



Are states prepared  
for a 30% reduction  
against ASHRAE  
90.1-2004

# The California Experience



	<b>Electricity Reduction</b>	<b>Peak Demand Reduction</b>	<b>Gas Reduction</b>
<b>1978</b>	<b>40% WAG</b>		
<b>1984</b>	<b>30% WAG</b>		
<b>1992</b>	<b>20% WAG</b>		
<b>2001 Update</b>	<b>12.9%</b>	<b>10.5%</b>	<b>34.7%</b>
<b>2005 Update</b>	<b>7.7%</b>	<b>8.5%</b>	<b>5.7%</b>
<b>2008 Update</b>	<b>?</b>	<b>?</b>	<b>?</b>

# The “Percent Savings” Dilemma



- **Percent against what?**
- **Percent of what?**

# Percent against what?



- **We have a one point frame of comparison (the latest version of ASHRAE 90.1)**
- **The one point is under continuous maintenance, e.g. it is a moving target or baseline.**
- **Really bad frame of comparison**
  - As the standard becomes more stringent, the part that we can't change gets larger (as a percentage)
  - As the pie get smaller, it becomes harder and harder to achieve high percent savings.
- **Should move to a more stable scale**
  - RESNET is a better model
  - Advanced Energy Design Guides are a better model

# Percent of what?



## ● Energy uses affected by 90.1

- Heating
- Cooling
- Water heating
- Interior lighting

## ● “Other” energy uses

- Plug loads
  - Computers
  - Appliances
- Vertical transportation
- Process energy
- Commercial kitchens

# Percent of what?



## ● Traditional energy savings needed to achieve total energy savings keyed to total savings percentages in LEED

Traditional Energy	100%	80%	60%	40%	20%	0%
Other Energy	0%	20%	40%	60%	80%	100%

Total Energy Savings	Traditional Energy Savings Needed				
10.5%	10.5%	13.1%	17.5%	26.3%	52.5%
14.0%	14.0%	17.5%	23.3%	35.0%	70.0%
17.5%	17.5%	21.9%	29.2%	43.8%	87.5%
21.0%	21.0%	26.3%	35.0%	52.5%	
24.5%	24.5%	30.6%	40.8%	61.3%	
28.0%	28.0%	35.0%	46.7%	70.0%	
31.5%	31.5%	39.4%	52.5%	78.8%	
35.0%	35.0%	43.8%	58.3%	87.5%	
38.5%	38.5%	48.1%	64.2%	96.3%	
42.0%	42.0%	52.5%	70.0%		

# What is the metric?



- **Site energy**
- **Source energy**
- **Cost**
- **Time Dependent Valued (TDV) Energy**
- **Green House Gas (GHG) Reductions or Carbon Footprint**

# The Current Rules



- **No conservation**
- **Can't increase equipment efficiency for HVAC and water heating**
- **Can only deal with “traditional” or “regulated” energy use.**
- **No credit for buildings with no air conditioning**
- **Little credit for daylighting and automatic controls**
- **Impact of many other measures are not credited or a difficult to quantify**
- **All buildings are assumed to comply (no credit for improving adoption and enforcement)**
- **Little relationship between consumption and efficiency**

# Recommendations



- **Move to a stable scale**
- **Make it clear what our metric is**
- **Expand the scope**
  - Plug energy
  - Transportation needs
  - Vertical transportation
- **Clarify what energy is to be included**
- **Consider impact of codes on existing buildings**
- **Consider adoption and enforcement**
- **Require a performance approach and that all buildings be \_\_\_% lower to account for “non universal” opportunities**