

Hatfield 2.2.2 and BCM2

- ◆ Both models design similar networks, using similar engineering design
- ◆ BCM2 estimates significantly higher loop costs than Hatfield
- ◆ Some inputs are the same - or BCM2 is lower
 - Input values for materials and placement
 - Differences in treatment of expenses
- ◆ For some inputs, BCM2 is significantly higher
 - Fill Factors
 - Differences in distribution plant engineering
 - BCM2 fails to recognize sharing of structure costs

Materials Cost

Distribution Cable Cost - Default Values

Cable Size	BCM2		H 2.2.2	
	u/g	aerial	u/g	aerial
3600	\$ 22.20	\$ 21.90	\$ 63.75	\$ 63.75
3000	\$ 18.80	\$ 18.50	\$ 53.25	\$ 53.25
2400	\$ 14.30	\$ 14.10	\$ 42.75	\$ 42.75
1800	\$ 12.44	\$ 12.24	\$ 32.25	\$ 32.25
1200	\$ 10.68	\$ 10.00	\$ 21.75	\$ 21.75
900	\$ 7.82	\$ 7.51	\$ 16.50	\$ 16.50
600	\$ 7.13	\$ 7.05	\$ 11.25	\$ 11.25
400	\$ 4.62	\$ 4.56	\$ 7.75	\$ 7.75
200	\$ 2.36	\$ 2.33	\$ 4.25	\$ 4.25
100	\$ 1.27	\$ 1.26	\$ 2.50	\$ 2.50
50	\$ 0.68	\$ 0.67	\$ 1.63	\$ 1.63
25	\$ 0.37	\$ 0.36	\$ 1.19	\$ 1.19
18	\$ 0.32	\$ 0.31	n/a	n/a
12	\$ 0.28	\$ 0.28	n/a	n/a

Placement Cost - BCM

- ◆ Calculations are done outside of BCM2 (are not user-accessible)
- ◆ In 650-850 density zone, cost ranges from \$6.13/ft. to \$14.51/ft. depending on terrain factors
- ◆ “Normal” values for plowing and trenching range from \$0.70/ft. to \$2.23/ft.

Placement Costs - Hatfield

- ◆ Calculations done within the model with all inputs variable
- ◆ In 650-850 density zone, cost ranges from \$3.00/ft. to \$25.00/ft depending on installation type (buried, underground)
- ◆ 20% distance penalty imposed (affecting both materials and placement cost) where terrain is difficult for placement

Fill Factors

Cable Fill Factors - Default Values

Density	BCM2		H2.2.2	
	Feeder	Distribution	Feeder	Distribution
0	0.75	0.40	0.65	0.50
5	0.80	0.45	0.75	0.55
200	0.80	0.55	0.80	0.60
650	0.85	0.65	0.80	0.65
850	0.85	0.75	0.80	0.70
2550	0.85	0.80	0.80	0.75

Sharing of OSP structure

- ◆ BCM2 assumes that all structure costs are attributable to telephony
- ◆ In the real world, poles, trenches, and conduit are shared between telephony, CATV, and electric
- ◆ Hatfield attributes 1/3 of structure costs to telephony (user-adjustable variable)

Effect of structure sharing

- ◆ Hatfield runs for Michigan, all inputs set to “default” values, except structure

	0-5	5-200	200-650	650-850	850-2550	2550+
33% structure to telephony	\$74.14	\$26.13	\$13.99	\$11.26	\$ 10.61	\$10.47
100% structure to telephony	\$85.93	\$29.70	\$15.12	\$12.45	\$ 14.04	\$16.79
%increase	15.9%	13.7%	8.1%	10.6%	32.3%	60.4%

Treatment of Expenses - BCM2

- ◆ BCM2 uses both investment factors and per-line embedded expenses
 - Investment factors
 - » 3 separate factors for cable & wire, switching, circuit equipment
 - » includes return on investment, taxes, plant-specific and non-specific expenses, depreciation & amortization
 - Per-line expenses
 - » customer operations, corporate operations, other depreciation/amortization
 - » Total amount is \$11.12 per line per month

Treatment of Expenses - H2

- ◆ Hatfield uses investment factors, per-line expenses, and incremental cost information
 - Investment factors used for plant-specific and non-specific expenses, general support
 - Per-line expense for network operations, adjusted downward by 30%
 - Incremental cost for billing and bill inquiry, switch operating expenses
 - All UNE costs factored up by 10% to cover corporate operations

Treatment of Expenses

- ◆ BCM2 expense methodology assumes that all embedded expenses for customer operations, corporation operations are forward-looking and efficient
- ◆ BCM2 expenses are developed on a nationwide basis -- do not reflect regional differences in operating costs

Important Differences

- ◆ Hatfield produces *both* universal service and UNE costs, BCM is only a universal service model
- ◆ Hatfield is more flexible -- many more inputs can be changed, including separate specification of depreciation and cost of capital inputs
- ◆ Hatfield uses state-specific data for calculation of expenses, BCM2 uses nationwide averages
- ◆ BCM2 does *not* model interoffice network, signaling -- Hatfield does in great detail

Conformance with FCC Order

- ◆ Hatfield 2.2.2 fully complies with FCC definition of TELRIC
 - “Scorched node” approach
 - Forward-looking network
 - Based on total demand
- ◆ Requirement to include contribution to common cost is accommodated in Hatfield overhead factor

Future Direction

- ◆ Business and residence line counts by ZIP+4 codes, reassignment of wire centers
- ◆ Additional network elements (*e.g.*, ISDN, T-1 loops, wire center interconnection/collocation)

Hartford Implementation of Pricing at Economic Cost

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Economic cost price standard

□ Forward-Looking Economic Cost

- Total Element Long-Run Incremental Costs
"TELRIC"
- Plus reasonable allocation of forward-looking common costs
- Applies to:
 - Unbundled network elements
 - Interconnection
 - Collocation
 - Transport and termination

THE PRINCIPLES

1. Assumptions

- > Efficient network configuration and "fill"
- > Forward-looking cost of capital
- > Economic depreciation rates
- > Total expected demand for element

Efficient network configuration

- Embedded network is irrelevant (but for scorched nodes)
- Hatfield estimates the cost of all current narrowband services
- Network assumed in Hatfield is identical to what the ILECs are installing today for narrowband

Efficient "fill"

- The sponsored model appear to assume much lower fill than HM
- Purposes of underfill
 - Buffer for unexpected current demand or "breakage"
 - Efficient way to expand capacity to accommodate expected "growth"
- HM allows for adequate buffer spare
- "Growth" spare is the responsibility of the growth lines, not current lines

Forward-looking cost of capital

- ILEECs should assign a weight to its current cost of 10%
- Financial non-market methods for cost of capital
 - incorporate the future risk that the ILEECs face
 - Dramatic risk increases are unlikely
 - DCF or CAPM methodologies anticipate risk
 - Current figures should be presumptive

Economic depreciation rates

- Should reflect service lives of efficient forward-looking plant
 - Look at actual retirement patterns
- Accelerated depreciation is inadmissible
- "Irreversibility" issue is a canard

total expected demand for element

1. The market is not there are scale economies

→ But will have nothing to fear from entry

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- The alternative is to price based on inefficient supply

Reasonable allocation of common costs

- Only efficient, forward-looking common costs that benefit the element
- May not result in prices above stand-alone cost
- Sum of allocated common costs cannot exceed the total of all such costs
- Presumptive equiproportional allocation (no ECPR)
- Reasonable to underallocate to less competitive elements

Additives not to be considered

- Financial/operating costs
- Retail costs
- Opportunity costs (DECIPR)
- Subsidies to other services

How Hatfield measures costs

■ Elements that include:

- All directly attributable forward-looking LRIC
- All element-specific fixed costs
- An allocation of all UNE-specific fixed and variable shared costs
- A 10% allocation of variable costs that are shared between the group of UNE and the rest of the firm

■ Treatment of fixed costs shared across the firm

- Appear to be de minimis
- Likely captured in the 10% allocation
- If more exist, they should be identified explicitly