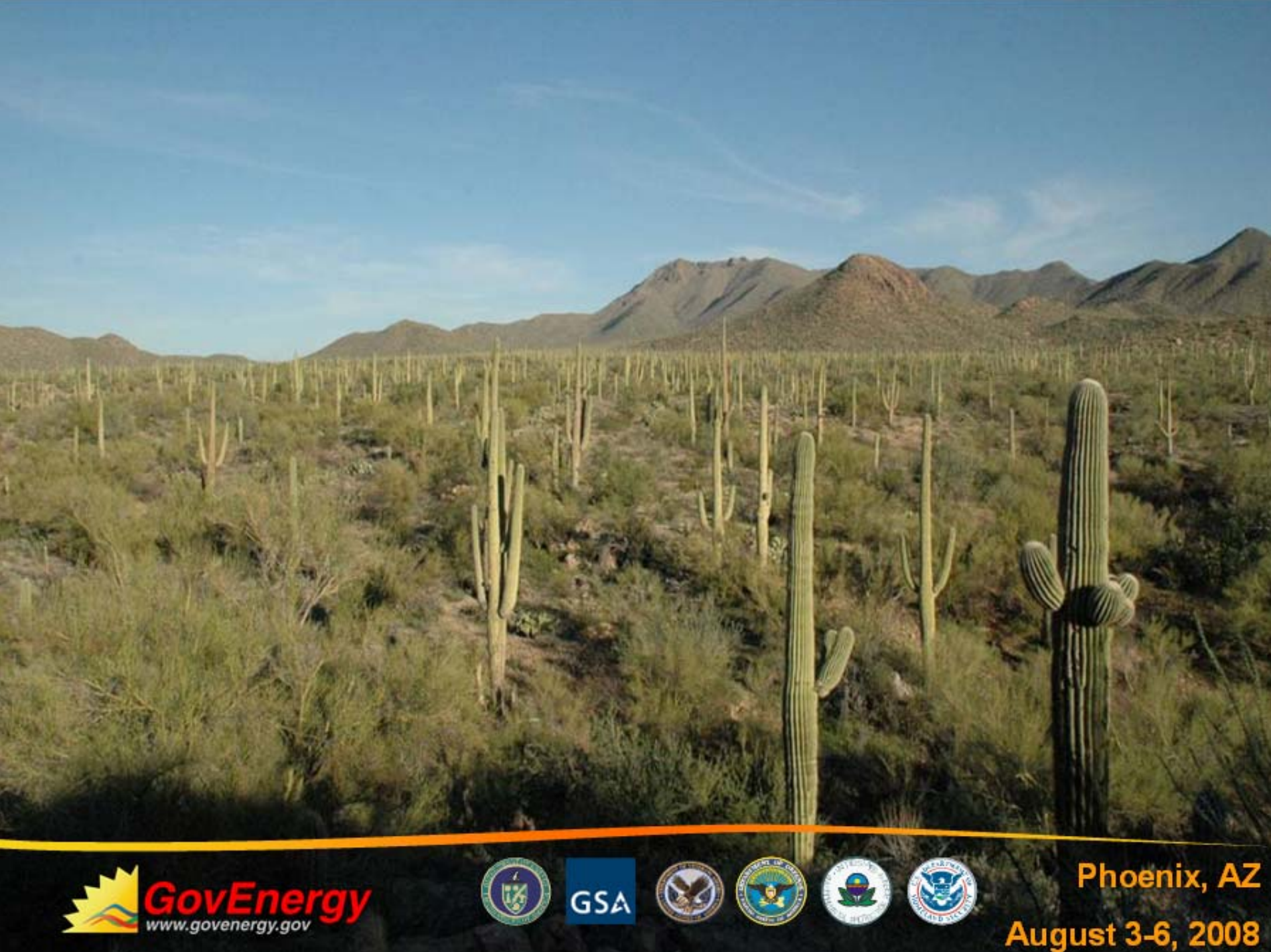

GovEnergy
www.govenergy.gov
GSA
Phoenix, AZ
August 3-6, 2008

Portfolio-Wide Metering Assessment Results at Navy Bureau of Medicine and Surgery

Terry Sharp, P.E.

Oak Ridge National Laboratory

GovEnergy

www.govenergy.gov

Purpose

- Build upon GovEnergy 2007 “Electric Metering for EPACT: How Many, Where, When, and Where Am I”
- Share portfolio-wide metering assessment methodology
- Show impacts of some key assumptions on metering assessment
- Share results at three prominent BUMED sites

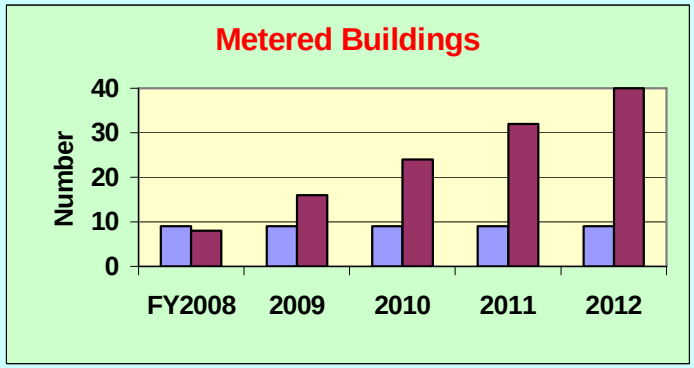
BUMED Building Portfolio

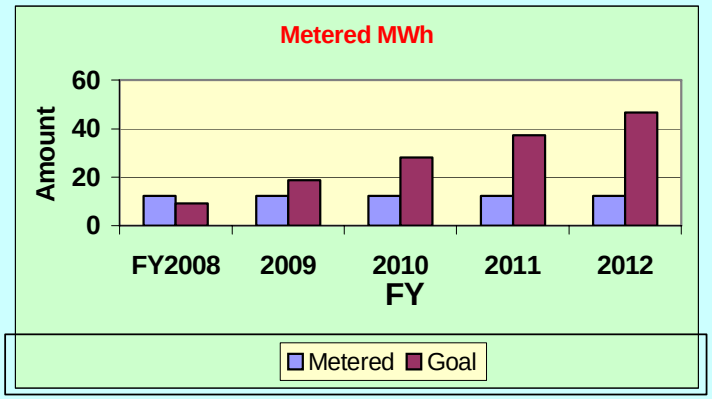
Building Type	Number of Buildings		Floor Area	
	Total	Percent of total	Total (ksf)	Percent of total
Hospital	19	4	6,952	33
Clinic	144	27	4,625	22
Admin Office	66	12	2,657	13
Quarters	71	13	2,272	11
Other Support	116	22	1,907	9
Instruction	43	8	1,711	8
Laboratory	73	14	761	4
Total	532	100	20,885	100
1) Numbers are approximate				
2) Type shading indicates electric intensity: red (high), green (low)				

Used MeterIQ Assessment Tool

Meter Prioritization and Assessment Tool

GOALS		
	Building Metering Achieved	23%
	Electricity Metering Achieved	26%





Calculate Average Electric Cost		
Enter Annual Electric Bill ($)	Enter Annual Electric Use (kWh)	Average Electric Cost ($/kWh)
52500	657000	0.080
or		
Enter Average Electric Cost ($/kWh)		0.080

Enter Savings From Metering	
Assumed Savings from Metering (%)	2

Average Electric Meter Cost ($)	6000

RESULTS			
No. Buildings		Electricity (MWh)	
Total	49	Total	49048
Target	40	Target	46703
Metered	9	Metered	12365
Metered %	23%	Metered	26%

Oak Ridge National Laboratory, Rev. 072507

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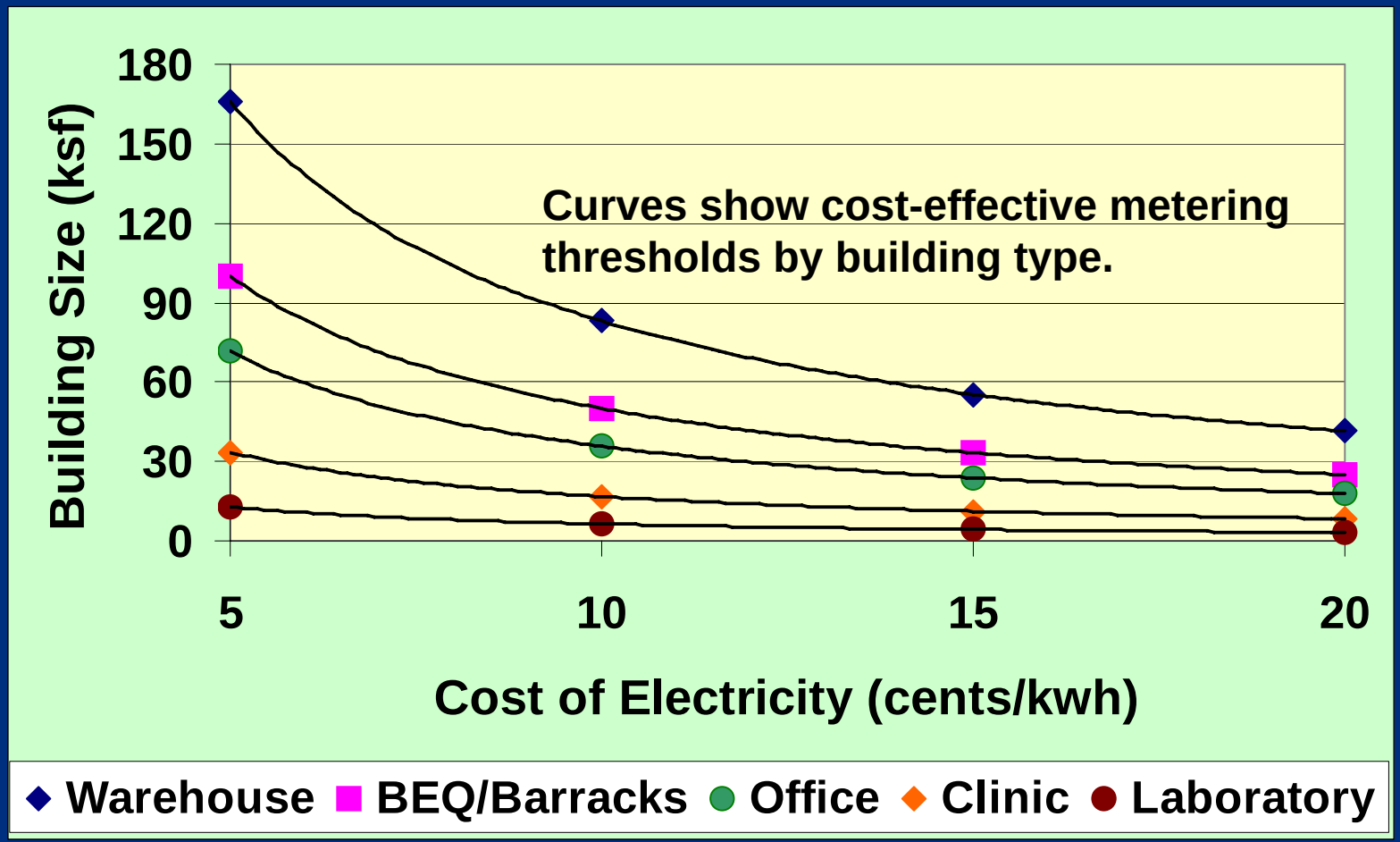
Tool Input and Calculations

Obs	Building		Building Floor Area	Metered	Target	Annual Total Electrical Use	Estimated Annual Electric Cost	Annual Electric Cost Savings	Simple Payback from Metering
	ID	Type	(sq-ft)			(kWh)	($/yr)	($/yr)	
1	182	Office	112381	y	1	3820954	305676	6114	1
2	156	Office	106460	y	1	3619640	289571	5791	1
3	167	Warehouse	206426	y	1	3509242	280739	5615	1
4	132	Warehouse	168285	n	1	2860845	228868	4577	1
5	148	Barracks	97781	n	1	2346744	187740	3755	2
6	147	Dining	44091	n	1	2028186	162255	3245	2
7	114	Barracks	84249	n	1	2021976	161758	3235	2
8	123	Office	51886	n	1	1764124	141130	2823	2
9	139	Office	25550	n	1	868700	69496	1390	4
10	108	Storage	51774	n	1	621288	49703	994	6
11	100	Storage	29581	n	0	354972	28398	568	11

20 Building Types Evaluated Inside MeterIQ: Why?

BUMED Building Type	
Clinic	Office
Data process center	Office, medical
BEQ/Barracks	Other
Exchange	Recreation center
Fire station	Rehabilitation center
Hospital	Religious
Lab/medical support	School/child dev center
Library	Training
Maintenance	Warehouse
Mess hall	Storage

Because Both Building Type and Electricity Costs Dramatically Impact Metering Cost-Effectiveness



Procedure (Preparation)

- Acquire asset list (n=1345).
- Drop assets less than 5000 sqft (n=427).
- QC assets: remove non-buildings, duplicates, etc. (n=333).
- Final portfolio file: 333 buildings
- Copy/paste into MeterIQ

Procedure (MeterIQ Analysis)

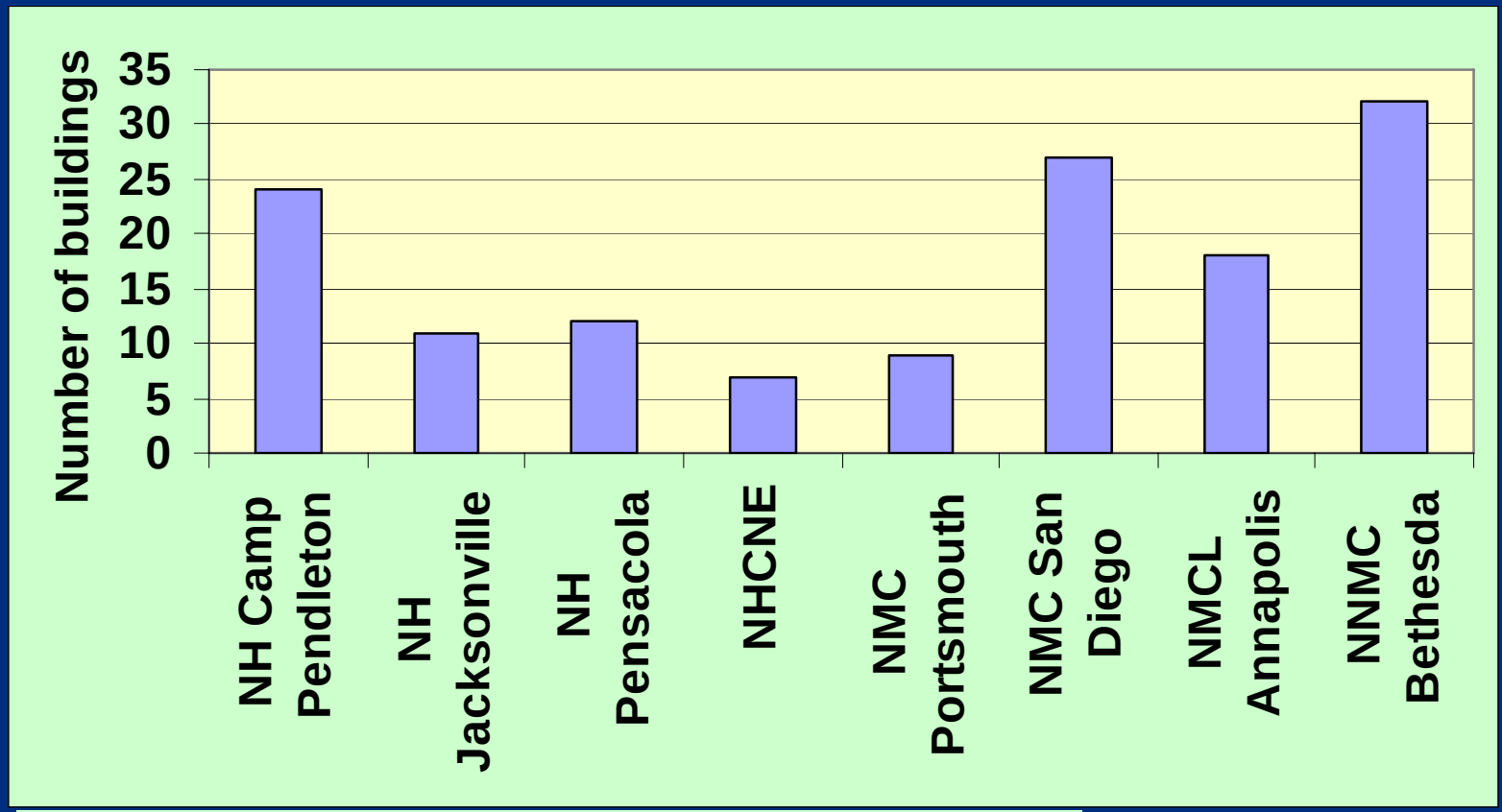
- Specify meter cost, expected savings (%), meters per building
- Specify type of each building
- Specify electricity cost for each site or building!!!
- Tool automatically estimates annual electric bills, cost savings, and meter simple paybacks
- Push-button sorts by simple payback (prioritize), drops cost-ineffective installs, provides final list where meters go across entire portfolio
- Very easy and fast reruns if things change!!!!

Results: Electricity costs dramatically impacted percents to be installed

Site	Number of buildings		Electric cost (cents/ kWh)	Percent installed in buildings > 12.5 ksf
	With size > 12.5ksf	With cost-effective metering		
NH Camp Pendleton	18	18	21.5	100%
NMC San Diego	24	22	21.5	92%
NH Jacksonville	14	12	7.9	86%
NNMC Bethesda	41	29	9.4	71%
NH Beaufort	6	4	5.1	67%
NH Guam	3	2	15.4	67%
BUMED HQ	7	4	9.4	57%
NH Bremerton	9	5	5	56%
NMC Portsmouth	25	10	5	40%
NH Camp Lejeune	10	2	5.8	20%

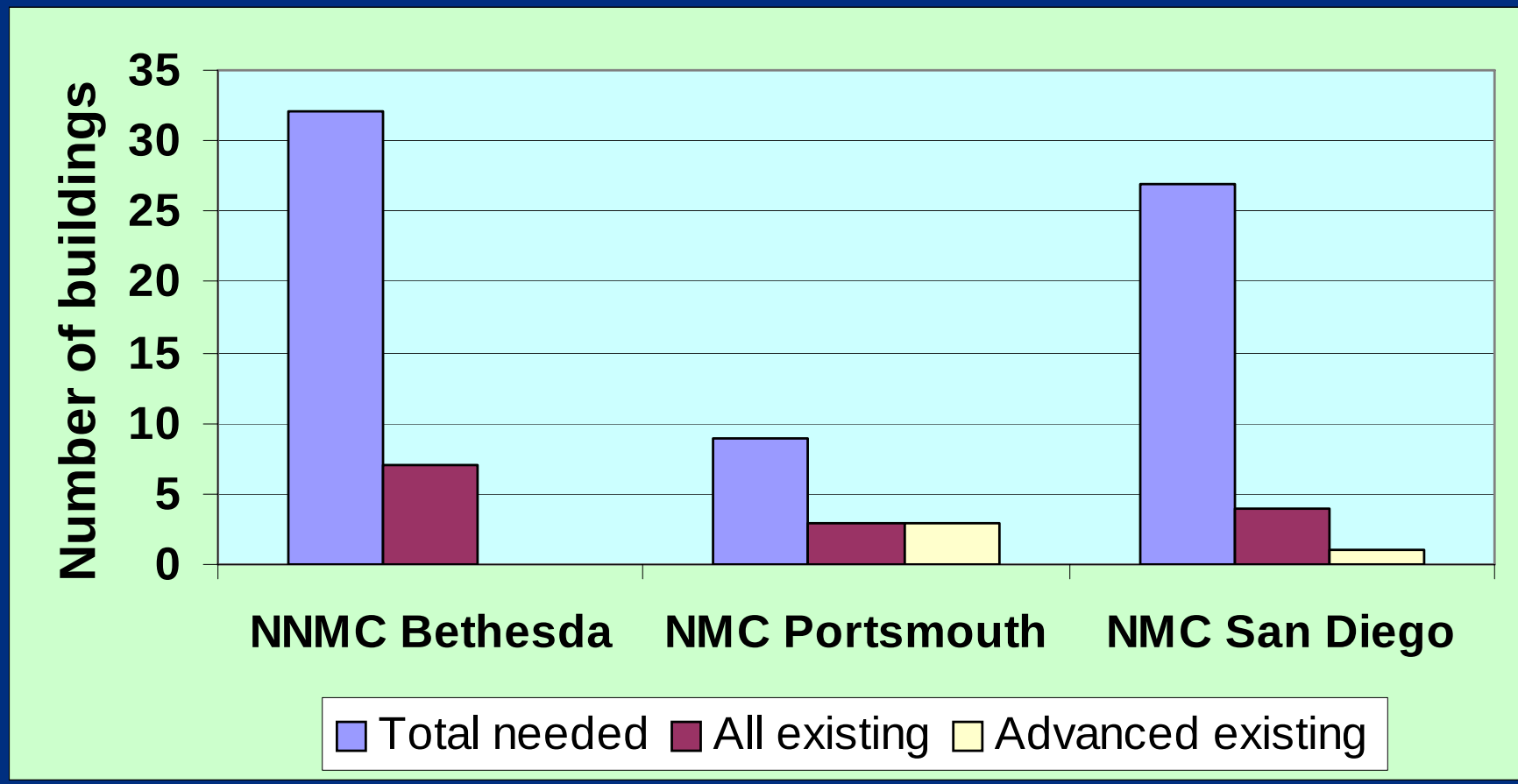
Based on $5k/meter, 2% savings, cost/kWh shown.
Cost-effective is simply payback <= 10.

Results: Where New Meters Go by BUMED Activity



Total BUMED buildings where metering is cost effective: 180

Results: Total Meters Needed, Total Existing, and Advanced Existing at 3 Large Activities



Results: MeterIQ Output for NMC Portsmouth

Asset #	Asset Size (sqft)	Cents/kWh	Std meter?	Adv meter?	Building Use	Estimated Annual Total Electric Use (kWh)	Annual Electric Cost ($/yr)	Annual Electric Cost Savings ($/yr)	Simple pay-back
1	139493	5			Hospital	3347832	167392	3348	1.5
2	1016000	5		y	Hospital	24384000	1219200	24384	0.2
3	497500	5		y	Hospital	11940000	597000	11940	0.4
256	17988	5		y	Exchange	755496	37775	755	6.6
285	75847	5			Clinic	1137705	56885	1138	4.4
3505	86077	5			Clinic	1291155	64558	1291	3.9
CD2	65800	5			Clinic	987000	49350	987	5.1
CD3	67400	5			Clinic	1011000	50550	1011	4.9
J50	47514	5			Rehabilita	712710	35636	713	7.0

For More Information

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- 865-574-3559
- MeterIQ template available at:
  - http://eber.ed.ornl.gov/benchmark/tools.htm

Don’t forget to fill out and drop off your session evaluations!