State of the DSM Market

Regulatory and Spending Trends

E Source

E Source web conference

Agenda

2018 market size

Shifting portfolios

US regulatory changes

Canadian CDM trends

Projected spending through 2020

Q&A

Today's speakers

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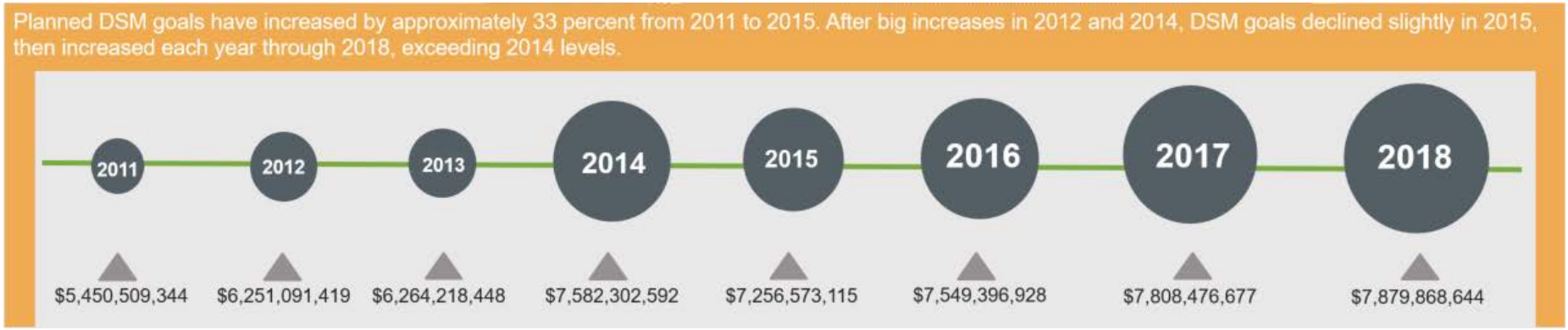
2018 market size

Spending trends

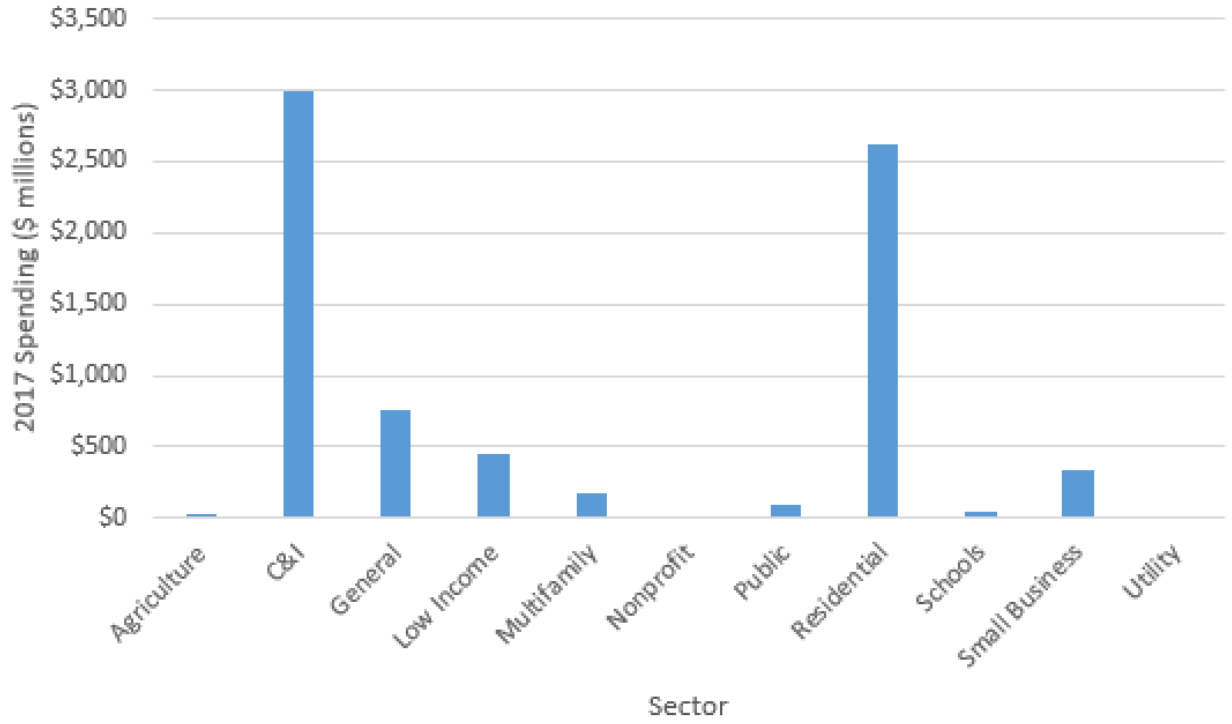
- Overall spending on DSM has been increasing over the past decade; it reached a new high in 2017 and remains consistent into 2018.
- Since 2012, utilities have increased their spending on new-construction projects, direct-install measures, behavioral programs, and retrocommissioning. We've also identified a shift to more-prescriptive programs. Utilities spend more of their efficiency funds on nonresidential programs than on residential.
- In 2015, we identified a slight decrease in spending. The primary reasons for this decline were:
  - A weakening of the Canadian dollar relative to the US dollar. Although Canadian utility spending remained consistent, when converted to US dollars, it shows a decline.
  - Other changes to program plans and budgets for a few large program administrators.

Total planned DSM spending by year



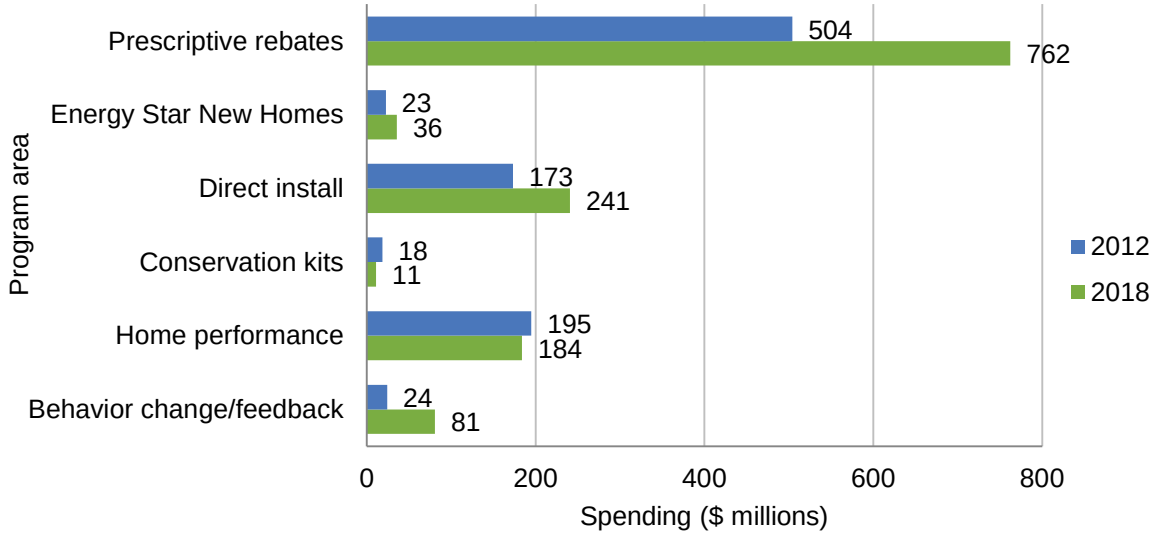
© E Source (DSM Insights)

Spending by sector (2017 planned spending)

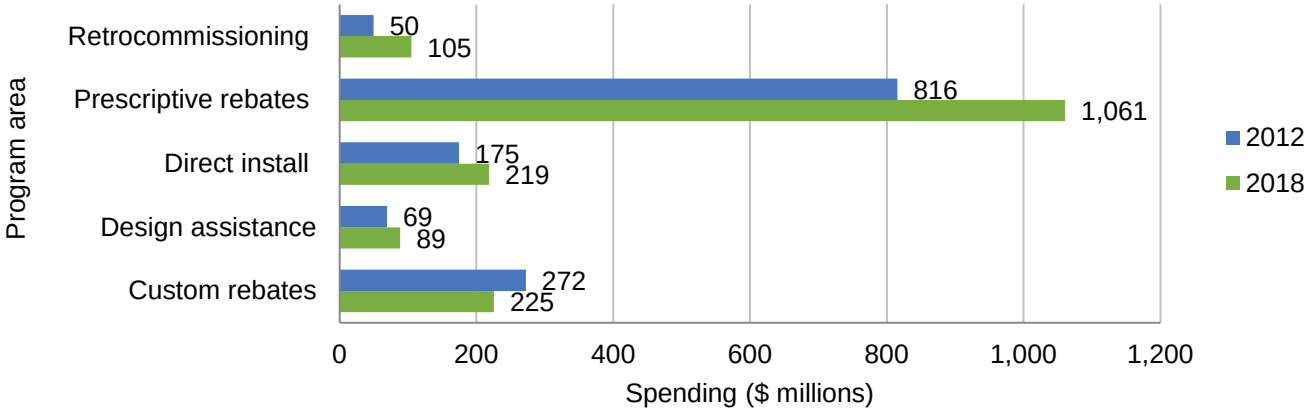


Planned residential expenditures

- The change in prescriptive rebate spending is likely due to energy-efficiency program maturation. As savings became more predictable, utilities could use “deemed savings” assumptions and fixed rebate amounts.
- The bulk of direct-install savings comes from lighting, which explains the significant growth in this area.

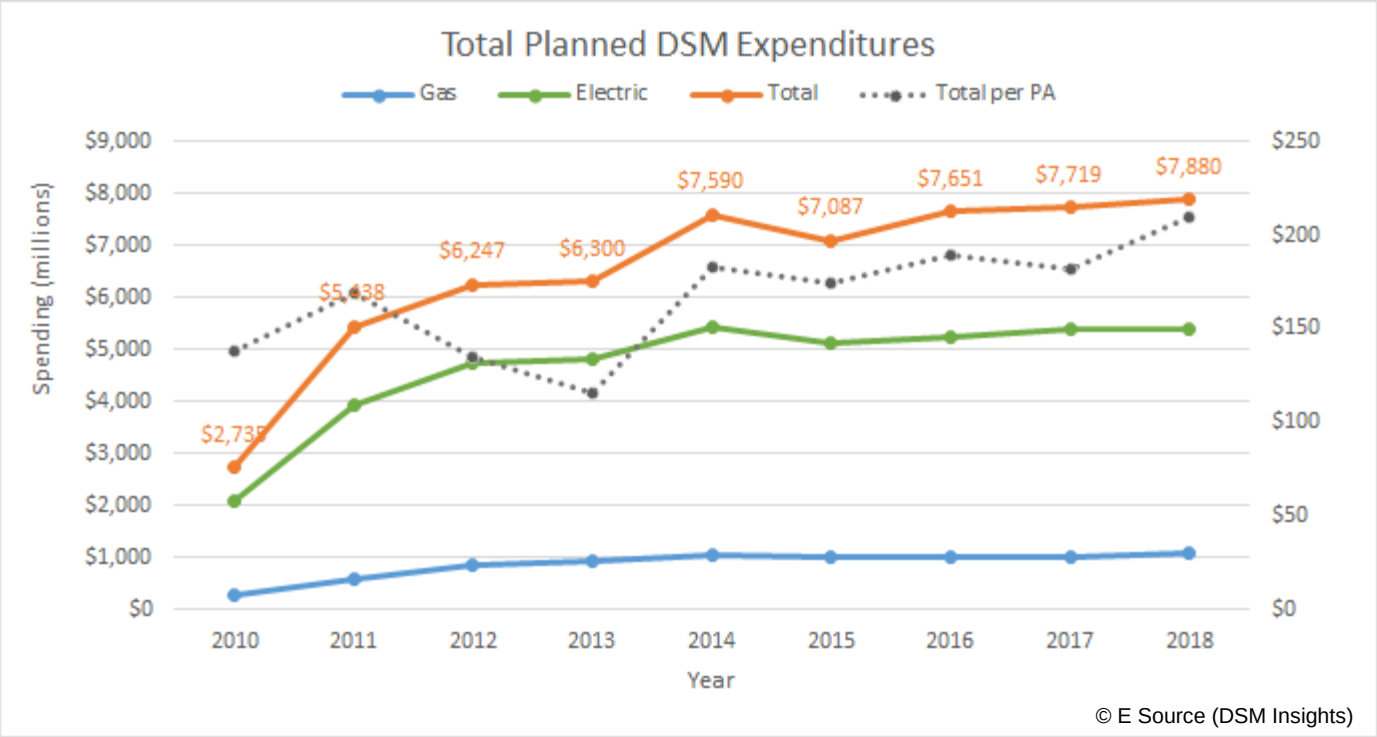


Planned nonresidential expenditures



- Similar to the residential sector, the growth in prescriptive rebate spending is likely due to energy-efficiency program maturation. This moves more measures to prescriptive programs and away from custom rebates. The direct-install program growth is largely from lighting.
- The increase in retrocommissioning program spending represents a trend in utilities seeking out low- and no-cost tune-up projects and a shift to capital-based measures.
- Design assistance spending reflects increases in new-construction projects within the commercial sector.

Total planned energy-efficiency expenditures by energy type



Shifting portfolios

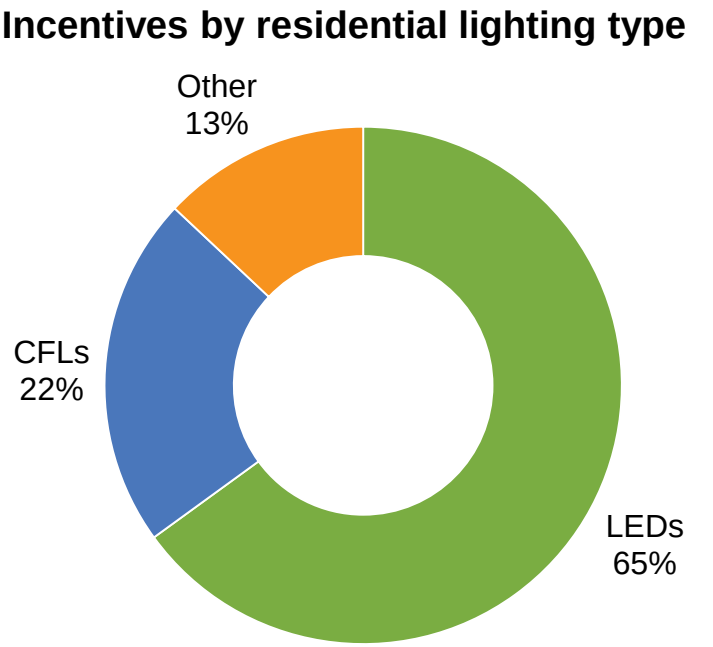
The current lighting landscape

This is the million dollar question for the industry

Portfolio savings are still between 40% and 70%

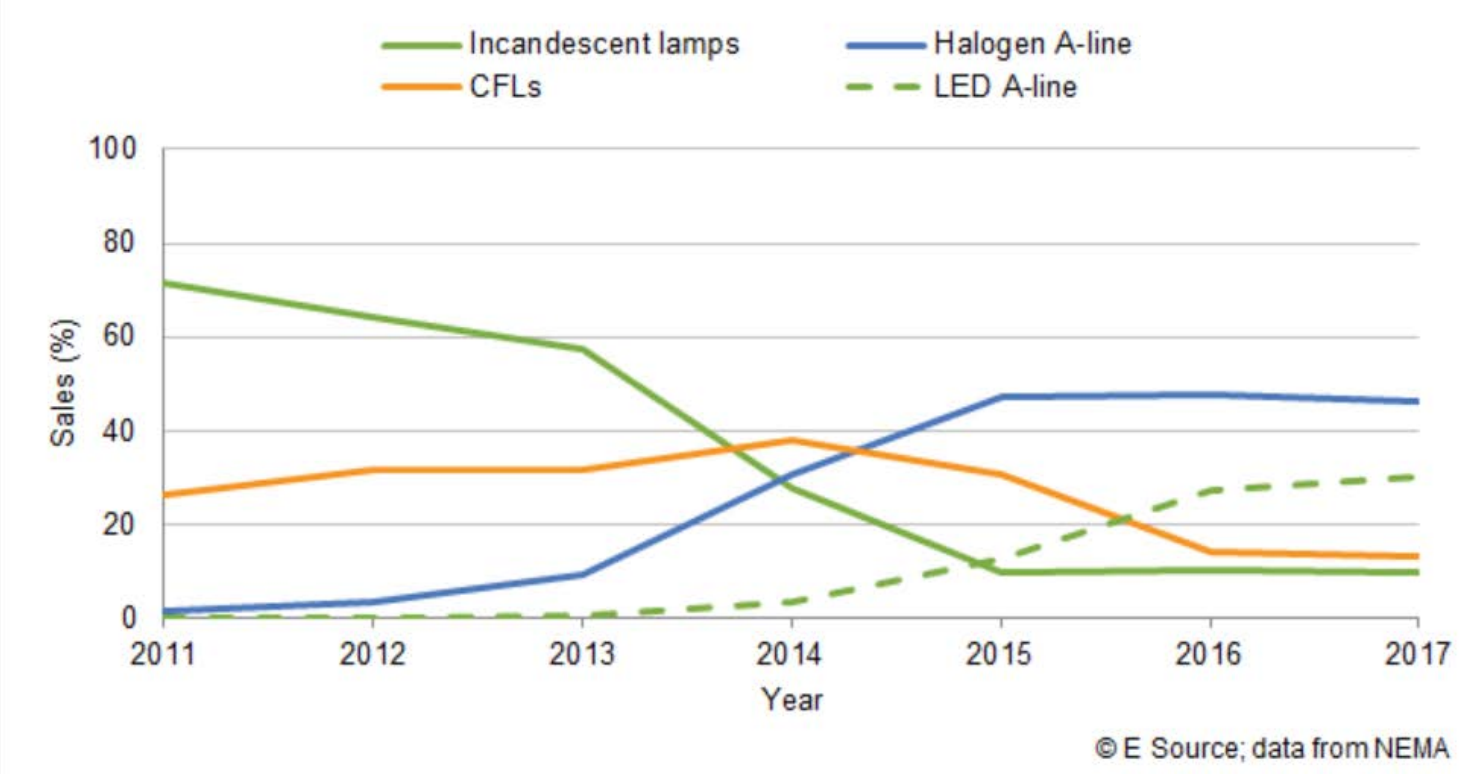
LEDs are the baseline in a few areas already

LEDs dominate program offerings

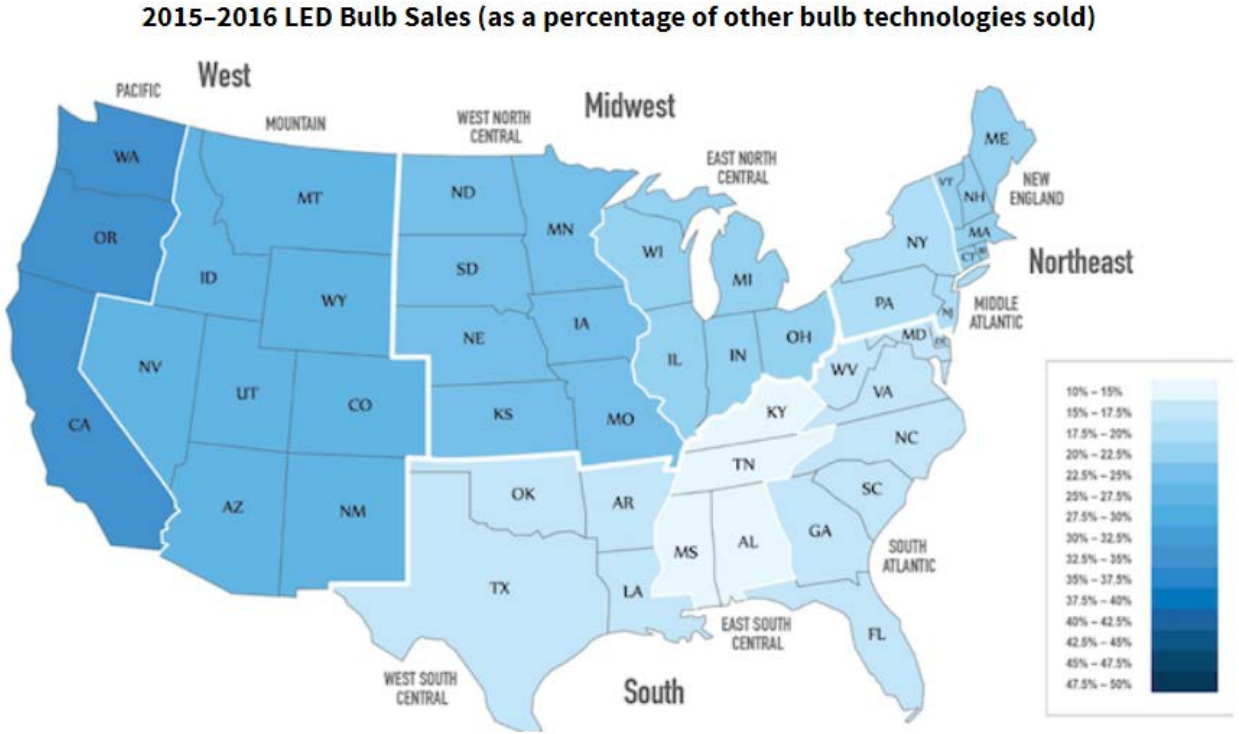


© E Source; data from Energy Star

LED sales relative to other bulbs

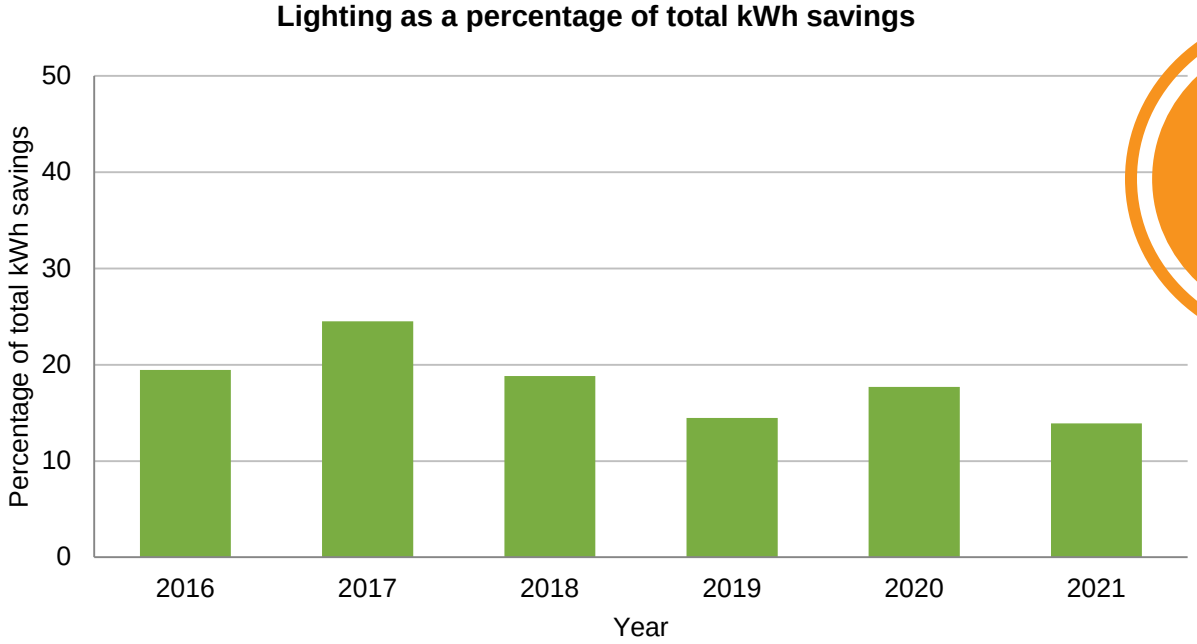


LED sales relative to other bulbs (cont.)



Source: EPA

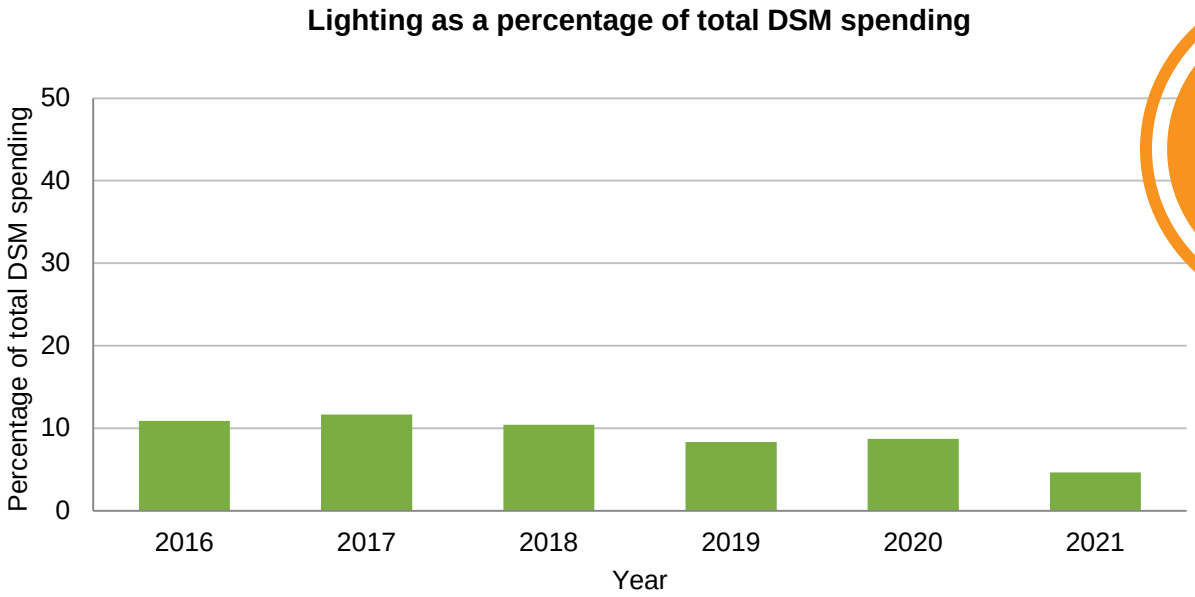
Lighting's contribution to total energy savings



Data for lighting-specific programs only

Base: n = approximately 100 programs from 28 states/provinces.
Notes: kWh = kilowatt-hours. Data for lighting-specific programs only; those programs with multiple measures including lighting are not represented. Data reported in net.

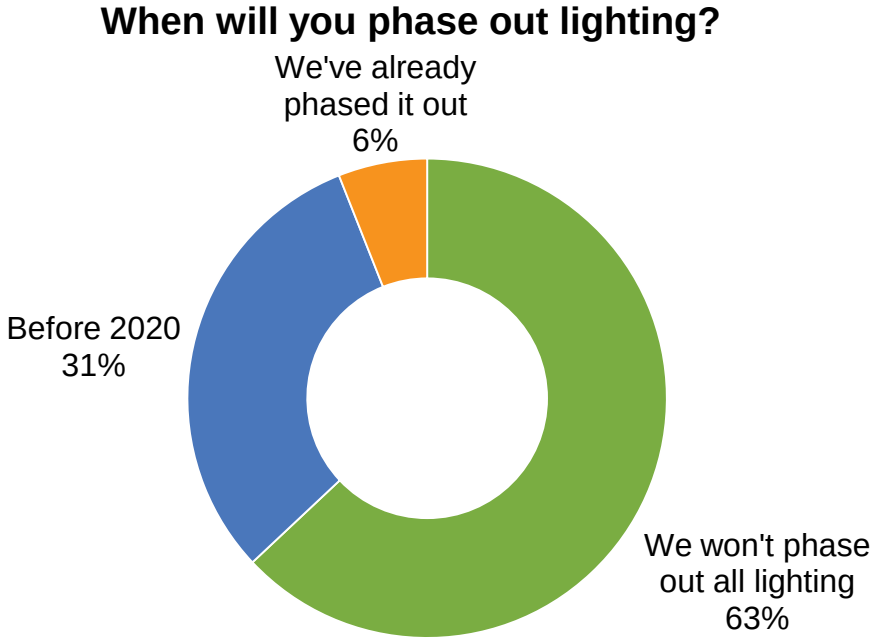
Role of lighting in DSM portfolios



Data for lighting-specific programs only

Base: n = approximately 100 programs from 28 states/provinces.
Notes: DSM = demand-side management. Data for lighting-specific programs only; those programs with multiple measures including lighting are not represented. Data reported in net.

The next few years

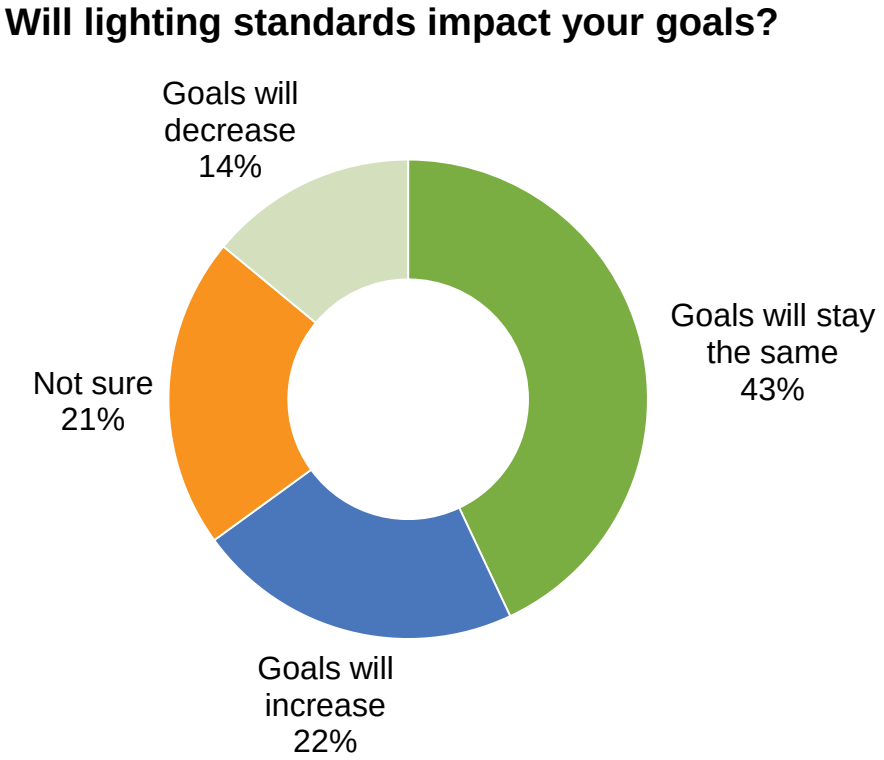


Note: We asked this questions during an E Source peer sharing call in June 2018.

Continued lighting opportunities

- Non-freeriders
- Midstream and upstream
- Controls and automation
- Other lighting technologies
  - Higher-wattage lamps
  - Specialty lamps
  - Smart LEDs
  - LEDs for home cannabis growers
- Blended or dual baselines

Portfolio shifts



Note: We asked this questions during an E Source peer sharing call in June 2018.

New programmatic trends

- Behavioral programs
- Pay for performance
- Connected homes and smart thermostats
- Integrated DSM
- Codes and standards
- Commercial portfolio shifts
- Upstream and midstream
- New cost-effectiveness treatments
- Online marketplaces
- Prepay programs
- Strategic energy management
- Targeting hard-to-reach customers
- Robust trade ally networks
- Deeper retrofits
- Advanced lighting controls
- Revised evaluation inputs

E Source Next Generation of Energy Savings Project

National Grid	• Current portfolio = 40% lighting • Future focus on non-wires alternatives, hard-to-reach customers, codes and standards, connected homes/businesses and controls
Pacific Gas and Electric Co.	• Current portfolio = < 20% lighting • Future focus on codes and standards, pay for performance, operations and maintenance, conservation, controls and automation, midstream, integrated DSM, AMI targeted outreach
Xcel Energy	• Current portfolio = 70% lighting • Future commercial portfolio = lighting (including LEDs and controls), midstream • Future portfolio = lighting for hard to reach customers

More E Source next-gen materials

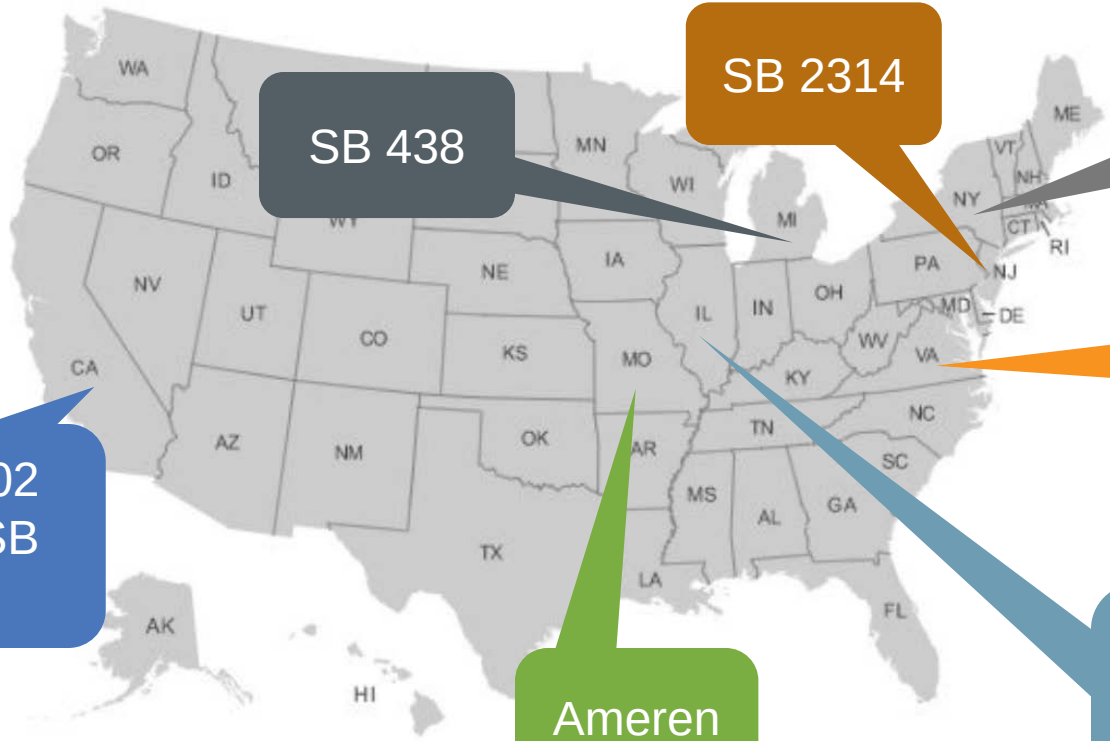
- Next Generation of Energy Savings Resource Center
- The Residential Lighting Market Is Transforming: Are You Ready?
- History of Lighting: How Technological Advances and Federal Regulations Shaped the Bulb
- DSM Programs for a Postlighting World
- C&I Technologies to Focus On After Lighting

Coming soon

- Beyond Lighting: A Commercial DSM Programs Peer Sharing Call, Thursday, July 12, 2018, at 2:00 p.m. ET
- Next-Generation Gas Savings: Peer Sharing Call, Thursday, August 16, 2018, at 2:00 p.m. ET
- Beyond Lighting: Next Generation DSM Programs and Technologies, Tuesday, August 21, 2018, at 2:00 p.m. ET
- Case study series on next-gen programs (July or August)

US regulatory changes

Increasing energy efficiency



SB 438

SB 2314

Reforming the Energy Vision

AB 802 and SB 350

State Energy Bill

Ameren MO plan

Future Energy Jobs Act

Illinois increases energy efficiency

- The Future Energy Jobs Act (Public Act 099-0906) encourages renewables and distributed energy
- Updates the renewable portfolio standard (RPS)
- Updates the energy efficiency portfolio standard (EEPS) and provides incentives to meet goals
  - Increases the energy-efficiency budget, specifically for research and development and caps spending
  - Requirement to measure lifetime savings, not first-year savings
  - Low-income and public sector programs now run by utilities

Virginia: New state energy bill

- The governor recently signed HB 1558/SB 966, much sooner than anticipated; takes effect July 2018
- Requires a certain level of utility investment in energy efficiency; doesn't impact demand response
  - Dominion is planning to quadruple its energy-efficiency spending; the new plan is due October 1, 2018
- Includes changes to cost-effectiveness testing and implements a stakeholder process
- Exempts large customers from energy-efficiency programs

Missouri: Expanding energy efficiency

- Ameren Missouri's plan calls for efficiency investments of nearly $92 million per year for the next six years
- Currently planning to spend $50 million per year, 2015–2018
- This is a draft plan and isn't yet final
- The utility is pushing for the longer, expanded plan, stemming from political pressure from the state

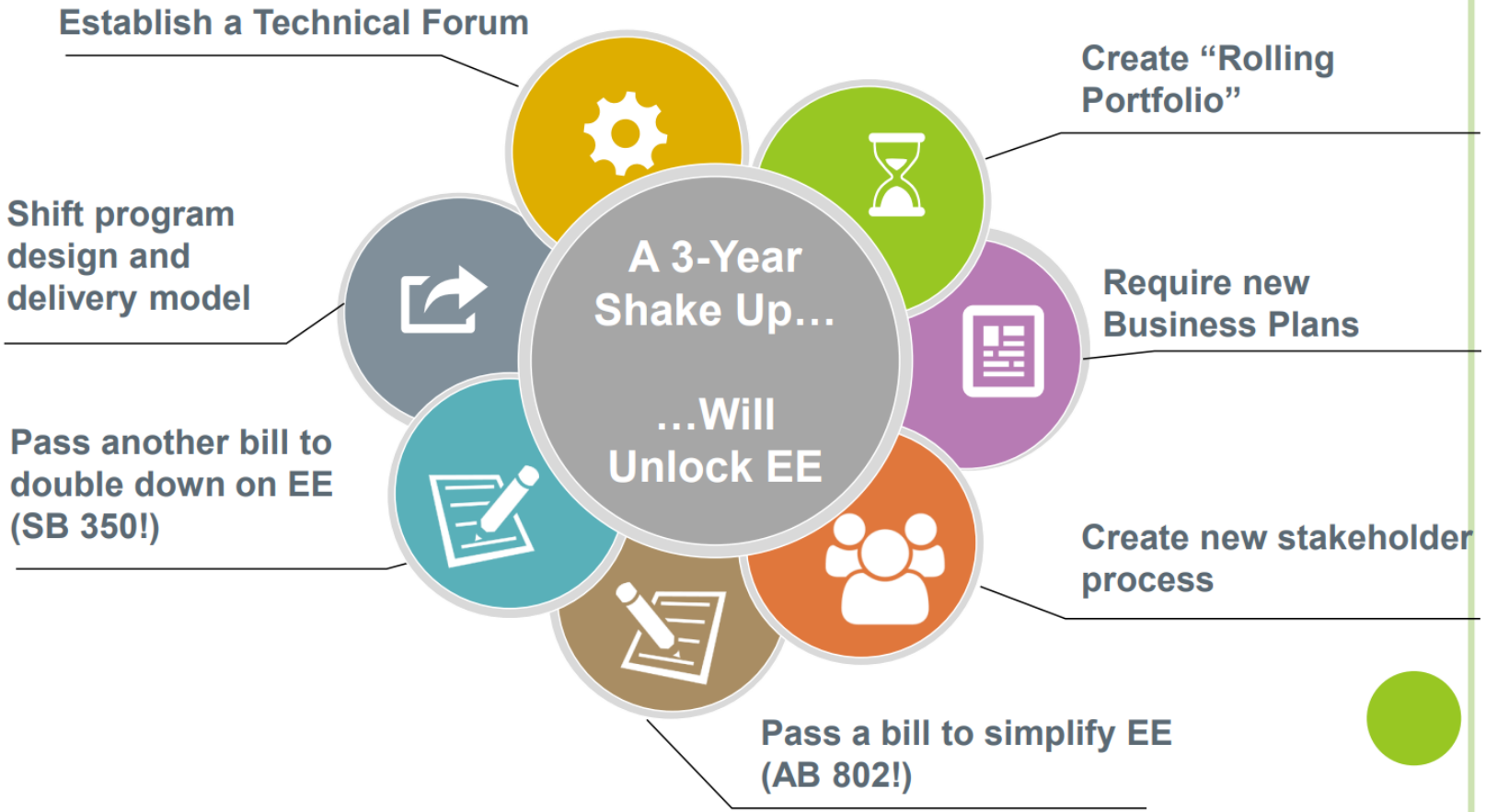
New Jersey: Targets increase

- Senate Bill 2314 passed in April
- Establishes energy-savings targets that ramp up to 2% annual incremental electricity savings and 0.75% annual incremental natural gas savings over five years
- Codes and standards can contribute up to 2%
- Utility plans expected soon

Michigan

- Non-wires alternatives investigation could enable more-targeted DSM investments
- Cost-recovery docket gives more certainty with DSM included in the integrated resource plan (IRP)
- Major utilities filed plans for new, higher savings targets in response to 2016 legislation (SB 438)

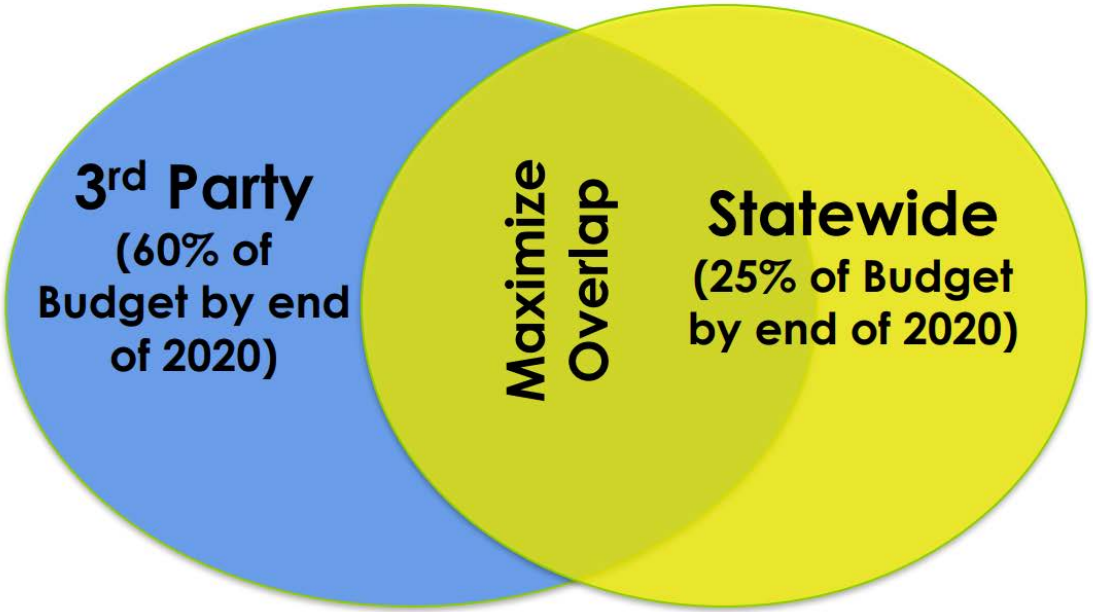
California


Establish a Technical Forum
Create "Rolling Portfolio"
Shift program design and delivery model
A 3-Year Shake Up…
…Will Unlock EE
Require new Business Plans
Pass another bill to double down on EE (SB 350!)
Create new stakeholder process
Pass a bill to simplify EE (AB 802!)

SB 350 Requires Doubling Cost-Effective EE by 2030

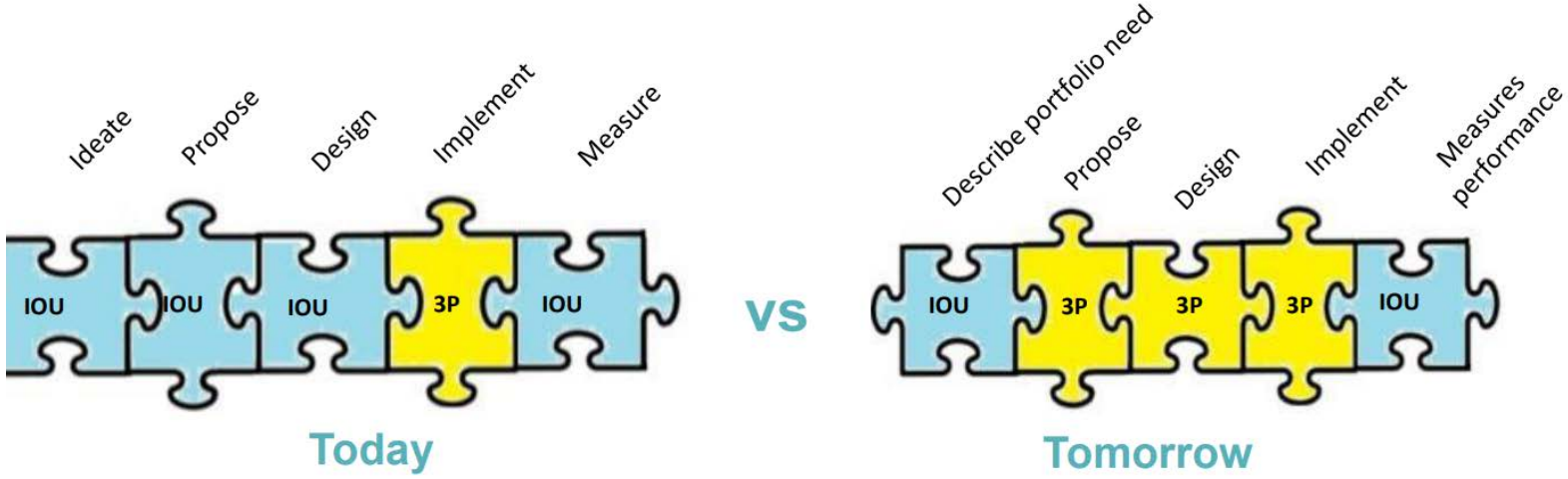
Establishes annual targets for **statewide EE savings** and demand reduction to achieve a **cumulative doubling of EE savings** in electricity and natural gas final end uses of retail customers by January 1, 2030

A New Paradigm is Upon Us, and We're Ready, Y'all



IOUs Shift to Portfolio Managers and Determiners of Need

IOUs' roles evolves to a Portfolio Manager, where we rely more on third parties to propose, design and deliver programs



Relevant resource

Lessons Learned from the Application of California's SB 350 and AB 802

In this session, we'll focus on the "California Experiment," including key elements of the state's IOUs' eight-year DSM plans and progress to advance the goals established under two pieces of groundbreaking legislation from 2015: Senate Bill 350 and Assembly Bill 802. SB 350 set California's 2030 greenhouse gas (GHG) reduction target of 40 percent below 1990 levels. To achieve this goal, the state is doubling down on energy efficiency and renewables and reducing GHG emissions. Under AB 802, California became the first US state to mandate that utilities provide energy-usage data to owners of all commercial and multifamily properties so they can benchmark the energy use of their buildings over time.

Moderator: Tim Stout, E Source

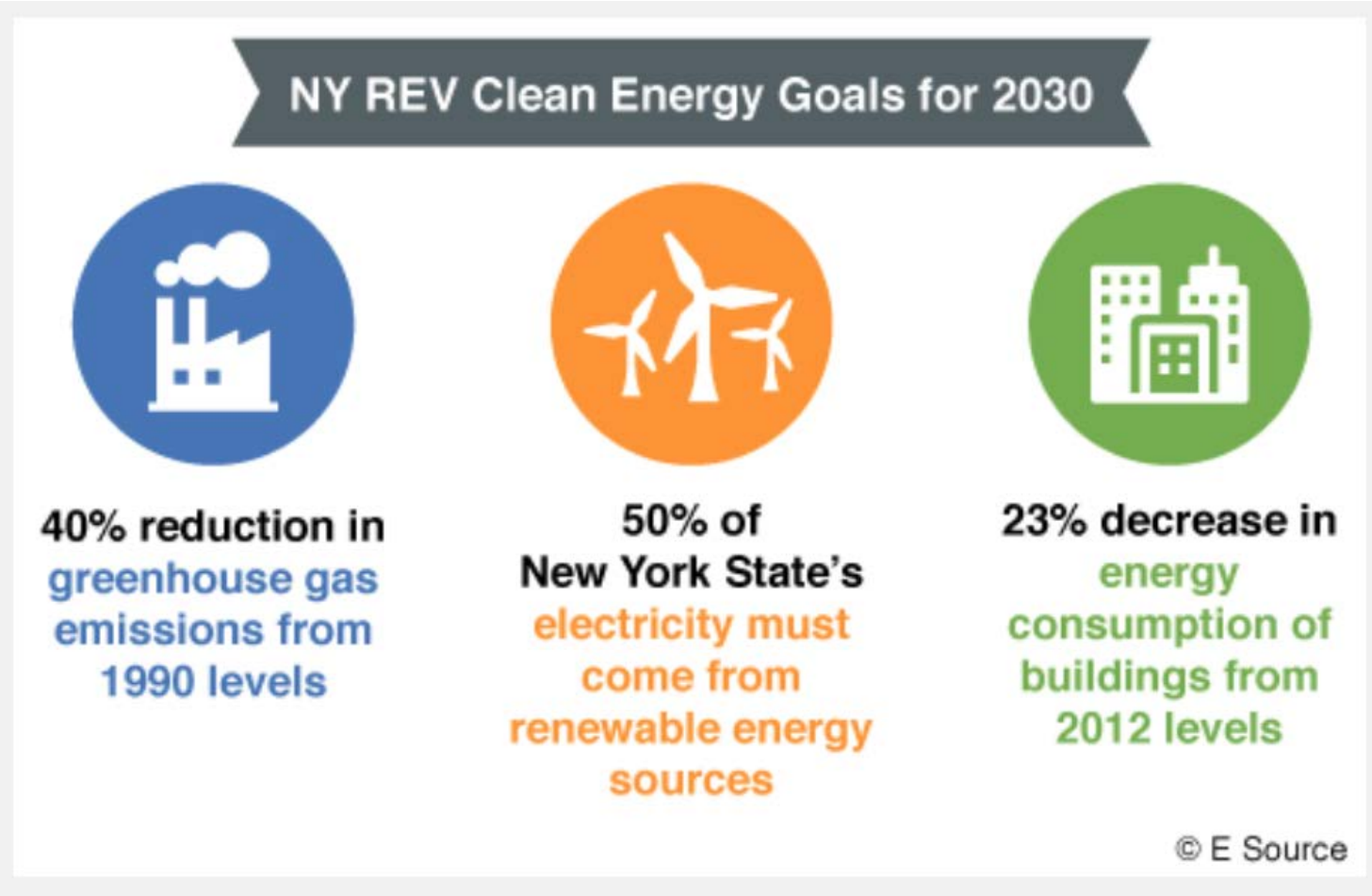
Erin Brooks, Southern California Gas Co.

Meghan Dewey, Pacific Gas and Electric Co.

Download The California Experiment: Creating a New Energy-Efficiency Paradigm (PDF), Erin Brooks and Megan Dewey

www.esource.com/es-1700007-067/esource-forum2017-lessons-california-brooks-dewey.pdf

New York


NY REV Clean Energy Goals for 2030
40% reduction in greenhouse gas emissions from 1990 levels
50% of New York State's electricity must come from renewable energy sources
23% decrease in energy consumption of buildings from 2012 levels
© E Source

Evolving utility business model

Traditional rate base opportunities	New rate base opportunities	Earnings adjustment mechanisms	Platform service revenues (PSRs)
• Pipes & wires • Regulated return on hard assets	• Regulatory assets • DSP and software • Energy efficiency and demand-side	• System efficiency • Energy intensity • Interconnection • Carbon reduction	• Marketplace transaction fees • AMI network use • Other

Non-wires alternatives and demonstration projects

Influence of REV?

- Several factors provide a unique confluence around New Nork's Renewing the Energy Vision (REV):
  - Utility holding companies
  - Single-state ISO (and restructured market)
  - State authorities
  - Executive authority
  - Experience of leadership
- In what form will REV principles migrate to other states?

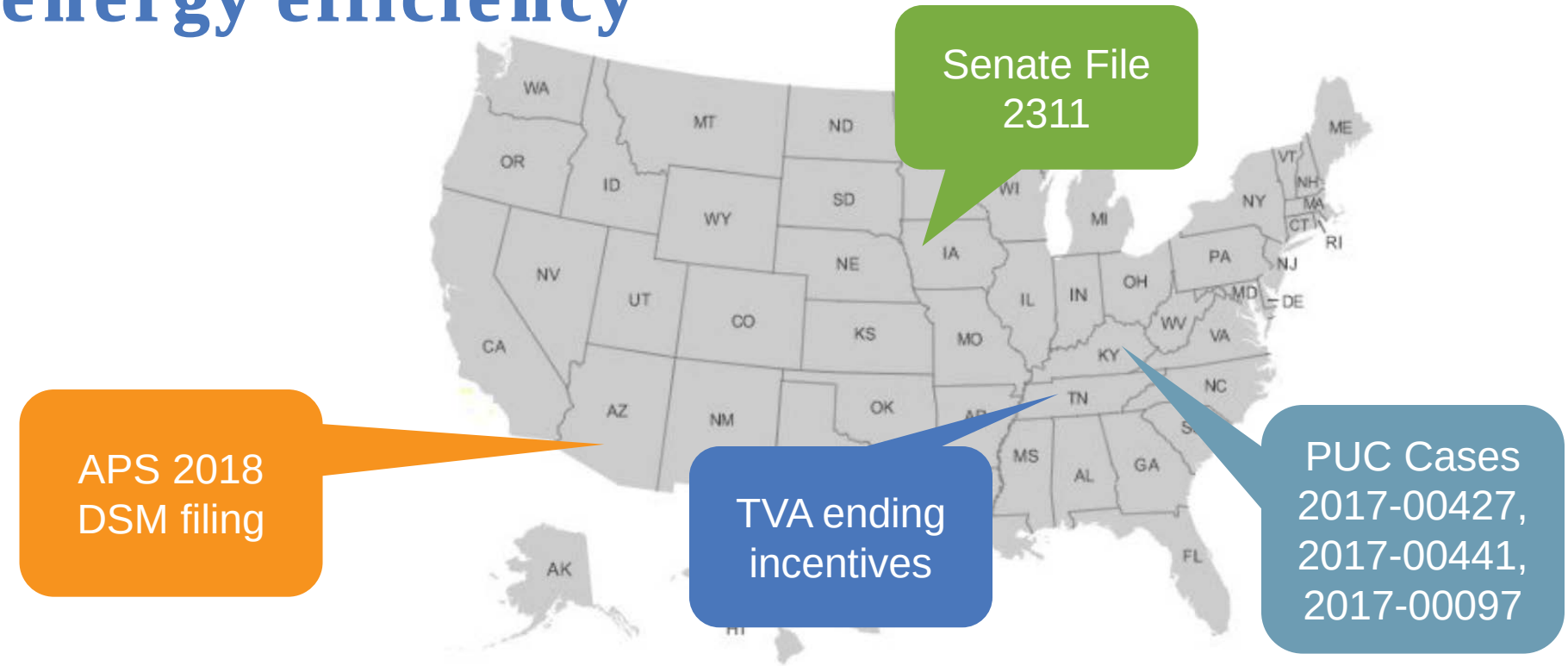
REV implications that may “ripple”?

- DSM is the core of the new model
- Con Edison’s energy-efficiency budget triples!
- Rate-basing energy-efficiency funding instead of using public-benefits funds

REV resources

- New York's Reforming the Energy Vision: Utility Business Models for the Future—Part 1
- Utility Business Models for the Future: A Resource Center
- Thorny Deliberations on DSM Budgets Under New York's Reforming the Energy Vision
- Lessons in Innovation for the Utility of the Future (PDF)

Shifting away from widget-based energy efficiency



Tennessee Valley Authority shifting to electrification

- Shifting all incentives for eScore program to electrification instead of energy efficiency
  - Residential program energy-efficiency incentives unavailable after October
  - Nonresidential energy-efficiency incentives unavailable after June
- Local power companies can offer energy-efficiency incentives on their own

Uncertain future for Iowa energy-efficiency programs

- The governor signed Senate File 2311:
  - Removes requirement for municipal utilities and co-ops to offer energy-efficiency programs
  - Places a spending cap on investor-owned utility energy-efficiency spending; will reduce programs by at least half
  - Allows any customer to opt out of paying for programs in the utility's portfolio doesn't pass the Ratepayer Impact Measure (RIM) test
- See the ACEEE blog post Iowa Takes Huge Step Backward on Energy Efficiency, While Other States Move Ahead

Kentucky: Long on generation

- Duke Energy KY programs currently suspended except low-income programs
- LG&E/KU's 2019–2025 plan features a substantial reduction in energy-efficiency offerings
  - Keeping low-income programs, demand response, nonresidential rebates, and school energy management program
- Kentucky Power suspended all DSM activity

Arizona shifting to load management

- The 2018 plan addresses system conditions and “customer needs”
- Focuses on peak demand reductions, storage, load-shifting, and demand-response programs
- APS has shifted its focus to energy-efficiency programs that conserve energy during peak hours

Connecticut

- Funding was cut for the 2017–2018 cycle by the legislature, leading to decreased savings targets

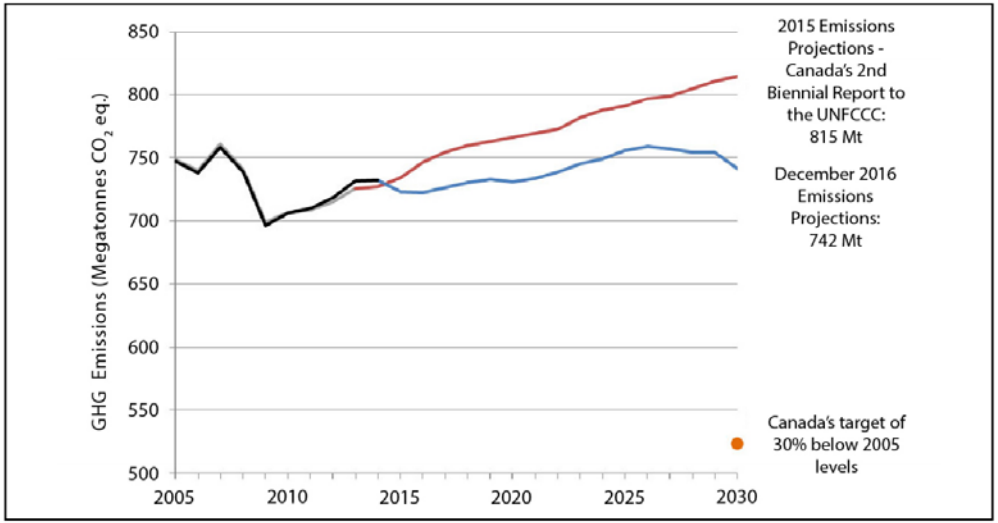
Canadian CDM trends

Pan-Canadian frameworks on clean growth and climate change

Pillars

1. Carbon pricing
2. Complementary actions
3. Climate-change resilience
4. Innovation to accelerate change

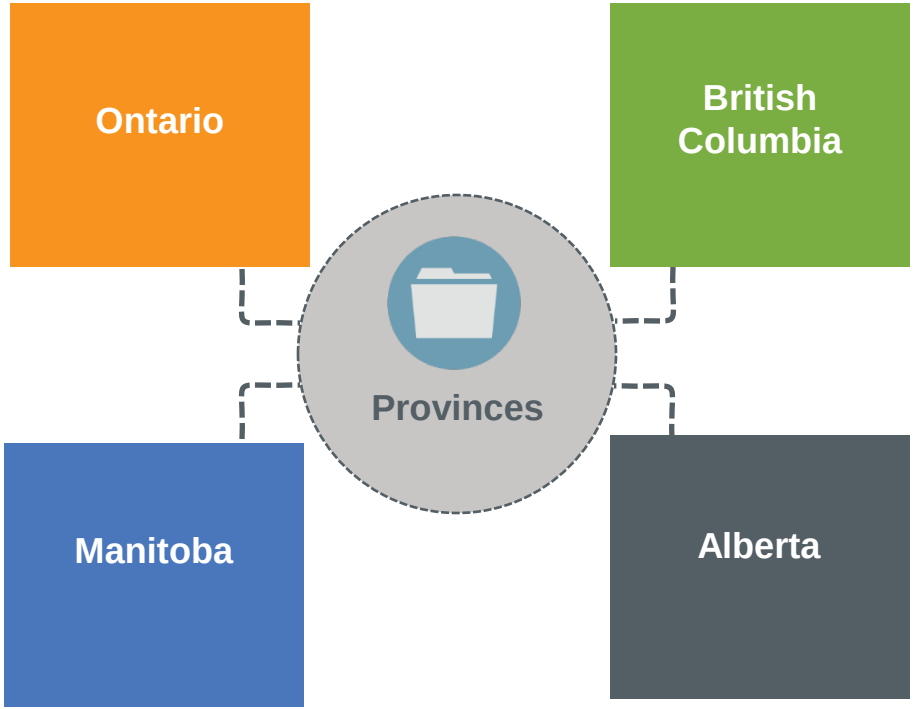
Figure 1: Emissions Projections to 2030



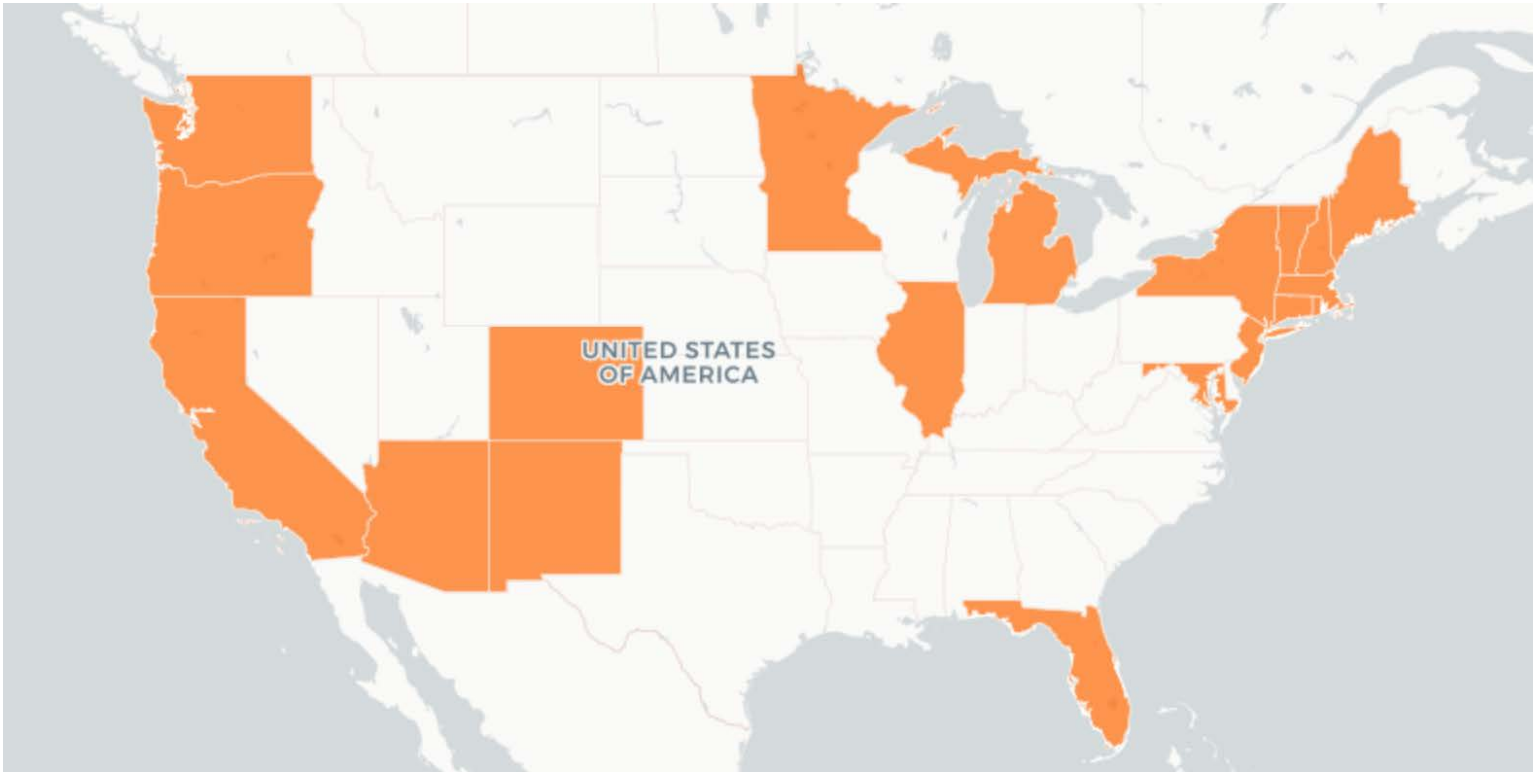
Major initiatives

- Coal phaseouts
- Grid modernization
- Net zero energy–ready
- Energy-labeling requirements
- Beneficial electrification
- Canada infrastructure bank

Spotlight on CDM in Canada



US states with greenhouse gas targets



Source: Center for Climate & Energy Solutions

Projected spending

Projected spending trends

- While overall spending on energy-efficiency programs increased through 2017, it's projected to decline from 2018–2020. Overall, we'll likely see an approximately 3% decrease in energy-efficiency spending between 2018 and 2020.
- However, on average, most utilities are projected to increase their portfolio spending on energy efficiency through 2020.
- Utilities with projected spending declines represent larger utilities with traditionally big energy-efficiency budgets, explaining why overall spend is decreasing even though most utilities will see an increase in spending.

Big utilities with decreases in spending

2016–2019/20

Utility	Amount of decrease ($M)
PNM	30
BGE	25
NV Energy	20
Toronto Hydro	13
Oncor	12
Delmarva Power	11

2018–2019/20

Utility	Amount of decrease ($M)
PSE&G NJ	56
National Grid Niagara Mohawk	55
Hydro One	25
LADWP	21
NV Energy	10

Big utilities with increases in spending

2016-2019/20

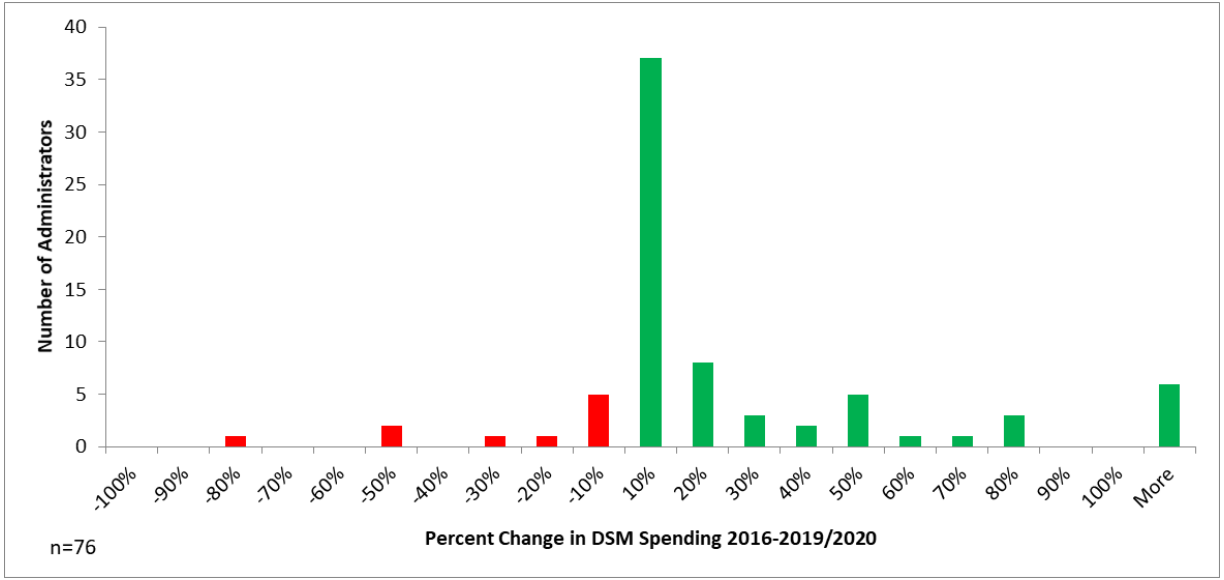
Utility	Amount of decrease ($M)
Efficiency Maine	95
Consumers Energy	54
Public Service of New Hampshire	28
LADWP	27
Georgia Power	27
Enbridge Gas	21

2018-2019/20

Utility	Amount of decrease ($M)
ComEd	49
Ameren IL	21
Public Service of New Hampshire	19
Efficiency Maine	17

Energy-efficiency spending change by utility 2016–2019/2020

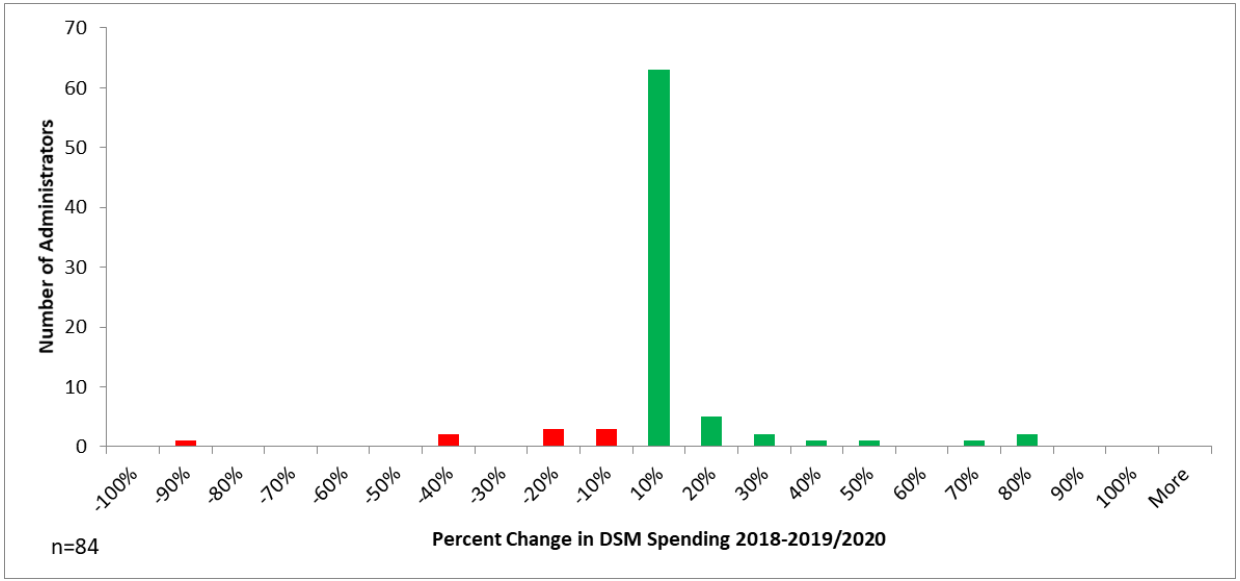
- Most utilities will have about a 10% increase in energy-efficiency spending between 2016 and 2020
- 13% of utilities with a decrease in spending
- ~60% of utilities with an increase in spending of up to 20%



Note: 25 states/provinces represented in this data; California utilities are not included in this analysis because planned spending beyond 2018 is not yet available.

Energy-efficiency spending change by utility 2018–2019/2020

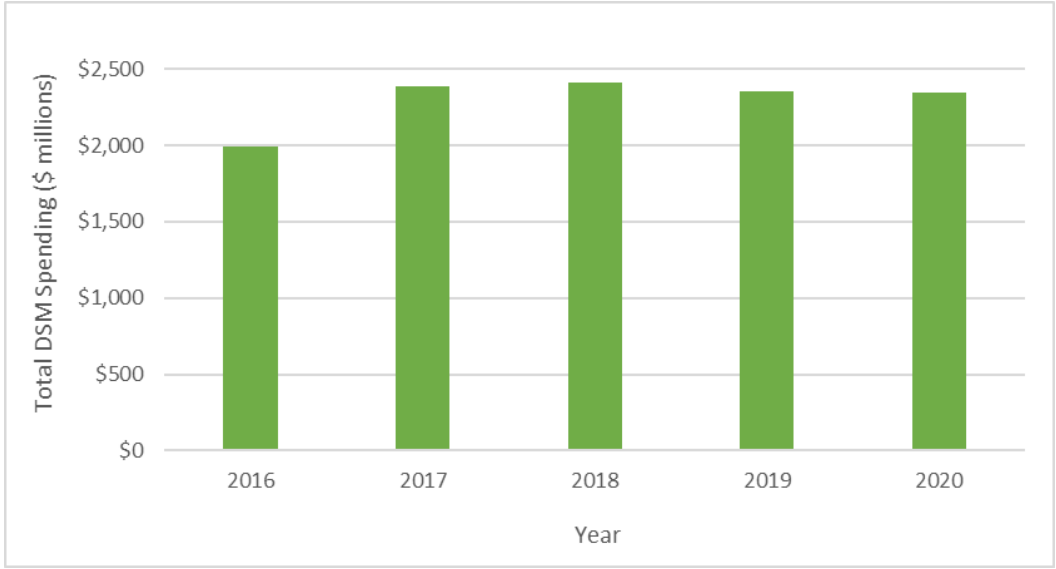
- DSM plans forecast that on an individual basis, most utilities will see about a 10% increase in energy-efficiency spending between 2018 and 2020
- 76% of utilities will see an increase in spending up to 10%
- 12% of utilities will see a decrease in spending



Note: 26 states/provinces are represented in this data.

Total energy-efficiency spending, 2016–2020

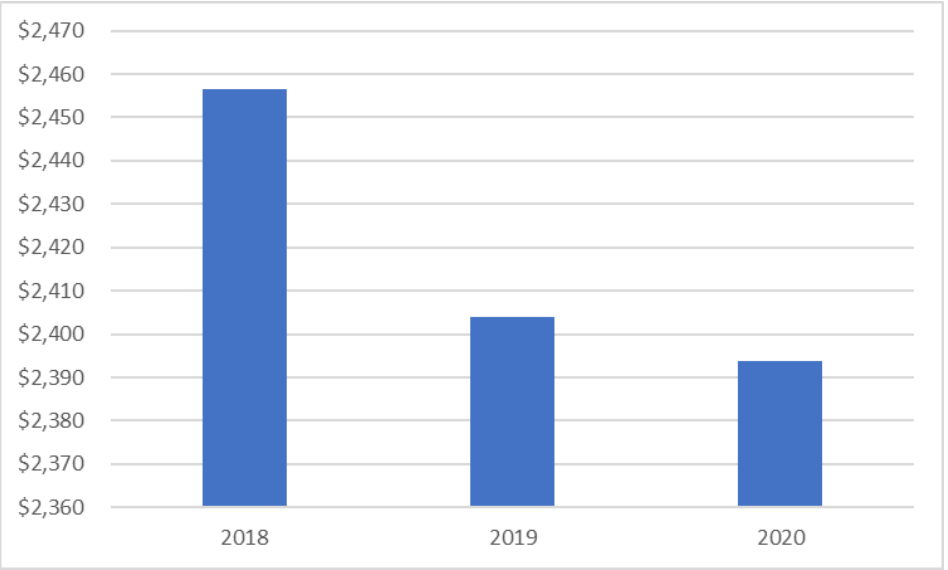
While utilities will see an **18% increase** overall in energy-efficiency spending between 2016 and 2020, spending between 2017 and 2020 is expected to decrease



Note: n = 45; 14 states/provinces are represented in this data. Trends from 2016–2020 include only those utilities that reported spending values for all five years.

Total energy-efficiency spending, 2018–2020

- Overall, we'll likely see a **3% decrease** in efficiency spending between 2018 and 2020
- The three-year picture shows a more recent trend of spending decreases; overall, utilities are increasing spending in portfolios on average, but those that are decreasing spending are big utilities that historically spend a lot on efficiency



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For more information

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Q&A