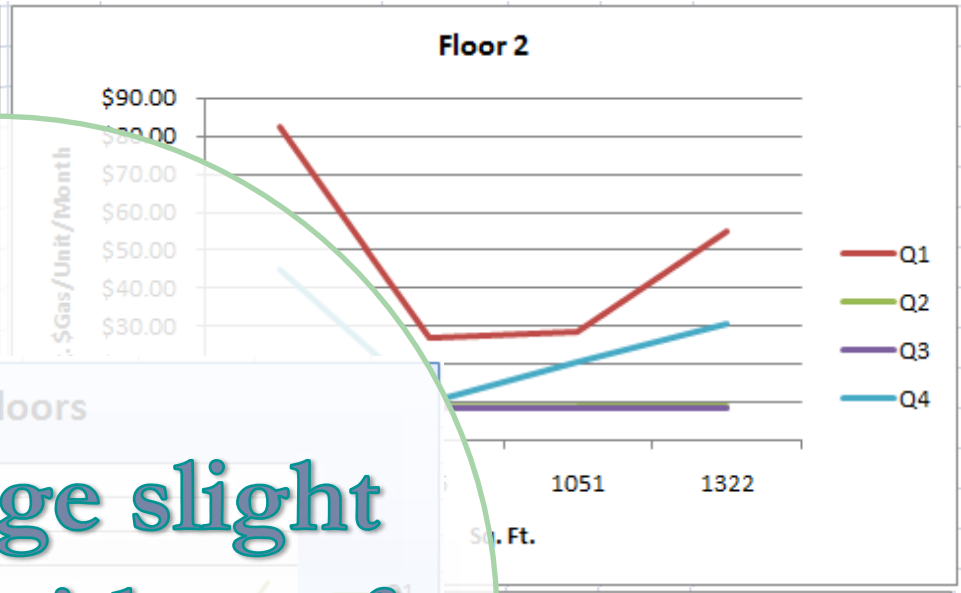
Quarter	Avg $Gas/Unit/Month
Q1	$ 40.59
Q2	$ 9.21
Q3	$ 8.57
Q4	$ 24.32

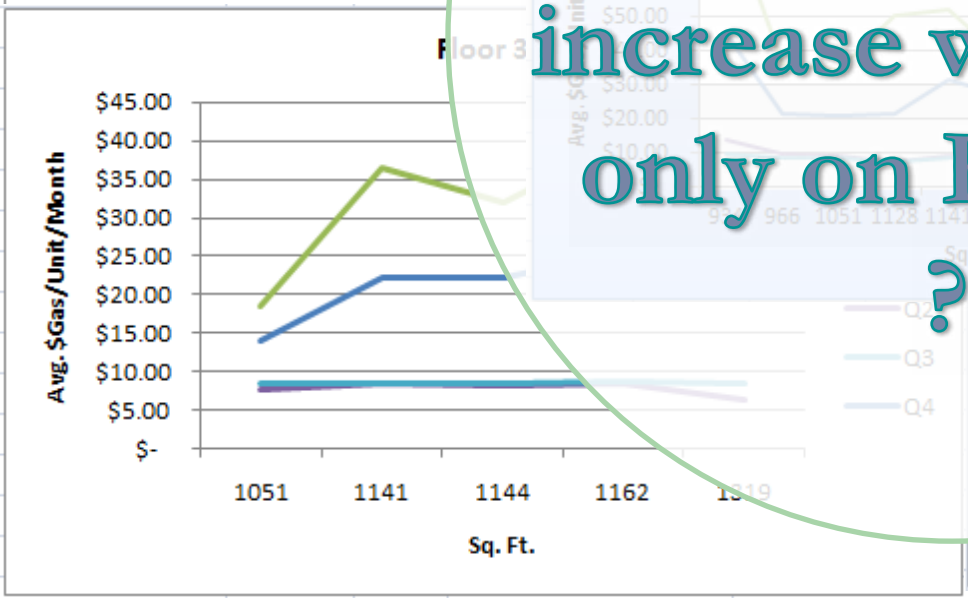


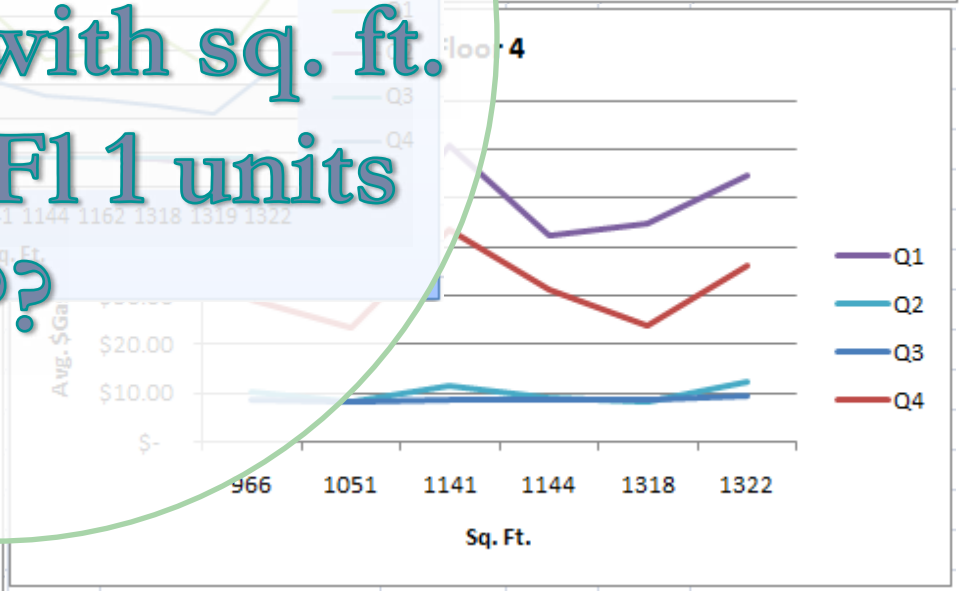


Gas costs are highest in Dec, Jan, and Feb









Gas usage slight increase with sq. ft. only on Fl 1 units ??

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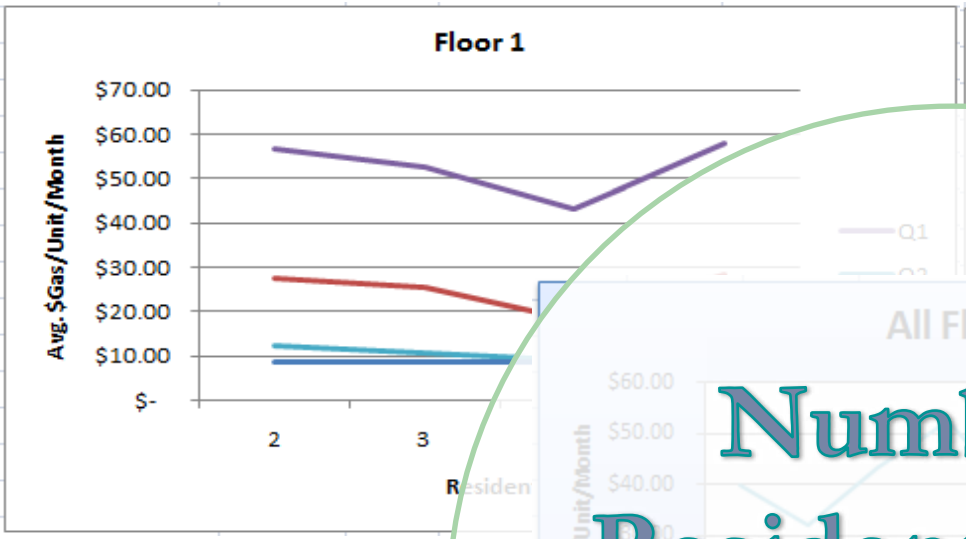
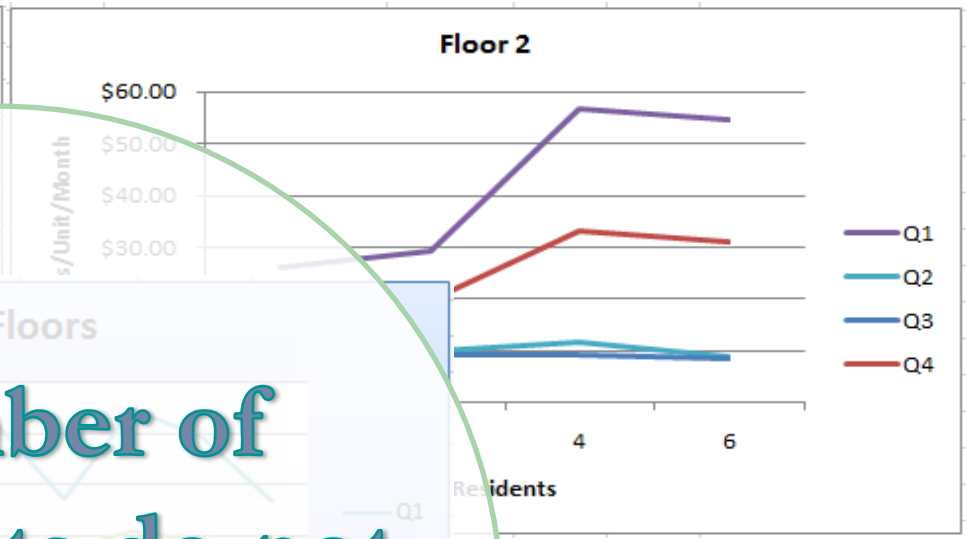
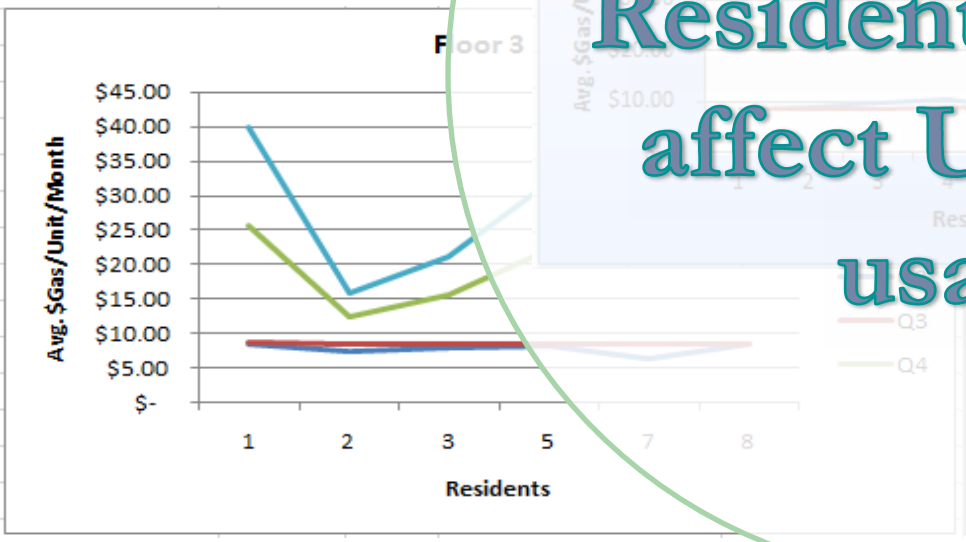
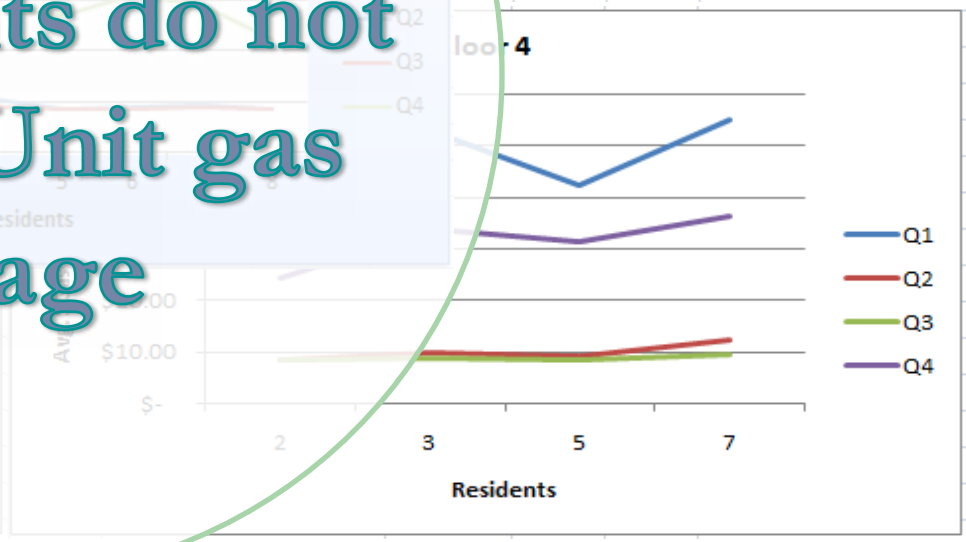
Unit: Area of the Unit









Number of Residents do not affect Unit gas usage

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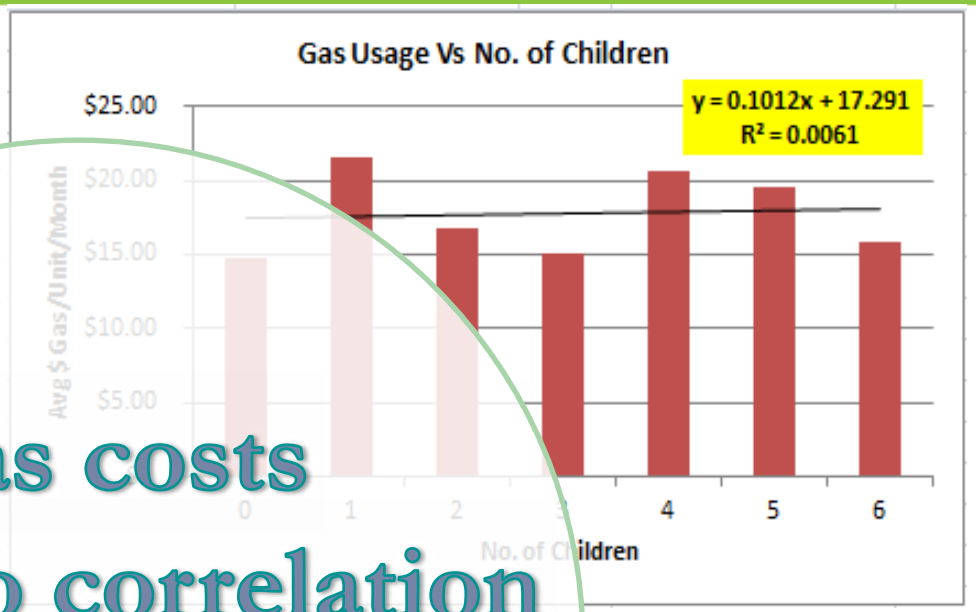
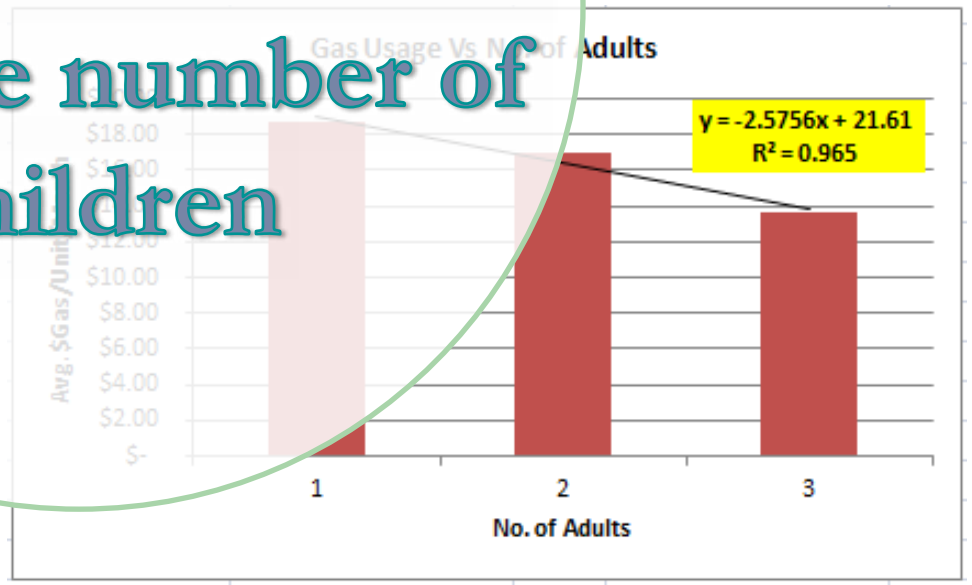
Unit: Number of Residents

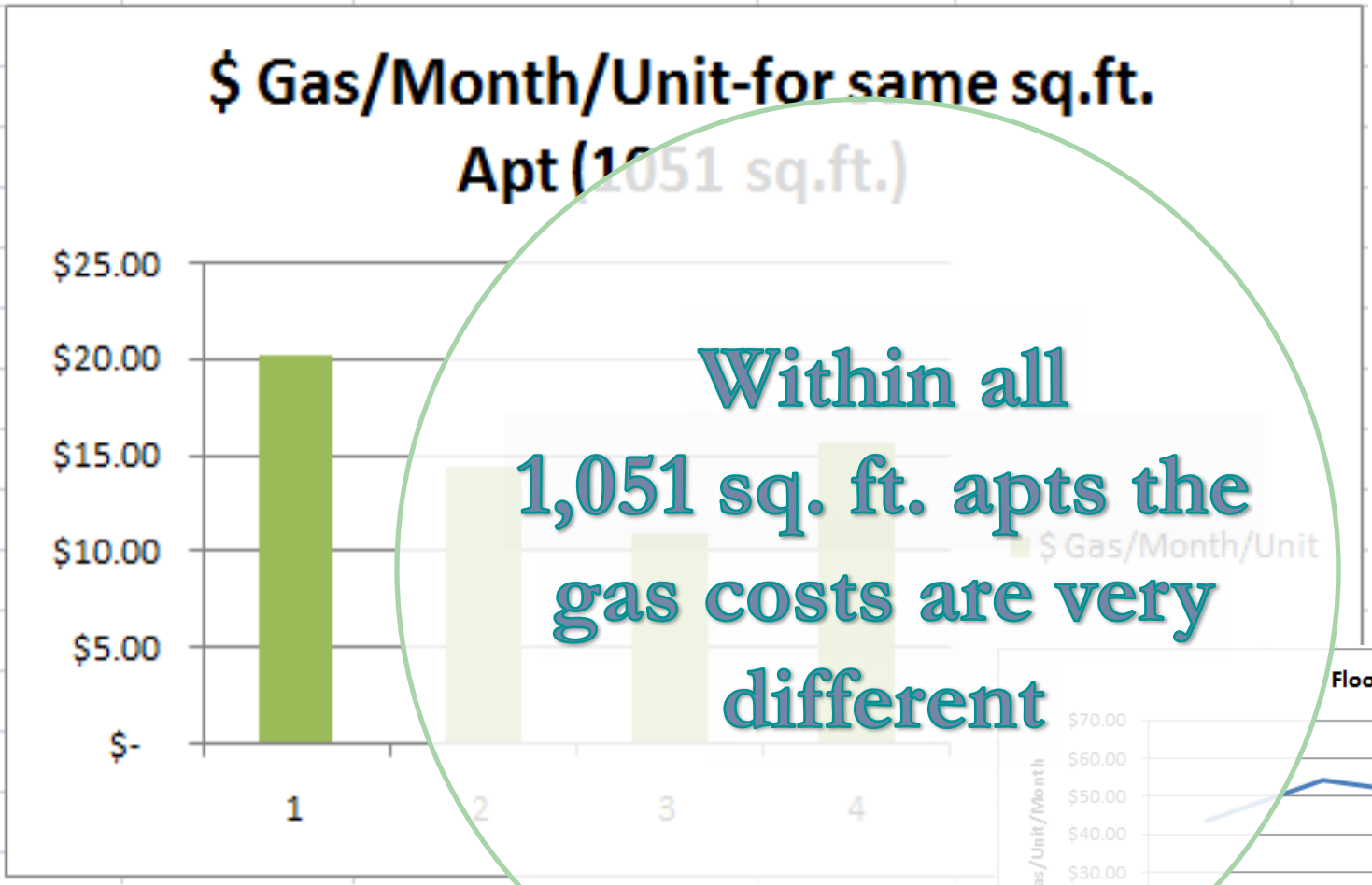
# Children	$ Gas/Unit/Month
0	$ 14.74
1	$ 21.54
2	$ 16.72
3	$ 15.02
4	$ 20.60
5	$ 19.48
6	$ 17.71

# Adults	$ Gas/Unit/Month
1	$ 18.75
2	$ 17.02
3	$ 13.60



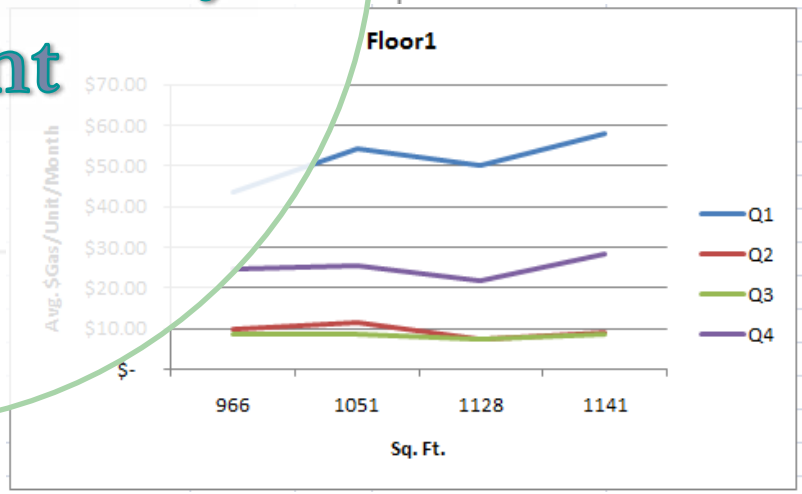


Gas costs show no correlation with the number of children



Within all 1,051 sq. ft. apts the gas costs are very different

Floor	# Units	$ Gas/Month/Unit
1	4	$ 20.25
2	3	$ 14.46
3	4	$ 10.97
4	4	$ 15.58



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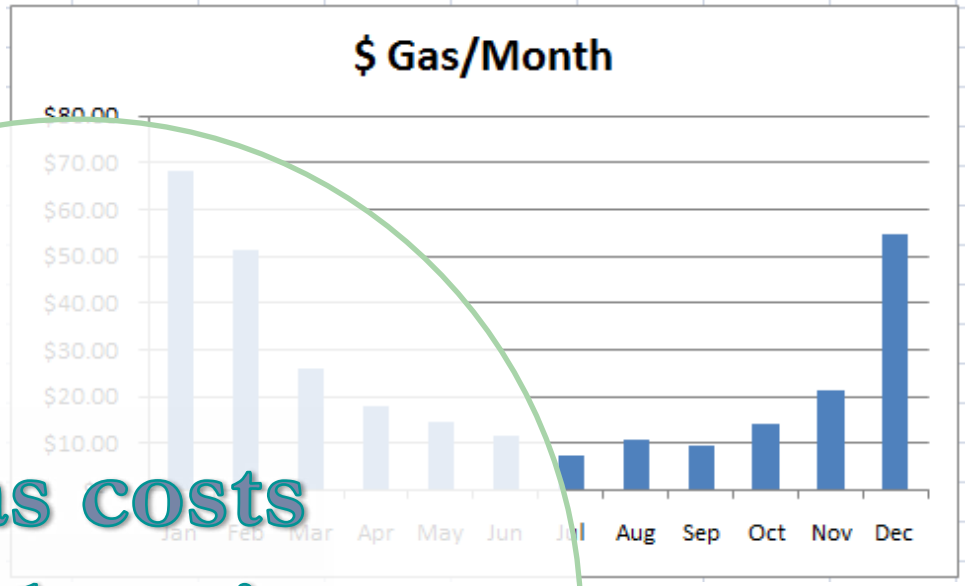
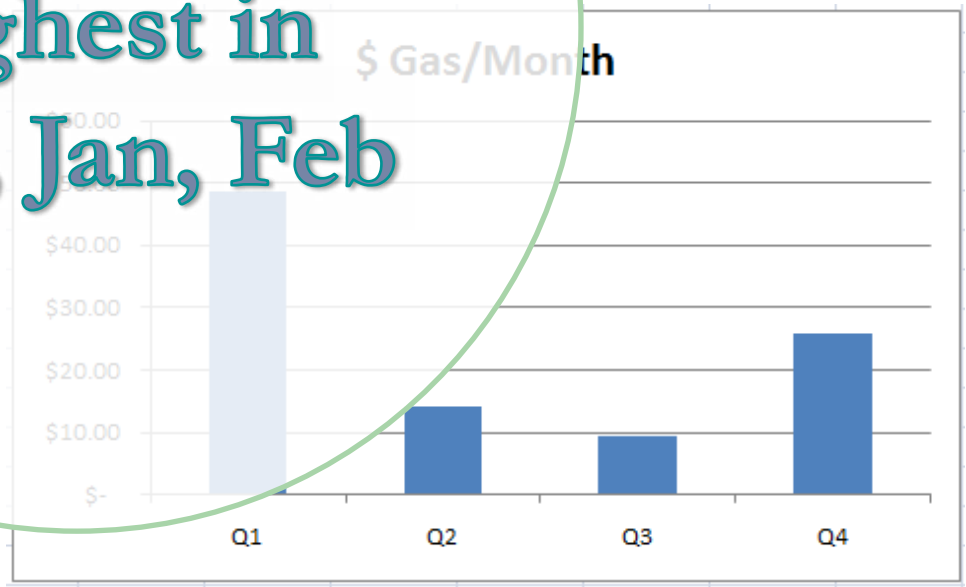
Differences: similar size units

Month	$ Gas/Month
Jan	$ 68.10
Feb	$ 51.52
Mar	$ 26.16
Apr	$ 18.11
May	$ 14.59
Jun	$ 11.87
Jul	$ 7.57
Aug	$ 10.86
Sep	$ 9.49
Oct	$ 14.04
Nov	$ 21.29
Dec	$ 54.78

Quarter	$ Gas/Month
Q1	$ 48.49
Q2	$ 14.21
Q3	$ 9.31
Q4	$ 25.71

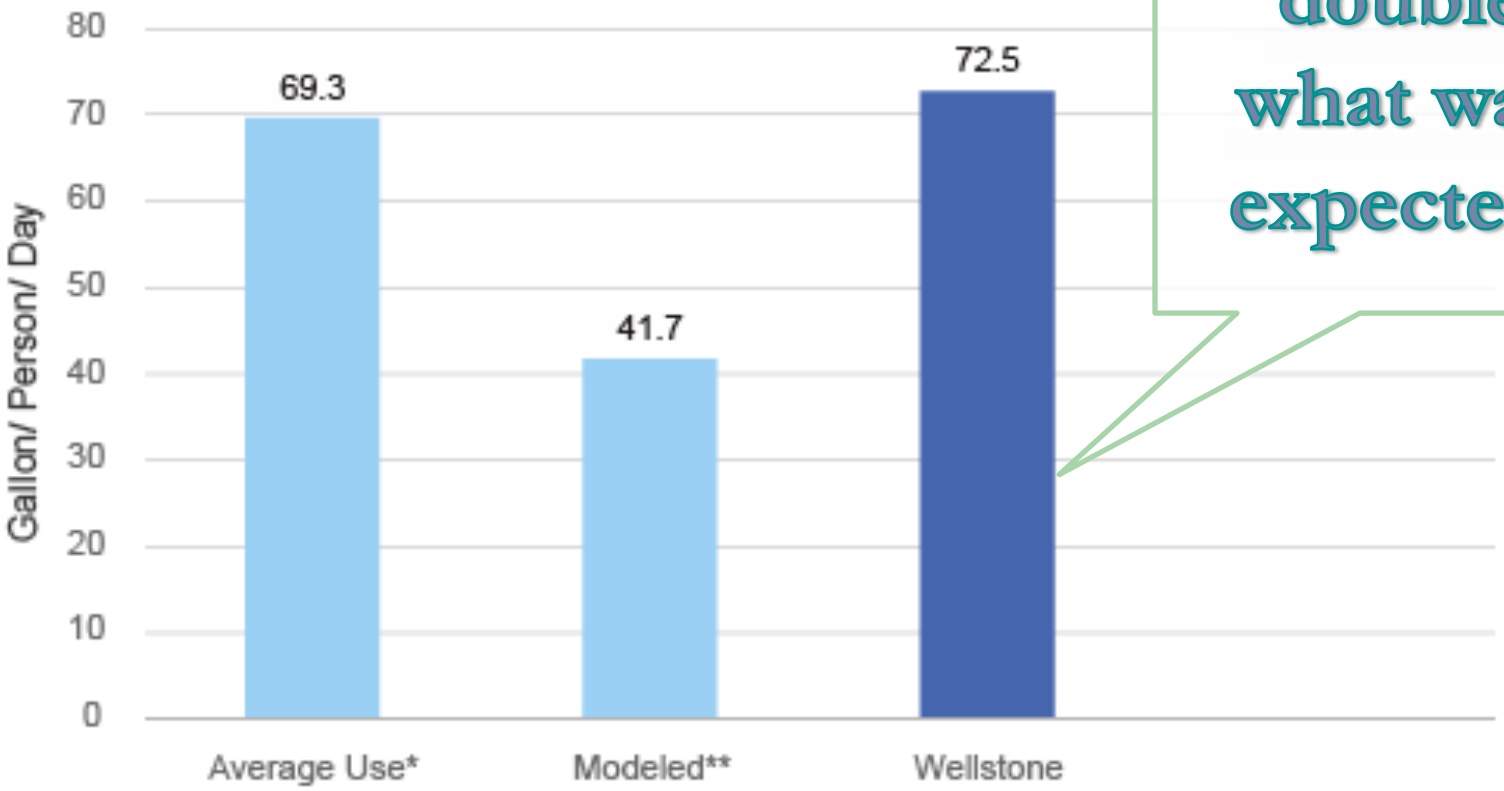




Gas costs highest in Dec, Jan, Feb

Water Summary

Indoor Water Use
Wellstone

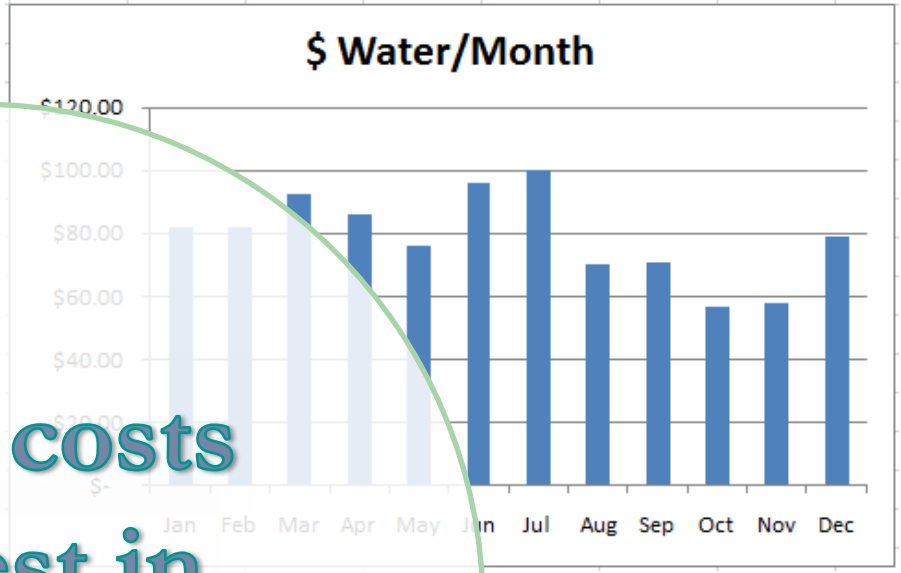


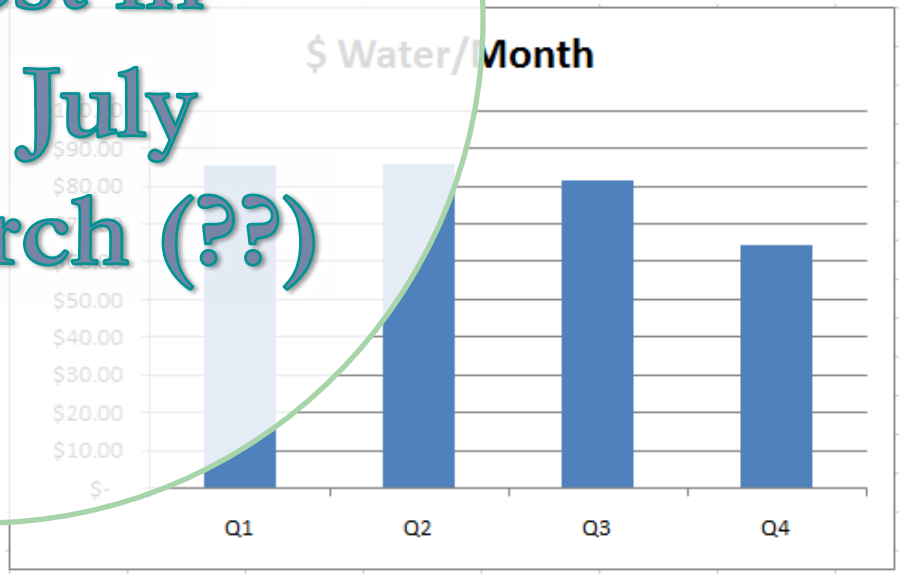
Nearly double what was expected.

** Average indoor water consumption - 69.3 gal/ person/ day*
Based on AWWA's drinktap.org project, which uses figures from the Handbook of Water Use and Conservation by Amy Vickers, Waterplow Press, 2001.
*** Modeled indoor water consumption based on AWWA, EPA, and "The Handbook of Water Use and Conservation" fixture and use data.*

Month	$ Water/Month
Jan	$ 81.82
Feb	$ 81.86
Mar	$ 92.53
Apr	$ 86.13
May	$ 76.16
Jun	$ 96.07
Jul	$ 99.85
Aug	$ 69.99
Sep	$ 71.03
Oct	$ 56.44
Nov	$ 57.96
Dec	$ 78.94

Quarter	$ Water/Month
Q1	$ 85.52
Q2	$ 86.00
Q3	$ 81.40
Q4	$ 64.52





Water costs highest in June, July and March (??)

Total House (Incl Units): Seasonality

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MINNESOTA SUSTAINABLE HOUSING INITIATIVE

Informing Healthy, Durable, and Energy and Resource Efficient Homes

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Wellstone Apartments

Minneapolis, MN
Opened December 2008

The Wellstone Apartments is a four story, 49-unit development at the corner of Franklin and Portland Avenues in Minneapolis. This project is the third of a four phase project being carried out by Hope Community Partners and Aeon (formerly, Central Community Housing Trust) at intersection of Franklin and Portland. The Wellstone followed Enterprise's Green Communities Criteria with the Minnesota Overlay and is one of the Minnesota Green Communities Initiatives pilot projects. The Wellstone includes a solar hot water heating system which is currently undergoing performance evaluation. As a pilot Green Communities project, the Wellstone also underwent a comprehensive verification process by Advanced Energy and CEE, with the purpose of field evaluating the Green Communities Criteria and assisting with installation procedures.

The building consists of mixed income housing, with 37 affordable and 12 market rate apartments. The building consists of one, two and three bedroom units, with approximately 7,000 square feet of commercial space. The project was developed and is owned by Hope

Site

Single Family
Breckenridge Townhomes
Autumn Hills
E2 City Homes
EcoVillage

Visit
www.mnshi.umn.edu

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- 23 Apts
- Intro to Project
- Informed Workshops

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Resident Survey

Voice of the Customer (VOC) and KJ

- VOC aligns products and services to the resident
- KJ – Summarize, Characterize, and Prioritize “voices”
- Developed by Japanese anthropologist Jiro Kawakita

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Cultivation of Resident Leaders

- 25 Apts
- Mix of Types & Sizes
- Personal Instruction

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Owl Feedback Meters

Curriculum and Tool Development

- **Enterprise Toolkit**
- **Customized to Resident Needs and Building Specifics**
- **Formal and Informal**
- **Props worked best**

101 Adults
51 Children

10 “Kiosks”

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Informal Information Sessions

7 Sessions

15 Apts

35 Residents

45 – 60 min.

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Workshops

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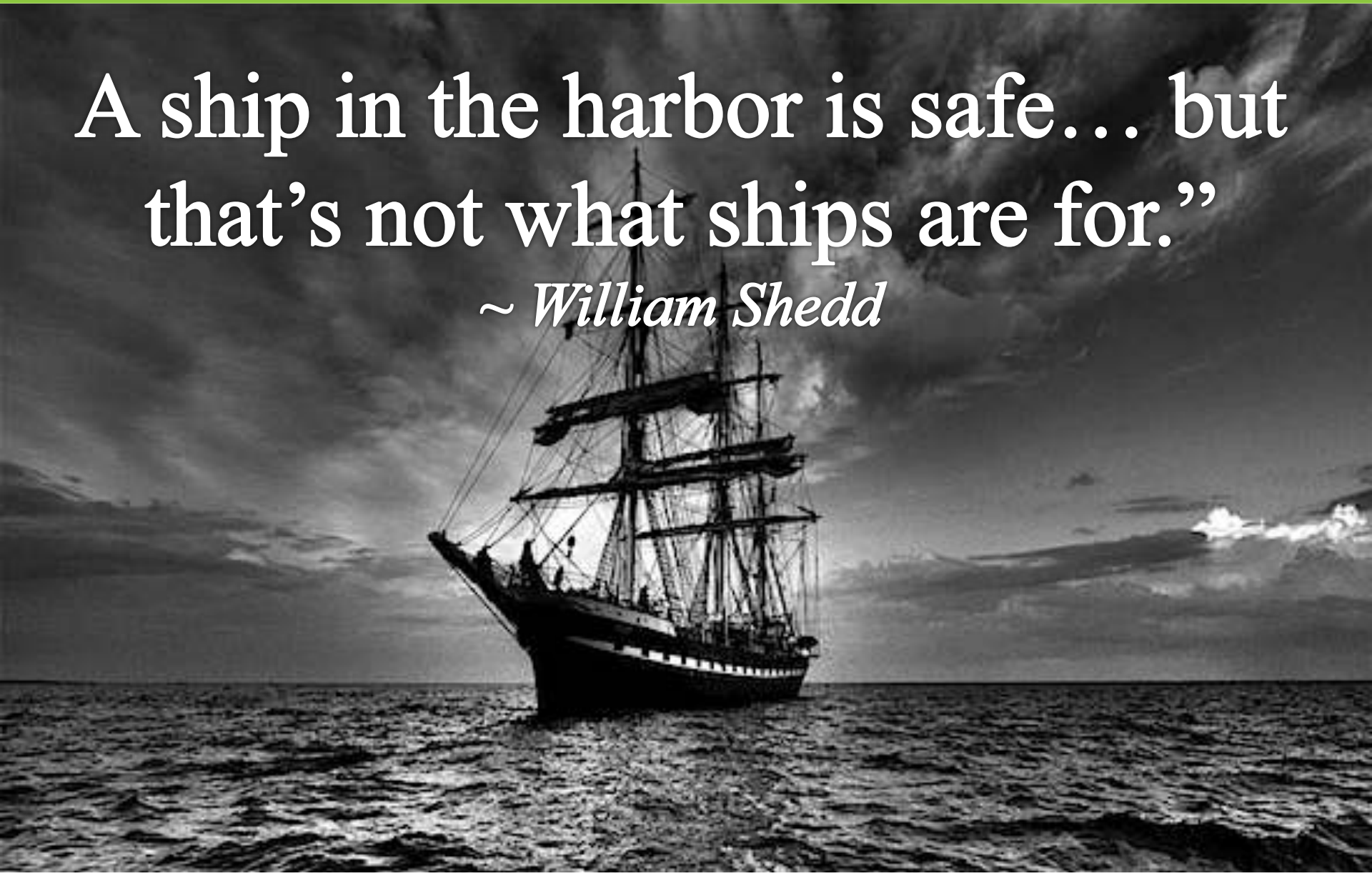
House Calls

Lessons Learned

- It is Not Easy!!!!
- Who/How to sustain metrics
- Motivating and Sustaining Resident Engagement and Leadership
- Replicate? Bring to Scale??



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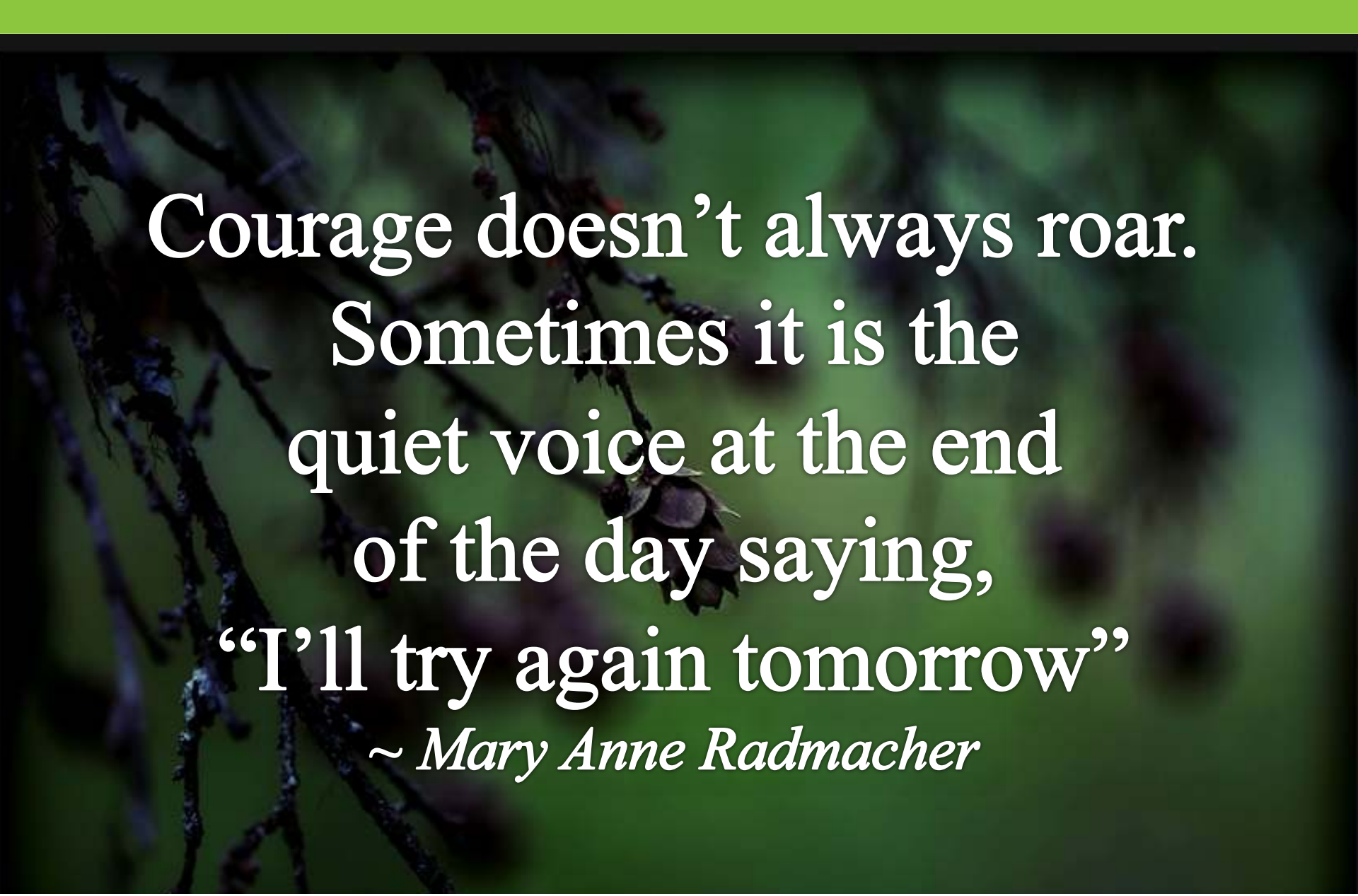
Courage doesn't always roar.
Sometimes it is the
quiet voice at the end
of the day saying,
"I'll try again tomorrow"
~ Mary Anne Radmacher