ENERGY STAR for Hospitals 2011 Update: Progression or Regression?

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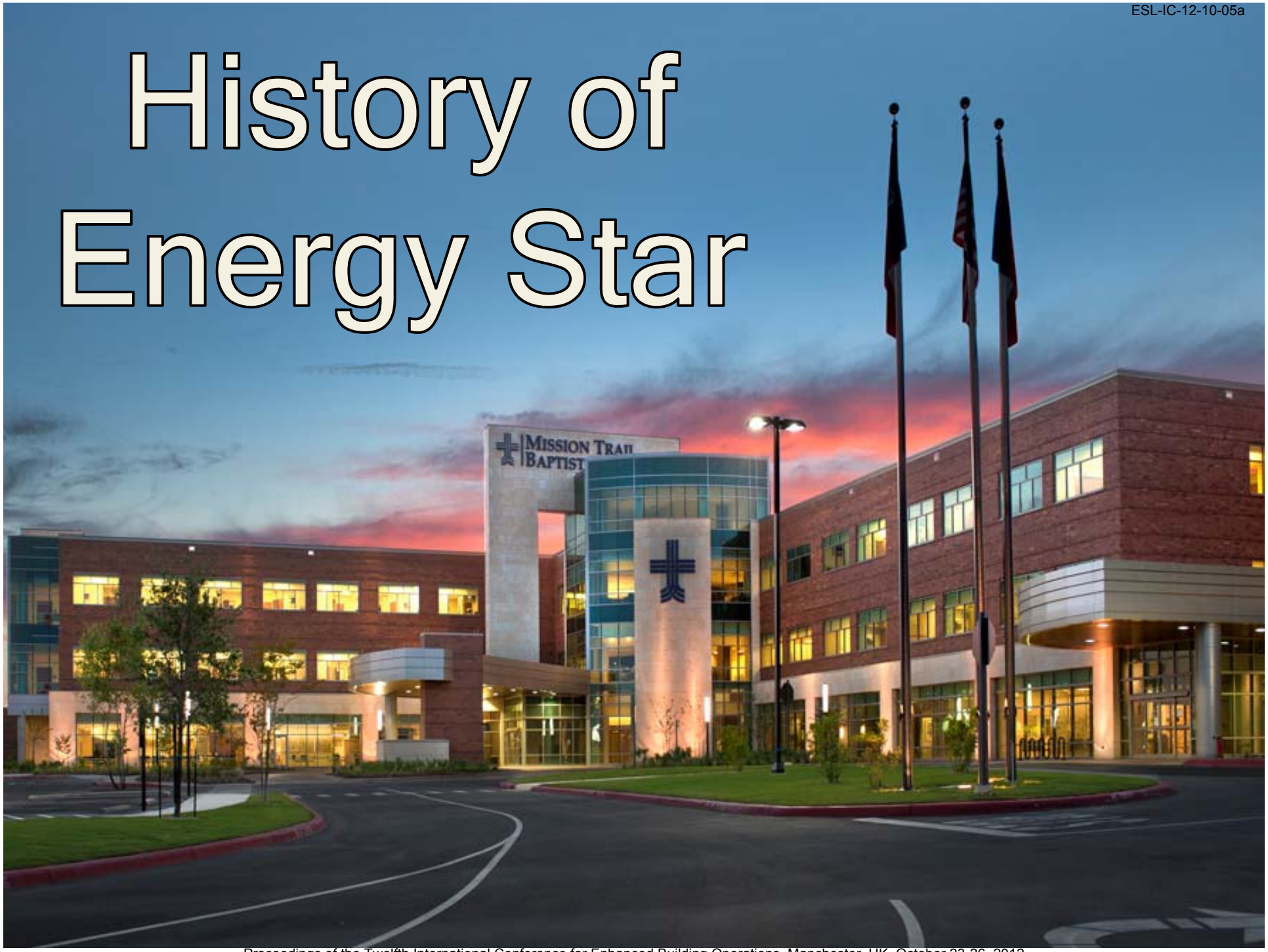
History of Energy Star

Energy Star for Hospitals

Critique & Conclusions

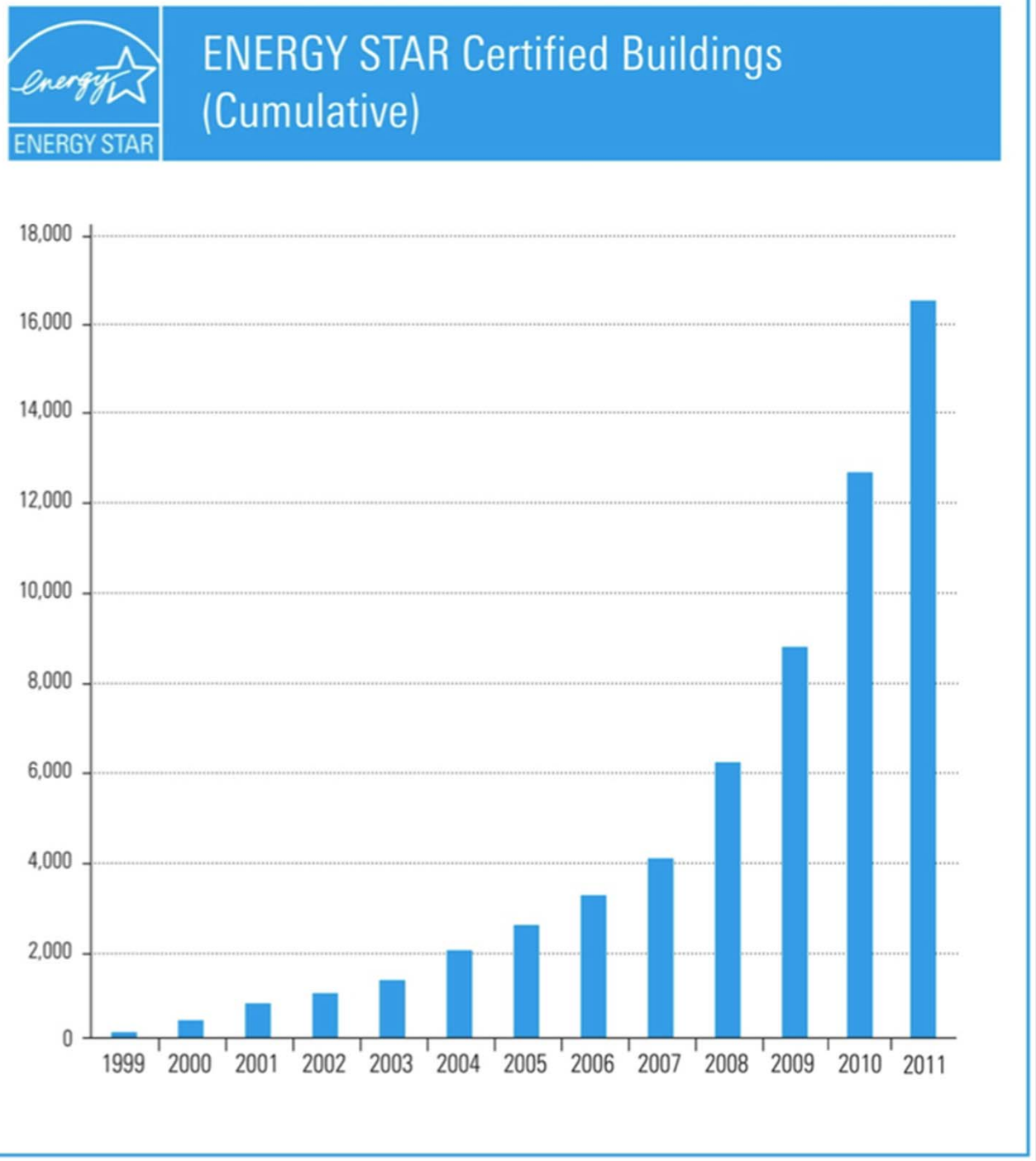
Outline

History of Energy Star



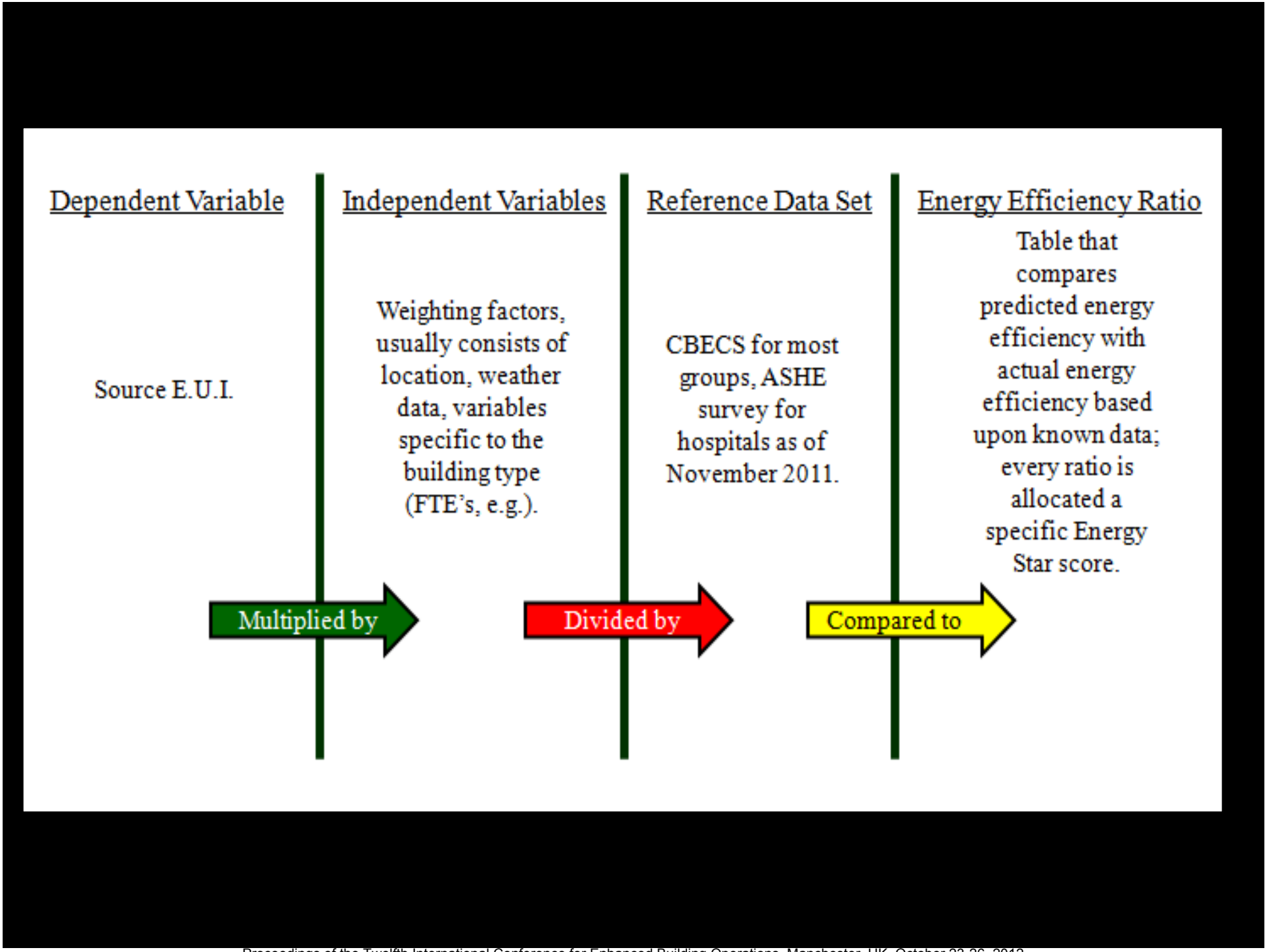
- Benchmarks are important
- Energy efficiency void
- Energy Star performance rating began in 1999 for most buildings

History


ENERGY STAR
ENERGY STAR Certified Buildings
(Cumulative)
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
0
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011

- 1-100 score
- 75 is required to earn Energy Star certification
- 15 building types eligible:
  - Hospitals
  - Office Buildings
  - K-12 Schools
  - Hotels
  - Datacenters, and more

History


Dependent Variable
Source E.U.I.
Multiplied by
Independent Variables
Weighting factors, usually consists of location, weather data, variables specific to the building type (FTE's, e.g.).
Divided by
Reference Data Set
CBECS for most groups, ASHE survey for hospitals as of November 2011.
Compared to
Energy Efficiency Ratio
Table that compares predicted energy efficiency with actual energy efficiency based upon known data; every ratio is allocated a specific Energy Star score.

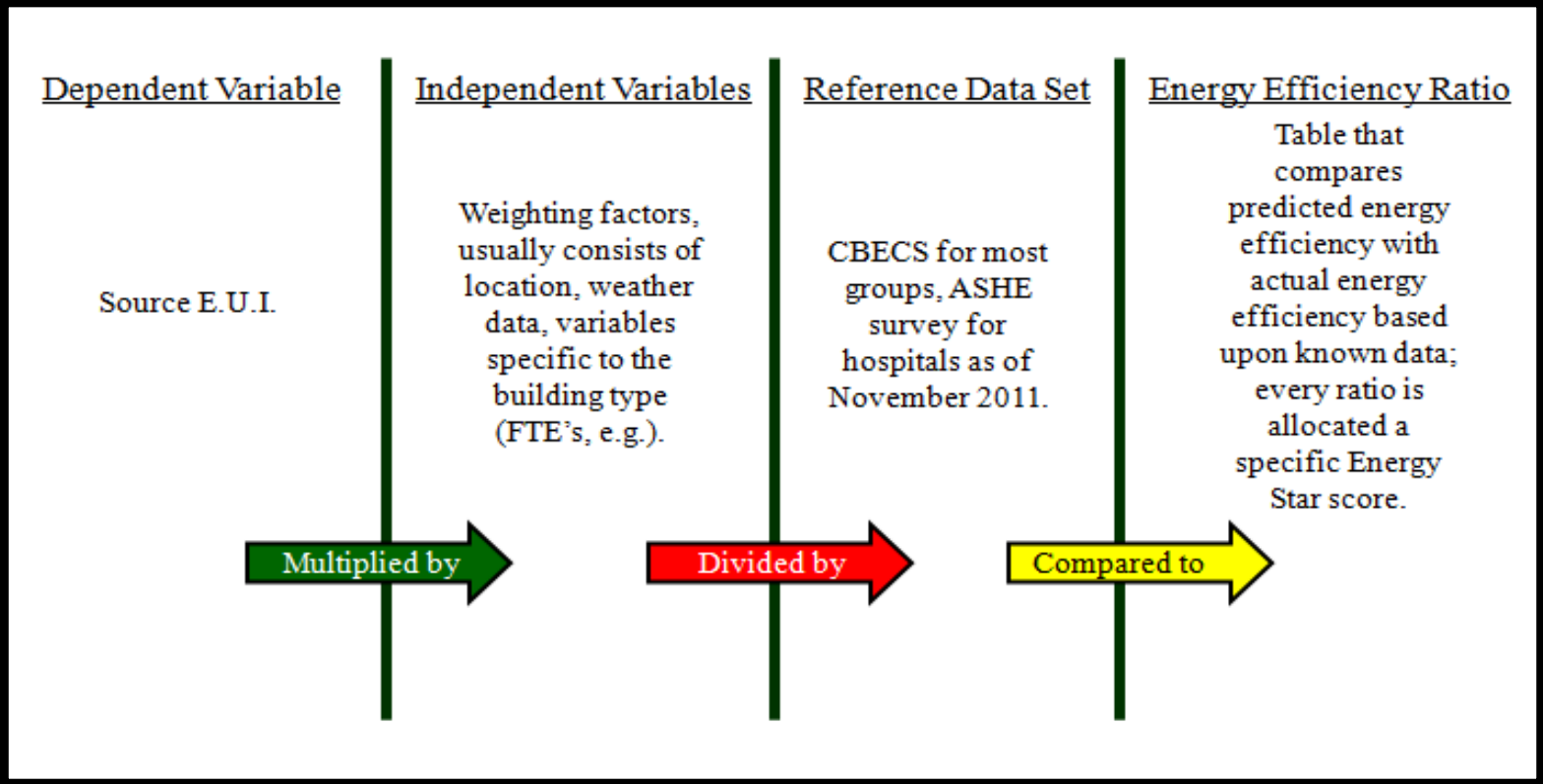
Energy Star for Hospitals

- Energy Star for Hospitals scoring system released in 2001

- As of September of 2011, the EPA stated that approximately **3600 of the 5200** hospitals in the U.S. (app. 69%) have been benchmarked in Portfolio Manager

- Latest update went live on November 7, 2011

Energy Star for Hospitals



	2001	2011
Dependent Variable	Natural Log of Source E.U.I.	Source E.U.I.
Independent Variables	8	4
Reference Data	1995 EPRI Survey	2010 ASHE Survey
Qualifications	3	4

Independent Variables

2001	2011
Natural log of gross square footage	Number of FTE workers per 1000 square foot
Acute Care/Children's Hospital	Number of staffed beds per 1000 square foot
Tertiary Care	Number of MRI machines per 1000 square foot
Natural log of number of beds	Cooling degree days
Natural log of the maximum number of floors	
Above ground parking facility	
Heating degree days	
Cooling degree days	

2011 Reference Data Set

Characteristic	ASHE Survey Sample
Sample Size	191
Average Source E.U.I.	485
Average Square Footage	448,061
Average Staffed Beds	197
Average MRI Machines	1
Average FTE Workers	1167

Critique & Conclusions

Definition of **benchmark**

noun

1 a standard or point of reference against which things may be compared:
*the pay settlement will set a **benchmark for** other employers and workers*

- a problem designed to evaluate the performance of a computer system:
Xstones is a graphics benchmark

2 a surveyor's mark cut in a wall, pillar, or building and used as a reference point in measuring altitudes.

verb

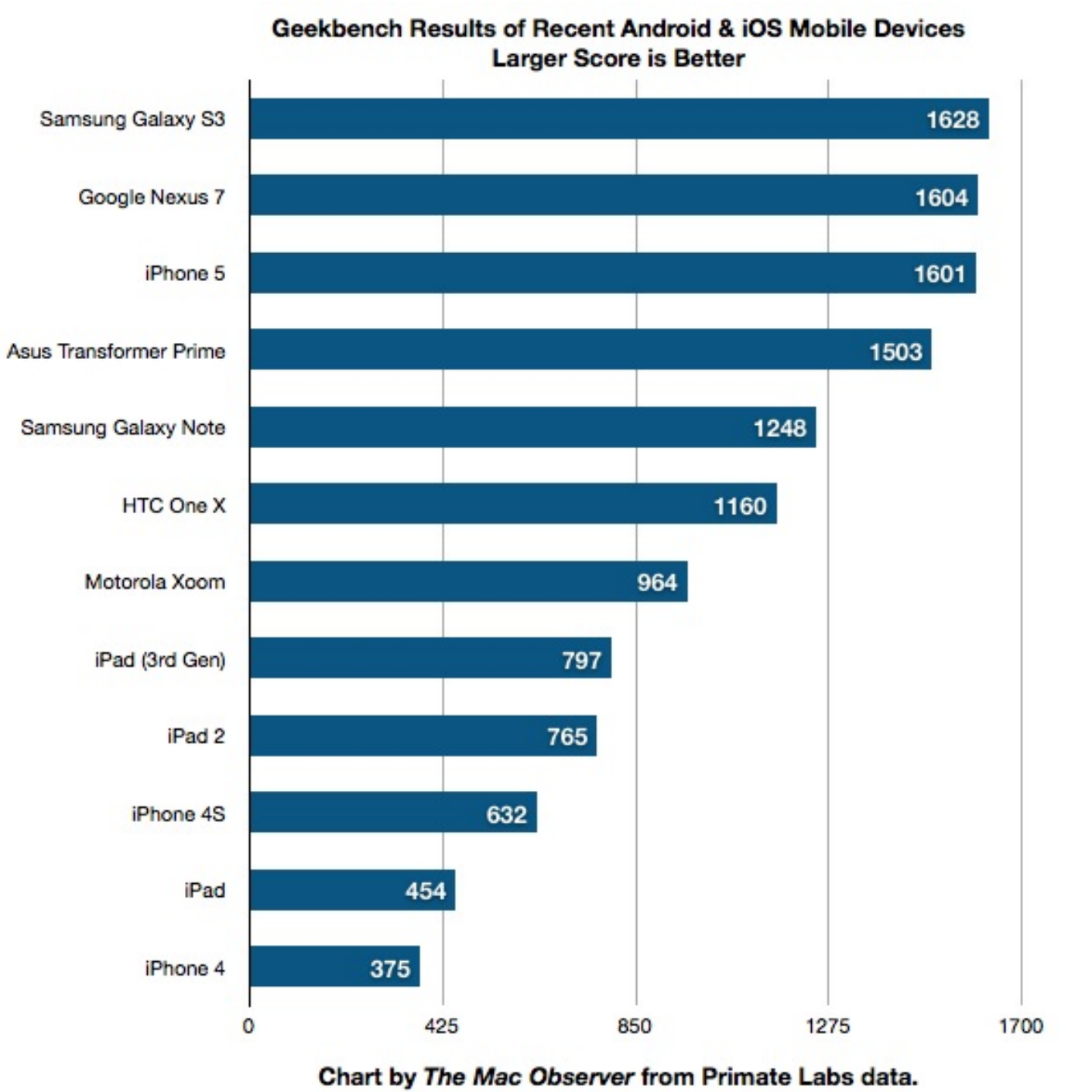
[*with object*]

evaluate (something) by comparison with a standard:
*we are **benchmarking** our performance **against** external criteria*

- [*no object, with adverbial*] give particular results during a benchmark test:
the device should benchmark at between 100 and 150 MHz

Quality Benchmark

- Repeatable
- Results are unambiguous
- Level playing field


Geekbench Results of Recent Android & iOS Mobile Devices
Larger Score is Better
Samsung Galaxy S3
1628
Google Nexus 7
1604
iPhone 5
1601
Asus Transformer Prime
1503
Samsung Galaxy Note
1248
HTC One X
1160
Motorola Xoom
964
iPad (3rd Gen)
797
iPad 2
765
iPhone 4S
632
iPad
454
iPhone 4
375
0
425
850
1275
1700
Chart by The Mac Observer from Primate Labs data.

BARCLAYS PREMIER LEAGUE

POS		LP	CLUB	P	W	D	L	GF	GA	GD	PTS
1	–	(1)	Chelsea	8	7	1	0	19	6	13	22
2	–	(2)	Manchester United	8	6	0	2	21	11	10	18
3	–	(3)	Manchester City	8	5	3	0	17	9	8	18
4	–	(4)	Everton	8	4	3	1	15	9	6	15
5	–	(5)	Tottenham Hotspur	8	4	2	2	15	12	3	14
6	–	(6)	West Bromwich Albion	8	4	2	2	12	9	3	14
7	–	(7)	West Ham United	8	4	2	2	12	9	3	14
8	–	(8)	Fulham	8	4	1	3	16	11	5	13
9	–	(9)	Arsenal	8	3	3	2	13	6	7	12
10	–	(10)	Swansea City	8	3	2	3	14	12	2	11
11	▲	(12)	Newcastle United	8	2	4	2	9	12	-3	10
12	▼	(11)	Liverpool	8	2	3	3	10	12	-2	9

John Player
Member #: 102034
Great Lakes Golf Club
Club #: 9191
29.2
USGA HDCP INDEX
Games Plyed YTD: 26
Effective Date: 03/29/2008
Slope Index: 79.8
Home Course Handicap: 29
SCORE HISTORY
105*H 102*H 101*H 104*H 100*H
105*H 102*H 101*H 104*H 100*H
105*H 102*H 101*H 104*H 100*H
105*H 102*H 101*H 104*H 100*H
HANDICAP HISTORY

11
Par 4
377
329
300
295
DEERWOOD

Quality Benchmark

- Repeatable
- Results are unambiguous
- Level playing field

1. Dataset Quality

- Unlike EPRI, ASHE survey has not been released to the general population
- EPRI had 493 records, ASHE has 191 (3.6%)
- Unknown post-processing

2. Source E.U.I.

- Leniency towards electricity
- Electricity ECMs boost score more than natural gas
- Hospital blend/rate
- Selection of independent variables…

Critique & Conclusions

2011
Number of FTE workers per 1000 square foot
Number of staffed beds per 1000 square foot
Number of MRI machines per 1000 square foot
Cooling degree days

3. Independent variables

- High Density Areas
  - Laundry (washers, presses, dryers)
  - Kitchens
  - Operating Rooms/Surgery
  - Laboratory space
  - SPD
- Low Density Areas
  - Connected medical office space

4. Classification of Spaces

HOSPITAL

The term "Hospital" accounts for all clinical and non-clinical spaces located within a campus or building, including medical and administrative offices, dormitory, hotel, retail spaces, and skilled nursing. The graphics below depict the two ways to properly categorize space to benchmark a hospital campus or free-standing hospital.

Hospital campus (multiple buildings):

A hospital campus includes all related buildings that are connected by corridors or walkways, or which are in close proximity to one another. If medical office space is located on the campus, it should be included in the gross square footage for the campus.

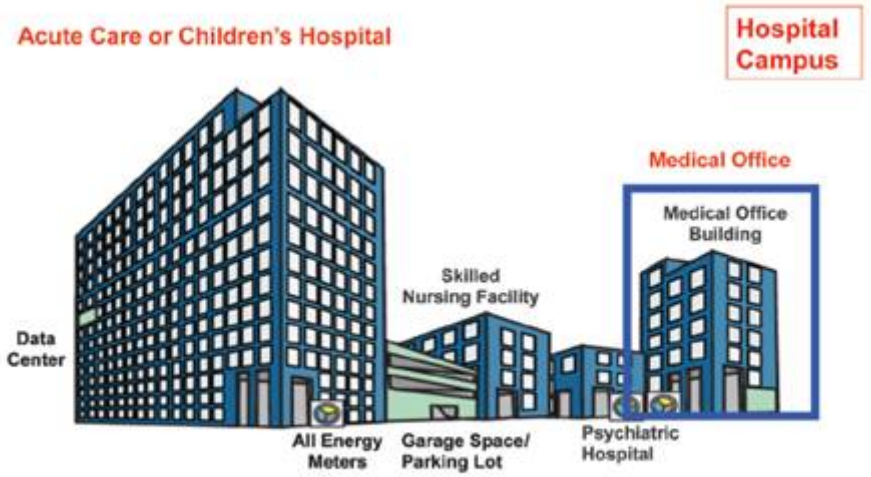


Illustration of Hospital Campus

Three other support buildings within a mile.

Conclusions

- Progression, but only slightly
- Hospitals are difficult to benchmark
- Energy star for hospitals is still a poor benchmark

Questions?