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"Flex Your Power" - Highlights of Global and U.S. DSM Programs

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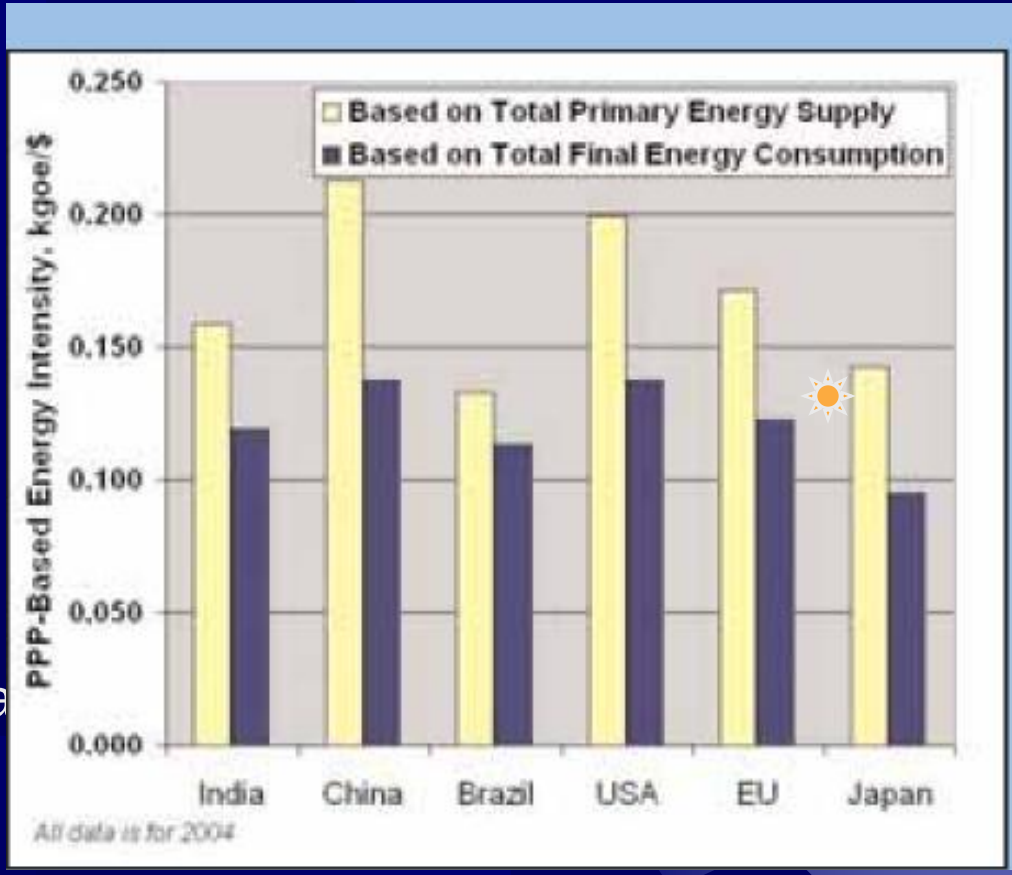
A Global Perspective

- IEA compiled and published a DSM practices database (October 2007)
- IEA shows that DSM can be successful in two key ways:
  - To relieve constraints on distribution and/or transmission networks at lower costs than building 'poles and wires', and
  - To achieve peak load reductions with various response times for network operational support.
- Estimated benefit of DSM in India
  - Industry 10-25%
  - Lighting 30-35%
  - Commercial Buildings 50%
  - Agriculture 40-45%



Source: IEA DSM Survey, 2007

ISRAEL: TPES/GDP (PPP) = 0.15

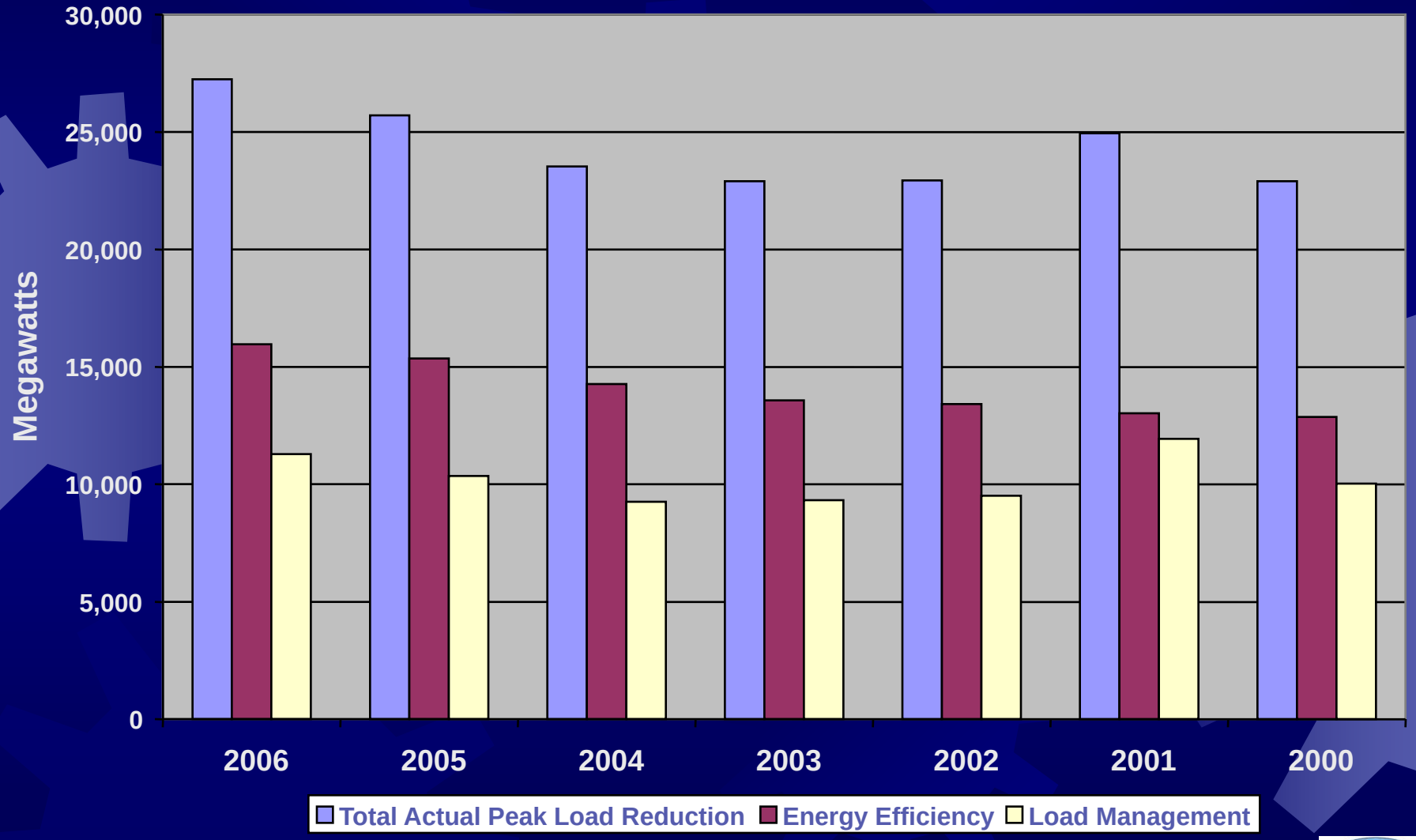
Features of Utility DSM in the U.S.

- **Energy-efficiency programs**
  - Reduce energy use, both during peak and off-peak periods,
  - No affect on the quality of services provided.
- **Peak load reduction programs**
  - Focus on reducing load during periods of peak power consumption
  - Includes interruptible load tariffs, time-of-use rates, direct load control, and other load management programs.
- **Load shape flexibility programs**
  - Modify prices, cycle equipment, or interrupt service,
  - Includes real-time pricing, interruptible load tariffs, and direct load control.
- **Load building programs**
  - Shift electricity consumption from peak to off-peak hours,
  - Includes valley filling programs that increase load during off-peak periods.

2006 U.S. DSM Highlights

- Total peak-load reductions of *27,240 MW* resulting from DSM programs
  - Increase of 6.0% compared to 2005,
  - DSM costs increased to $2.1 billion, a 6.7% increase from 2005.
- For the last 4 years, DSM costs and program benefits have tracked consistently
  - Nominal DSM expenditures have increased significantly since 2003, averaging 16.5% annual growth over the period,
  - Actual peak load reductions have improved by an annual average of 5.9%, and
  - Energy savings have risen to 8.3% on average since 2003.
- New pricing programs designed to deliver real-time signals to consumers may account for some of the recent cost increases and improved efficiency over the last several years.

U.S. DSM Trends for 2000 - 2006



Source: EIA 2007 Annual Power Report

DSM Program for Large Utilities:
Annual Effects by Sector, 2000-2006

	2006	2005	2004	2003	2002	2001	2000
Actual Peak Load Reductions (MW)							
Residential	10,730	9,432	8,870	9,431	9,137	9,619	9,446
Commercial	7,779	7,926	7,194	6,774	6,839	8,210	6,987
Industrial	8,692	8,343	7,454	6,594	6,500	6,553	6,141
Transportation	39	9	14	105	NA	NA	NA
Other	NA	NA	NA	NA	460	573	327
TOTAL	**27,240**	**25,710**	**23,532**	**22,904**	**22,936**	**24,955**	**22,901**
Energy Savings (Thousand MWh)							
Residential	21,437	19,255	17,763	13,469	15,438	16,027	16,287
Commercial	28,982	28,416	24,624	25,089	24,391	24,217	25,660
Industrial	13,348	12,178	12,273	11,156	11,339	10,487	9,160
Transportation	50	48	51	551	NA	NA	NA
Other	NA	NA	NA	NA	2,907	3,206	2,593
TOTAL	**63,817**	**59,897**	**54,710**	**50,265**	**54,075**	**53,936**	**53,701**

Source: EIA 2007 Annual Power Report

Estimated 2005 State DSM Expenditures

- Northeast (New York, New Jersey and New England States)
  - $500 million
- California
  - $400 million plus
- Texas
  - $80 million
- Northwest (Idaho, Oregon, Washington)
  - $85 million

Example Legislation & Regulations

- **New Mexico**: ***"Efficient Use of Energy" Act***
  - Increased spending on DSM for gas and electric utilities up to 1.5% of revenues
  - Spending growth from $2 million per year to ~$18 million per year, or about $750 million through 2020
- **Pennsylvania: *Bankable Credits***
  - Development of a system generating "alternative energy credits" from DSM programs (can replace use of alternative energy)
- **Connecticut: *Conservation and Load Management***
  - Budget of $86.45 million (public goods charge: $cents 0.3/kWh)
  - Performance incentives: pre-tax rewards of 2-8% of C&LM budget for savings achievements of 70-13 0% of targets;
  - No net lost revenue recovery

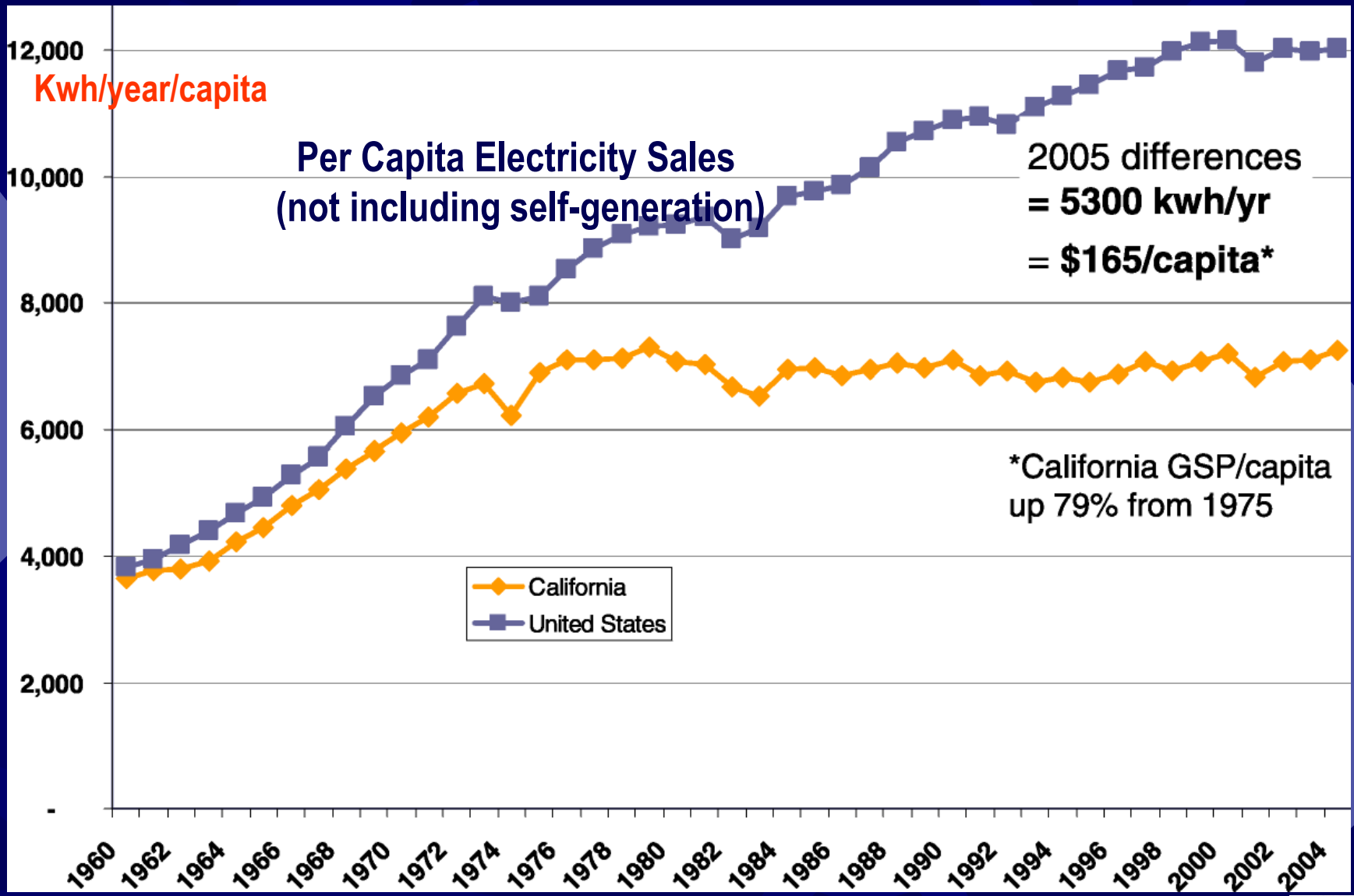
Legislation & Regulations *(continued)*

- **Colorado: *Coal plant construction settlement***
  - By January 1, 2014 the Company will achieve a cumulative level of 320 MW of total demand reduction and 800 GWh of annual energy savings;
  - Spending up to $196 million total.
- **Massachusetts: *Energy Efficiency Program***
  - Budget $155-120 million ($cent 0.25/kWh)
  - Performance incentives: After-tax rewards of 5-5.5% of budget for savings achievements of 75-110% of targets
  - No net lost revenue recovery

California's DSM Policy Framework

- Cost-effective energy efficiency and demand response must be pursued before supply-side options
- After energy efficiency and demand response, renewable resources are California's first supply-side options
  - California Solar Initiative
  - Self Generations Incentive Program
- Strong demand response and advanced metering infrastructure programs

Outcome of California's Energy Policies



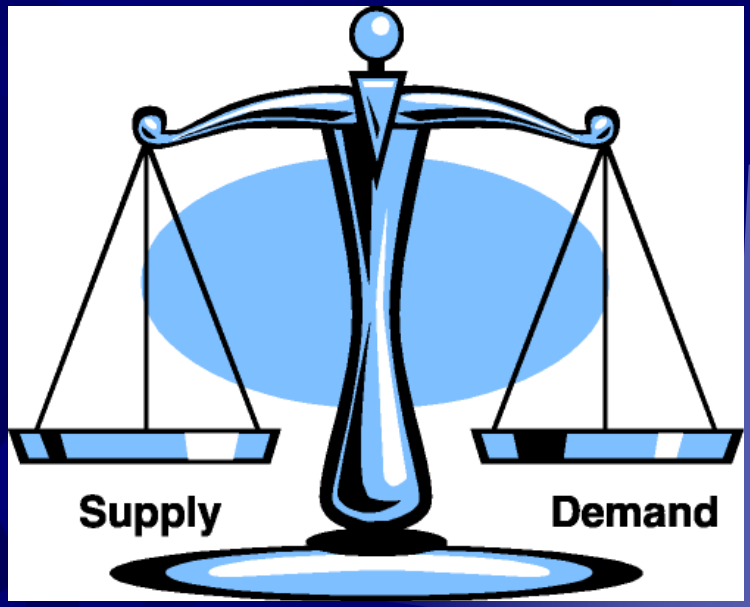
Source: California Energy Commission

California's Incentive/Penalty Mechanism

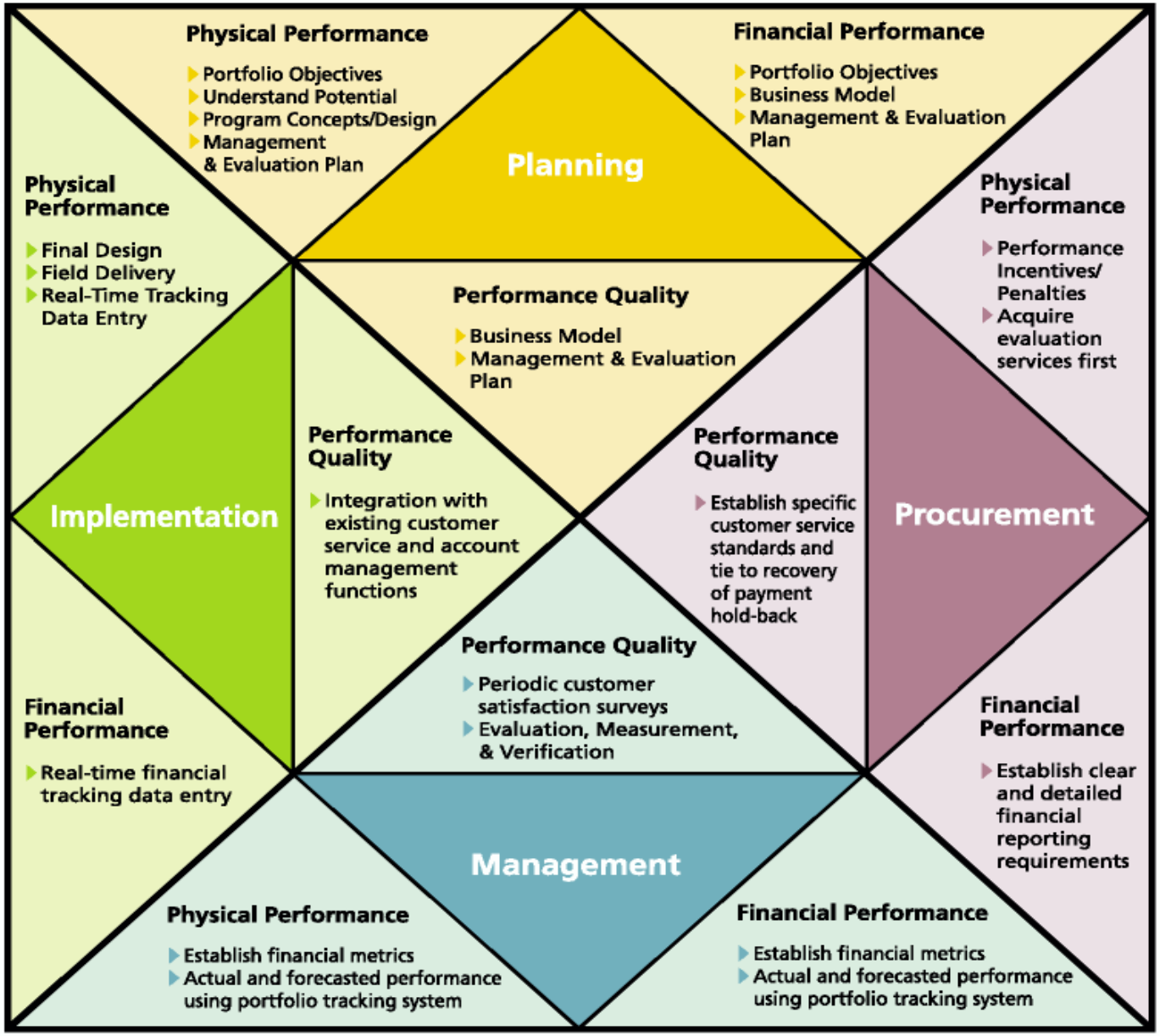
The CPUC is implementing a set of financial rewards balanced by penalties for poor performance, tied to prescribed kW and kWh savings goals.

Lessons Learned: Key DSM Considerations

- **Physical performance**
  - Delivery of an energy efficiency resource of specified magnitude within a specified time frame
- **Financial performance**
  - Delivery of the resource at or below projected cost within a system of well-defined financial controls
- **Performance quality**
  - Using the programs to maximize customer satisfaction while meeting or exceeding regulatory requirements



The DSM Business Process Model



Source: ICF 2005

Summary

- Best practices from around the world have demonstrated the role of:
  - Load Management Programs to reduce MW installed;
  - Energy Efficiency Programs to reduce MWH supplied
- Robust DSM programs rely on
  - Sound considerations for both physical and financial performance;
  - Advanced metering and tracking coupled with appropriate instrumentation.
- DSM programs could be used in operating permits as offsets,
  - For renewable energy credits
  - For emissions from coal fired power plants

For further Information:
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