The Macro View of New Federal & State Energy Legislation that Will Affect You and Your Customers

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Overview

▪ Information for you and your customers:
▪ Federal Legislation compared to CA
  - Almost Done (?) Deals and Done Deals
  - In progress, or not…..
▪ Building Codes / Standards (other states vs. CA)
▪ Federal Regulations compared to CA
  - Some things change, others don’t…..
▪ Transportation Policy – Federal vs CA
▪ Q & A
Overview (part 2)

- “If you see a fork in the road, take it”

- “It’s like déjà vu all over again”
Issue 1 - Federal vs CA Laws
Federal Legislation (1a)

- EPCA 1975
- 1978 NECPA, PURPA, PIFUA
- NAECA 1987 / 1988 amendments
- EPACT 1992
- EPACT 2005
- EISA 2007
- ARRA 2009 Stimulus Bill
- AEMTCA 2012, EEIA 2015, CAA (Dec. 2015)
Federal Legislation (1b)

- Many federal tax incentives expired on 12/31/2016
  - Residential New Homes Efficiency Tax Credit
  - Residential Existing Homes Efficiency Tax Credit
  - Commercial Buildings Efficiency Tax Deduction
  - AFV Infrastructure Tax Credit (residential & commercial)

- Other tax incentives start to phase out
  - Wind starting this year (1/1/2017)
  - Solar (but not until 2020)
Other federal tax incentives are still in place

- Electric vehicle tax credit (up to $7,500 for first 200,000 vehicles per manufacturer, then phase out)
- 50% Bonus Depreciation in 2017
- Small Business 1st Year Expensing
- The 15-year recovery (depreciation) period for qualified leasehold, restaurant, and retail property

- Tax reform could have an impact on these.
Federal Legislation in Progress (1d1)

- Federal Energy Bills
- March 2017 S. 385 – “Energy Savings and Industrial Competitiveness Act” (Portman-Shaheen)
- March 2017 S. 226 – External Power Supply for LED’s bill (Portman / Shaheen / Cantwell)
Federal Legislation in Progress (1d2)

- Federal Energy Bills (continued)
- January 2017 HR 518 – EPS Improvement Act (Dent / DeGette / Guthrie / Matsui) same language as S. 226.
- June 2017 S. 1460 – Murkowski / Cantwell “Energy and Natural Resources Act of 2017”
  - Latest version of comprehensive bipartisan energy bill
  - Legislation was headed straight to Senate floor, without going through any committees.
  - Current status is unclear.
Federal Legislation in Progress(?) (1e)

- Other Issues:
  - Hurricane Harvey Aid, Irma Aid
  - Budget (FY 2018) (CBO: FY 2017 $693 Billion deficit)
  - Debt Ceiling (September December 2017)
  - Tax Reform
  - Infrastructure - $1 Trillion plan (?) including Energy, Transportation, Water, & Broadband (according to DOT)
  - Now, in California…
California Law (1f1)

- **SB 32** – Signed into law in September, 2016
- Requires the state to reduce all Greenhouse Gas (GHG) emissions to 40% below 1990 levels by 2030.
- Previously, The Global Warming Solutions Act of 2006 (AB 32) required that the state CO2e emissions be equal to the 1990 levels by 2020. According to CARB:
  - In 1990, CA emissions were 431 Million Metric Tons.
  - In 2014, CA emissions were 441.5 Million Metric Tons.
  - In 2015, CA emissions were 440.4 MMT
California Law (1f2)
California Law (1f3)

- **SB 32** - By 2030, the emissions will have to be less than or equal to 258.6 MMT of CO2e. (2030 = **42.2% reduction** from 2015, lower CO2e emissions by > 12.1 MMT every year)

- The current CARB calculations:
  - **Include** emissions from electricity imports (out of state generation)
  - **Exclude** interstate / international aviation emissions, ship emissions, and fuels purchased outside of CA by cars, trucks, and trains. (source: CARB “California Greenhouse Gas Emissions Inventory for 2000 to 2015”, June 2017)
California Law (1f4)

2015 Total CA Emissions: 440.4 MMTCO2e
California Law (1f6)

- AB 398 – Cap and Trade, Signed into law July 2017
- Extends the Cap and Trade Program to 2030 (from current end date of 2020). Revenue: ~$1.5 Billion / yr
- CARB required to set price floor ($/MT of CO2), price ceiling, and “speed bump” provisions
- August 2017 Advance Auction Settlement Price was $14.55 / Metric Ton
- [https://www.arb.ca.gov/cc/capandtrade/auction/results_summary.pdf](https://www.arb.ca.gov/cc/capandtrade/auction/results_summary.pdf)
California SB 1 (1f7)

- Road Repair & Accountability Act of 2017
  - Signed by Governor Brown on 4/28/17. ($5.2 Billion / year)
  - Increases state diesel fuel tax by $0.20/gallon as of 11/1/2017
  - Increases state diesel fuel sales tax by 5.75% on 11/1/2017
  - Increases state gasoline tax by $0.12/gallon as of 11/1/2017
  - Vehicle license fees increase by ~ $38 / vehicle on 1/1/2018
  - EV’s have a new $100 registration fee as of 1/1/2018
  - New annual “Transportation Improvement Fee” based on the market value of your vehicle ($25 to $175) as of 1/1/2018
  - Taxes and fees adjusted for inflation annually.
California SB 584 100 (1f8)

- Introduced in February 2017 and revised.
- Changes the current 50% RPS by 2030 to:
  - 50% RPS by 2026, and **60%** RPS by 2030
- Policy goal (**not** mandate) of **100%** RPS by 2045
- Status: Passed CA Senate by 25-13 on 5/31/17, and now going through the CA Assembly (vote by 9/15?).
- CEC goal: **All** new commercial buildings “ZNE” by 2030, Residential “ZNE” by 2020
Other California Proposals (1f9)

- A.B. 1184 – Requires CARB to issue a report on ZEV incentives (and changes needed) by 1/1/2019 (bill started out as a $3 Billion increase in EV incentives)
- A.B. 193 – Extends rebate program to apply to used all-electric vehicles bought from dealers (up to $1800)
- A.B. 1082 – Authorizes utilities to start pilot programs to install charging stations at public schools.
- A.B. 813 – Allows utilities to procure renewable energy faster than RPS targets to take advantage of federal renewable energy tax credits.
Issue 2 – Building Codes / Standards (Fed vs CA)
ASHRAE 90.1-2016 published last October.

Under Federal law, States had until September 2016 to meet or exceed the 2013 version of ASHRAE 90.1 for commercial buildings.

How have states responded?

- (source: http://bcap-energy.org/code-status/commercial/)
Building Codes / Standards (2a1 Com)
Building Codes / Standards (2b)


- Under Federal law, States had until June 2017 to meet / exceed the 2015 version of the IECC Residential Energy Code provisions.

- How did states respond?

(source: http://bcap-energy.org/code-status/residential/)
This map shows effective statewide residential energy codes as of March 1, 2017.
ASHRAE 90.1-2016

121 changes have been made since 2013

DOE estimated site energy savings of 6.7% in the 2016 version compared to the 2013 version (as of July, 2017).

The Lighting Power Density (LPD) reductions, based on LED technology, played a key role in the savings.

PNNL estimated that 90.1-2016 saves 34.1% on a site energy basis compared to the 90.1-2004 version.
Building Codes / Standards (2c2)

- ASHRAE 90.1-2016 – Big Changes
- New Climate Map based on ASHRAE Standard 169
- Updated Equipment Efficiency / Envelope Tables
- Indoor Lighting Power Densities are lowered
- Outdoor Lighting Power Allowances are lowered
- Outdoor parking lot fixtures are required to dim by at least 50% after 15 minutes of no noticed activity while your business is open.
Building Codes / Standards (2d1)

- Public Comment Hearings ended in October, 2016.
- There were 297 commercial energy code proposals that were considered.
- Then there was the on-line code official voting that was the “final say”. It occurred in November, 2016.
Resulting Big Issues (compared to 90.1-2016):

- Many of the IECC Equipment Efficiency tables were not updated.
- The IECC Climate Zone map was not updated (affects insulation and window requirements that are based on climate zone).
- Much of the performance path was not updated.
- Other ASHRAE 90.1 efficiency improvements were not adopted into the IECC.
- As a result, there are significant differences between ASHRAE 90.1-2016 and IECC 2018.
- IECC can’t be changed for 3 years; 90.1 is on continuous maintenance.
Under current Federal law (nothing has changed):

DOE is required to publish a final determination on ASHRAE 90.1-2016 by October 2017. Preliminary Analysis published 7/25/17.

If the determination is positive, states will have 2 years to update their commercial building energy codes to meet or exceed 90.1-2016.

After the IECC gets published (Sept 2017?), DOE will be required to publish a final determination of IECC 2018 within one year.

If the determination is positive, states will have 2 years to update their residential building energy codes to meet or exceed the IECC 2018.
California Building Codes (2e)

- Title 24  2016 version – passed CEC in June 2015, in effect for all new commercial buildings as of 1/1/2017
- As shown in a previous slide, it exceeds the requirements of ASHRAE 90.1-2013.
California Building Codes (2f1)

- Title 24-2019 version: In progress. CEC policy goals:
  - Commercial buildings: “Zero Net Energy” by 2030
  - Current RPS = 33% by 2020, 50% by 2030
  - CPUC: % of RPS procurement currently under contract for 2020: PG&E 43.0%; SCE 41.4%; SDG&E 45.2%  
    http://www.cpuc.ca.gov/RPS_Homepage/
  - SB 100 – 60% RPS by 2030?
  - Next slide: CA ISO Renewables Watch April 14, 2017
California Building Codes (2f2)

Hourly Average Breakdown of Total Production By Resource Type

This graph depicts the production of various generating resources across the day.

Previous Renewables Watch reports and data are available at http://www.caiso.com/green/renewableswatch.html
Issue 3 – Fed vs CA Regulations
Federal Regulations (3a)

- DOE was very busy in the last half of 2016 and until late January 2017. New final rules for efficiency were published or “pre-published” for several products.
- In January, the new administration issued a 60-day regulatory review period (“freeze”), similar to past administrations.
- In March, the effective dates were changed by 3-6 months for certain products.
- By July, compliance dates were re-certified. No changes at all.
Federal Regulations (3b)

- Commercial Rooftop AC and HP units: Stage 1 increase in standards on 1/1/2018
- Beverage Vending Machines: New and increased standards start in January, 2019
- Commercial Pre-Rinse Spray Valves: January 2019
- Ceiling Fans: New / Increased Stds January 2020
- Commercial / Industrial Pumps: New federal minimum efficiency standards start in January, 2020
Federal Regulations (3c1)

- Walk-in Coolers and Freezers: Revised increased standards went into effect in June 2017, enforcement starting in 2020 (DOE / manufacturer settlement)
- Residential Central Air Conditioners and Heat Pumps increase efficiency standards on 1/1/2023
- Commercial Rooftop Warm Air Furnaces: Increasing standards as of January 2023
- Commercial Rooftop AC and HP Units: Stage 2 increase in standards on 1/1/2023
Federal Regulations (3c2)

- Final Rules that *may be* published this fall (DOE):
  - Commercial / Industrial Air Compressors
  - Portable Air Conditioners
  - Consumer Ovens/Ranges ("conventional cooking")
  - Walk-in Coolers & Freezers
  - Uninterruptible Power Supplies
  - Residential Gas Furnaces
  - Mobile Home Gas Furnaces
Federal Regulations (3d1)

- General Service Lamps: EISA 2007
  - Phased out least efficient light bulbs from 2012-2014, with 5 category exceptions (such as 3-way lamps, rough service, etc)
  - Required a DOE rulemaking by 1/1/2017, to go into effect on 1/1/2020
  - If no DOE rule, the law had a “backstop requirement” of 45 lumens / Watt for general service lamps (2 times higher than current halogens)

- DOE issued the proposed rule in March 2016. DOE has not published the final rule yet.
Federal Regulations (3d2)

- NEMA data:
  - Q1 2012
  - LED – 0.0%
  - CFL – 31.0%
  - Inc – 66.2%
  - Hal – 2.5%

  Weighted Ave:
  ~ 27.8 lum / W

 Q1 2017
 LED – 32.0%
 CFL – 13.3%
 Inc – 9.6%
 Hal – 45.1%

 Weighted Ave:
 ~45.1 lum / W
Federal Regulations (3d3)

- EISA 2007 – “Backstop” of 45 lumens / Watt as of 1/1/2020
- DOE (2016 / Jan 2017): On a per lamp basis
- NEMA: Why not on a weighted average basis, based on consumer choice?
  - (NEMA has sued DOE over this rulemaking)
- Status of federal regulations is unclear

- Now, in California, there is more clarity…
California Regulation (3e1)

- General Service Lighting: In January, 2016, the CEC adopted new standards for LED general service light bulbs (and small diameter direction lamps, like MR 16’s)
- Tier 1 takes effect on January 1, 2018
- Tier 2 for general service LED’s starts on July 1, 2019
- What are the impacts of this regulation?
California Regulation (3e2)

- NEMA
- Chart
- (2016):

Proposed Compliance Equations and Medium Screw Base Omnidirectional Performance Data from Energy Star and Lighting Facts Lists

CCT ≤ 3000K
R9 not specified
What about other products?

Illuminating Gas Lamp
- 2,500 Btu / hour (= 732.5 Watts)
- 800 Lumens (1.09 lumens / Watt)
- 20+ Year Life
- Continuously Burning Pilot Light, so
- Standby mode energy = 2,500 Btu / hour (732.5 W)
- 18 therms / month, 216 therms / year

LEGAL in 2018 and 2019! (based on current versions of Title 20 and 24)
California Regulation (3e4)

- Other Current CEC Title 20 Rulemakings: (Déjà vu all over again!)
- Commercial / Industrial Fans & Blowers
- Commercial Tumble Dryers
- Pool Pumps and Pool Pump Replacement Motors
- Portable Electric Spas
- Set Top Boxes
- Low Power Mode & Power Factor (networked equipment)
- Solar Inverters
- Air Filter Labeling
- Water products (tub spout diverters, spray sprinklers, irrigation controllers)
Issue 4 – Fed vs CA Transportation
Federal Transportation Regs (4a)

- Light Duty Vehicles: EPA to review 2022-2025 Determination, NHTSA to have a full Rulemaking.
- EPA Mid-Term Determination came out in Jan. 2017 (it was originally due in 2018). Now, EPA is going to review the determination.
- Note that standards (tailpipe GHG emissions and the fuel economy standards) are locked into place until Model Year 2021 2020.
- They are going to review the 2021 values as well.
### Table 1. NHTSA Estimated\(^9\) Required Average Fuel Economy (mpg) under the Final Standards – MYs 2017-2021

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<td><strong>Passenger cars</strong></td>
<td>2010</td>
<td>38.2 –</td>
<td>39.6 –</td>
<td>41.1 –</td>
<td>42.5 –</td>
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<td>41.6</td>
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<td>44.8</td>
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<tr>
<td><strong>Light trucks</strong></td>
<td>2010</td>
<td>28.9 –</td>
<td>29.1 –</td>
<td>29.6 –</td>
<td>30.0 –</td>
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<td><strong>Combined</strong></td>
<td>2010</td>
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For 2022-2025, annual increase in stringency for cars is about 4.7% (versus 3.8% in 2017-2021). For trucks, the annual increase in stringency is about 4.9% (versus 2.6% in 2017-2021).

Table 2. NHTSA Estimated\textsuperscript{9} Required Average Fuel Economy (mpg) under the Augural Standards – MYs 2022-2025

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<th>MY Baseline</th>
<th>2022</th>
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Federal TransportationRegs (4d)

- Graphically:
CARB Mobile Source Strategy, May 2016

Calls for putting more than 4.2 Million PHEV’s and BEV’s on the road in CA by 2030

- Now, the current population of BEV’s in CA is about 139,000 and 123,000 for PHEV’s. (Auto Alliance).

Calls for increasing overall passenger fleet fuel economy to 49 mpg by 2030

- Now, the overall fleet fuel economy is about 24 mpg

Table 3 of the report highlights 20+ programs/policies for on-road and off-road vehicles.
CA Transportation Regs (4f1)

- CA Light Duty Vehicles as of 2016 (Auto Alliance info)
- 30.62 Million Registered Vehicles
- Average Age of CA vehicles = 10.8 years
  - Cars: 15.8 Million (51.72%)
  - SUV’s / CUV’s: 7.7 Million (25.30%)
  - Pickup Trucks: 4.8 Million (15.7%)
  - Vans / Minivans: 1.9 Million (6.2%)
- 93.47% Gasoline, 2.41% Diesel, Hybrids: 3.2%
- PHEV’s: 0.40%    BEV’s: 0.45%
CA Transportation Regs (4f2)

- CA Light Duty Vehicle **2016 Sales** (Auto Alliance info)
- 2.09 Million Vehicles sold (median age ~14-15 years?)
  - Cars: 1.098 Million (52.64%)
  - SUV’s / CUV’s: 0.683 Million (32.71%)
  - Pickup Trucks: 0.215 Million (10.32%)
  - Vans / Minivans: 90,368 (4.33%)
  - 89.46% Gasoline, 2.28% Diesel, Hybrids: 4.74% (98,854)
- PHEV’s: 1.59% (33,135)  BEV’s: 1.93% (40,347)
- US sales 2016: 158,614 PHEV’s + BEV’s
CA Transportation Regs (4g)

- CNCDA (CA New Car Dealers Association), California Auto Outlook™, Aug 2017 (Vol 13, #3), Data Source: IHS Markit
- Sales forecast of 2.05 Million vehicles for 2017
- Light Truck Market share for 1st Half of 2017: 50.1%
- Hybrids: 4.5%
- PHEV’s: 2.1% (21,065) 2017 Total PEV’s:
- BEV’s: 2.5% (25,632) = 46,697
- To reach CARB goals, PHEV/BEV sales need to be > 300,000 per year, or 15%+ market share as of 2018.
CA Transportation Regs (4h)

- (Federal incentives phase out at 200,000 sold per automaker)

2015 Total CA Emissions: 440.4 MMTCO2e
Summary

▪ Across the US, appliances, buildings, and vehicles will become more efficient over the next several years (to 2023) due to existing / current laws, final rules, and building energy codes that are “locked into place”.
▪ California is on a much more aggressive path in all areas.
▪ Tax reform will likely change Federal tax incentives, but may or probably won’t go into effect until next year.
Q & A

- The floor is open!