Modeling a Rate Structure for Conservation

John Lovie,
Sun Vista/Sunlight Beach HOA
john.lovie@whidbey.com

Sun Vista/Sunlight Beach HOA

- Class A system
- 163 hookups
- Two shallow wells – second well used in Summer
- Many second homes – seasonal consumption
- King Water is our Operator

Rate Plan Constraints

- WAC 246-290-800 requires us to implement a water use efficiency program, which includes a rate structure that promotes conservation
- Meet budgetary needs
- Be more equitable than existing plan
- Be better aligned with cost structure
- Be straightforward to understand and implement

Spreadsheet Rate Plan Model

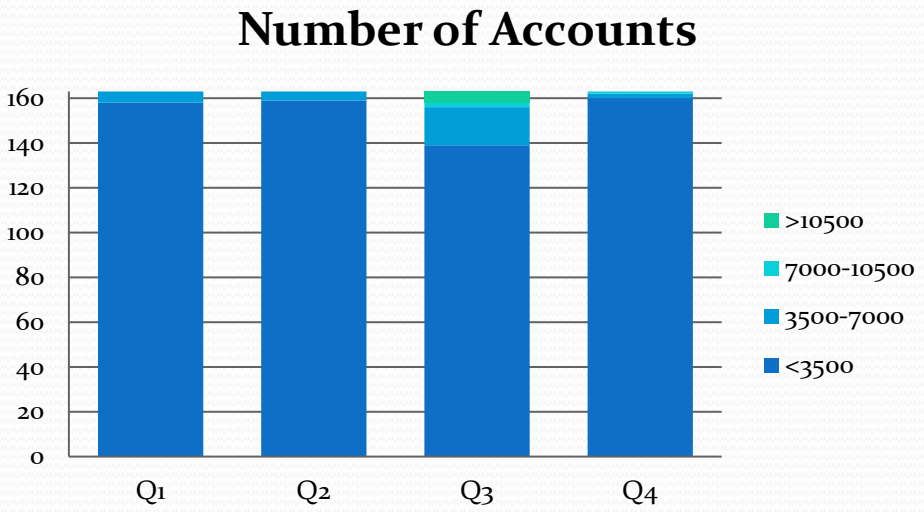
- List consumption for each account by quarter for 2011
- Look at consumption and revenue by quarter and tier
- Model for different conservation % and rate structures
- Check results against constraints
- Choose plan that best meets needs

Sample of Spreadsheet

	Total cubic feet				<3500				3501 to 7000				7001 to 10500				>10500				Total
Account	Mar-11	Jun-11	Sep-11	Dec-11	Mar-11	Jun-11	Sep-11	Dec-11	Mar-11	Jun-11	Sep-11	Dec-11	Mar-11	Jun-11	Sep-11	Dec-11	Mar-11	Jun-11	Sep-11	Dec-11	2011
9001	1374	1545	2029	1042	1374	1545	2029	1042	0	0	0	0	0	0	0	0	0	0	0	0	5990
9002	178	1376	9322	9489	178	1376	3500	3500	0	0	3500	3500	0	0	2322	2489	0	0	0	0	20365
9003	0	56	6199	803	0	56	3500	803	0	0	2699	0	0	0	0	0	0	0	0	0	7058
9004	100	249	1380	142	100	249	1380	142	0	0	0	0	0	0	0	0	0	0	0	0	1871
9005	1452	1315	4687	1319	1452	1315	3500	1319	0	0	1187	0	0	0	0	0	0	0	0	0	8773
9006	1316	1316	1302	1114	1316	1316	1302	1114	0	0	0	0	0	0	0	0	0	0	0	0	5048
9007	970	1087	3354	1047	970	1087	3354	1047	0	0	0	0	0	0	0	0	0	0	0	0	6458
9008	17	244	1419	226	17	244	1419	226	0	0	0	0	0	0	0	0	0	0	0	0	1906
9009	0	856	2708	30	0	856	2708	30	0	0	0	0	0	0	0	0	0	0	0	0	3594
9010	0	436	2234	312	0	436	2234	312	0	0	0	0	0	0	0	0	0	0	0	0	2982
9011	621	756	1274	768	621	756	1274	768	0	0	0	0	0	0	0	0	0	0	0	0	3419
9012	127	356	11471	371	127	356	3500	371	0	0	3500	0	0	0	3500	0	0	0	971	0	12325
9013	5640	2120	1579	3055	3500	2120	1579	3055	2140	0	0	0	0	0	0	0	0	0	0	0	12394
9014	1425	949	976	1236	1425	949	976	1236	0	0	0	0	0	0	0	0	0	0	0	0	4586
9015	591	594	4908	597	591	594	3500	597	0	0	1408	0	0	0	0	0	0	0	0	0	6690
9016	0	306	4487	50	0	306	3500	50	0	0	987	0	0	0	0	0	0	0	0	0	4843
9017	639	965	3839	1374	639	965	3500	1374	0	0	339	0	0	0	0	0	0	0	0	0	6817
9018	423	623	2382	500	423	623	2382	500	0	0	0	0	0	0	0	0	0	0	0	0	3928
9019	425	732	1702	599	425	732	1702	599	0	0	0	0	0	0	0	0	0	0	0	0	3458
9020	21	99	639	270	21	99	639	270	0	0	0	0	0	0	0	0	0	0	0	0	1029

Sample of Model

Current Rate System				Number of Accounts				
Level	Label	Cubic feet	Rate	Q1	Q2	Q3	Q4	%(avg)
1	<3500	0 $	75.00	158	159	139	160	94%
2	3500-7000	3500 $	0.02	5	4	17	2	4%
3	7000-10500	7000 $	0.04	0	0	2	1	0%
4	>10500	10500 $	0.12	0	0	5	0	1%
Total				**163**	**163**	**163**	**163**	**100%**



Sample Calculations

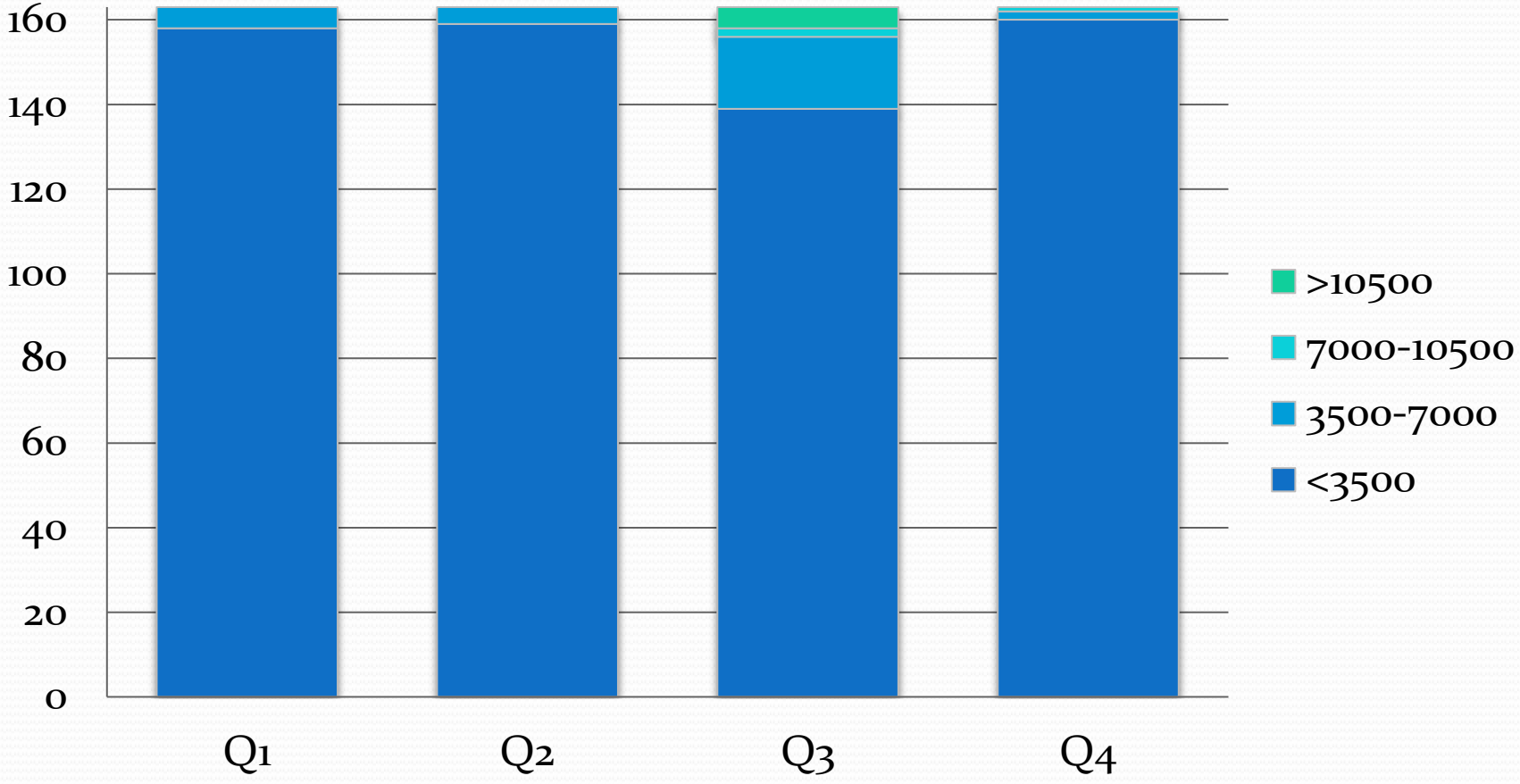
- =COUNTIF('Cubic Feet'!F$3:F$165,"<="&Summary!$C4)
- “Count if cubic feet less than or equal to 3500”

- =COUNTIFS('Cubic Feet'!F$3:F$165,">"&Summary!$C4,'Cubic Feet'!F$3:F$165,"<="&Summary!$C5)
- “Count if cubic feet less than 3500 AND cubic feet less than or equal to 7000”

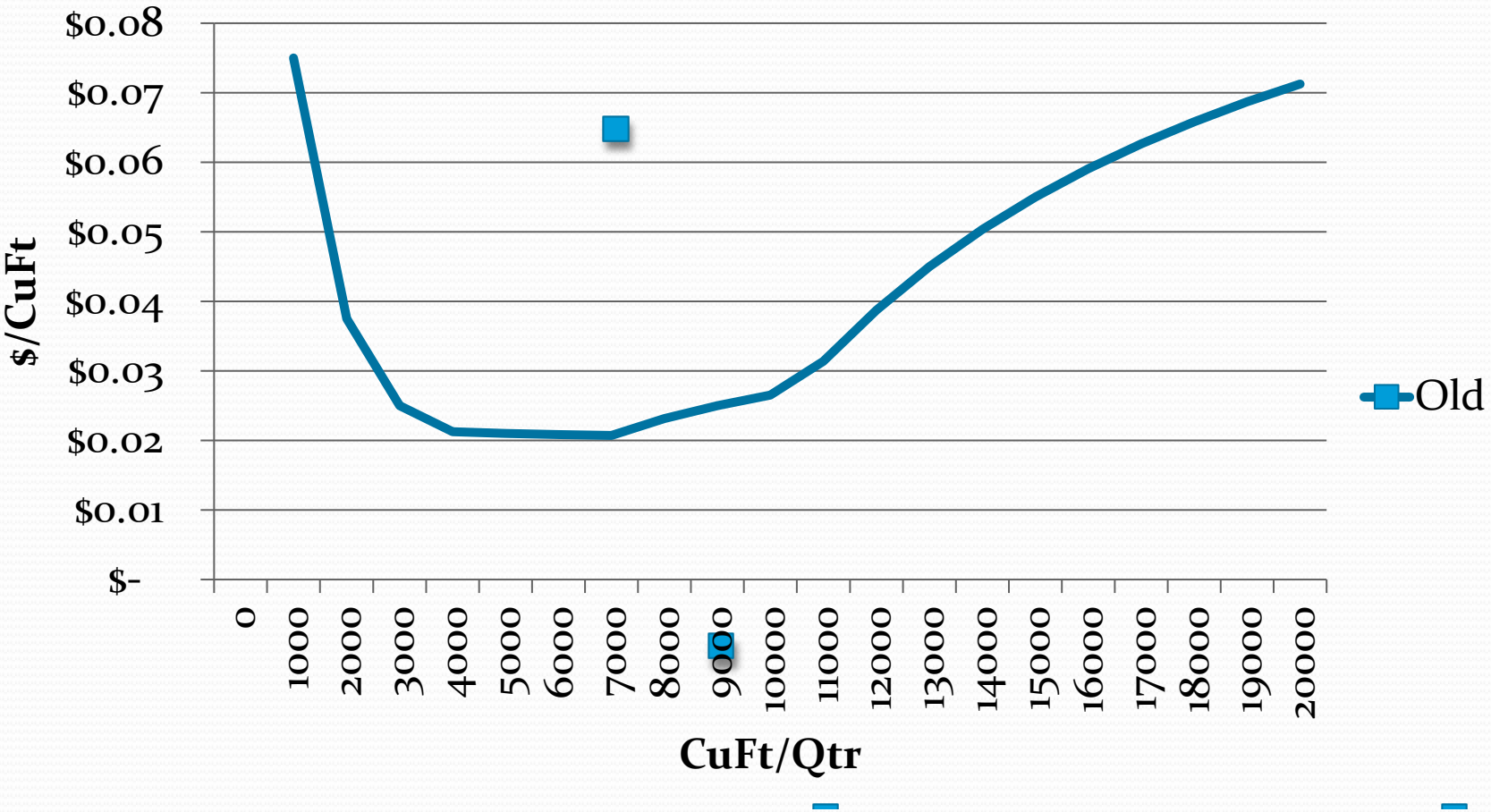
Old Rate Plan

Tier	Rate, $/CuFt/Qtr
Base	$75.00
<3500 CuFt	$-
3500-7000 CuFt	$0.02
7000-10,500 CuFt	$0.04
>10,500 CuFt	$0.12

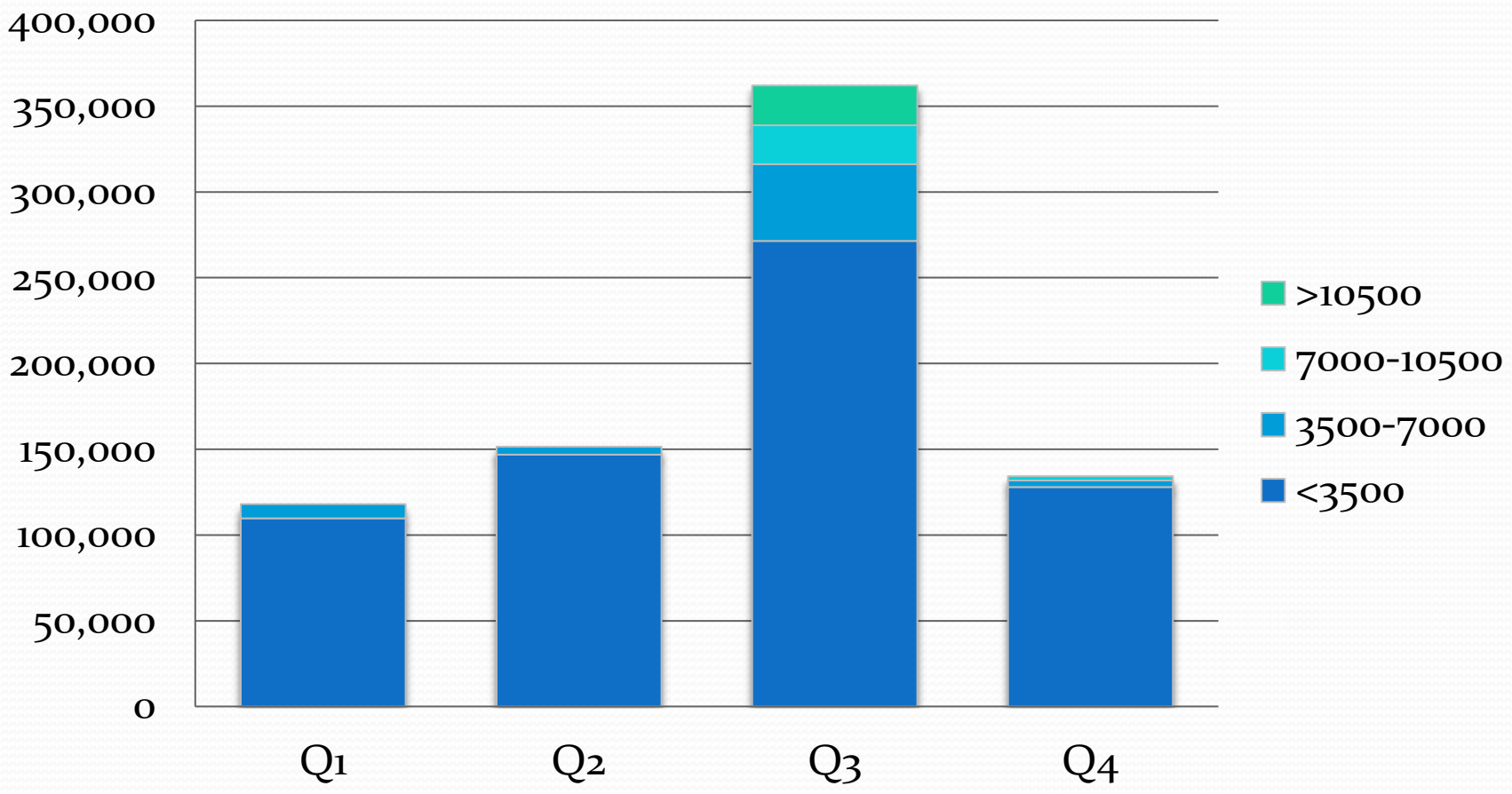
Number of Accounts by Tier



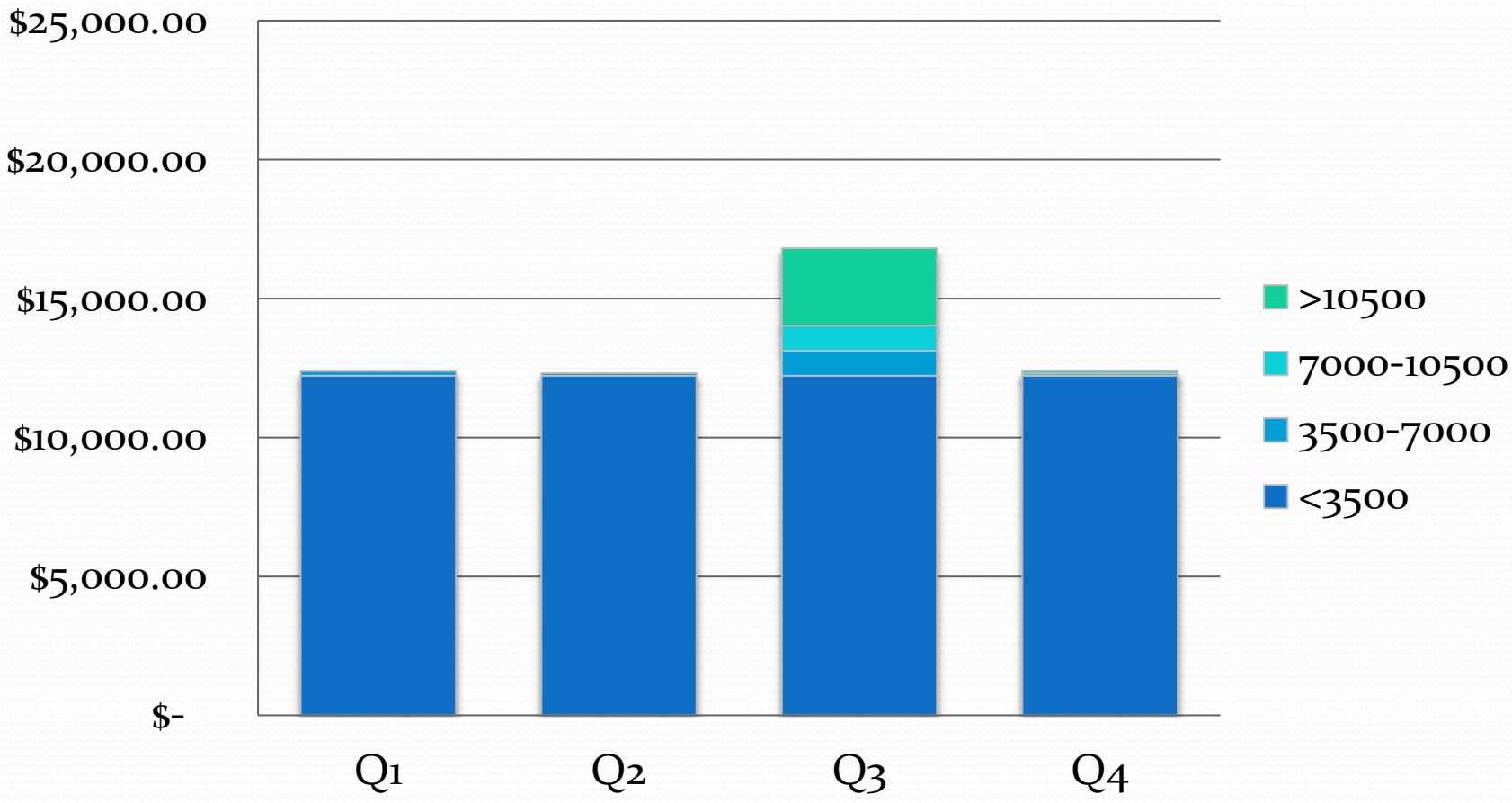
Effective Rate by Consumption



Consumption by Tier & Quarter



Revenue by Tier & Quarter



Old Plan vs Constraints

- Does not reward conservation
  - Almost all users are in Tier 1
  - Most consumption is in Tier 1
- Is not equitable
  - Low and high usage customers subsidize the middle
- Does not meet budgetary needs
  - Revenue does not track consumption
  - Revenue not aligned with cost structure

Old and New Rates

2012 Plan

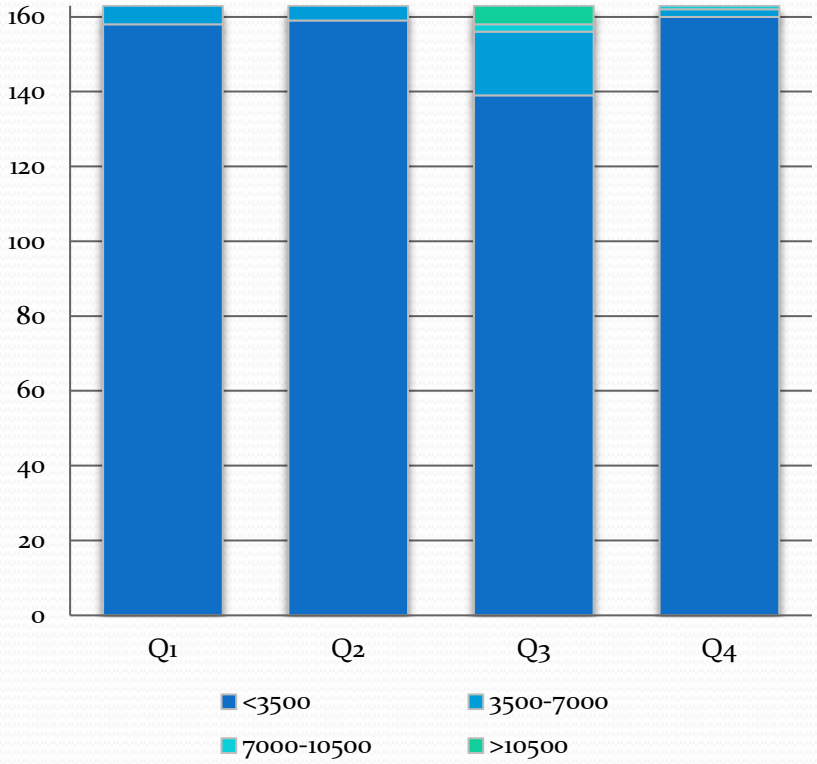
Cubic feet	Rate
Base charge	$ 75.00
<3500	$ -
3500-7000	$ 0.02
7000-10500	$ 0.04
>10500	$ 0.12

2013 Plan

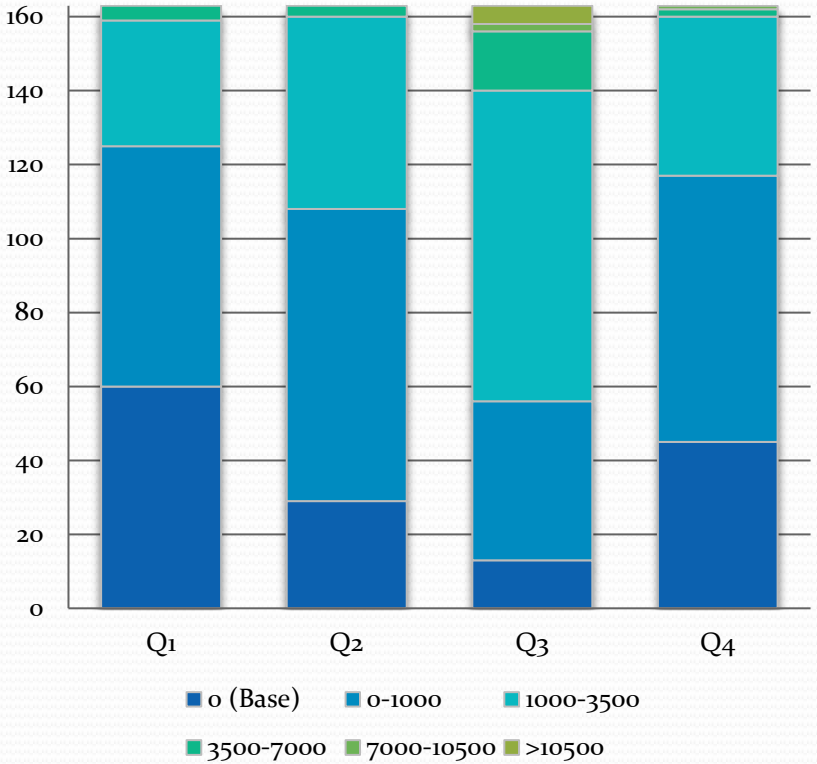
Cubic feet	Rate
Base charge	$ 65.00
<1000	$ 0.01
1000-3500	$ 0.02
3500-7000	$ 0.04
7000-10500	$ 0.06
>10500	$ 0.12

Number of Accounts by Tier

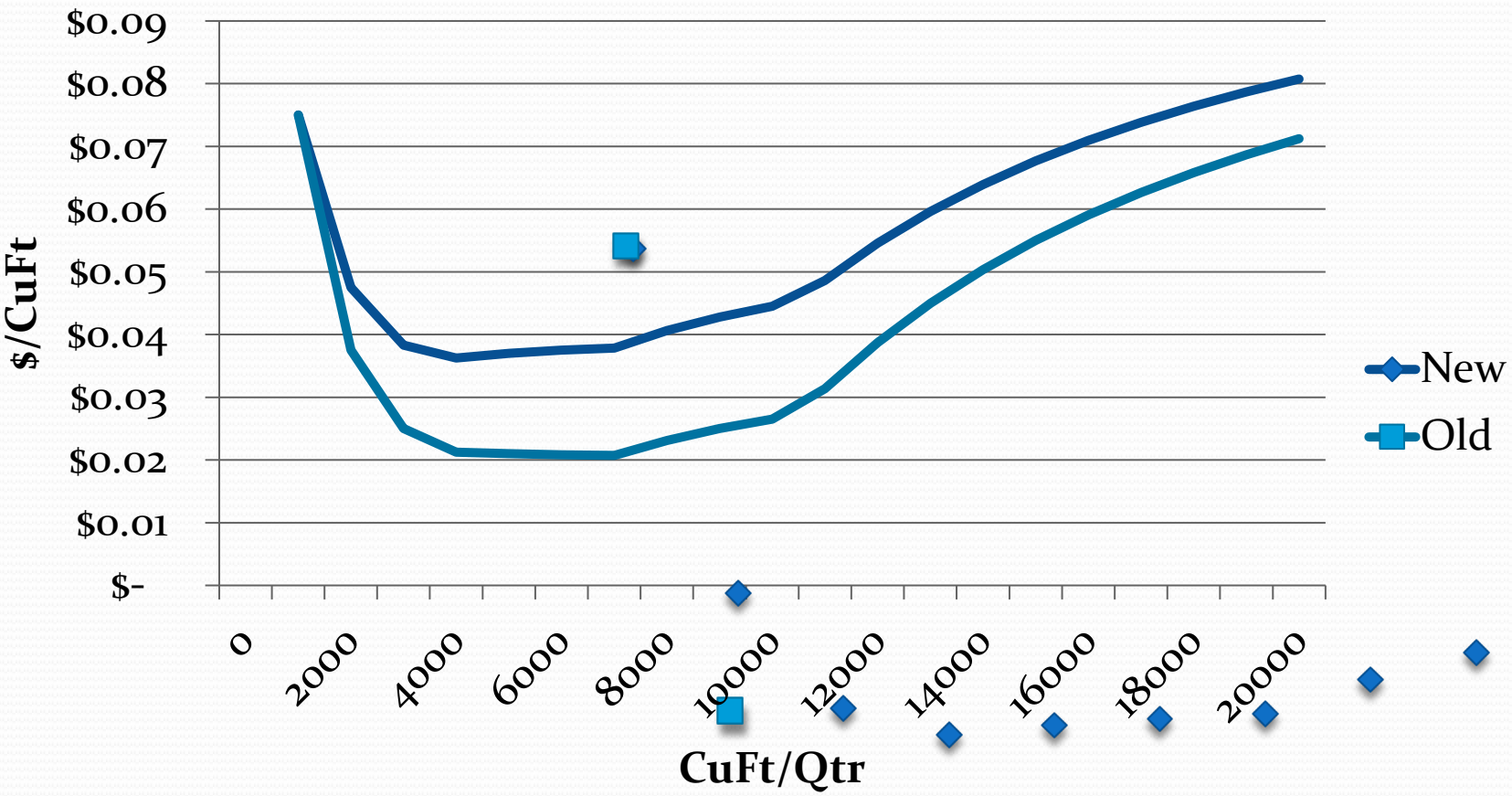
Old Rate Structure



New Rate Structure

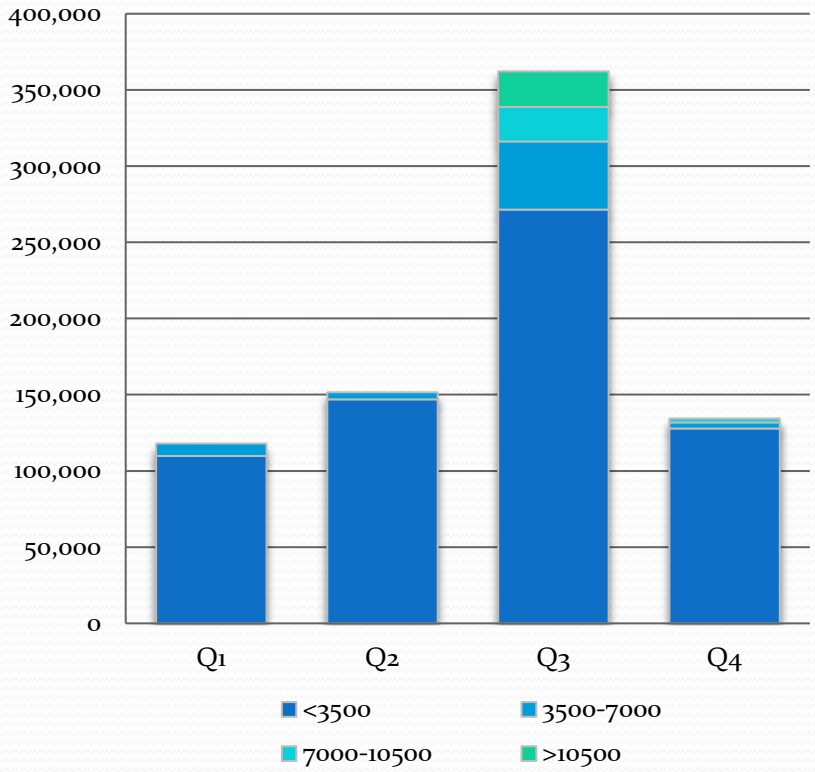


Effective Rate by Consumption

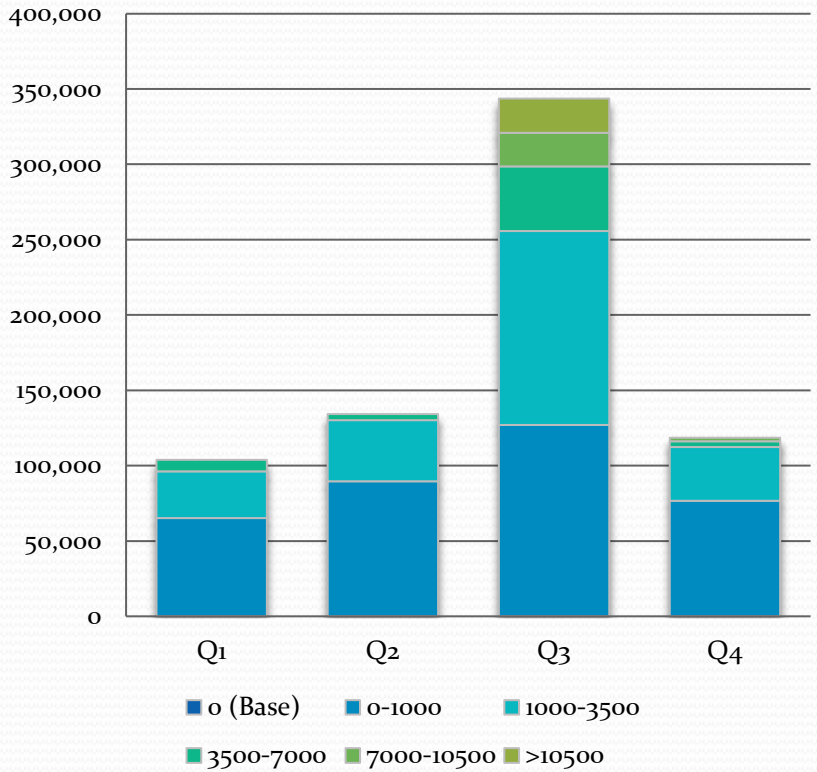


Consumption by Tier & Quarter

Old Rate Structure

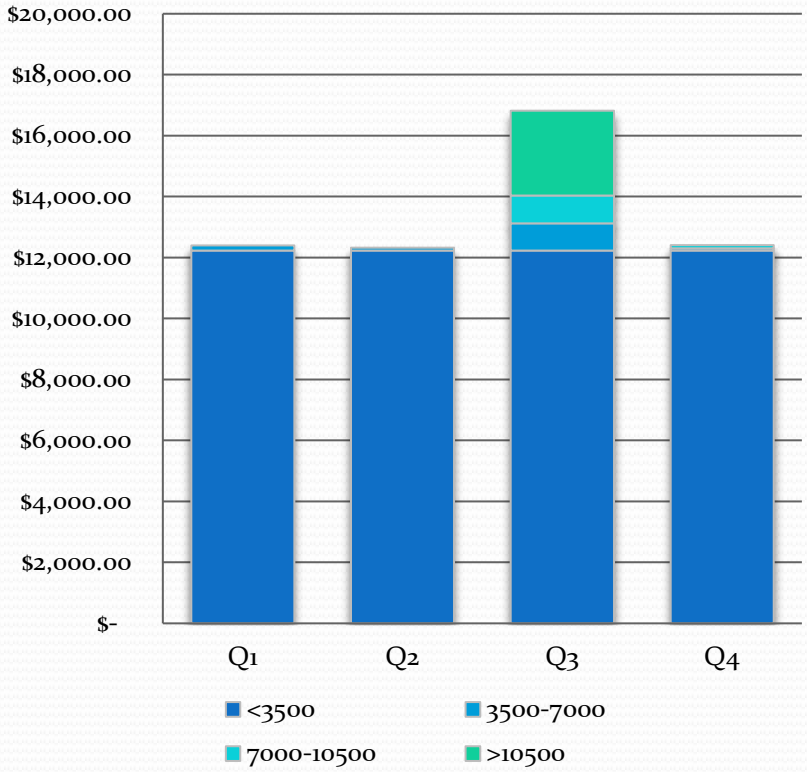


New Rate Structure

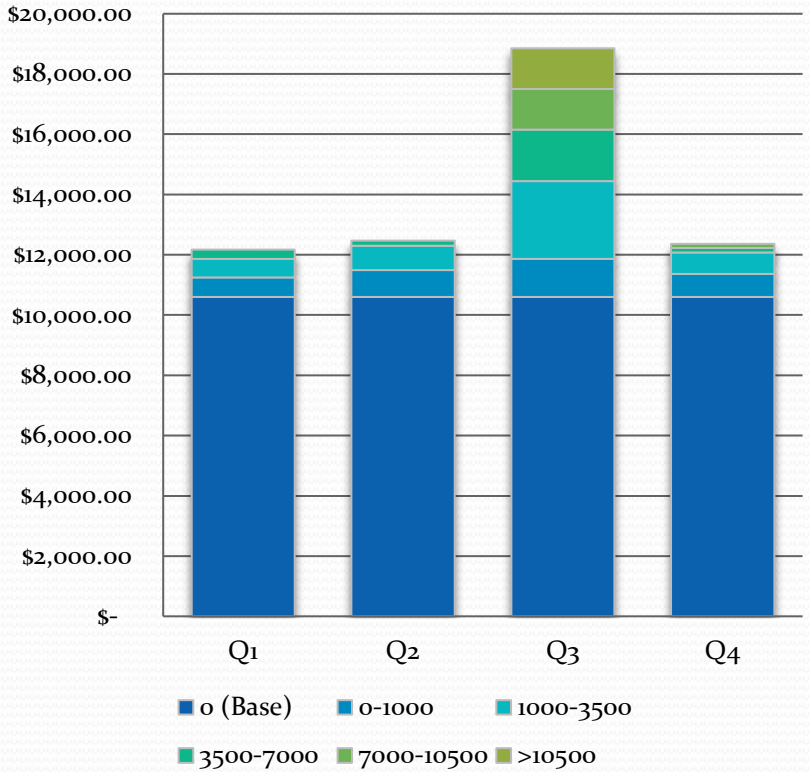


Revenue by Tier & Quarter

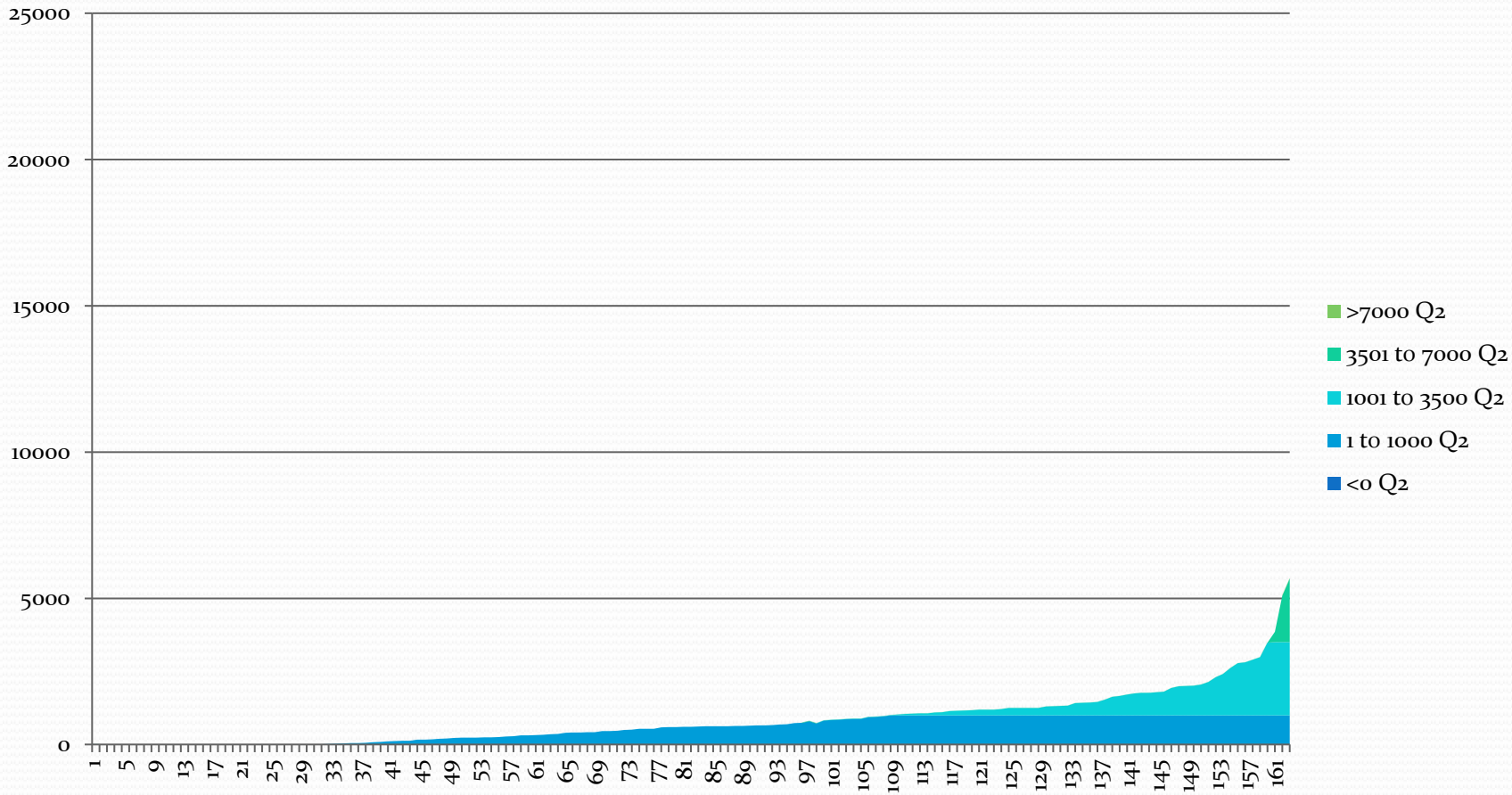
Old Rate Structure



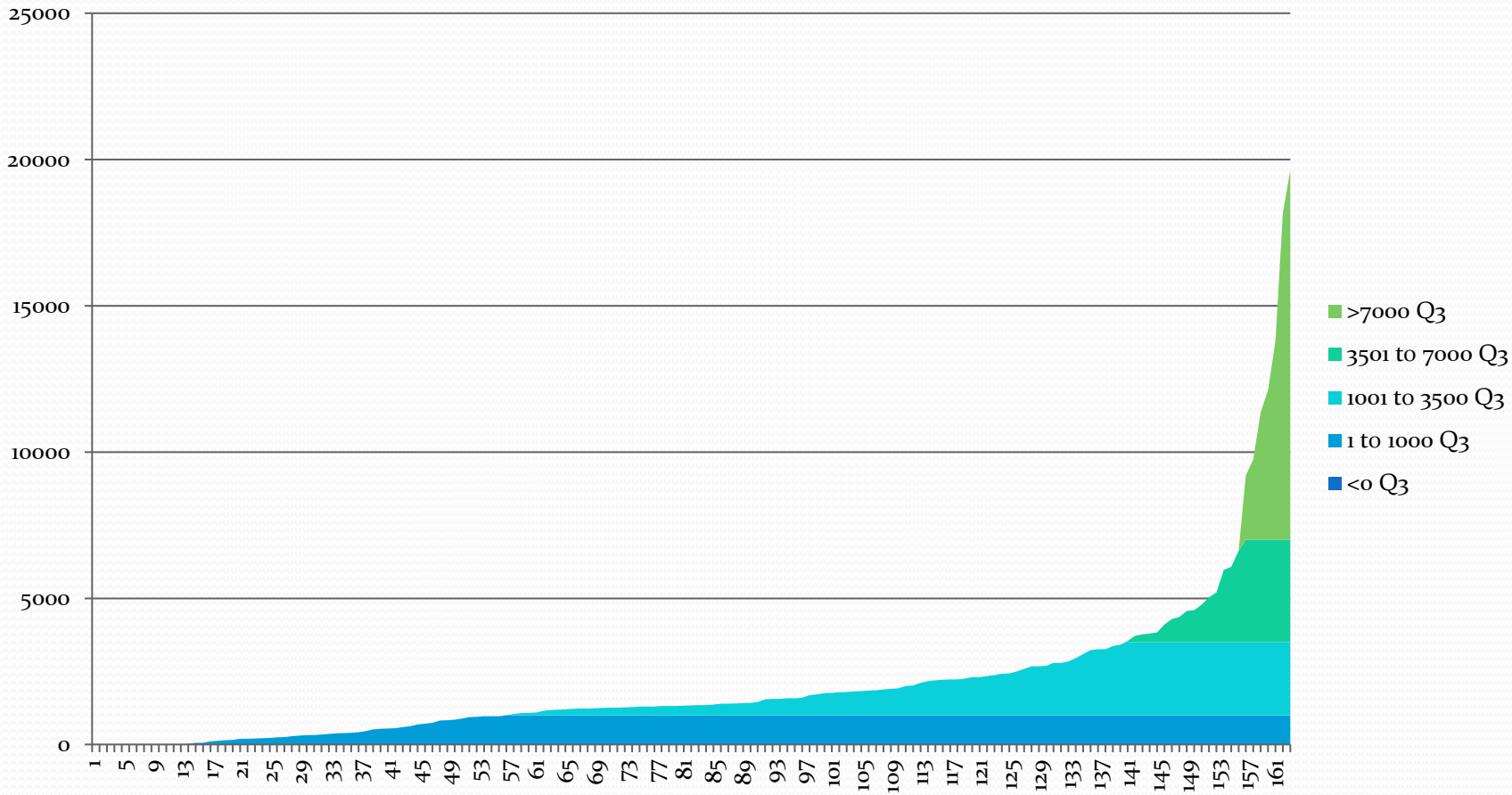
New Rate Structure



Spring Water Consumption



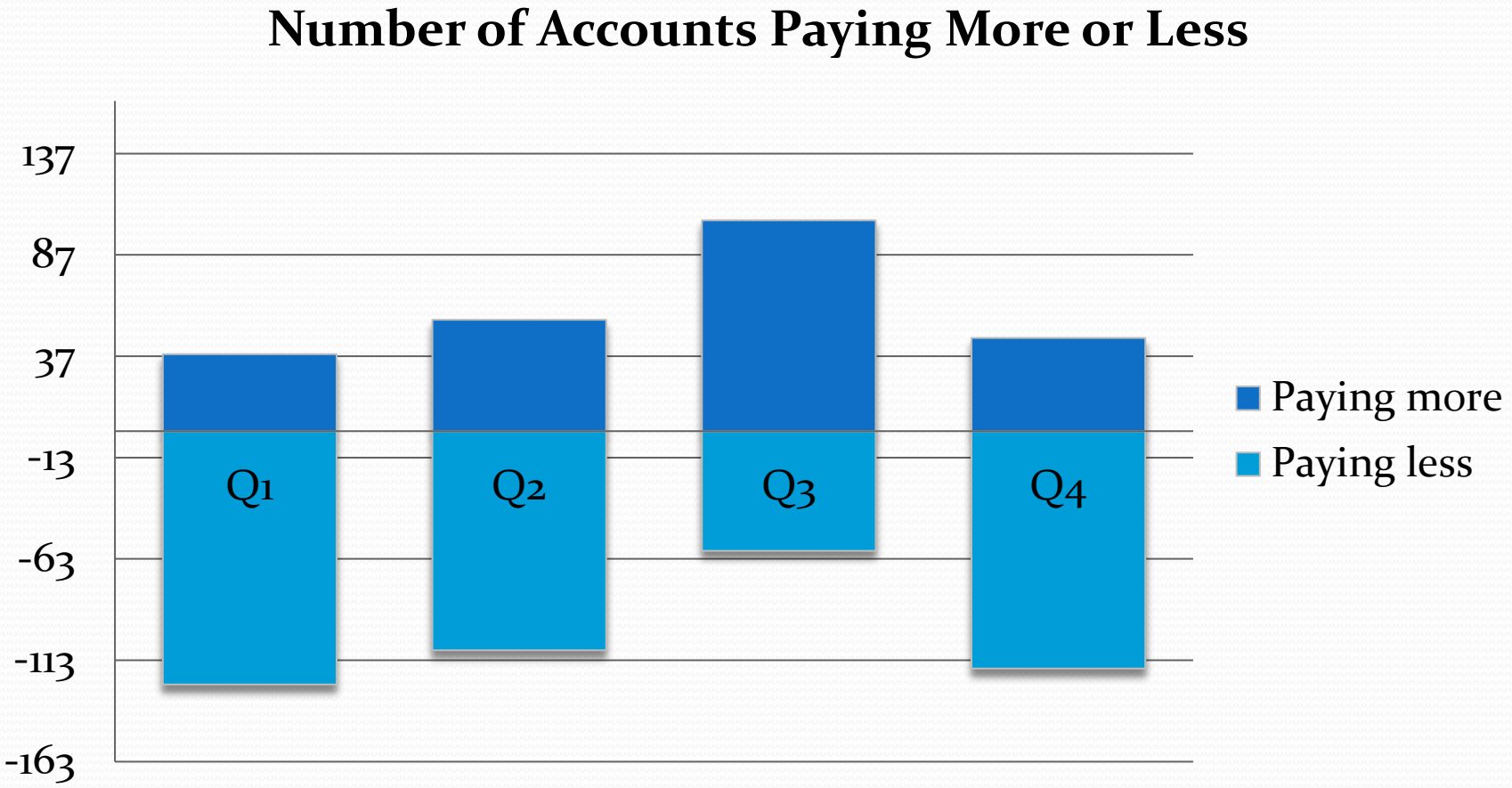
Summer Water Consumption



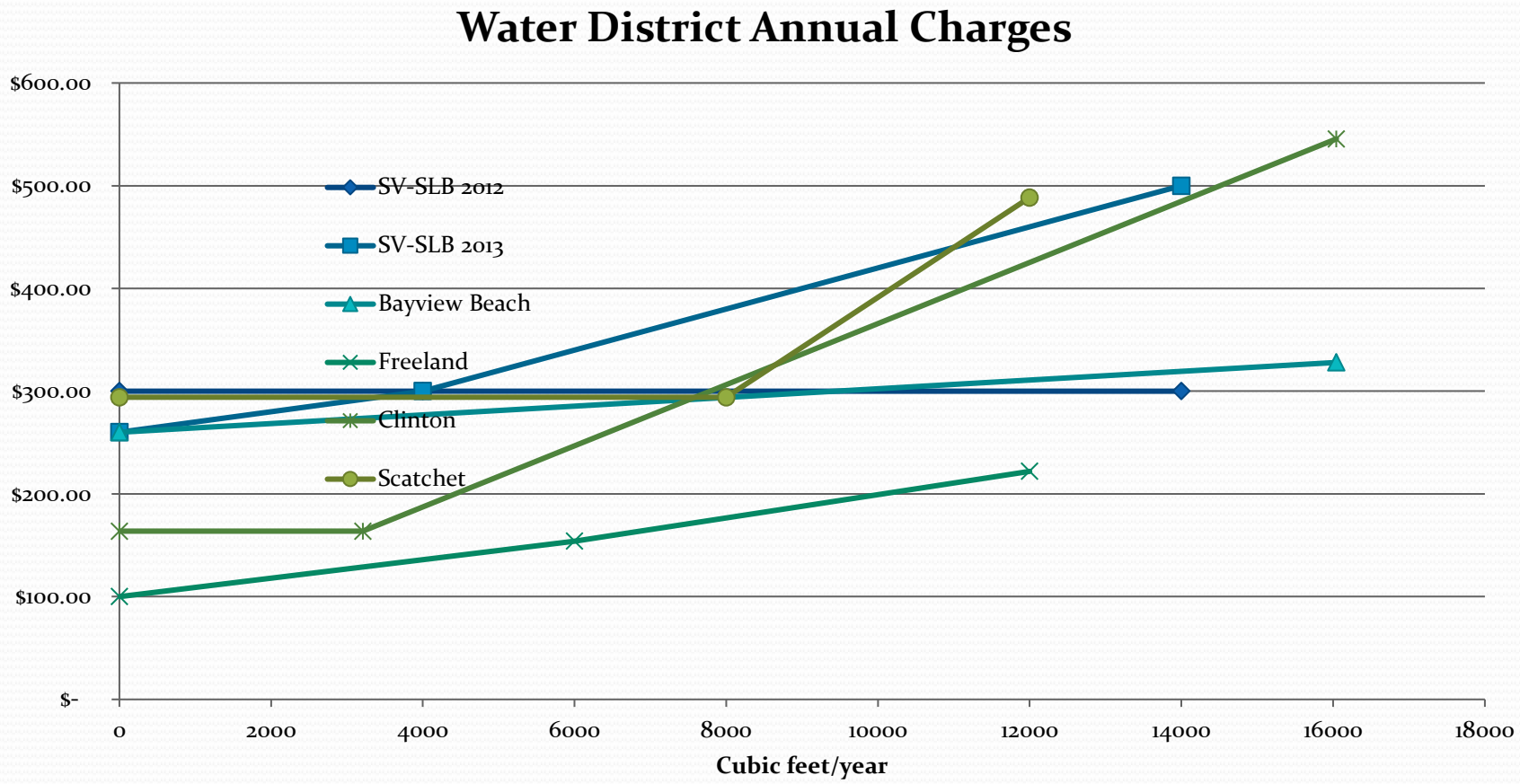
Bill Comparison

Cuft/quarter	2012	2013	Difference $
0	$75	$65	-$10
1000	$75	$75	$0
2000	$75	$95	$20
3000	$75	$115	$40
4000	$85	$145	$60
5000	$105	$185	$80
7000	$145	$265	$120
10,000	$265	$445	$180
15,000	$825	$1,015	$190
20,000	$1,425	$1615	$190

Most Users will Pay Less



Water District Rates



Rate Plan Constraints

- WAC 246-290-800 requires us to implement a water use efficiency program, which includes a rate structure that promotes conservation
- Meet budgetary needs
- Be more equitable than existing plan
- Be better aligned with cost structure
- Be straightforward to understand and implement

New Plan

- Rewards all users for conserving
  - All users pay overage from the first cubic foot
- Meets budgetary needs
  - Maintains revenue even at 10% reduction in consumption
- Is more equitable
  - Bills for low volume (most) users reduced
  - Middle is not subsidized as much
- Is better aligned with cost structure
  - Increased revenue in Summer
- Is easy to understand
  - Small changes from existing rate structures

Further considerations

- Billing is more complicated as every bill is different
- Consider seasonal rates in future to help full-time residents

Summary

- Write down rate plan objectives and constraints
- Collect consumption by account and billing period
- Calculate consumption and billing by account, period, and tier using existing rate structure
- Analyze consumption and revenue
- Try new rate structures and evaluate the results against objectives and constraints
- Rinse and repeat!

Conclusion

- Spreadsheet modeling is an effective way to model rate structures and choose one that meets your needs
- The model allows the board to participate in rate setting “What if…”
- The model helps the board understand the issues and reach a consensus
- The model is a great tool for communicating the new rate structure to the general membership

Modeling a Rate Structure for Conservation

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