

# Is Demand Response a Program or a Resource?

**The Evolution of Demand Response  
and Why It Matters to Utilities  
Developing Load Control Capability**

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# Evolution from Program to Resource

## Load Control Programs:

- Residential water heater and A/C switches
- Large C&I interruptible rates
- Utilities administered programs internally
- Predictable MW reductions

- Thermostats and more diverse loads
- Vendors playing a bigger role
- MW reductions less predictable

- Curtable “resource” (MW) purchased from aggregators
- No “program” for utility to run
- MW reductions guaranteed through DR portfolio

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Early Years

Past Decade

Latest Trend

# What's the Difference?

## Program

- Administered by utility
- Focus on energy savings (kWh)
- Demand (MW) reductions secondary goal
- Reduces load forecast
- Compliance assessed for each customer
- Indefinite duration

## Resource

- Acquired from developer or built by utility
- Focus on MW
- Energy impacts related to type of resource
- Increases capability to meet load forecast
- Compliance assessed at the portfolio level
- Finite contract term

# Each Utility Has a Different Need for Demand Response



From DR providers:

“What’s going on with [*utility name here*]?”

From utility staff:

“How are other utilities doing it?”

Utilities all want load curtailment and [*select from below*]

- Close relationship with customers
- Maintain control over programs
- Demonstration of DSM efforts (can’t just buy it)
- Easy way to get it fast

# Which Is Better Depends on What You're After?

## Benefits to utilities...

### Program

- Closer contact with customers
- Develop internal expertise
- Easier synergies with other DSM programs
- Leverage existing Account Rep relationships
- Use existing DSM cost recovery mechanisms

### Resource (buy MW)

- Fewer staffing needs
- Quicker ramp-up time
- Reliable MW / Less risk
- Lock in price
- Customized incentives
- Compliance at portfolio level

# One Definition of Demand Response

**“Changes in electric usage by end-use customers... in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use....”**

**- U.S. Dept. of Energy, 2006**

## **Price signals vs. direct incentive:**

- Distinction useful for program design**
- Not directly relevant to utility resource planning and systems operations**

# Dispatchable vs. Non-Dispatchable DR

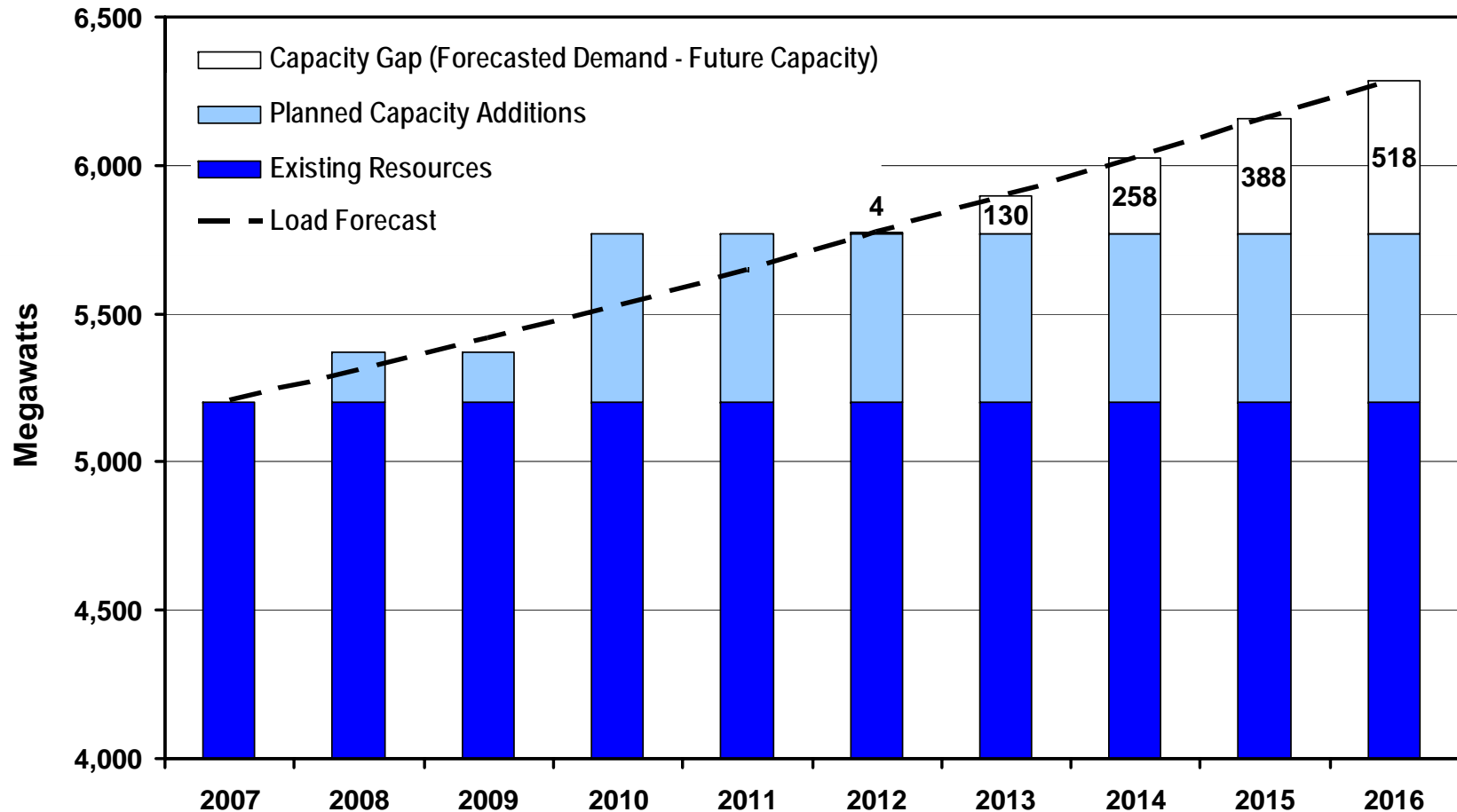
## ■ Dispatchable DR

- Short-term event
- Called by the utility
  - ◆ Direct load control
  - ◆ Critical peak pricing

## ■ Non-dispatchable DR

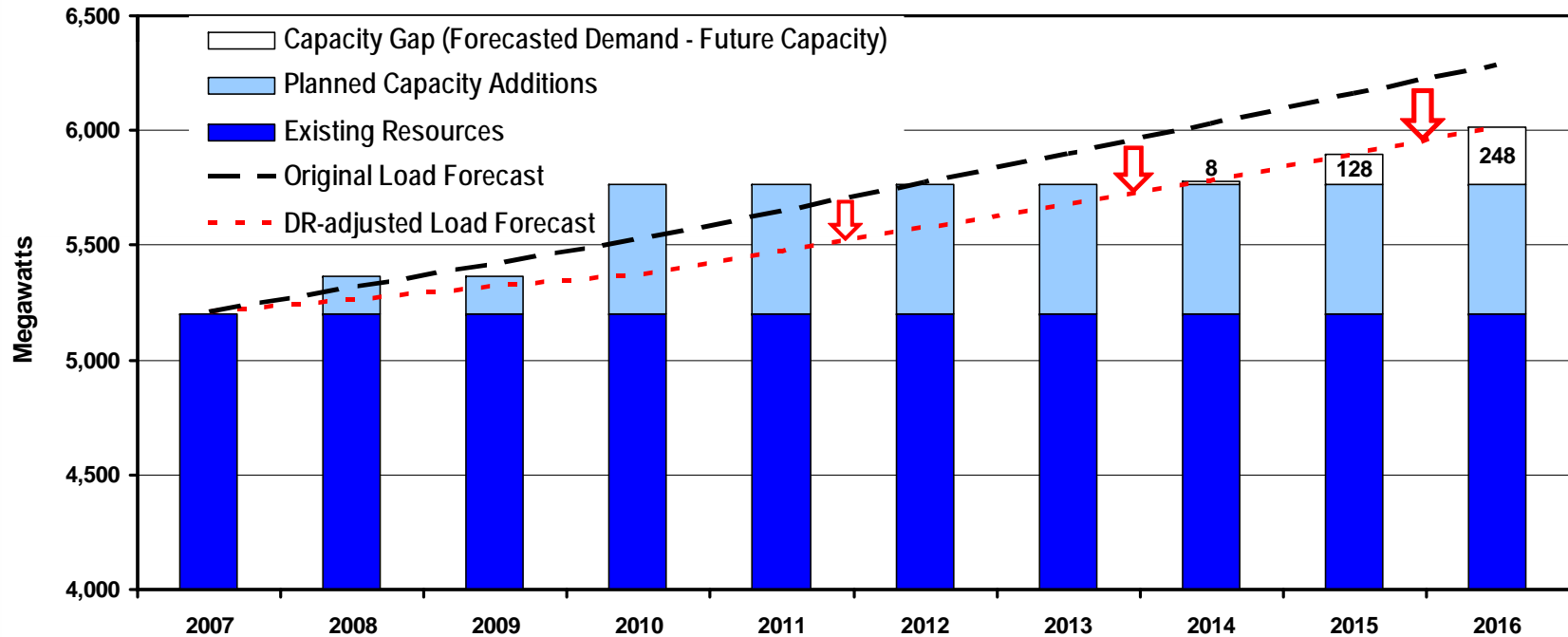
- Permanent load reductions during specific seasons or times of day
  - ◆ Scheduled load shifting
  - ◆ Thermal energy storage
  - ◆ Time-of-use rates

# Resource Planners' Dilemma: How to Meet Future Demand?

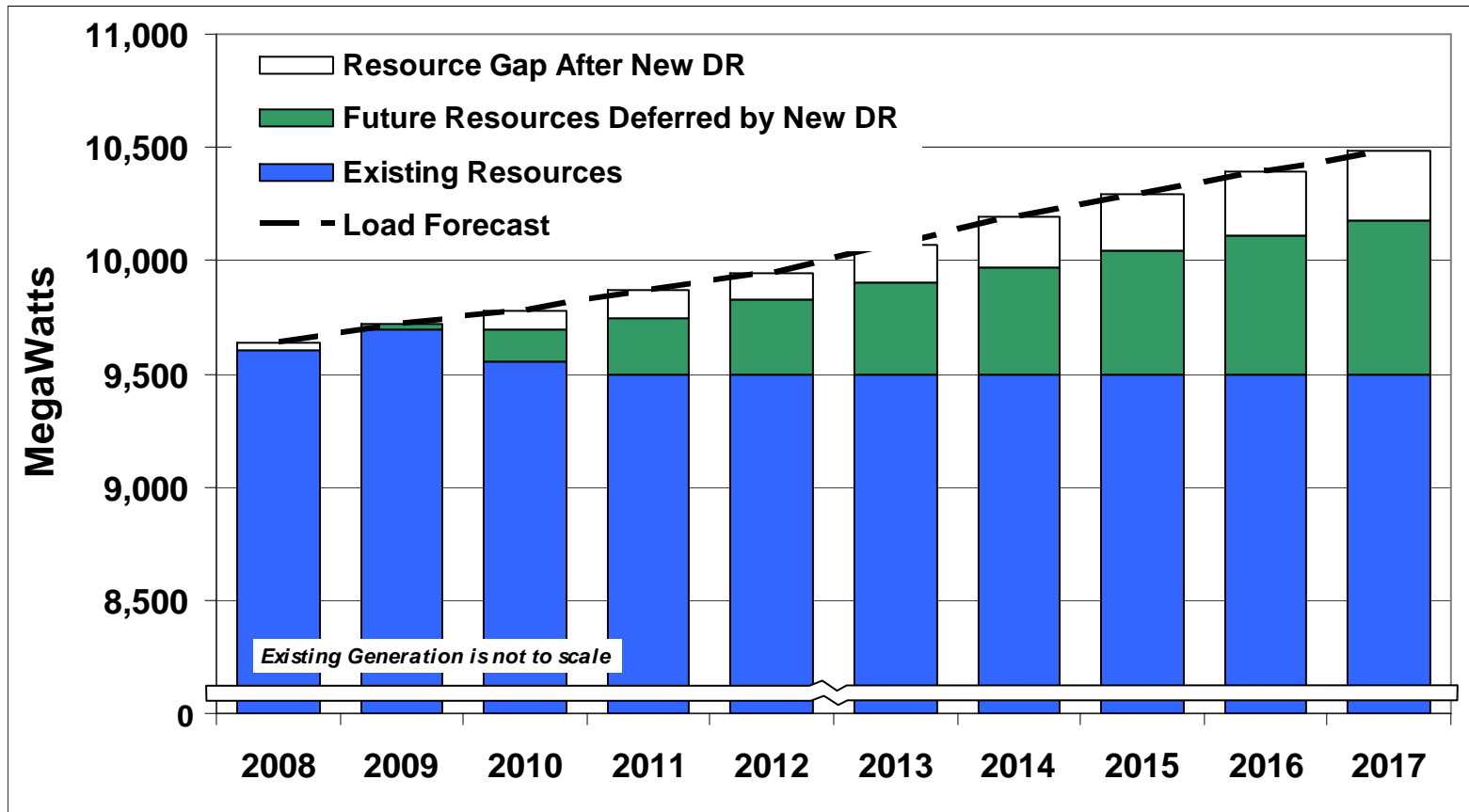




# Non-dispatchable DR Reduces Forecast Load



# Dispatchable DR *Meets* Forecast Load



# DR is Not a Combustion Turbine... ...but It Can Act Like One

Combustion Turbine	DR Resource
MW unit size	# and size of customers; scope of curtailable loads
Temperature-dependent heat rates and capacity	Temperature-dependent loads; Season and time of day
Start-up/ramp-up times	Advanced notification requirements
Emissions limits	Constraints on # and duration of events
Available fuel supply & transmission capacity	Communications reliability & interaction of DR resources
Fuel diversity	Diversity of self-generation and end- uses

## “Program” or “Resource”: More than Just Semantics

- As a “program” to reduce load, DR is valued as:
  - Avoided cost of new capacity
  - Related benefits (eg, deferral of distribution upgrades)
- As a “resource” like new generation, value depends on:
  - Months of year and hours of day dispatched
  - Time-varying avoided costs
  - “Fit” with future portfolios and growth scenarios

# Where has DR evolved?

- DR being viewed less as a form of DSM...and more like a resource handled by resource procurement and system operations staff
- The “right” way to view DR depends on the utility’s...
  - Resource mix
  - Customer relationships
  - Regulatory environment
  - Risk profile and tolerance
- No two utilities are alike
  - Running a DR “program” will always be part of what some utilities do
  - Some utilities will prefer to buy DR like it were a generation resource



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