

CERTIFIED DEMAND SIDE MANAGER - CDSM

CDSM EXAM FLASH CARDS

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DSM

Demand-Side Management:
utility activities that influence
customer energy use to change
the load shape.

Load Management

Actions that shift or reduce
customer load timing to flatten
the utility load curve.

Demand Response (DR)

Customer load changes in
response to price signals or
reliability incentives.

Energy Efficiency

Delivering the same service
while using less energy.

Conservation

Reducing energy use by curtailing or going without a service.

IRP

Integrated Resource Planning: compares supply and demand resources on equal footing.

Least-Cost Planning

Choosing the resource mix with the lowest total cost to meet service needs.

PURPA

1978 US law that promoted cogeneration and renewables and required avoided-cost purchases.

NECPA

National Energy Conservation
Policy Act of 1978; required
utility residential energy audits.

EPAct 1992

Encouraged IRP and efficiency
and opened wholesale power
competition.

EPAct 2005

Directed states to consider
time-based rates and smart
metering.

EISA 2007

Set efficiency standards,
phased out inefficient lighting,
and advanced the smart grid.

FERC Order 745

Requires paying DR the full LMP in wholesale markets when cost-effective.

FERC Order 719

Required RTOs to accept DR bids and allow aggregators of retail customers.

FERC Order 2222

Lets aggregated DER participate in wholesale markets.

1973 Oil Embargo

Energy crisis that sparked conservation programs and early DSM.

Decoupling

Separates utility revenue from sales volume so efficiency does not reduce earnings.

LRAM

Lost Revenue Adjustment Mechanism: recovers revenue lost to efficiency savings.

Shared Savings Incentive

Lets a utility keep a share of net program benefits.

ENERGY STAR

US EPA and DOE label identifying energy-efficient products.

Peak Clipping

Reducing load at the peak,
typically through direct load
control.

Valley Filling

Building off-peak load to
improve load factor, such as
off-peak thermal storage.

Load Shifting

Moving load from peak to
off-peak without changing total
energy use.

Strategic Conservation

Load reduction across all hours
from efficiency programs.

Strategic Load Growth

Increasing sales in off-peak or all hours, such as electrification.

Flexible Load Shape

Load that can be varied on request to meet system reliability needs.

Load Factor

Average load divided by peak load over a period.

Diversity Factor

Sum of individual peak demands divided by the coincident group peak.

Coincident Peak

A customer's demand at the time of the system peak.

Non-Coincident Peak

A customer's own maximum demand regardless of when the system peaks.

Load Duration Curve

Chart of loads ranked from highest to lowest across the hours of a period.

Load Profile

Graph of demand versus time for a customer, class, or system.

Baseload

Minimum continuous demand;
served by always-on
generation.

Peaking Plant

Generator run only during
highest demand; high cost per
kWh, low capital cost.

Reserve Margin

Capacity above expected peak
demand, as a percentage.

Load Forecast

Projection of future demand and
energy needs.

Demand (kW)

Rate of electricity use at a moment, measured in kilowatts.

Energy (kWh)

Total electricity consumed over time; kW multiplied by hours.

Power Factor

Ratio of real power to apparent power; low values raise utility costs.

Connected Load

Sum of the ratings of all equipment connected to a system.

Demand Factor

Maximum demand divided by
total connected load.

Capacity Factor

Actual output divided by
maximum possible output over
a period.

Spinning Reserve

Online generation capacity that
can respond immediately to a
contingency.

Avoided Cost

Cost a utility does not incur
because of a DSM resource.

Avoided Capacity Cost

Value of deferred or avoided generation, transmission, or distribution capacity.

Avoided Energy Cost

Value of the fuel and variable cost of generation not needed.

Cost-Effectiveness

Whether program benefits exceed costs under a chosen test.

TRC Test

Total Resource Cost: all program costs and benefits to utility and participants combined.

Utility Cost Test (PAC)

Compares utility avoided costs to utility program costs and incentives.

RIM Test

Ratepayer Impact Measure: shows effect on rates for non-participants.

Participant Cost Test

Compares participant bill savings and incentives to participant costs.

Societal Cost Test

TRC test that adds externalities such as emissions and health effects.

Benefit-Cost Ratio

Present value of benefits divided by present value of costs; above 1 passes.

Net Present Value

Discounted benefits minus discounted costs over the analysis period.

Discount Rate

Rate used to convert future dollars to present value.

Simple Payback

Initial cost divided by annual savings; ignores time value of money.

IRR

Internal Rate of Return:
discount rate that makes NPV
equal zero.

Life-Cycle Cost

Total cost of owning an asset
over its life, including energy
and maintenance.

Levelized Cost

Annualized cost per unit of
energy saved or produced over
the life.

Cost of Saved Energy

Program cost per kWh saved
over the measure life.



Market Potential Study

Estimates energy savings that
can be achieved in a service
territory.



Technical Potential

Savings if all feasible measures
were installed, ignoring cost and
acceptance.



Economic Potential

Technical potential limited to
measures that pass a
cost-effectiveness screen.



Achievable Potential

Share of economic potential
attainable given market barriers
and program limits.

Maximum Achievable Potential

Achievable savings assuming
ideal incentives and
unconstrained program effort.

Baseline

Conditions that would have
existed without the program or
measure.

Free Rider

Participant who would have
taken the action without the
program.

Spillover

Additional savings caused by a
program but not claimed or paid
for by it.

Net-to-Gross Ratio

Net savings divided by gross savings; accounts for free ridership and spillover.

Gross Savings

Change in energy use at participant sites regardless of cause.

Net Savings

Savings caused by the program after removing free ridership.

Rebound Effect

Increased use after efficiency lowers cost of service, reducing savings.

Market Transformation

Lasting shift in market structure that sustains efficiency without ongoing incentives.

Market Barrier

Obstacle such as first cost, split incentives, or lack of information.

Split Incentive

Owner pays for upgrades while tenant gets the bill savings.

Market Segmentation

Grouping customers by characteristics to target programs.

End-Use

Specific service the energy provides, such as lighting, cooling, or motors.

Load Research

Metering and analysis of customer usage to understand load shapes.

Technical Reference Manual

Document of vetted savings algorithms and assumptions for measures.

Deemed Savings

Pre-approved savings per measure without site-specific measurement.

Avoided T&D Cost

Savings from deferring
transmission and distribution
upgrades.

Externalities

Costs or benefits, such as
pollution, not reflected in market
prices.

Non-Energy Benefits

Benefits beyond bill savings,
such as comfort, health, and
productivity.

Time-of-Use Rate

Price per kWh varies by fixed
time blocks, such as peak and
off-peak.

Critical Peak Pricing

Very high price during a limited number of called event hours.

Peak Time Rebate

Credit paid for reducing use below baseline during events; no penalty.

Real-Time Pricing

Rates that follow hourly or sub-hourly wholesale market prices.

Interruptible Rate

Discounted rate for customers who curtail load on utility request.

Demand Charge

Fee based on highest kW demand during the billing period.

Ratchet Clause

Billing demand never falls below a percentage of past peak demand.

Inclining Block Rate

Price per kWh rises as consumption increases.

Direct Load Control

Utility remotely cycles or shuts off customer equipment such as air conditioners.

Incentive

Payment or benefit offered to encourage participation.

Rebate

Cash returned after purchase of qualifying efficient equipment.

Prescriptive Rebate

Fixed payment for standard measures with predefined savings.

Custom Rebate

Payment based on engineered, site-specific calculation of savings.

Direct Install

Program contractor installs measures at low or no cost to the customer.

Midstream Incentive

Incentive paid to distributors or retailers at the point of sale.

Upstream Incentive

Incentive paid to manufacturers to lower the product price.

Behavioral Program

Uses feedback, comparisons, and nudges to change energy habits.



Home Energy Report

Mailed or digital report comparing a home's use with similar homes.



Emergency DR

Load reduction called during system emergencies or reliability events.



Economic DR

Load reduction offered in response to high wholesale prices.



Capacity DR

Committed load reduction that counts as a resource for resource adequacy.



Ancillary Services DR

Load providing regulation,
spinning, or other grid support
services.



Curtailement Service Provider

Entity that enrolls customers
and offers their DR into the
market.



Aggregator

Combines many small loads
into one dispatchable resource.



Notification Lead Time

Warning time customers receive
before a DR event begins.

Event Duration

Length of time a DR event lasts.

Dispatch

Order to reduce load or start a resource.

Customer Baseline (CBL)

Estimate of normal usage used to measure DR performance.

High X of Y Baseline

Averages the highest days from recent similar days to set the baseline.



Day-of Adjustment

Scales baseline using usage in
hours just before the event.



Penalty

Charge for failing to deliver
committed DR reduction.



Opt-In

Customers must actively
choose to enroll.



Opt-Out

Customers are enrolled by
default and may decline.

Logic Model

Diagram linking program activities, outputs, and expected outcomes.

Value Proposition

Benefit customers receive compared to their cost and effort to participate.

Smart Thermostat

Connected thermostat that can respond to DR signals and optimize schedules.

BYOD

Bring Your Own Device: customers use their own connected equipment in DR programs.

Load Control Switch

Device installed on equipment to receive utility cycling commands.

AMI

Advanced Metering Infrastructure: two-way communicating meters and network.

AMR

Automated Meter Reading: one-way remote collection of meter data.

Smart Meter

Digital meter recording interval usage and communicating with the utility.

MDMS

Meter Data Management
System: stores, validates, and
processes interval data.

Home Area Network

In-home network linking meters,
thermostats, and appliances.

EMS

Energy Management System:
monitors and controls
energy-using equipment.

BAS

Building Automation System:
controls HVAC, lighting, and
other building systems.

SCADA

Supervisory Control and Data Acquisition: remote monitoring and control of grid assets.

OpenADR

Open standard for automated DR communication between utilities and customers.

DRMS

Demand Response Management System: software to plan, dispatch, and settle events.

Auto-DR

Automated DR where equipment responds to signals without manual action.

ESCO

Energy Service Company:
develops, finances, and installs
efficiency projects.

Performance Contracting

Payment tied to measured
results of installed measures.

Guaranteed Savings

ESCO guarantees savings;
customer finances and the
ESCO covers shortfalls.

Shared Savings Contract

ESCO financed project where
savings are split by a set
formula.

ESPC

Energy Savings Performance
Contract: repaid from the
savings produced.

Energy Audit

Systematic survey and analysis
of a facility's energy use and
savings options.

ASHRAE Audit Levels

Level 1 walk-through, Level 2
survey and analysis, Level 3
investment-grade.

Retro-Commissioning

Tuning an existing building's
systems to restore intended
performance.

Commissioning

Verifying systems are installed and operate per design intent.

RFP

Request for Proposal: solicitation used to select vendors and implementers.

Trade Ally

Contractor or vendor network that delivers measures and promotes programs.

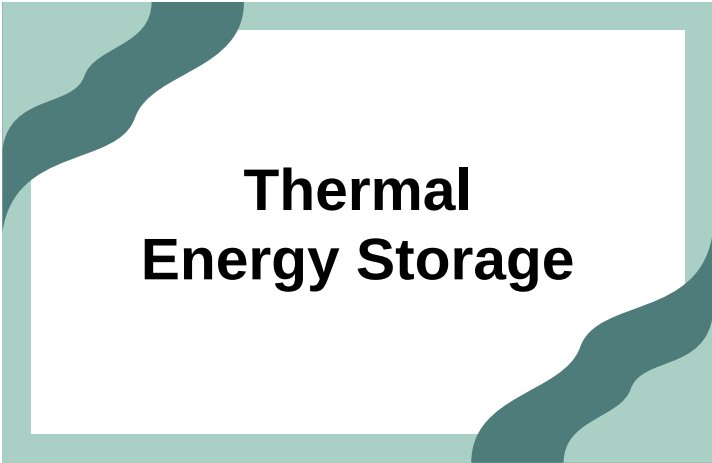
Pilot Program

Small-scale test of a program before full rollout.



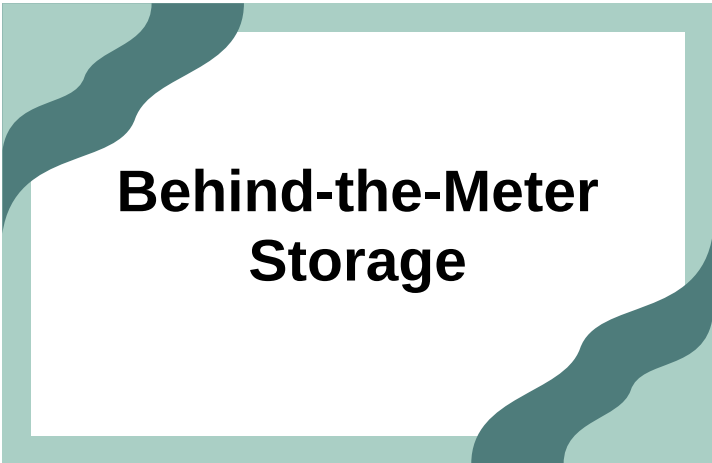
Quality Assurance

Processes ensuring installations and data meet program standards.



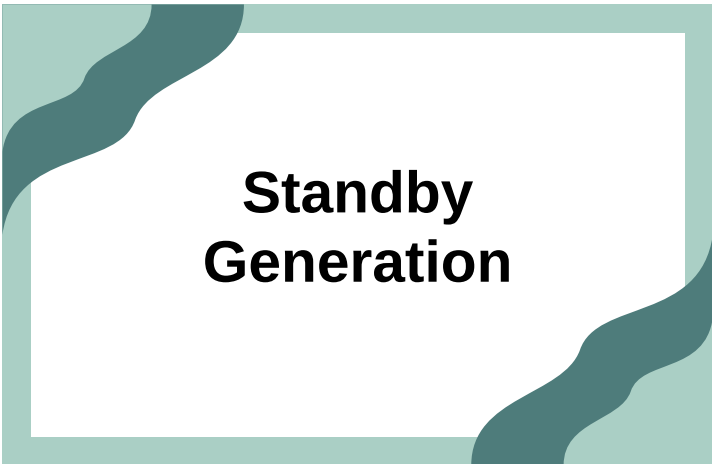
Thermal Energy Storage

Storing cooling or heat off-peak for use during peak.



Behind-the-Meter Storage

Customer-sited battery that can shift load and provide DR.



Standby Generation

On-site generator that can serve load during outages or DR events.

VFD

Variable Frequency Drive:
adjusts motor speed to match
load.

LED Lighting

High-efficacy solid-state lighting
with long life and low heat.

Pre-Cooling

Cooling a building before an
event to reduce load during
peak hours.

Program Budget

Approved funds for incentives,
administration, marketing, and
evaluation.

Cost Recovery

Mechanism allowing the utility to collect DSM program costs through rates.

Rate Case

Regulatory proceeding where a utility's rates and revenue are set.

Public Utility Commission

State regulator that approves rates and DSM portfolios.

DSM Rider

Charge on customer bills that funds DSM programs.

KPI

Key Performance Indicator:
metric tracking progress toward
program goals.

Stakeholder Collaborative

Group of regulators, advocates,
and utilities that guides program
design.

Customer Engagement

Outreach and communication
that builds awareness and
participation.

Risk Management

Identifying and mitigating risks
to program delivery and
savings.



Program Portfolio

Set of programs managed together to meet overall goals.



Continuous Improvement

Using results to refine program design and delivery.



Customer Satisfaction

Measure of participant experience, affecting retention and enrollment.



Data Privacy

Protection of customer usage data and personal information.



Cybersecurity

Protection of meters, controls,
and DR systems from attack.

M&V

Measurement and Verification:
process to determine actual
savings from measures.

IPMVP

International Performance
Measurement and Verification
Protocol.

IPMVP Option A

Retrofit isolation with key
parameter measurement; others
estimated.

IPMVP Option B

Retrofit isolation with all
parameters measured.

IPMVP Option C

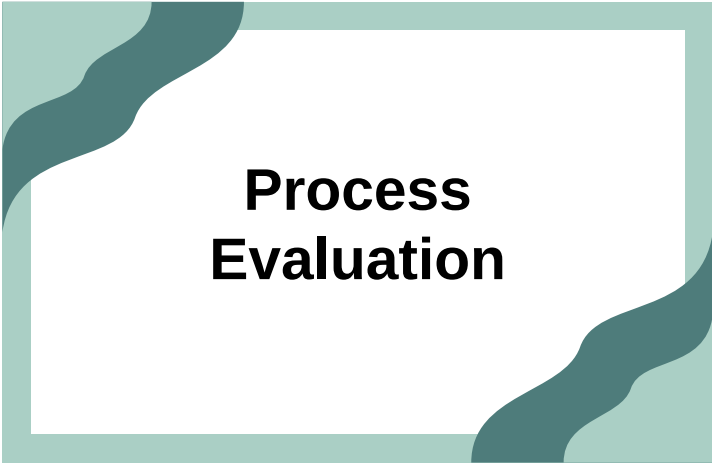
Whole facility analysis using
utility meter data.

IPMVP Option D

Calibrated simulation of the
facility.

EM&V

Evaluation, Measurement, and
Verification of program-level
impacts.



Process Evaluation

Assesses how well a program is
designed and delivered.



Impact Evaluation

Quantifies energy and demand
changes caused by a program.



Market Effects Evaluation

Assesses lasting changes in
market structure and behavior.



Regression Analysis

Statistical model relating energy
use to weather and other
drivers.

Billing Analysis

Compares pre and post usage from utility bills to estimate savings.

Confidence and Precision

Statistical reliability of a sample estimate, such as 90/10.

Realization Rate

Verified savings divided by reported savings.

Persistence

Whether savings continue over time.

Effective Useful Life

Estimated years a measure continues to deliver savings.

Interactive Effects

Changes in other end uses, such as lighting cutting heat and raising heating.

Normalization

Adjusting data to standard conditions, such as typical weather.

Control Group

Similar non-participants used to isolate program impacts.

Randomized Controlled Trial

Random assignment to
treatment and control groups to
estimate impact.

Non-Routine Adjustment

Baseline change for events
such as added load or changed
occupancy.

Uncertainty

Range of possible error in
measured or estimated savings.

ASHRAE Guideline 14

Standard for measuring energy
and demand savings.

Coefficient of Variation

Standard deviation divided by mean; used to size samples.

DER

Distributed Energy Resources: small generation, storage, and flexible loads near customers.

Virtual Power Plant

Aggregated DER dispatched together as one resource.

Microgrid

Local grid that can operate connected or islanded.

Smart Grid

Grid using two-way communication and controls for reliability and efficiency.

GEB

Grid-interactive Efficient Building: optimizes energy use for both efficiency and grid needs.

Transactive Energy

Market-based value signals that coordinate supply and demand.

Beneficial Electrification

Switching to electricity that cuts emissions or costs without raising peaks.

Managed EV Charging

Smart control of charging timing
and rate, also called V1G.

V2G

Vehicle-to-Grid: EV batteries
discharge back to the grid.

Non-Wires Alternative

DER or DSM used to defer
network upgrades.

Resilience

Ability to prepare for, withstand,
and recover from disruption.



Demand Flexibility

Load able to change timing or amount in response to grid conditions.



Net Metering

Credits customers for excess on-site generation exported to the grid.



Prosumer

Customer who both consumes and produces energy.



AI Analytics

Machine learning for forecasting, targeting, and optimizing DR and efficiency.

Decarbonization

Reducing greenhouse gas emissions from energy supply and use.

Duck Curve

Net load shape with midday solar dip and steep evening ramp.

Energy Equity

Fair access to program benefits for low-income and underserved customers.

Locational Marginal Pricing

Wholesale price reflecting energy, congestion, and losses at each node.



Dynamic Rates

Prices that change with grid conditions to guide customer behavior.