
California Lighting Efficiency Technology Report

(1996)

Priorities for Action
in
Lighting Energy Efficiency



Lighting Efficiency Technology Report

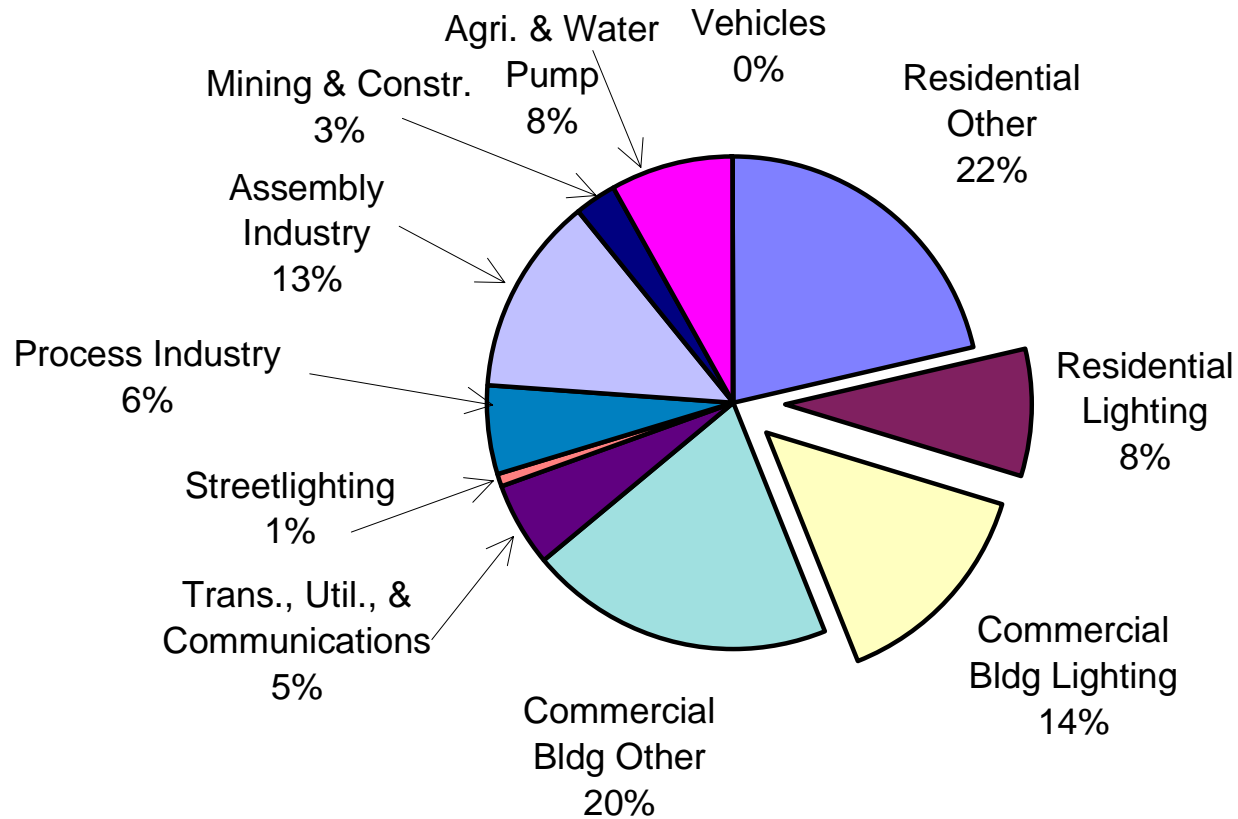
- Senate Bill 639 1993
- Formation of LEAGue 1995
 - Lighting Efficiency Advisory Group
- CEC Contractor 1996
 - Heschong Mahone Group
 - Eley Associates
 - Benya Lighting Design
 - Business Economic Applications & Research
- Public Review and Comment 1997
- CEC Recommendations to Legislature

Project Process

- Residential Baseline and Scenarios
- Commercial Baseline and Scenarios
- Recommendations
 - 5 basic recommendations

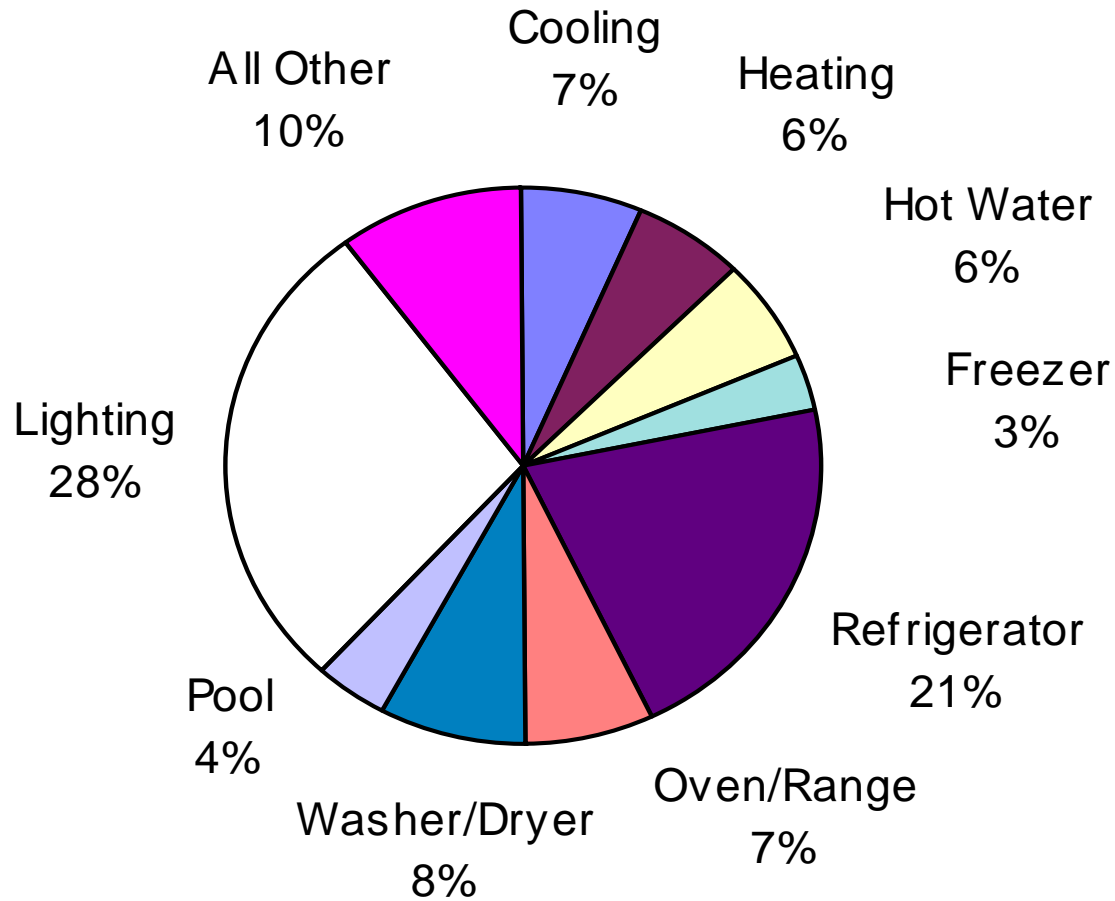
Statewide Electricity Use

California Electricity Use



Source— Forecasting Department of CEC, September 1996

Residential Energy Use



Residential Lighting Data

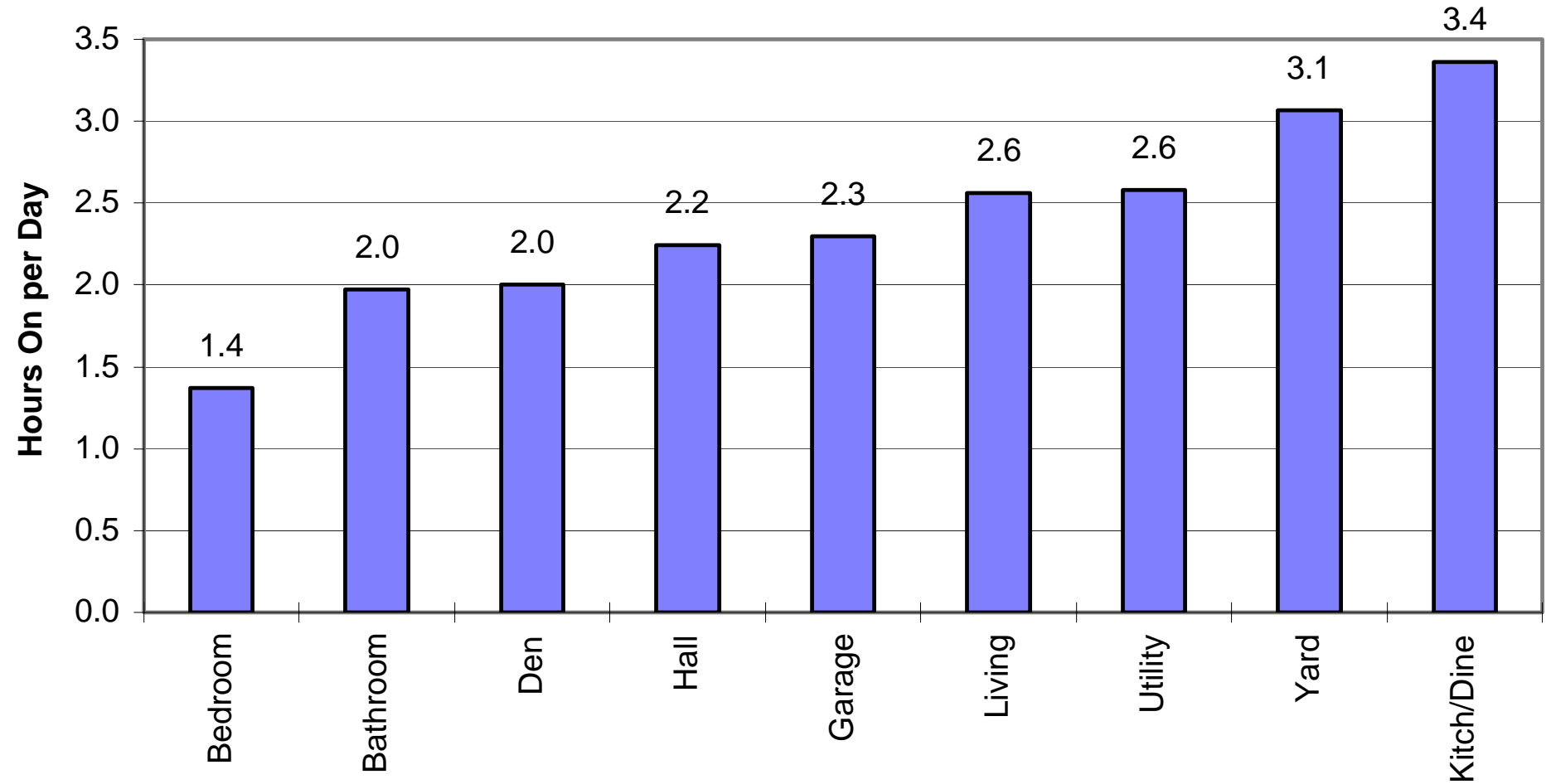
- SCE Lighting Inventory
 - 683 SF & MF homes, 16,275 fixtures
 - Every socket & bulb, by fixture, room, control
- SCE Time of Use Metering
 - 359 SF & MF homes, one socket per house
 - Time of use patterns, diversity profiles
- TPU (Northwest) Metered Lighting
 - 161 SF homes, 2641 (80%) fixtures monitored
 - Total hours of use

Lighting per Dwelling Unit

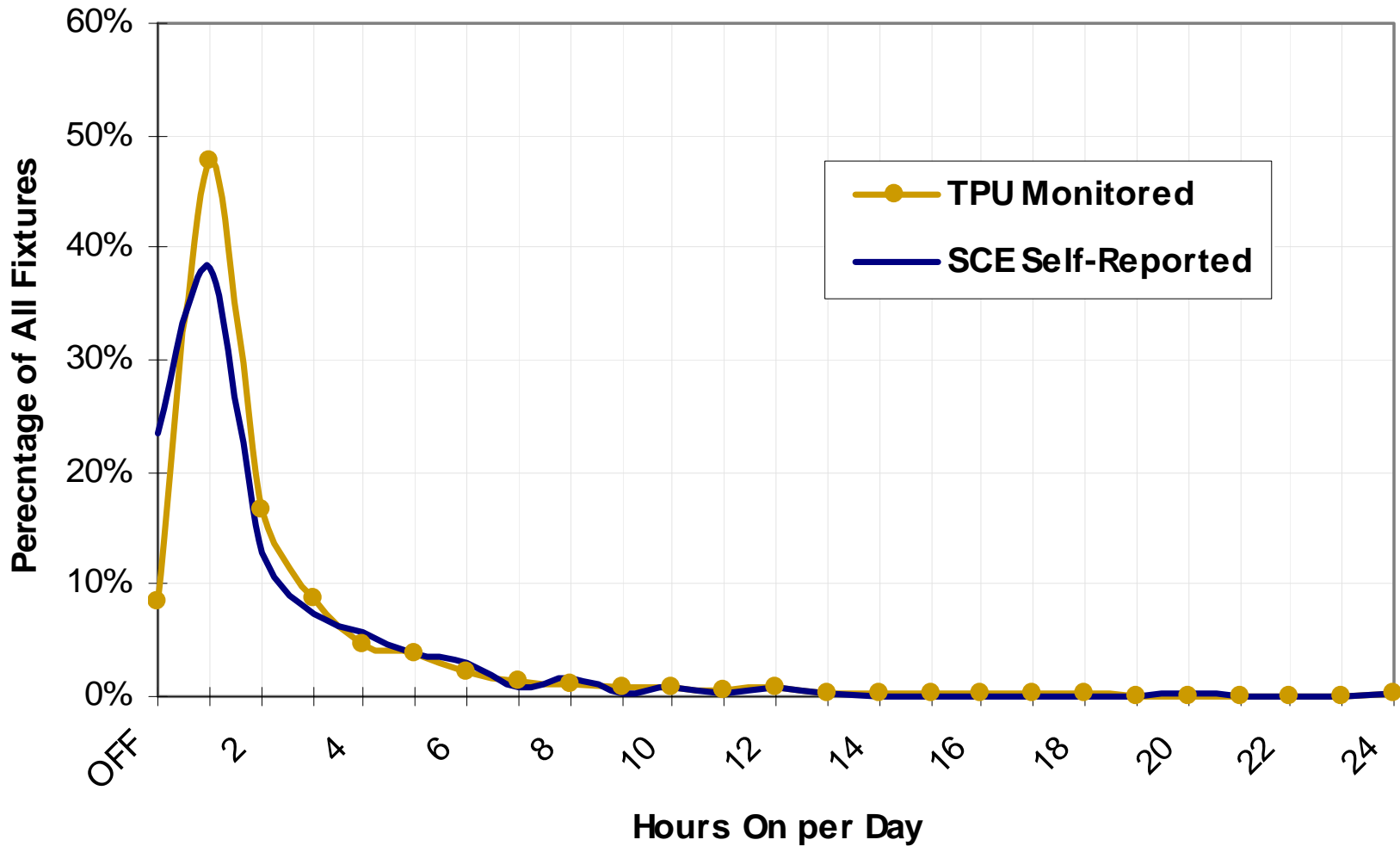
	Fixtures /House hold	Sockets /Fixture	Watts/ Socket	Watts/ House hold	kWh/yr per House hold	Average Hours/ Day
SF	26.2	1.64	57.66	2475	2076	2.30
MF	13.1	1.51	60.33	1195	1084	2.49
Total	21.3	1.61	58.24	1995	1704	2.34

Statewide Residential Lighting Characteristics

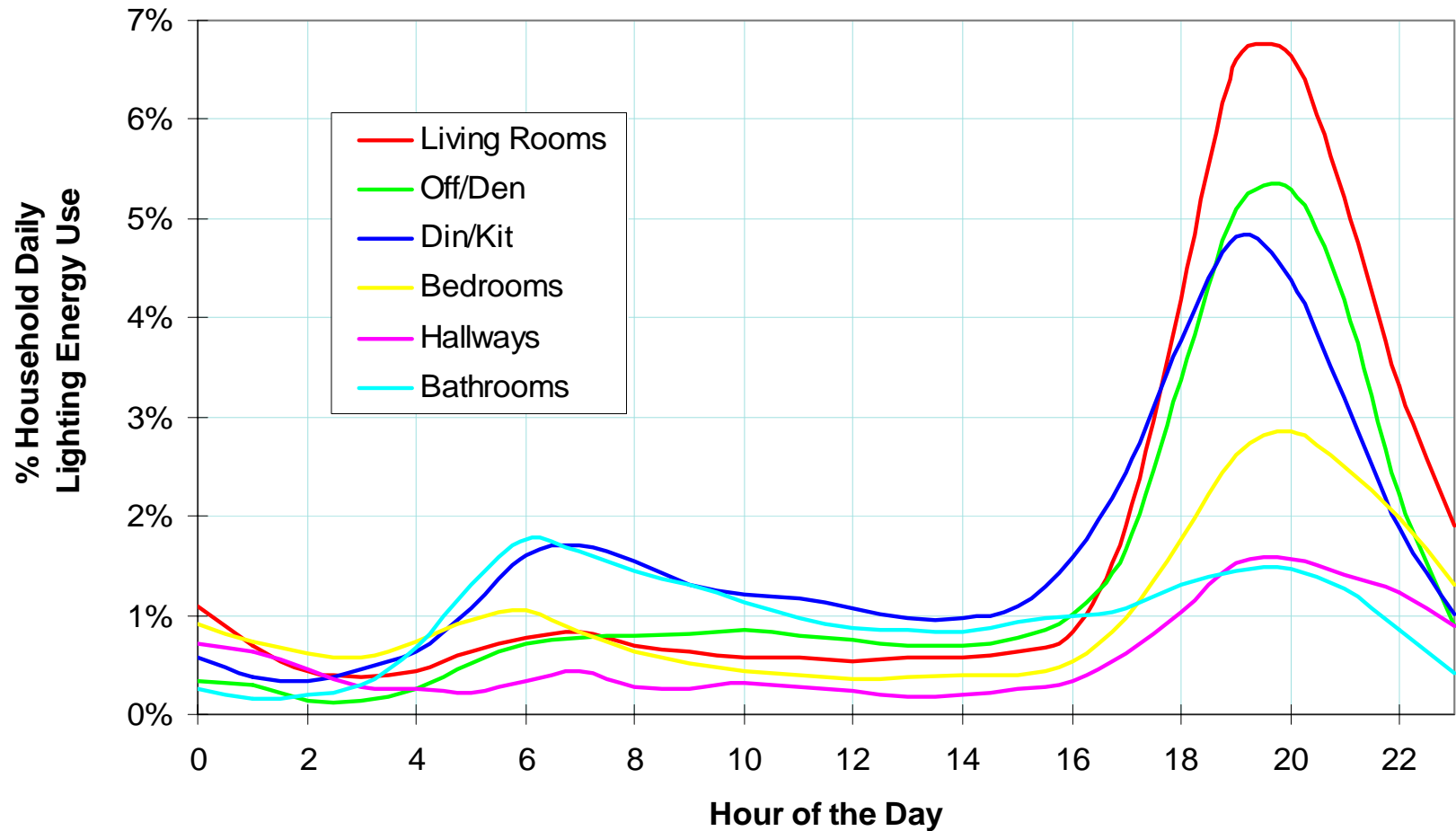
Average Hours of Operation



Self Reported vs. Monitored Hours

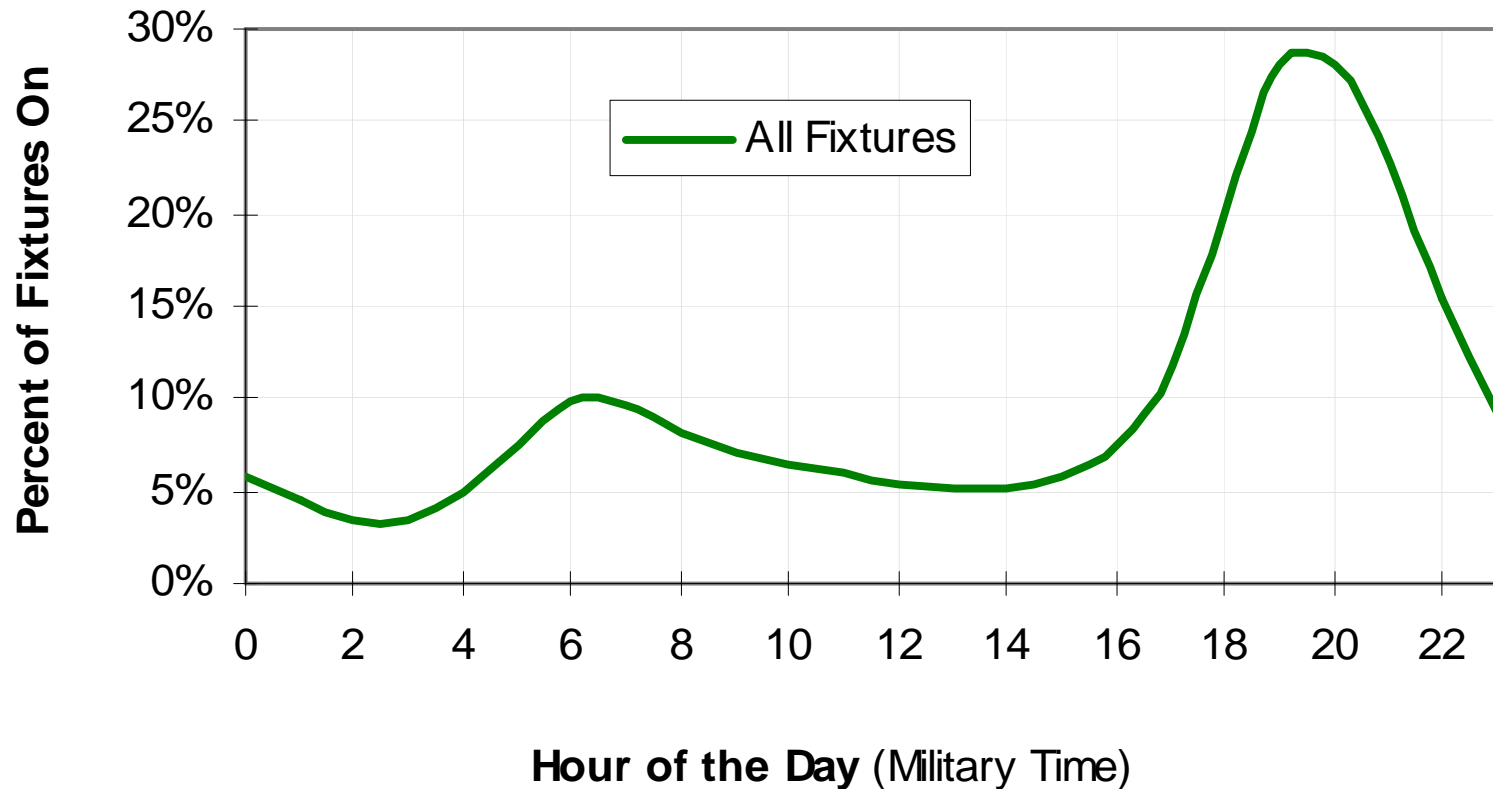


Load Profiles (by Room Type)



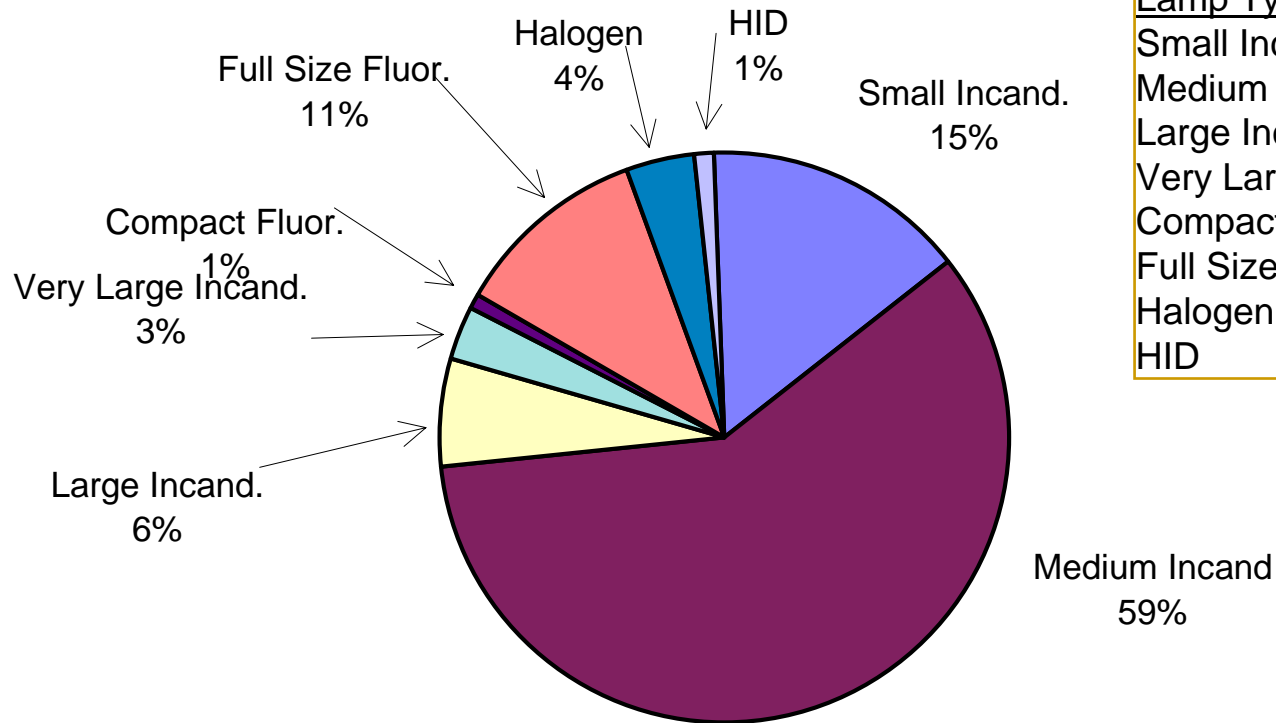
Load Profile– Combined

Diversity Profile of Residential Fixtures



Statewide Energy Use by Lamp Type

Statewide Residential Energy Use by Lamp Type



Lamp Type	Wattage
Small Incand.	1 - 50
Medium Incand.	51 - 100
Large Incand.	101 - 150
Very Large Incand.	151+
Compact Fluor.	1 - 30
Full Size Fluor.	31+
Halogen	all sizes
HID	all sizes

Top Six Residential Lighting Applications by Energy Use

Residential Lighting Application	Lighting Energy Use
1. Outdoor wall-mounted fixtures	10.6%
2. Suspended, ceiling mounted in kitchens and dining rooms	8.3%
3. Table lamps in living rooms	8.1%
4. Recessed, ceiling mounted in kitchens and dining rooms	7.6%
5. Wall mounted fixtures in bathrooms	7.3%
6. Surface, ceiling mounted fixtures in kitchens and dining rooms	6.3%
Total for top six applications:	48.2%

Summary of Recommendations of the 1996 study

- Support Efficient A-lamp Replacement
- Three Step Residential Approach
 - Upgrade Residential T-24 Lighting
 - Promote Compact Fluorescents
 - Labeling & Appliance Standards
- Support Lighting Education
- Pursue Lighting Research

Changes since 1996

- Average size of homes
- Increasing energy usage?
- More home offices
- Increasing awareness of energy efficiency
- Increased penetration of CFLs
- Maturing controls technology
- Codes and standards