



New Commercial ZNE Action Plan Workshop

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California's Policy Goals

Sector	Type	Now	2020	2025	2030	2050
Residential	New Construction ZNE		100%			
	Existing Homes (reduction relative to 2005 stds)		40%			
Commercial	New Construction ZNE				100%	
	Existing ZNE				50%	
State buildings	New construction & major retrofit ZNE		50%	100%		
	Existing (by square footage) ZNE			50%		
SB 350	Increase energy efficiency in buildings				50%	
AB 32	GHG Levels		Achieve 1990 Levels		40% Below 1990 Levels	80% Below 1990 Levels
Water Efficiency	Reduce Water Use	25%				

*Supporting
Agencies:*



Note: Residential and commercial goals initially established in California's *Long Term Energy Efficiency Strategic Plan*, developed by the CPUC. The State buildings goal was established by Governor Brown's Executive Order B-18-12.

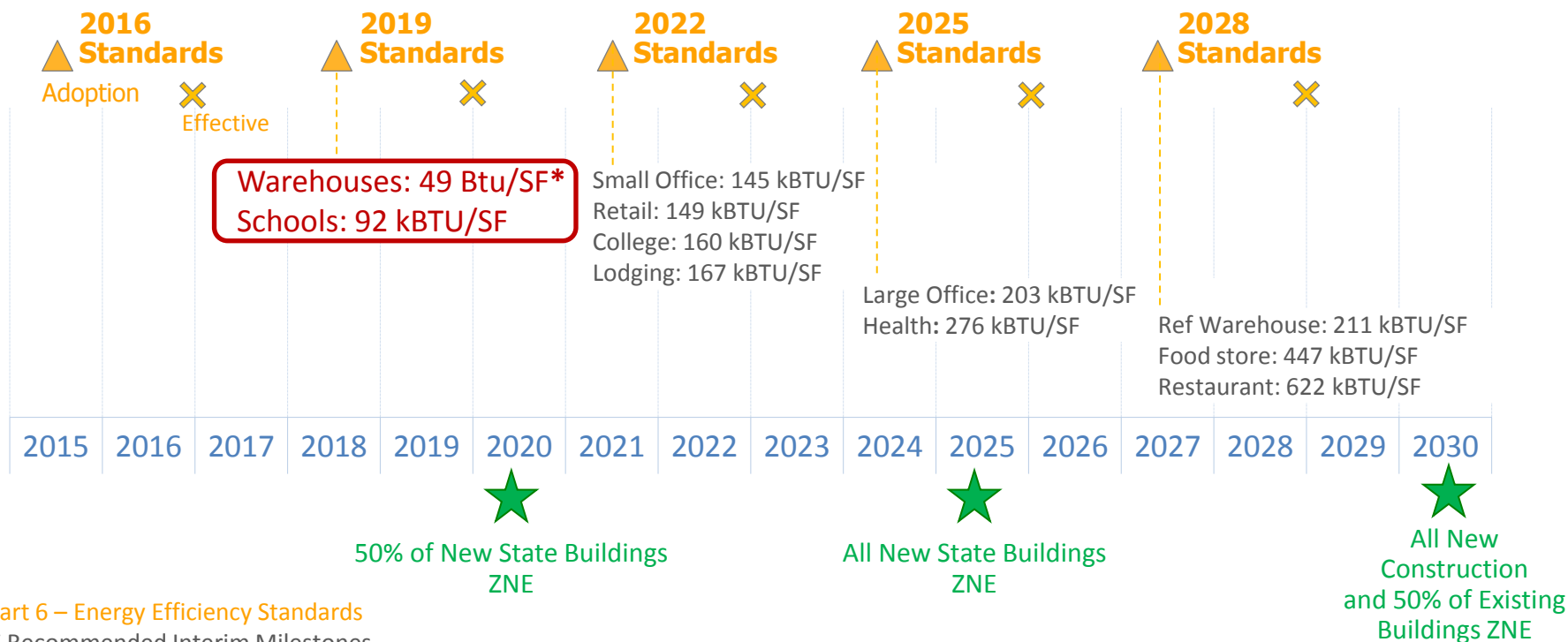


Nonresidential ZNE New Construction by 2030

Easiest Building Classes First and Support Exec Order

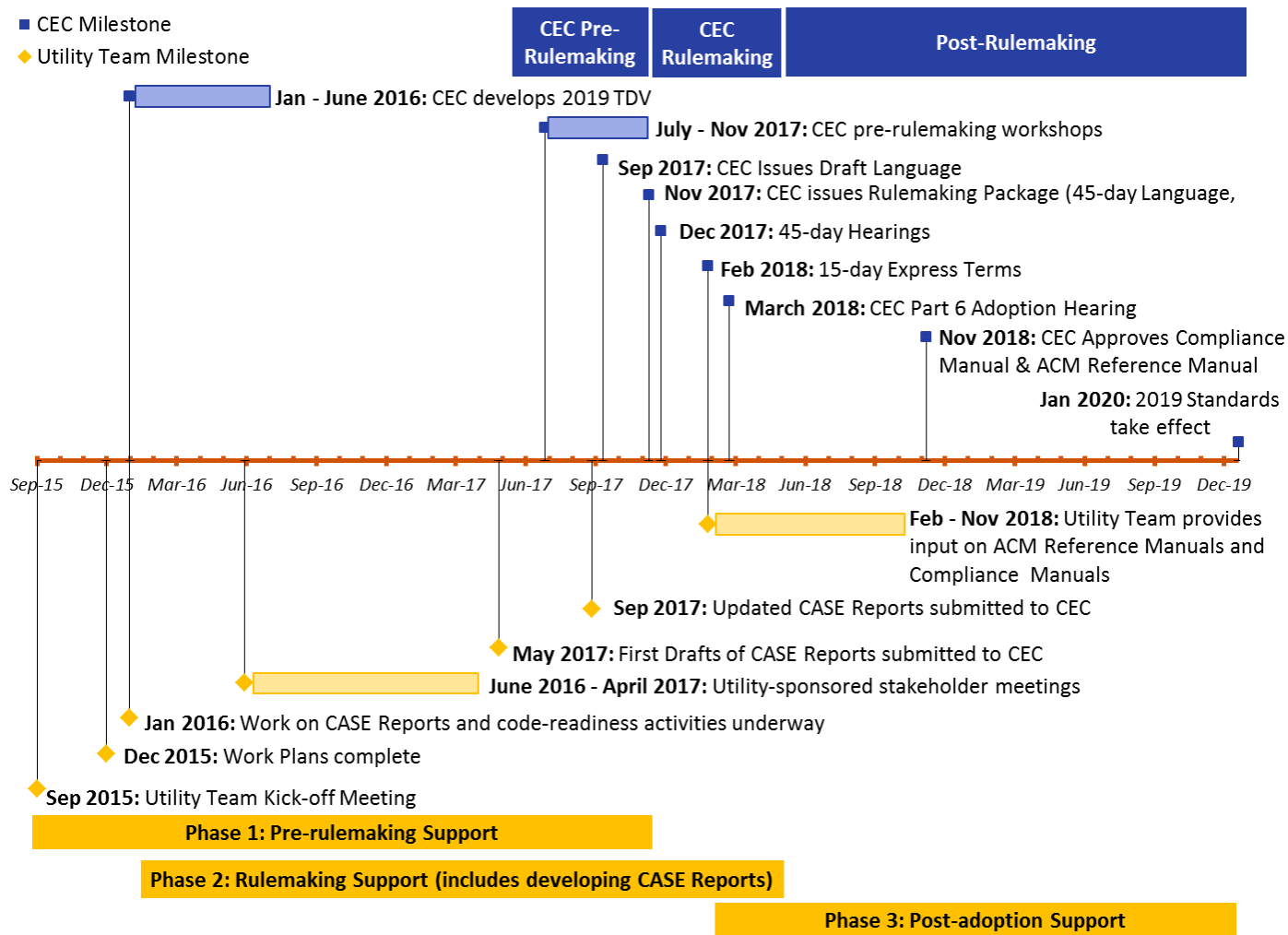
Start now doing buildings that are easier.

Begin with End in Mind





2019 Title 24 Timeline

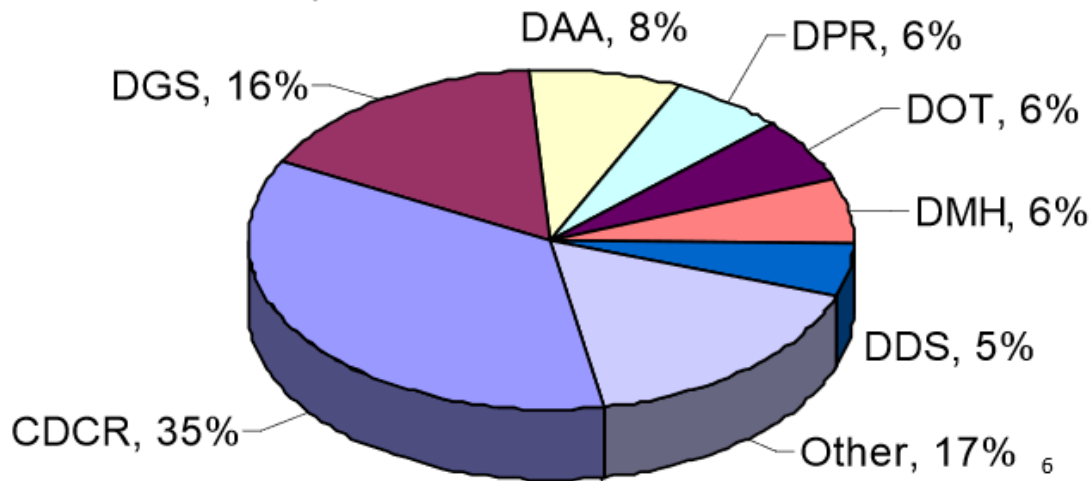


State Owned Buildings

State of CA Owned Facilities



- 33 State agencies own buildings
 - Executive branch buildings only, does not include higher educ.
- >1700 facilities
- 110 million sq. ft.



- CDCR = Corrections and Rehabilitation,
- DGS = General Services,
- DOT = Transportation,
- DAA=District Agricultural Association,
- DPR = Parks and Recreation,
- DMH = Mental Health,
- DDS = Developmental Services



2020 Commercial NC ZNE Goals

Warehouse

- Envelope design: Unrefrigerated Warehouse
- Optimal Warehouse HVAC
- DR Controls Forklift Charging
- **Warehouse Indoor and Outdoor Lighting & Controls**
- Warehouse PV
- PV + Storage Integration

Schools

- **School indoor lighting & controls**
- School daylighting
- School outdoor lighting & controls
- **High eff low load HVAC & controls** – radiant, mini-split, heat pump
- Dedicated Outside Air Supply (DOAS)
- Natural ventilation (operable windows)
- Improved ventilation
- Advanced air conditioning systems
- Occupant based comfort
- Standardized Optimized Controls
- Improved lab fume hoods
- Efficient School Kitchens
- Plug load controls for schools
- Efficient hot water systems
- High perform relocatable classrooms
- Water reduction at schools
- Emergency generation, storage and PV

State Buildings

- ZNE Definition, EDRating = 0 TDV
- Simulation model defining TDV ZNE Comm Bldg
- Plug Load Model Comm Buildings
- Drainwater Heat recovery and heat recovery from Ac to pre-heat water
- Lighting and Daylighting Controls
- Daylighting: Window VT and Overhangs
- **High eff low load HVAC**
- Dedicated outdoor air systems (DOAS)
- Improved ventilation
- Water reduction measures
- Emergency gen, storage and renewables
- **High eff lab fume hoods**
- High eff kitchens
- ZNE State Building Retrofits

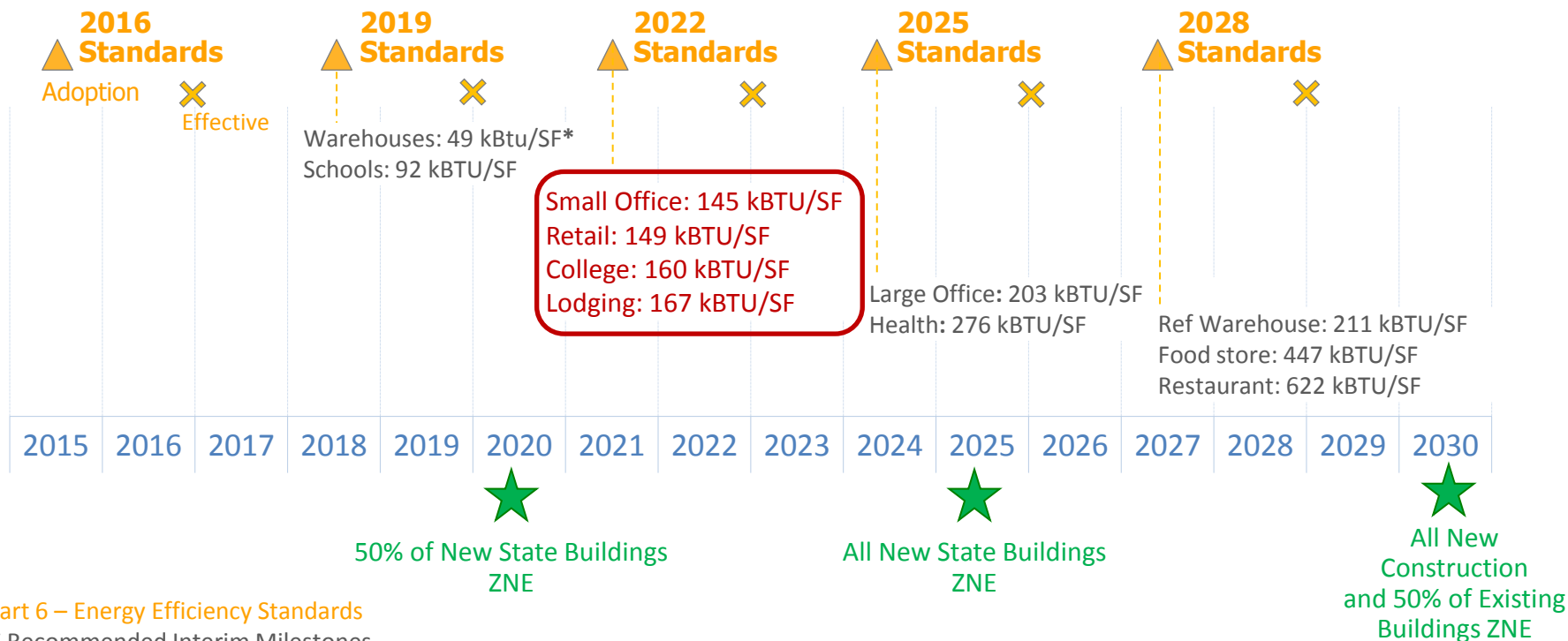


Nonresidential ZNE New Construction by 2030

Moderate Difficulty in 2022 Std also Office Overlaps with State Bldg

Start now doing buildings that are easier.

Begin with End in Mind





2022 Commercial NC ZNE Goals

Offices

- Simulation models for advanced HVAC
- **Office indoor & outdoor eff lgtg & controls**
- Office daylighting and glazing VT
- **High eff low load HVAC & controls**—radiant, mini-split, heat pump
- Improved ventilation
- Office water reduction
- Emergency generation, storage & PV
- Energy use display
- Efficient envelope
- Natural ventilation (operable windows)
- Advanced air conditioning systems
- Building level controls, including plug load controls

Retail

- **LED display and general lighting**
- Task/ambient lighting design
- **Occupancy sensor control of display and/or general lighting**
- Occupancy sensing controlling TV's and other equipment displays
- Warehouse measures
- Bi-level motion controlled parking lighting (including tall poles)
- Env retrofits incl cool roofs

Lodging

- **Drain water heat recovery**
- **Central scheduling control** — ventilation and purge control
- All high efficacy lighting
- High eff elevators and regeneration
- Operable windows with window HVAC lock-out switches
- Set top box scheduling and sleep mode
- Exhaust air heat recovery
- Electric vehicle charging
- Solar pool heating



Federal Process Timeline

- According to U.S. Code (42 U.S.C. 6295(m)), DOE shall revisit a standard every **6 years** after issuance of any final rule and shall publish
 - a notice of the determination of the Secretary that standards for the product do not need to be amended
OR
 - a notice of proposed rulemaking including new proposed standards



DOE Standards Likely to be Developed or Revised between 2015 and 2030

Nonresidential

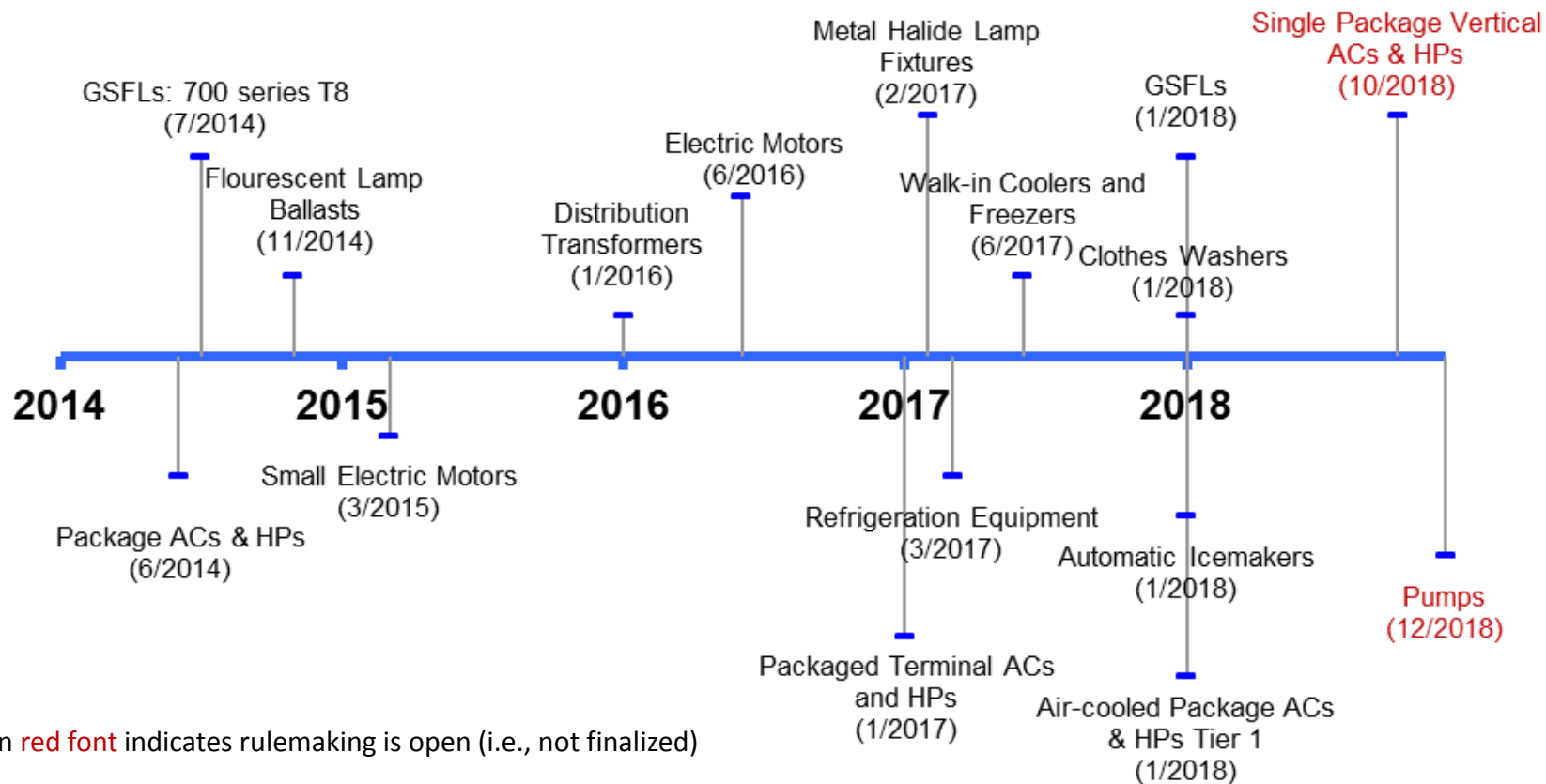
- Automatic Icemakers
- Clothes Washers
- Compressors
- Distribution Transformers
- Electric Motors
- Fans and Blowers
- Prerinse Spray Valves
- Pumps
- Refrigeration Equipment
- Small Motors
- Vending Machines
- Walk-in Coolers and Freezers
- Water-source HPs
- Packaged Boilers**
- Package ACs & HPs**
- Package Terminal ACs & HPs**
- Single Package Vertical ACs & HPs**
- Warm-air Furnaces**
- Water Heaters**

Lighting

- Candelabra & Intermediate Base Incandescent Lamps
- Ceiling Fan Light Kits
- Compact Fluorescent Lamps
- Fluorescent Lamp Ballasts
- General Service Fluorescent Lamps
- General Service Lamps
- HID Lamps
- Incandescent Reflector Lamps
- Incandescent Reflector Lamps (includes certain BR and Other Exempted IRLs)
- Mercury Vapor Lamp Ballasts
- Metal Halide Lamp Fixtures



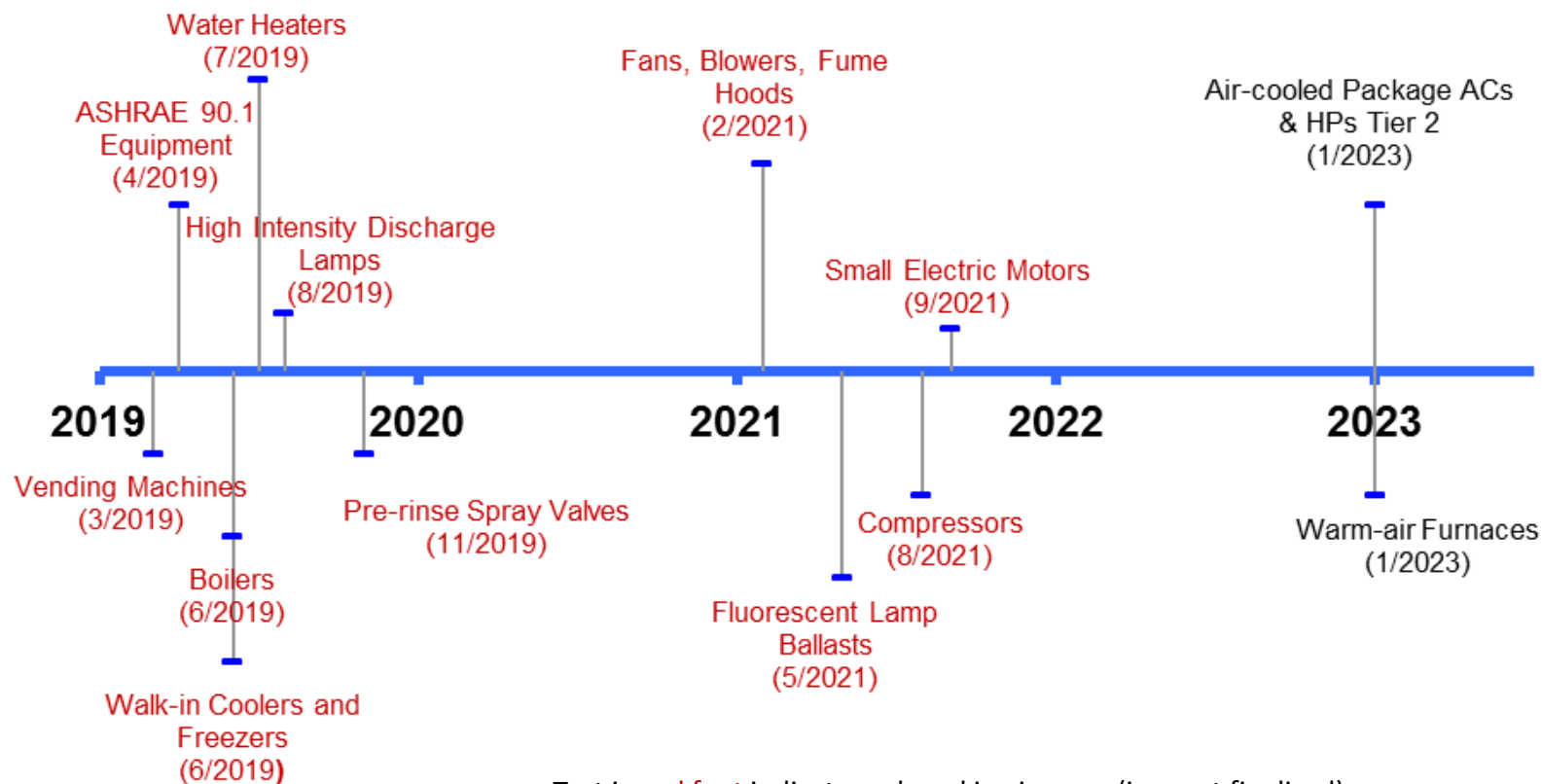
Near Term Federal Appliance Std



Text in red font indicates rulemaking is open (i.e., not finalized)



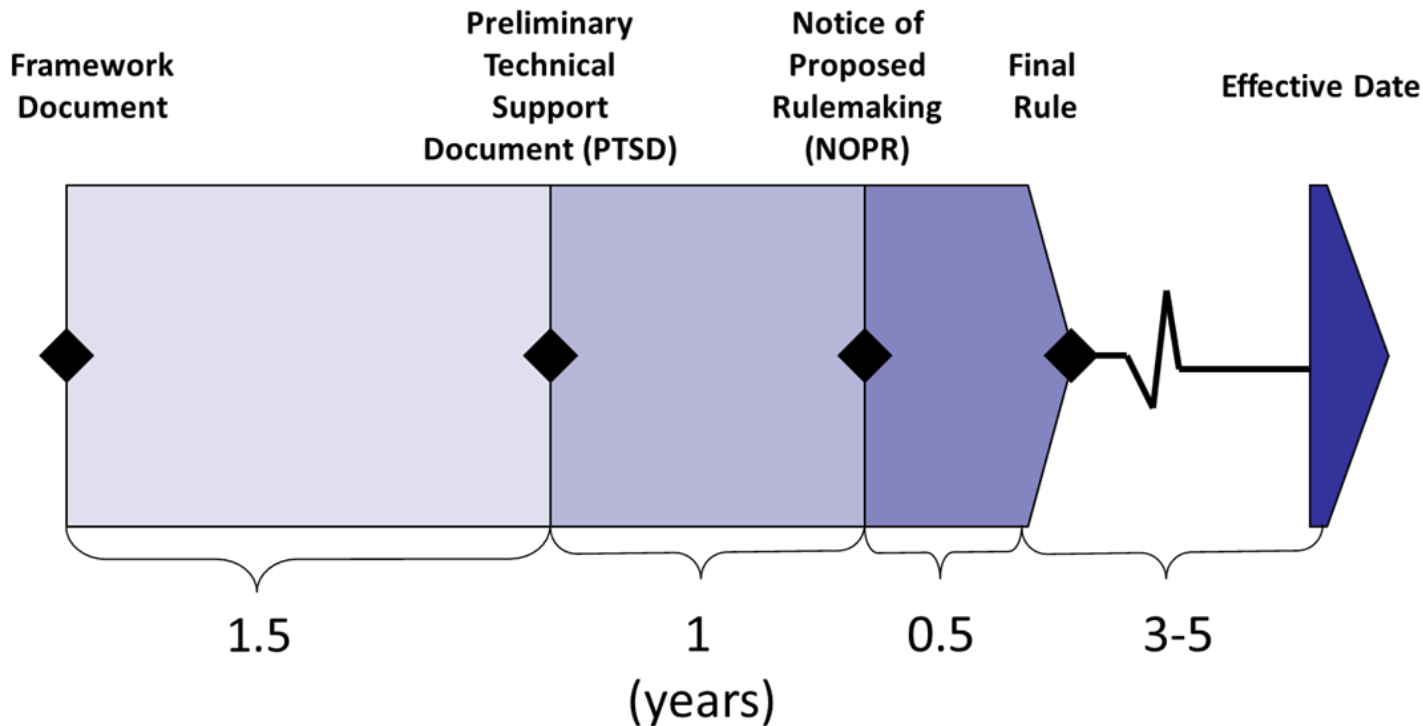
Medium Term Federal Appliance Stds



Text in red font indicates rulemaking is open (i.e., not finalized)

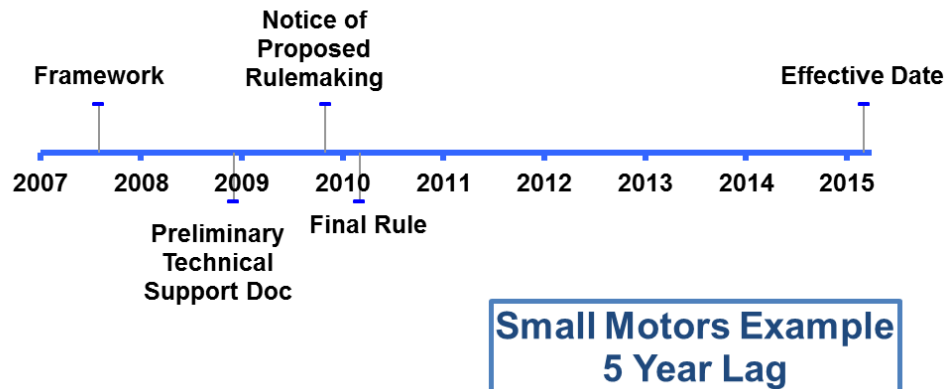
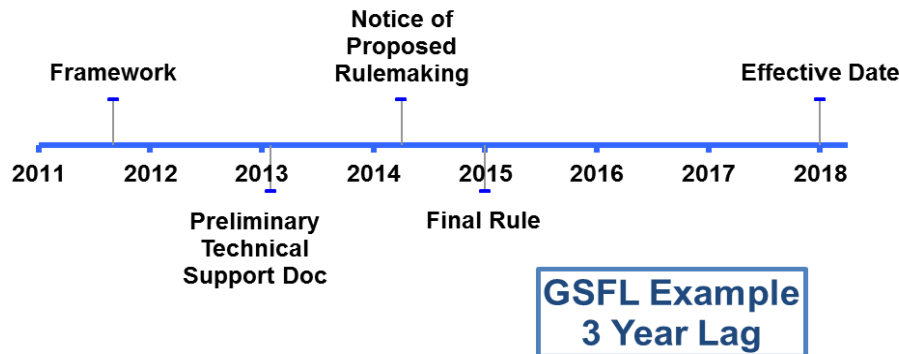


DOE Process and Timeline: General





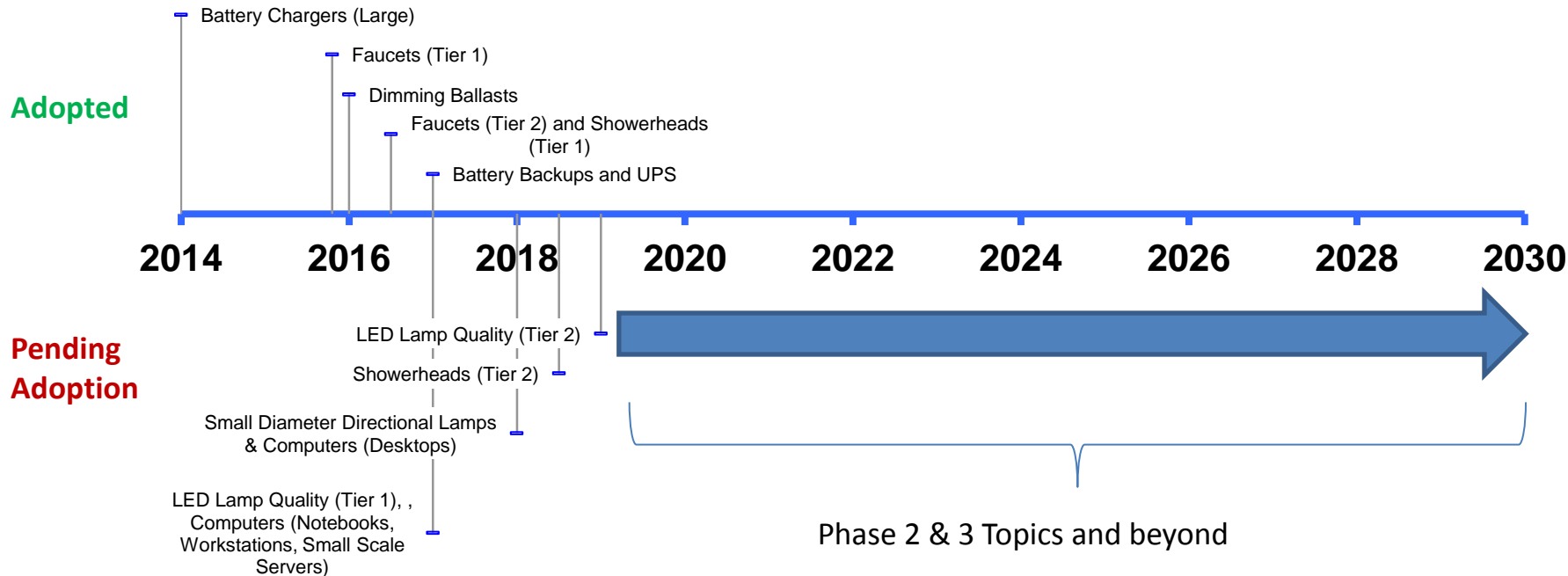
DOE Process and Timeline: Examples





CA Title 20 Appliance Effective Date Timeline

Phase 1, 2, 3, and beyond





Future Title 20 Standards Under Consideration

Electronics

- Servers
- Network Equipment
- Imaging Equipment
- Televisions (update)
- Power Factor
- Computer Kiosks
- Projectors
- Phones
- Low Power Modes

Lighting

- GSFLs (T12 Loophole)
- EISA exempt Lamps
- Outdoor Lighting
- Lighting Accessories

Other

- Plug-in Luminous Signs
- Coffee Makers
- EV Chargers
- Blast Freezers
- Lab Grade Coolers & Freezers
- Portable Air Cleaners
- Spot Air Conditioners
- Commercial Range Tops (Gas)
- Commercial Convection Ovens
- Evaporative Coolers
- DR Enabling
- Economizers
- Refrigeration Condensing Units
- Slushy & Softserve Machines



Thank You.