



Cost of Service / Tariffs



Presented To: Ministry of Electricity

Date: 2005 May 16



Business and Systems Aligned. Business Empowered.™

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Cost of Service



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Cost of Service - Purpose



- **Assign costs on basis of causation**
- **Determine how costs are recovered within each customer class**
- **Calculate costs of each type of service**
- **Determine total revenue requirement to be paid by customers**
- **Separate costs by regulatory jurisdictions**

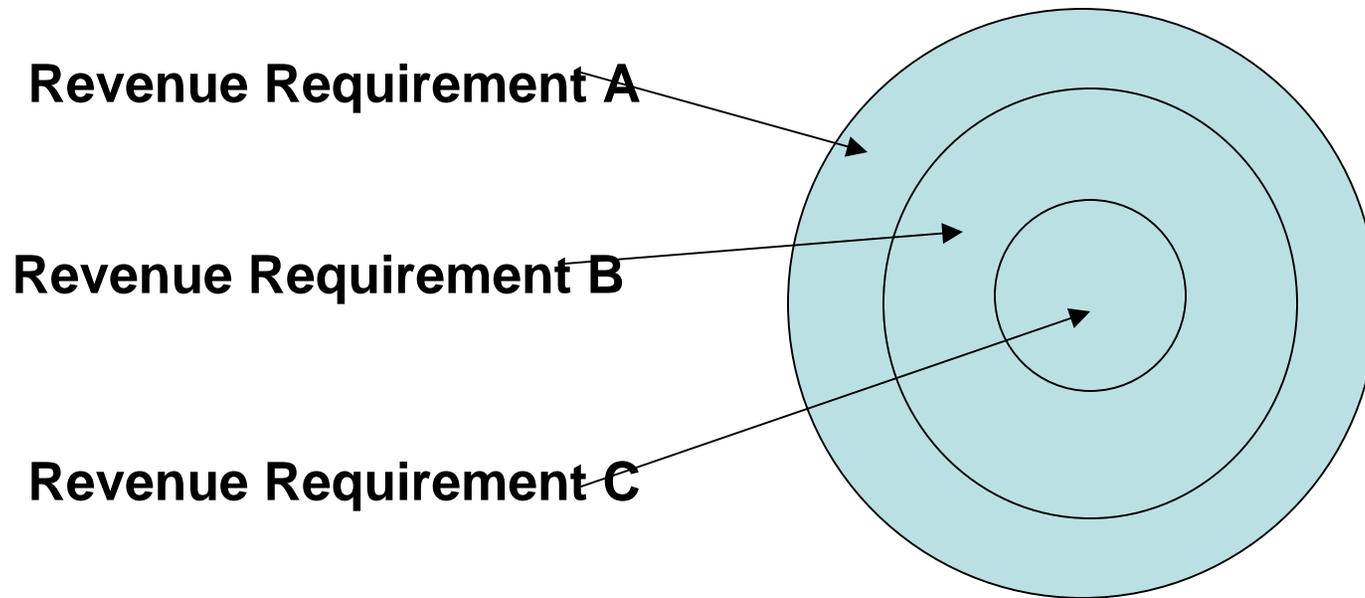
Process



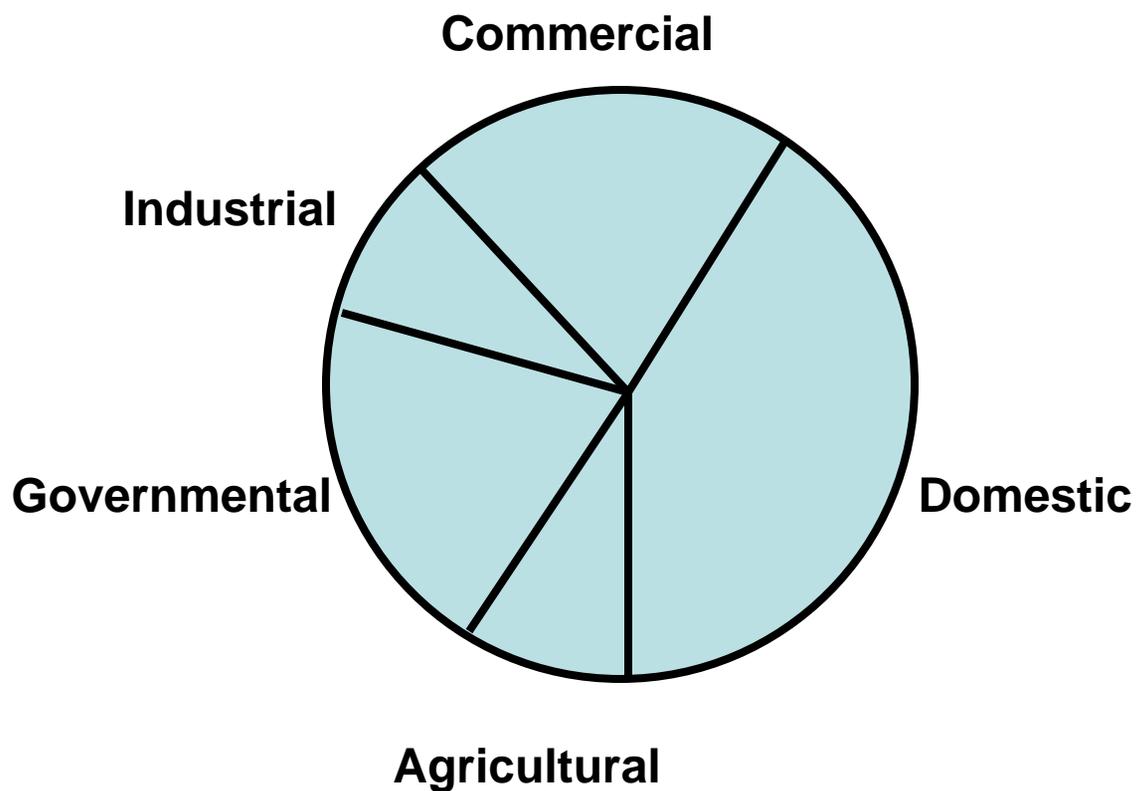
For Cost of Service Cost Allocation Rate Design



Cost of Service – How big is the pie?



Cost Allocation – How big is each slice?



Rate Design



How Do I Charge the Customer ?

**Per Kwh? Per Kw?
Flat Rate? Multi-Blocks?
Seasonal Rates?
Time of Day Rates?**



Cost Procedures



- **Functionalization** – Separating by Function
 - Generation / Transmission / Distribution / Common
- **Classification** – Separating by Type
 - Demand / Energy / Customer
- **Allocation** – Separating the two above by Customer Class
 - Domestic / Commercial / Industrial / Governmental / Agricultural

Classification of Costs



- **Demand Related – Costs that vary with demand (cause plant to be built)**
- **Energy related – Costs that vary with energy used (such as fuel)**
- **Customer related – Costs that vary with number of customers (such as meter reading)**

Cost Allocation Example



	<u>Class 1</u>	<u>Class 2</u>	<u>Class 3</u>	<u>Total</u>
Generation	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Transmission	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Distribution	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Common	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Total	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
% Total	80%	15%	5%	100%
	60%	30%	10%	100%
	65%	20%	15%	100%



Rate Design - Steps



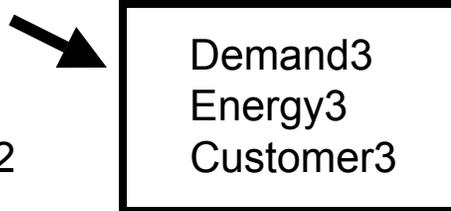
- **Determine Test Period**
- **Calculate Test Period Revenue Requirement**
- **Allocate Costs to each Customer Class**
- **Design Rates to Recover Costs from all Customers**

Cost Allocation Example



	<u>Class 1</u>	<u>Class 2</u>	<u>Class 3</u>	<u>Total</u>
Generation	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Transmission	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Distribution	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Common	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Total	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
% Total	80%	15%	5%	100%
	60%	30%	10%	100%
	65%	20%	15%	100%

Target Revenue



Process Example



COST OF SERVICE **TOTAL All Customers = 529,106,140 (1,000 ID)**
ALLOCATION **to Class 3 = 132,742,674 (1,000 ID)**
TARGET REVENUE **for Class 3 = 132,742,674 (1,000 ID)**

UNIT COSTS / Billing Unit

Demand= 60,438,804 (1,000 ID) / 14,196 Billing Mw = 4,257 ID/Kw
Energy= 72,297,652 (1,000 ID) / 7,051 Gwh = 10.25 ID/Kwh
Customer = 6,218 (1,000 ID) / 14,219 Customers = 36.44 ID/Month

RATE DESIGN Using Flat Rates

Set Unit Costs = Rates

Total Revenue = 132,742,674 (1,000 ID)



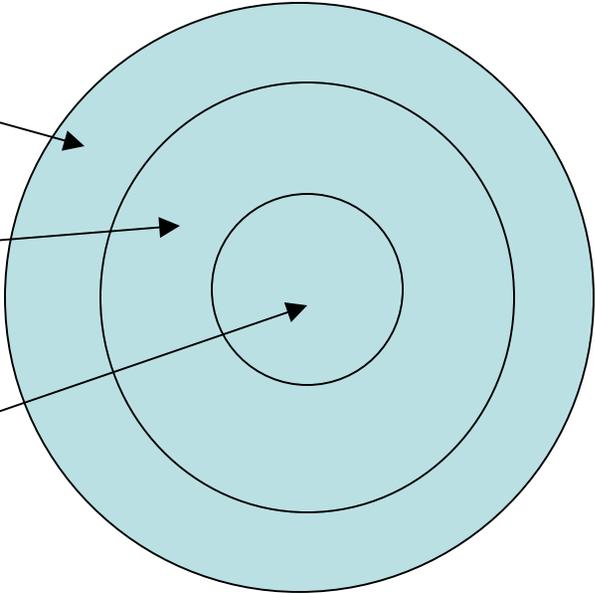
Cost of Service Study



Revenue Requirement A

Revenue Requirement B

Revenue Requirement C



Revenue Requirements(RR)



$$RR=[Tr/(1-Tr) + 1]X(OE+R+FITA+SITA-OR)$$

- **RR=Total Retail Revenue Requirements**
- **Tr=Revenue Tax Rate, if applicable**
- **OE=Operating Expenses, Excluding Income and Revenue Taxes**
- **R=Return**
- **FITA=Federal Income Taxes Allowable**
- **SITA=State Income Taxes Allowable**
- **OR=Other Operating Revenue, exclusive of Revenue Taxes**

Revenue Requirements(RR)



$$RR=[Tr/(1-Tr) + 1]X(OE+R+FITA+SITA-OR)$$

Presently in Iraq, there is no Revenue Tax, no Federal or State Tax and a Return is not required (Assets paid for by the Government)

$$\cancel{RR}=\cancel{[Tr/(1-Tr)} + 1]X(OE+\cancel{R}+\cancel{FITA}+\cancel{SITA}-OR)$$

Therefore

$$RR=OE-OR$$

Cost Accounts in Total Costs



<u>Act #</u>	<u>Account</u>
31	Salary & Payments
32	Commodities Required (Fuel, etc)
33	Required Services
34	Contracts & Services
35	Purchases for Resale
36	Interest and Rent of Land
37	Depreciation
38	Transfer Expenses
39	Other Expenditures
11	Small Capital (Expensed)



Historical Costs vs. Marginal Costs



Historical Costs

- Assumption is that future will be similar to past
- From actual records during test period
- Original costs less depreciation
- test period O&M
- Adjusted for “known and measurable changes”
- Regulators prefer because costs are booked and verifiable

Historical Costs vs. Marginal Costs



Marginal Costs

- Assumption is that future costs will be different
- Lowest costs are the costs of adding the next KW to the system – costs “at the margin””
- Estimated costs of the next plant addition
- Regulators like because Marginal Costs rates encourage conservation
- Regulators don’t like because rates may rise above average costs and over collect

Historical Costs vs. Marginal Costs



- Historical booked
- Average costs
- During stable costs
- Verifiable data
- Estimated future
- Costs of next addition
- Encourages conservation but may over collect

Solution: Use historical costs but modify rate in last rate blocks for marginal costs to encourage conservation

To Attract Future Investment



- **The investment in new plants which was paid for by the government will now come from new outside investors.**
- **Outside Investors need to earn a Return to pay for financing costs of new plant.**
- **Future Rates need to include a Return to collect the financing costs from the customers.**

Return Calculation



$$\text{Return} = \text{RoR} \times \text{RB}$$

where

RoR = Rate of Return

RB = Rate Base

Rate Base



- **Value of invested assets which are “used and useful” in public service**
- **Investment on which a fair Return is allowed**
- **Includes other items besides investment property, i.e. cash working capital.**
- **Different valuation methods**

Rate Base Valuation Methods



- **Original Cost – Cost at time the plant was put into service**
- **Fair Value – Based on Regulator’s judgment and may include original cost, replacement costs, market value, etc.**
- **Reproduction Cost – Estimated cost to reproduce existing plant in present form at current cost levels**

Rate Base



Original Cost of Electric Plant in Service

- Accumulated Depreciation

- Operating Reserves

+Plant Held for Future Use

+Construction Work in Progress

+ Working Capital

= Rate Base

Rate of Return Calculation



RoR = Weighted Cost of Capital

	% Debt		Rate
Debt A	25%	4%	1.0%
Debt B	35%	10%	3.5%
Debt C	<u>40%</u>	6%	<u>2.4%</u>
Average	100%		6.9%

Data Needed





Cost Allocation



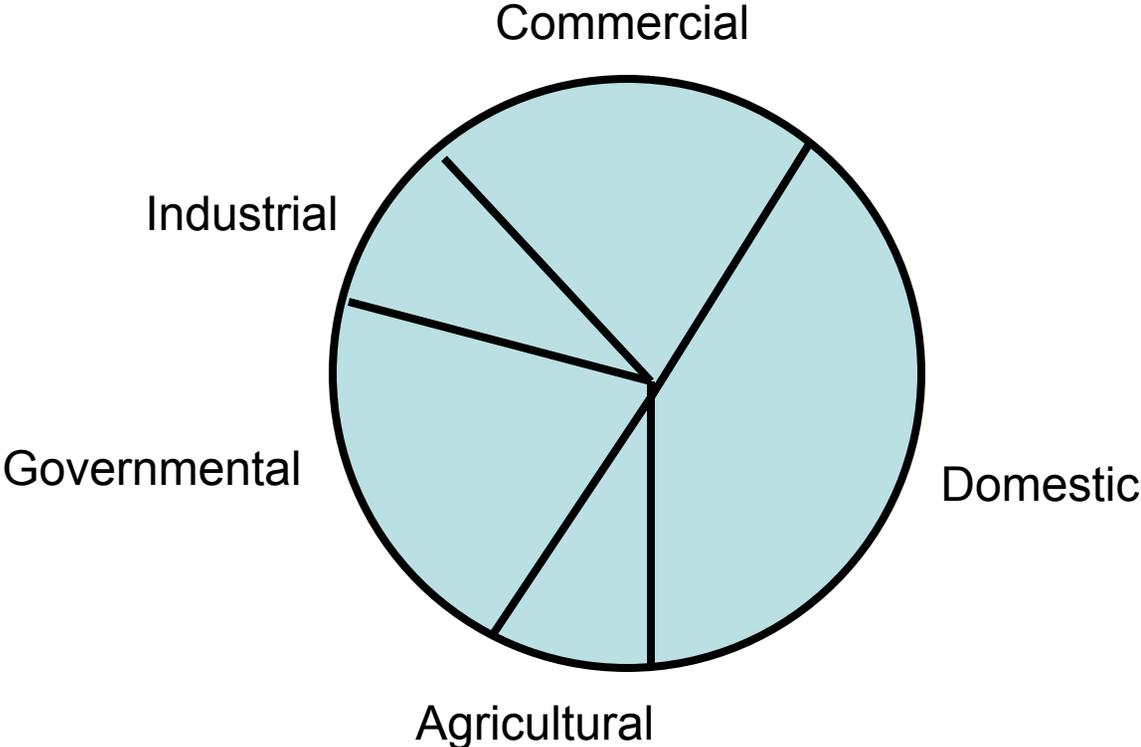
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Cost Allocation



Typical Generation Cost Allocation



- **Depreciation** ▶ **Demand**
- **Debt Service** ▶ **Demand**
- **Return on Investment** ▶ **Demand**
- **Fuel** ▶ **Energy**
- **O&M** ▶ **Energy**
- **Purchased Power Demand Charges** ▶ **Demand**
- **Purchased Power Energy Charges** ▶ **Energy**

Typical Transmission Cost Allocation



- **Fixed costs that do not vary with energy transmitted** ▶ **Demand**
- **Investment made to avoid line losses** ▶ **Energy**

Typical Distribution Plant Allocation



- Land & Land Rights ▶ Demand / Customer
- Structures, Improvements ▶ Demand / Customer
- Station Equipment ▶ Demand
- Storage Battery Equip ▶ Demand
- Poles, Towers, Fixtures ▶ Demand / Customer
- Overhead conductors ▶ Demand / Customer
- Underground Conduit ▶ Demand / Customer
- Line transformers ▶ Demand / Customer
- Services, meters ▶ Customer
- Installations on Customer Premises ▶ Customer
- Leased Property on Customer Premises ▶ Customer

Typical Distribution Operation Expense Allocation



- **Supervision & Engineering** ▶ **Demand / Customer**
- **Load Dispatching** ▶ **Demand**
- **Station Expenses** ▶ **Demand**
- **Overhead Line Expenses** ▶ **Demand / Customer**
- **Underground Line Expenses** ▶ **Demand / Customer**
- **Meter Expenses** ▶ **Customer**
- **Customer Installation Expenses** ▶ **Customer**
- **Miscellaneous Expenses** ▶ **Demand / Customer**
- **Rents** ▶ **Demand / Customer**



Typical Distribution Maintenance Expense Allocation



- **Supervision & Engineering** ▶ **Demand / Customer**
- **Structures** ▶ **Demand / Customer**
- **Station Expenses** ▶ **Demand**
- **Overhead Line Expenses** ▶ **Demand / Customer**
- **Underground Line Expenses** ▶ **Demand / Customer**
- **Line transformers** ▶ **Demand / Customer**
- **Meters** ▶ **Customer**
- **Miscellaneous Expenses** ▶ **Demand / Customer**

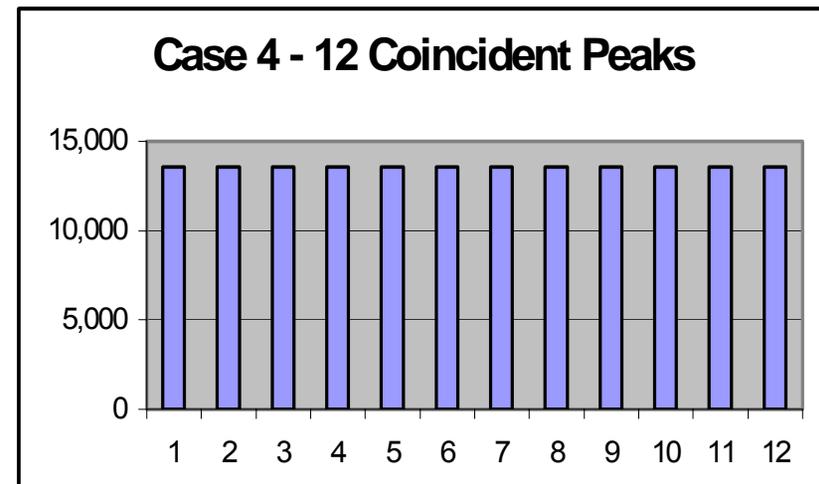
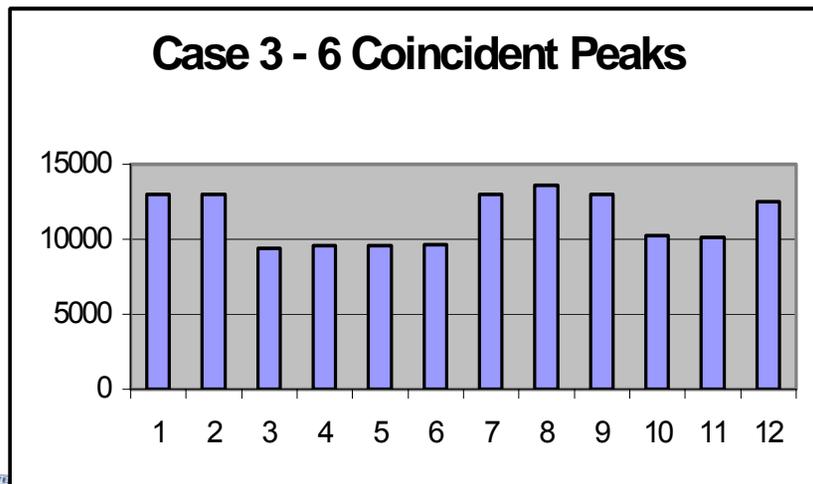
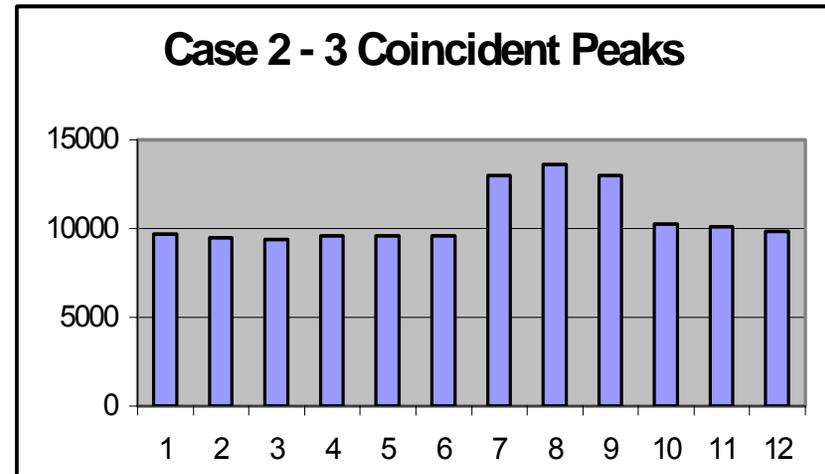
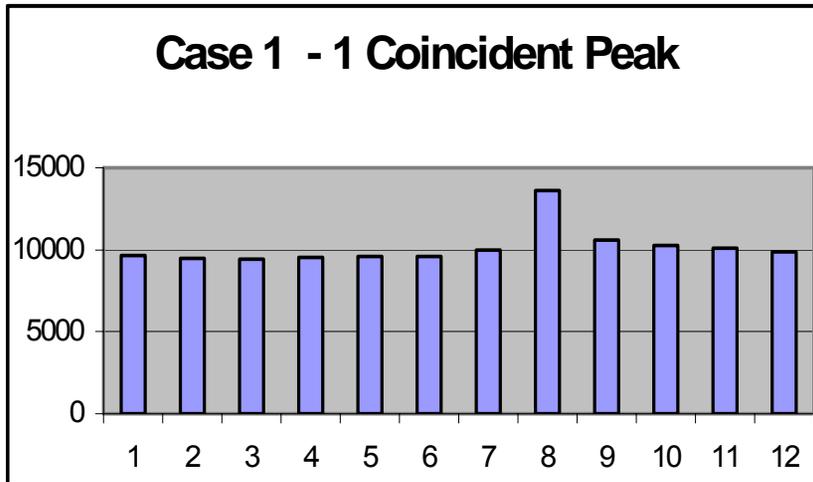
DEMAND ALLOCATION PEAK METHODS



- **Coincident Peak- Each Class Demand at time of System Peak divided by System Peak**
- **Non-Coincident Peak - Each Class Demand at the time of its own peak divided by Sum of the Class Peaks**
- **Peak methods do not allocate costs to classes whose usage occurs outside peak hours, such as interruptible customers**

DEMAND ALLOCATION EXAMPLE

Coincident Peak Method



Demand and Energy Data



- At Generation Level  Used for Allocation
- At Sales Level  Used for Rate Design
- Difference  Losses

Demand Allocation – Peak Data



DEMAND ALLOCATION EXAMPLE

Class Demands at Generation Level for 12 Monthly System Peaks

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Ave
Domestic	3,887	3,863	2,669	2,103	2,881	3,338	4,537	4,735	4,202	2,534	3,434	4,086	42,269	3,522
Comm	3,065	3,020	3,743	4,340	4,930	4,725	5,106	5,062	5,106	4,736	3,644	3,137	50,614	4,218
Industrial	2,536	2,401	2,818	2,888	3,102	3,067	3,219	3,347	3,404	3,170	2,786	2,444	35,182	2,932
Agricult	84	117	144	232	405	453	450	447	360	284	138	75	3,189	266
St. Ltg	94	105	28	0	0	0	0	0	0	0	103	126	456	38
TOTAL	9,666	9,506	9,402	9,563	11,318	11,583	13,312	13,591	13,072	10,724	10,105	9,868	131,710	10,976
%Peak	71%	70%	69%	70%	83%	85%	98%	100%	96%	79%	74%	73%		



Demand Allocation – Peak Data

					Ave 3		
		1 C P	12 C P	12 C P	Summer	N C P	N C P
Class	Peak	Factor	Peaks	Factor	Peaks	Demand	Factor
Domestic						4735	
Comm						5106	
Industrial						3404	
Agricult						447	
St. Ltg						126	
TOTAL						13818	

Demand Allocation – Peak Answers

		1 C P	12 C P	12 C P	Ave 3		
		Factor	Peaks	Factor	Summer	N C P	N C P
Class	Peak	Factor	Peaks	Factor	Peaks	Demand	Factor
Domestic	4735	34.84	3522	32.09	4491	4735	34.27
Comm	5062	37.25	4218	38.43	5091	5106	36.95
Industrial	3347	24.63	2932	26.71	3323	3404	24.63
Agricult	447	3.29	266	2.42	419	447	3.23
St. Ltg	0	0.00	38	0.35	0	126	0.91
TOTAL	13591	100	10976	100	13324	13818	100

ENERGY ALLOCATION FACTORS

Class	Annual Energy MMH	Energy Alloc Factor	On Peak Energy MMH	On Pk Energy Factor	Off Peak Energy MMH	Off Pk Energy Factor
Domestic	21,433,001	30.96	3,950,368	32.13	17,482,633	30.71
Comm	23,439,008	33.86	4,452,310	36.21	18,986,698	33.35
Industrial	21,602,999	31.21	3,474,929	28.26	18,128,070	31.85
Agricult	2,229,000	3.22	335,865	2.73	1,893,135	3.33
St. Ltg	513,600	0.74	80,889	0.66	432,711	0.76
TOTAL	69,217,608	100.00	12,294,361	100.00	56,923,247	100.00

CUSTOMER ALLOCATION FACTORS

Class	Customers	Cus Alloc Factor	Weight	Weighted Number of Customers	Cus Alloc Factor
Domes	2,530,001	50.47	1	2530001	29.13
Comm	2,027,589	40.45	1	2027589	23.35
Industr	407,902	8.14	10	4079020	46.97
Agricul	14,219	0.28	1	14219	0.16
St. Ltg	33,223	0.66	1	33223	0.38
TOTAL	5,012,934	100.00		8684052	100.00

Data Needed





Rate Design



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Rate Design



How Do I Charge the Customer ?



Rate Design Principles



Public Policy Issues

- Value of service
- Allocation of scarce resources
- Conservation
- Ability to pay
- Social rate making
- Lifeline rates

Economic Issues

- Substitution of energy sources
- Comparative prices
- Economic Development
- Price Elasticity
- Migration of customers

Rate Design Principles



Management Issues

- **Price Signals – Influence customers to act**
- **Load Management – Improve Load Factor**
- **Performance based rates – Rewards for better management performance**
- **Incentive rates – encourage actions to save on bill by conservation, time of use, etc.**

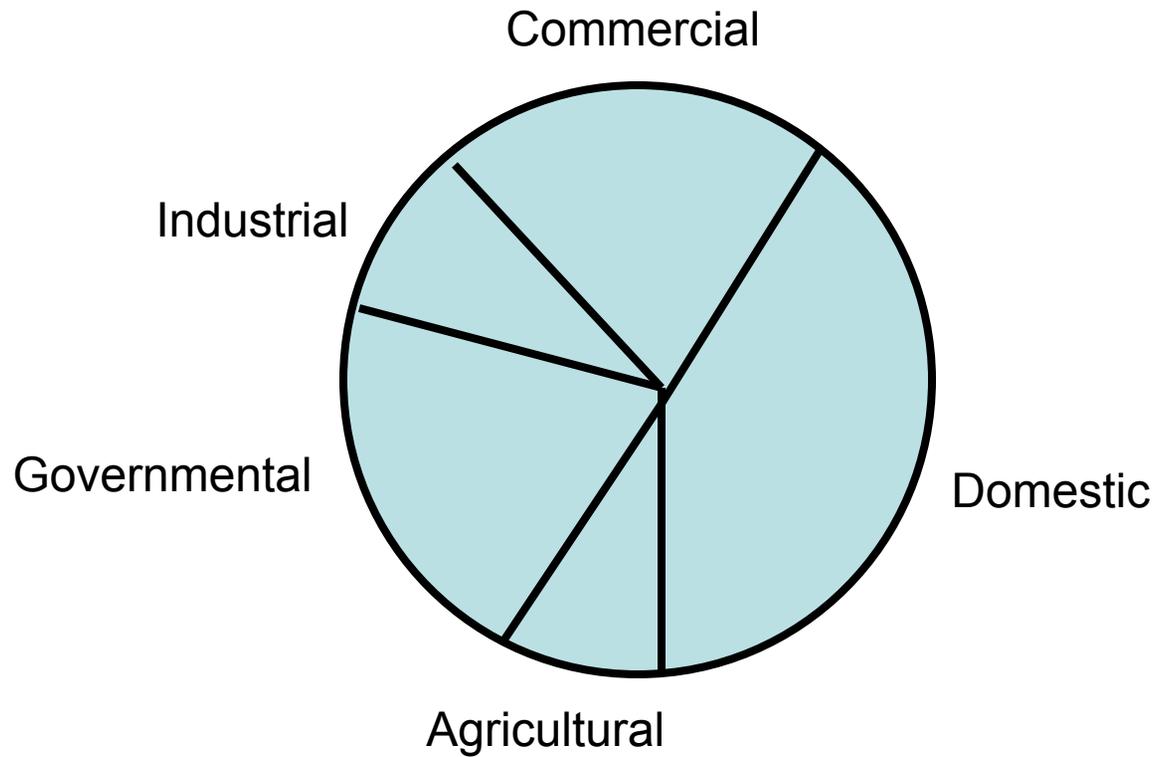
Rate Design Principles



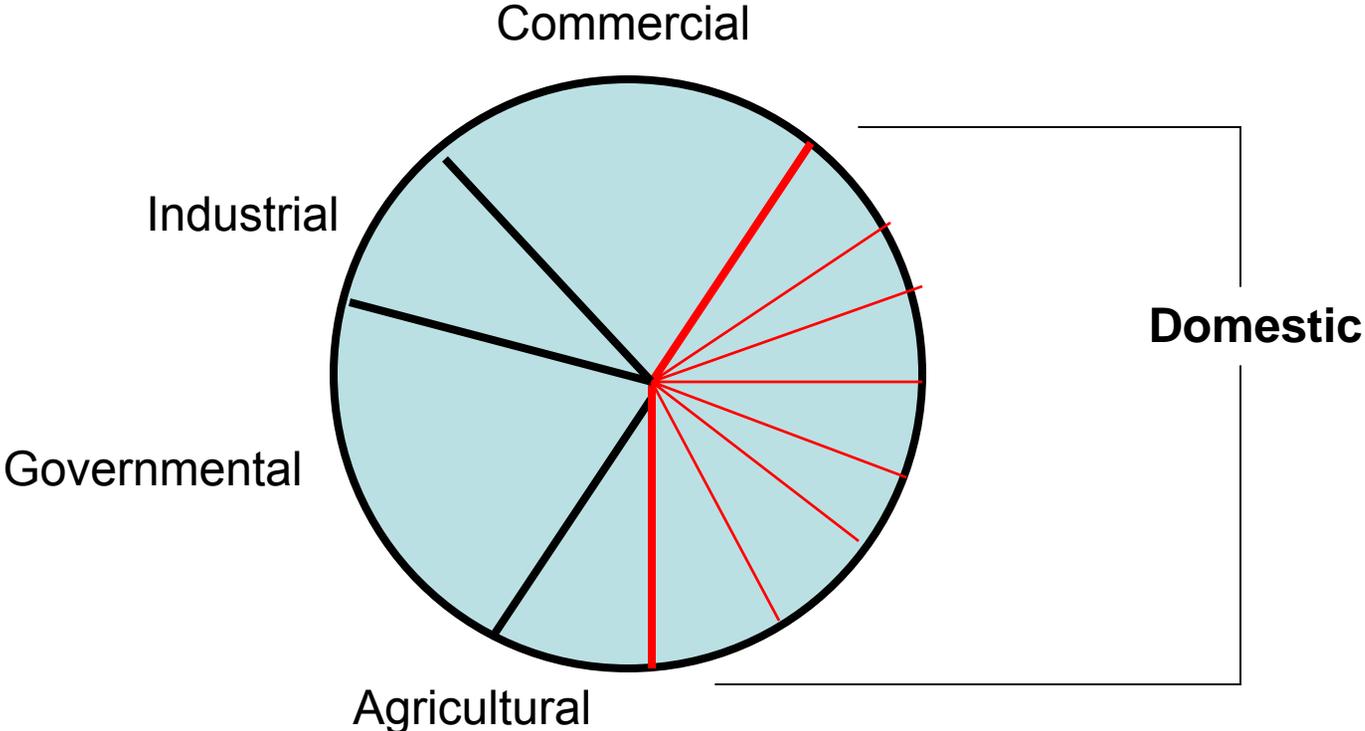
Regulatory Issues

- Full cost recovery
- Proper allocation
- Fixed vs variable costs
- Fair and Reasonable
- Understandable
- Predictable
- Price stability
- Revenue Stability
- Inter and Intra Class Subsidies
- Unitized Rates of Return by Class
- Time of Use Rates

Target Revenue by Class



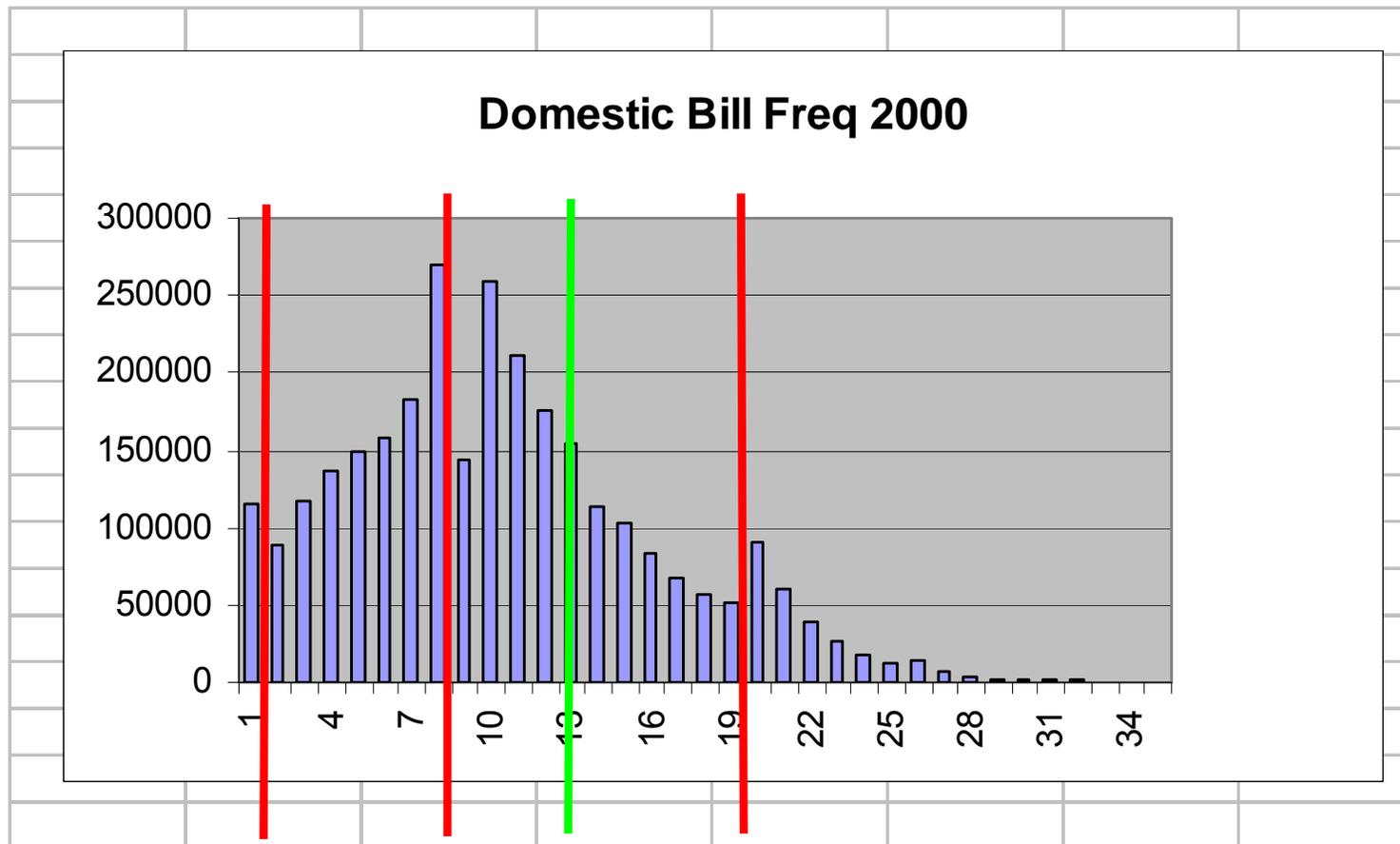
Sub-Dividing Customer Class



Using Frequency Distributions



Bill Frequency Distribution



Distribution of kwh in Rate Blocks



Assume last block ends at 7,000							Blk 7	Blk Size	Gwh
							G1	2000	35
				Blk 5	F1	F2		2100	115
			Blk 4	E1	E2	E3		900	235
		Blk 3	D1	D2	D3	D4		600	483
	Blk 2	C1	C2	C3	C4	C5		600	1,378
Blk 1	B1	B2	B3	B4	B5	B6		600	4,597
A1	A2	A3	A4	A5	A6	A7		300	6,842
300	600	600	600	900	2100	2000			13,685

Revenue Simulation



Domestic	Block	Gwh	Present Rate		Present Revenue	
			ID/kwh	¢/kwh	(1,000) ID	(1000)\$US
24.2555%	1-300	6,842	1	0.0714	6,841,749	4,887
16.2960%	301-900	4,597	1	0.0714	4,596,613	3,283
4.8851%	901-1500	1,378	1	0.0714	1,377,940	984
1.7132%	1501-2100	483	4	0.2857	1,932,969	1,381
0.8347%	2101-3000	235	7	0.5000	1,648,107	1,177
0.4070%	3001-5100	115	15	1.0714	1,722,037	1,230
0.1258%	5101- Rest	35	30	2.1429	1,064,532	760
48.5173%	Total	13,685	1.4	0.1001	19,183,947	13,703



Cost Recovery in Rate class



- Demand Costs
- Energy Costs
- Customer Costs
- TOTAL
- X ID
- Y ID
- Z ID
- TOTAL Target Rev

Typical Pricing by Class



- **Domestic**
- **Commercial**
- **Industrial**
- **Energy**
5 ID/kwh
- **Energy, Customer**
5 ID/kwh
10 ID Customer Chg
- **Dem, En, Cus**
5 ID/kwh
10 ID/kw
25 ID Customer Chg

Rate Block Pricing



Flat Rate

10 ID/kwh for all kwh

Multi-Block

- **Declining Prices**
6 ID/kwh first 300 kwh
4 ID/kwh next 600 kwh
2 ID/kwh rest
- **Increasing Prices**
2 ID/kwh first 300 kwh
4 ID/kwh next 600 kwh
6 ID/kwh rest

Rate Mechanisms



Example

- **Minimum Bill**

Demand costs

- **Customer Charge**

Customer costs

- **Flat Charge in First Block**

Demand & Energy

- **Bill will be no less than X ID**

- **X ID / Customer**

- **700 ID for first 300 kwh**
4 ID/kwh for next 600 kwh
6 ID/kwh for next 800 kwh
8 ID/kwh for rest

Rate Mechanisms



- **Demand Charge** **10 ID/kw of Actual Demand**
- **Demand Ratchet**
Billing Demand=
Higher of:
This Month's kw
OR
80% of highest kw
during last 11 months **10 ID/kw of Billing Demand**



Work Session



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Cost Allocation Example



	<u>Class 1</u>	<u>Class 2</u>	<u>Class 3</u>	<u>Total</u>
Generation	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Transmission	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Distribution	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Common	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
Total	Demand1	Demand2	Demand3	DemandT
	Energy1	Energy2	Energy3	EnergyT
	Customer1	Customer2	Customer3	CustomerT
% Total	80%	15%	5%	100%
	60%	30%	10%	100%
	65%	20%	15%	100%



Work Session – Total Costs



31	Salary & Payment		154,329,898		
32	Commodities Req		42,695,122		
33	Required Services		9,459,301		
		Demand		25.52%	
		Energy		64.76%	
		Customer		9.73%	
34	Contracts and Services		99,124		
35	Purchase for Resale		0		
36	Interest and Rent		908,050		
37	Depreciation		2,338,032		
38	Transfer Expenses		52,656,308		
		Demand		99.66%	
		Customer		0.34%	
39	Other Expenditures		1,265,598		
11	Small Capital		5,000,000		
	TOTAL		268,751,433		



Work Session – Allocation Basis



<u>Act #</u>	<u>Account</u>		<u>Costs</u>		<u>Allocator</u>
31	Salary & Payment		154,329,898		Demand
32	Commodities Req		42,695,122		Energy
33	Required Services				
		Demand	2,413,823	25.52%	Demand
		Energy	6,125,387	64.76%	Energy
		Customer	920,091	9.73%	Customer
34	Contracts and Services		99,124		Energy
35	Purchase for Resale		0		Energy
36	Interest and Rent		908,050		Demand
37	Depreciation		2,338,032		Demand
38	Transfer Expenses				
		Demand	52,478,084	99.66%	Demand
		Customer	178,224	0.34%	Customer
39	Other Expenditures		1,265,598		Demand
11	Small Capital		5,000,000		Demand
	TOTAL		268,751,433		



Demand and Energy Data



- At Generation Level  Used for Allocation
- At Sales Level  Used for Rate Design
- Difference  Losses

Losses



	All	<u>Customer Class</u>	
	<u>Customers</u>	<u>Dom</u>	<u>Ind</u>
Generation	2.73%	2.73%	2.73%
Transmission	9.08%	9.08%	4.54% (1/2)
Distribution	13.19%	13.19%	6.60% (1/2)
Total	25.00%	25.00%	13.87%

Work Session – Allocators



	TOTAL	Domestic	Sm Comm	Industrial	Governmenta	Agricultural
Demand @ Generation	7,488	3,776	384	1,347	1,664	318
	100.00%	50.43%				
Energy @ Gen (Gwh)	39,142	19,487	2,327	9,473	6,227	1,628
(w/ Ave 25% Losses)	100.00%					
Customers	2,511,695	2,014,086	403,491	13,904	33,146	47,068
	100.00%					
Demands @ Meter	6,096	3,021	307	1,183	1,331	254
	100.00%					
Billing Demands	73,152	36,252	3,684	14,196	15,972	3,048
12 Monthly Demands	100.00%					
Sales @ Meter (Gwh)	32,054	15,589	1,862	8,319	4,981	1,302
	100.00%					



Work Session – Allocators vs. Billing



ALLOCATION FACTORS							
	TOTAL	Domestic	Sm Comm	Industrial	Governmental	Agricultural	
Demand @ Generation in Mw	7,488 100.00%	3,776 50.43%	384 5.12%	1,347 17.99%	1,664 22.22%	318 4.24%	
Energy @ Gen (Gwh) (w/ Ave 25% Losses)	39,142 100.00%	19,487 49.79%	2,327 5.95%	9,473 24.20%	6,227 15.91%	1,628 4.16%	
Customers	2,511,695 100.00%	2,014,086 80.19%	403,491 16.06%	13,904 0.55%	33,146 1.32%	47,068 1.87%	
BILLING UNITS							
Demands @ Meter	6,096	3,021	307	1,183	1,331	254	
Billing Demands(X 12)	73,152	36,252	3,684	14,196	15,972	3,048	
Sales @ Meter (Gwh)	32,054	15,589	1,862	8,319	4,981	1,302	
Billing Customers(x 12)	30,140,340	24,169,032	4,841,892	166,848	397,752	564,816	



Work Session – Allocation Basis



<u>Act #</u>	<u>Costs</u>	<u>Alloc</u>	<u>Dom</u>	<u>Comm</u>	<u>Ind</u>	<u>Gov</u>	<u>Agr</u>
31	154,329,898	Dem	77,828,568	7,901,691	27,763,949	34,292,103	6,543,588
32	42,695,122	En	21,257,901	2,540,360	10,332,220	6,792,794	1,776,117
33							
	2,413,823	Dem	1,217,291	123,588	434,247	536,351	102,346
	6,125,387	En	3,049,830	364,461	1,482,344	974,549	254,816
	920,091	Cus	737,821	147,767	5,061	12,145	17,206
34	99,124	En	49,354	5,898	23,988	15,771	4,124
35	0	En	0	0	0	0	0
36	908,050	Dem	457,930	46,492	163,358	201,769	38,501
37	2,338,032	Dem	1,179,070	119,707	420,612	519,511	99,133
38							
	52,478,084	Dem	26,464,698	2,686,878	9,440,807	11,660,630	2,225,071
	178,224	Cus	142,918	28,623	980	2,353	3,333
39	1,265,598	Dem	638,241	64,799	227,681	281,216	53,661
11	5,000,000	Dem	2,521,500	256,000	899,500	1,111,000	212,000
TOT	268,751,433		135,545,121	14,286,262	51,194,746	56,400,192	11,329,895



Work Session – Unit Costs



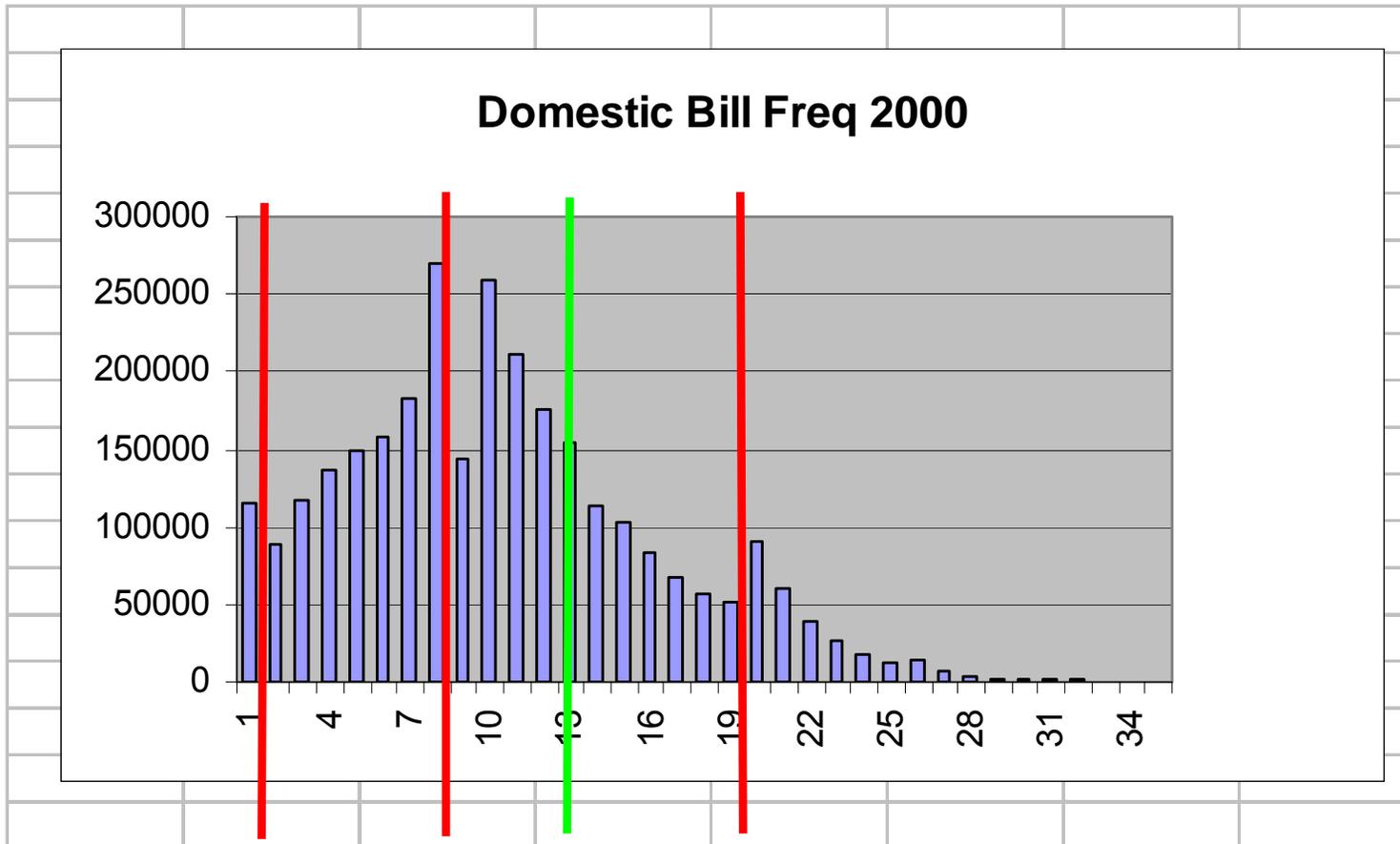
		<u>Alloc</u>	<u>Dom</u>	<u>Comm</u>	<u>Ind</u>	<u>Gov</u>	<u>Agr</u>
	<u>Costs</u>						
	218,733,485	Dem	110,307,296	11,199,154	39,350,154	48,602,580	9,274,300
	48,919,633	En	24,357,085	2,910,718	11,838,551	7,783,114	2,035,057
	1,098,315	Cus	880,739	176,389	6,041	14,498	20,538
TOT	268,751,433		135,545,121	14,286,262	51,194,746	56,400,192	11,329,895
	<u>Billing Units</u>						
	Billing Kw	Dem	73,152	36,252	3,684	14,196	15,972
	Sales (Gwh)	En	15,589	1,862	8,319	4,981	1,302
	Cust x 12	Cus	24,169,032	4,841,892	166,848	397,752	564,816
	<u>Cost / Unit</u>						
	ID / Kw	Dem	1.51	0.31	10.68	3.42	0.58
	ID / Kwh	En	1.56	1.56	1.42	1.56	1.56
	ID / Cus/ mon	Cus	0.036	0.036	0.036	0.036	0.036

Work Session – Unit Costs vs Rates



<u>Cost / Unit</u>		<u>Dom</u>	<u>Comm</u>	<u>Ind</u>	<u>Gov</u>	<u>Agr</u>
ID / Kw	Dem	1.51	0.31	10.68	3.42	0.58
<u>OR</u> ID/Kwh		7.08	6.01	4.73	9.76	7.12
ID / Kwh	En	1.56	1.56	1.42	1.56	1.56
ID / Cus/ mon	Cus	0.036	0.036	0.036	0.036	0.036
<u>OR</u> ID/Kwh		0.06	0.09	0.00	0.00	0.02
<u>TOTAL - ID/KWH</u>		8.69	7.67	6.15	11.32	8.70
<u>Present Average Rate</u>						
ID / Kwh		1.4	7	3.1	2.7	5

Bill Frequency Distribution



Work Session – Rate Structure



Domestic

Present	(ID/ kwh)		Proposed	(ID/kwh)
First 1500 kwh	1		First 300 kwh	5
			Next 600 kwh	10
			Next 600 kwh	15
Next 600 kwh	4		Next 600 kwh	30
Next 900 kwh	7		Next 900 kwh	40
Next 2100 kwh	15		Rest	50
Rest	30			



Work Session – Revenue



Domestic

		Present Rate	Proposed Rate	Present Revenue	Proposed Revenue	Target Revenue
Block	Gwh	ID/kwh	ID/kwh	(1,000) ID	(1,000) ID	(1,000) ID
1-300	6,842	1	5	6,841,749	34,208,744	
301-900	4,597	1	10	4,596,613	45,966,127	
901-1500	1,378	1	15	1,377,940	20,669,102	
1501-2100	483	4	30	1,932,969	14,497,270	
2101-3000	235	7	40	1,648,107	9,417,753	
3001-5100	115	15	50	1,722,037	5,740,125	
5101- Rest	35	30	50	1,064,532	1,774,220	
Total	13,685	1.4	9.7	19,183,947	132,273,342	135,545,121



Work Session – Try One



Domestic

	A		B		C	
		Present Rate	Proposed Rate	Present Revenue	Proposed Revenue	Target Revenue
Block	Gwh	ID/kwh	ID/kwh	(1,000) ID	(1,000) ID	(1,000) ID
1-300	7,000	1	0	7,000,000	0	
301-900	4,500	1	0	4,500,000	0	
901-1500	2,000	1	0	2,000,000	0	
1501-2100	500	4	0	2,000,000	0	
2101-3000	300	7	0	2,100,000	0	
3001-5100	100	15	0	1,500,000	0	
5101- Rest	50	30	0	1,500,000	0	
Total	14,450	1.4	0.0	20,600,000	0	200,000,000
					C= A X B X 1,000	



Work Session – Congratulations!



**You Have Just
Designed a Rate!**



Other Rate Studies

- Customer Migration
- Income versus Ability to Pay
- Demand Elasticity
- Customer Acceptance
- Impact on Collections