Hourly Electricity Load Model (HELM), Version 2.0

DAWG Meeting

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HELM Methodology

- Annual consumption by end use and building type (residential and commercial) or NAICS groupings (remaining sectors) input from sector forecasts
- Applies end use or NAICS grouping load shapes to consumption to give hourly loads; hourly assignment of weather-sensitive end use load based on average temperatures
- Traditionally used to develop annual consumption and net peaks by planning area

HELM 2.0

- Updated end use/building type and NAICS grouping load shapes
- Adds:
  - Efficiency load shapes
  - PV hourly generation profiles
  - Electric vehicle charging profiles (EVIL submodel)
  - Forecast zone level
- New platform

Data Sources

- 2006 CEUS
- Database for Energy Efficiency Resources
- EPRI Load Shape Library
- E3 Energy Efficiency Calculator
- Various end-use load research studies
- Previous ADM work products
- IOU interval meter data
- Chargepoint data
- CSI data

Link for HELM 2.0/Load Shapes Report

- https://ww2.energy.ca.gov/publications/displayOneReport_cms.php?pubNum=CEC-500-2019-046

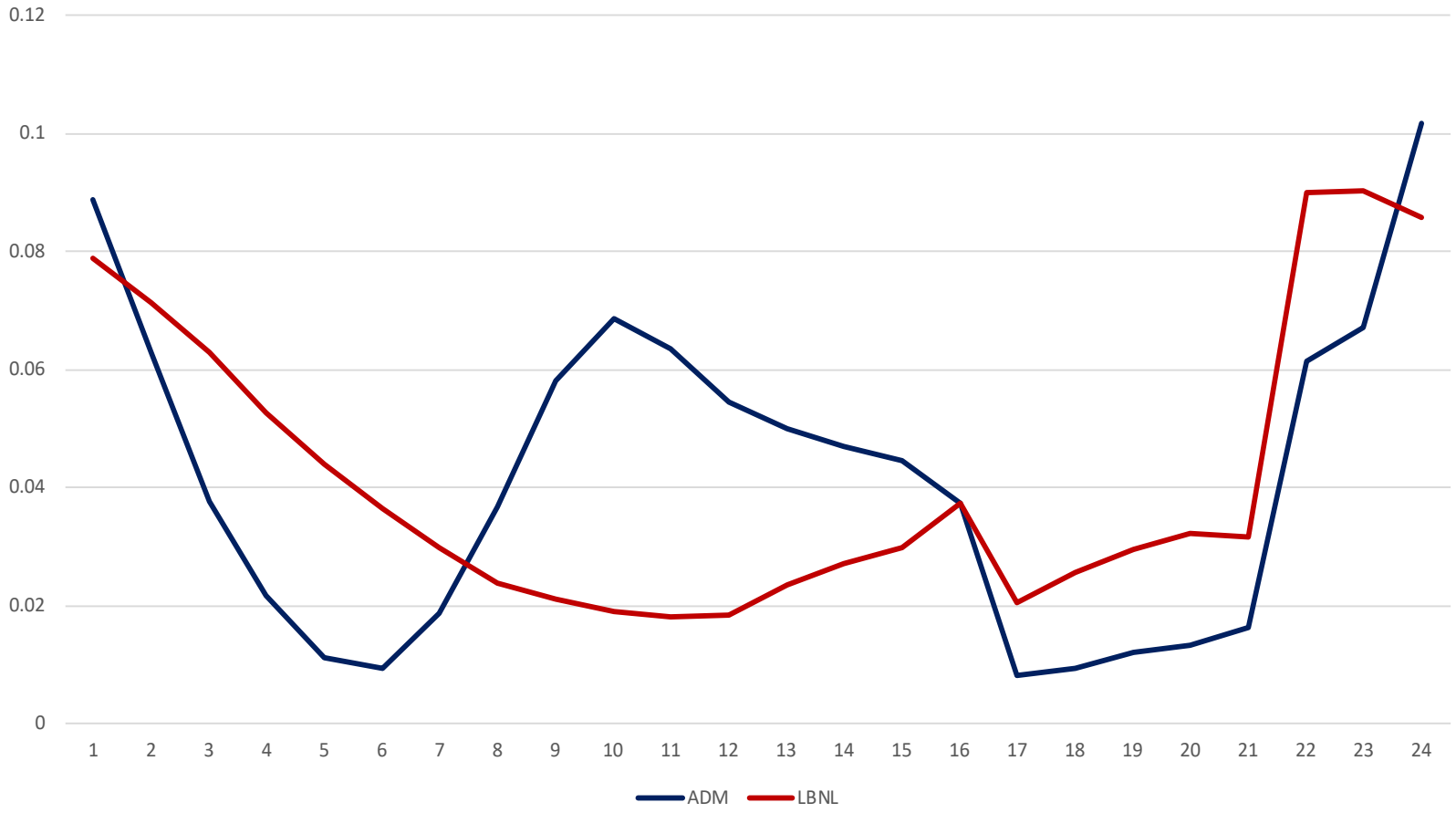
Applying Average Temperatures

- ADM initially used TMY for each forecast zone (using representative weather stations). However, this led to inconsistencies between forecast zone temperatures
- CEC and ADM developed method to select “typical” months across forecast zones

Selection of Average Month

Weight	Summer (May-October)	Winter (December-March)	Shoulder (April+November)
25%	CDD55	HDD70	Max
25%	CDD70	HDD60	CDD65
25%	CDD85	HDD55	HDD65
25%	Max	Min	Min
	Zonal weights in proportion to cooling (com+res)	Zonal weights in proportion to electric heating (com+res)	Zonal weights in proportion to electric heating + cooling (com+res)

Light-Duty EV Comparison, SCE June 2030



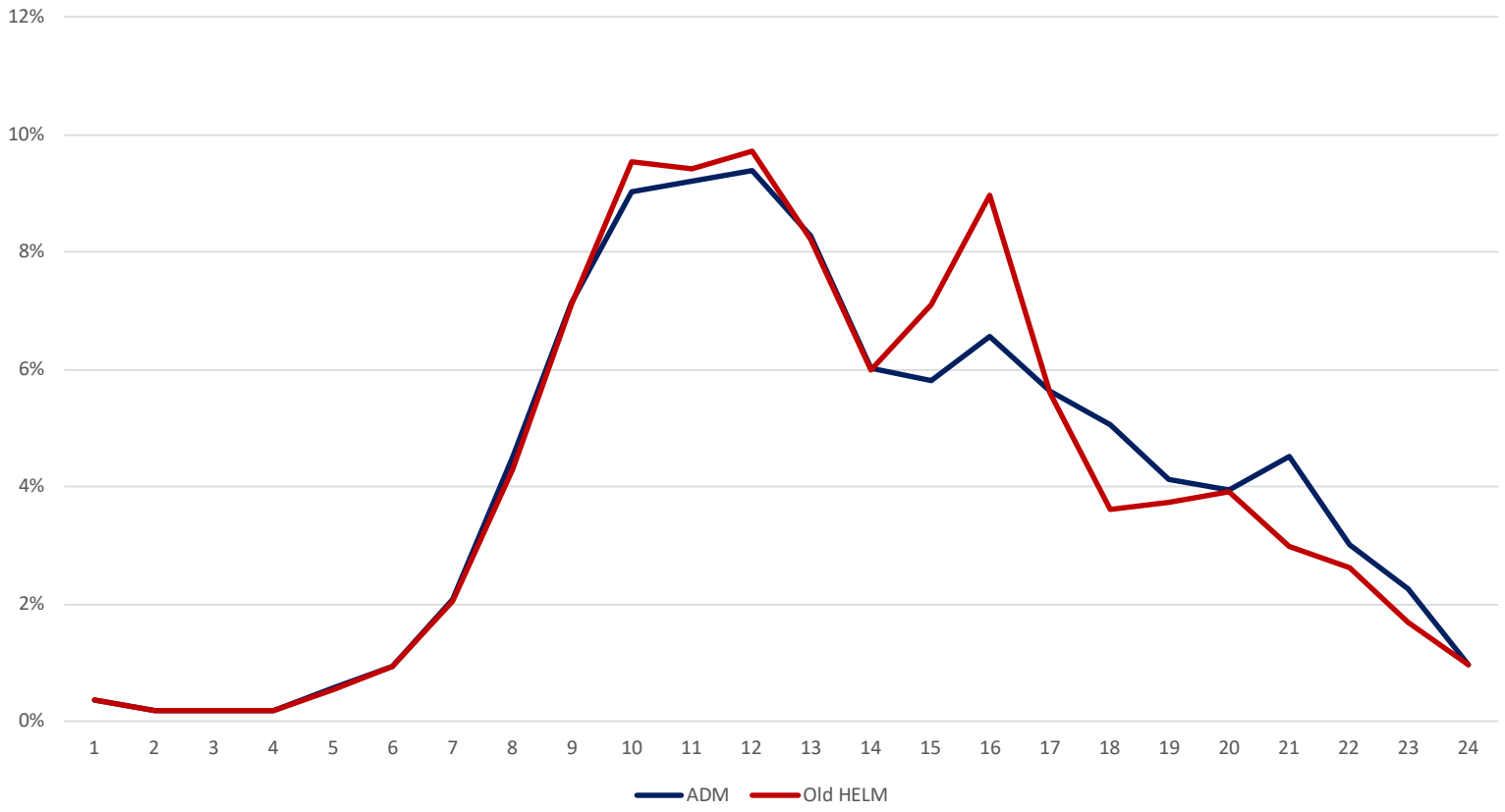
Integrating HLM and HELM 2.0

- Ideally, HELM 2.0 will provide a sound 8760 hourly forecast for each year
  - In this case, the HLM would be used as a check and for regional studies (regions not covered in HELM 2.0)
- If not, HLM could be calibrated each year to HELM 2.0 annual peaks

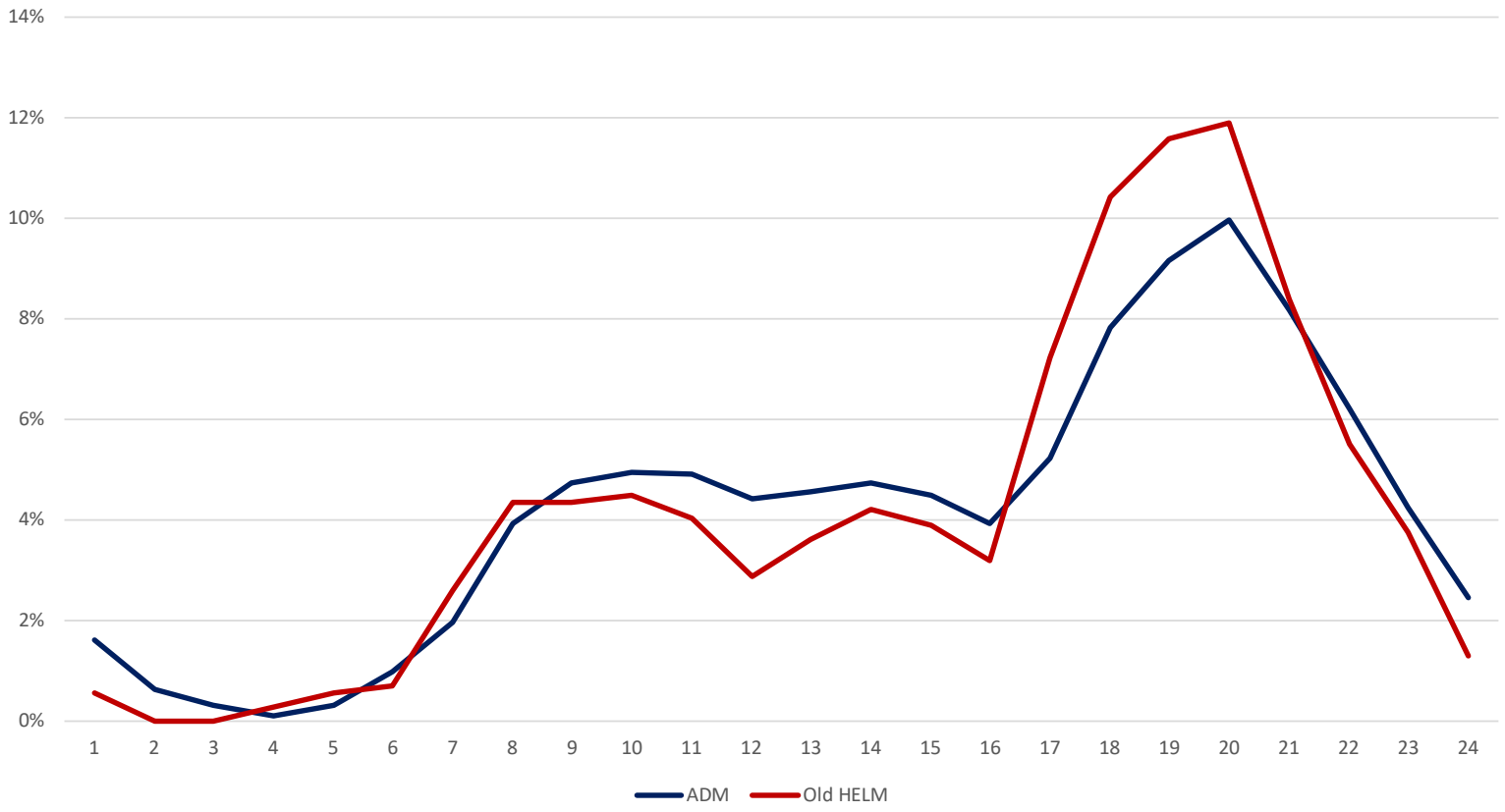
Questions/Comments

Additional Load Shapes

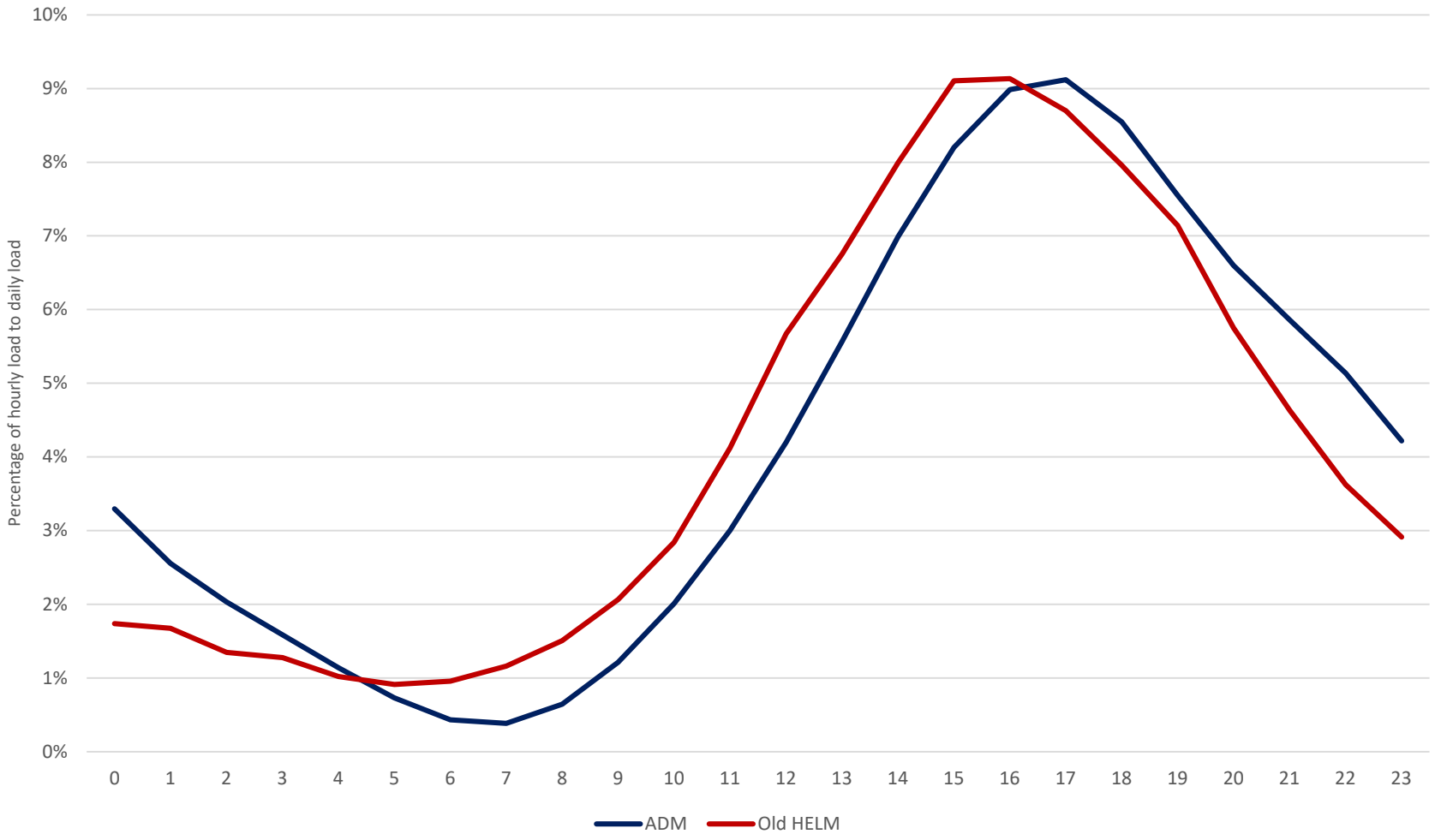
Residential Washer Winter Weekday



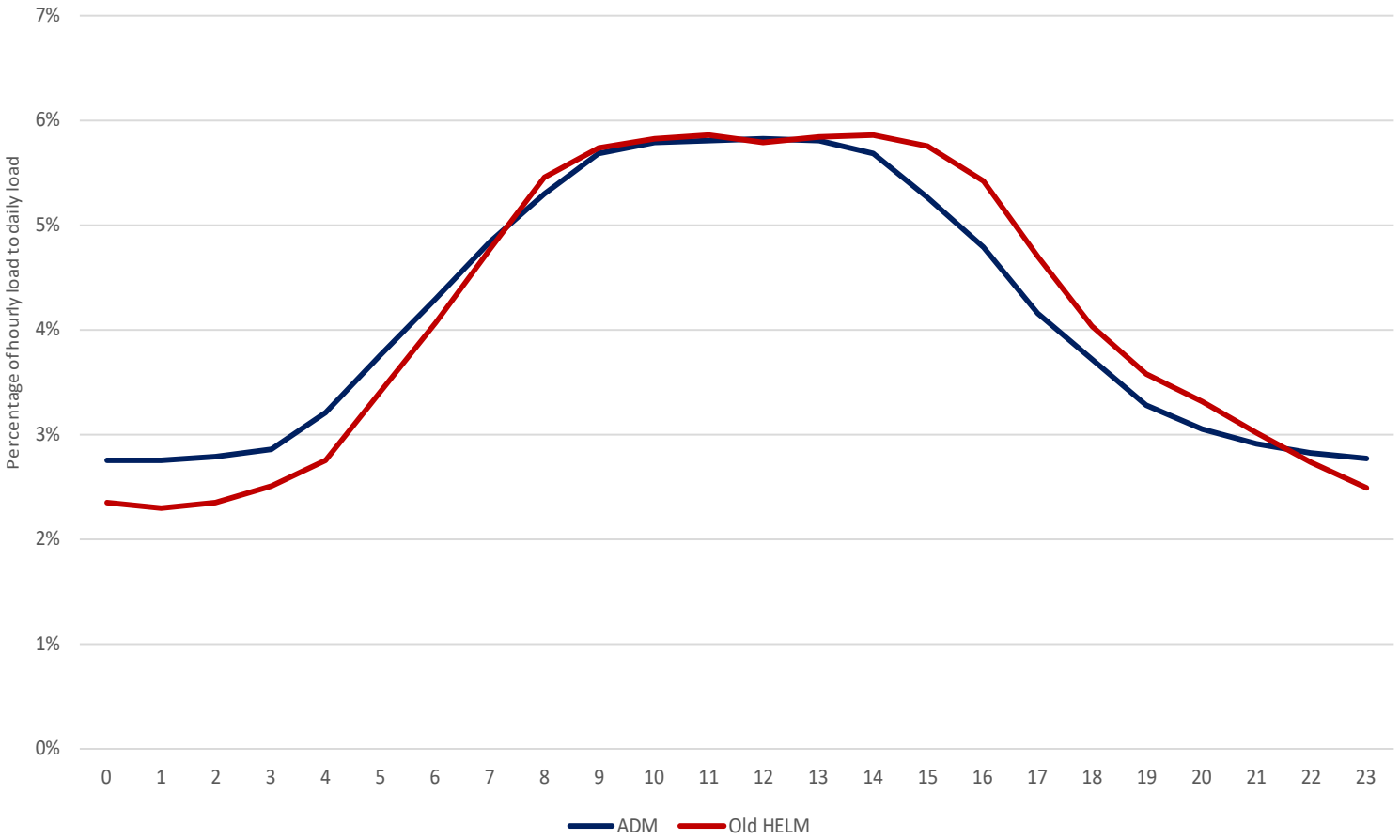
ADM Residential Dishwashing Summer Weekday



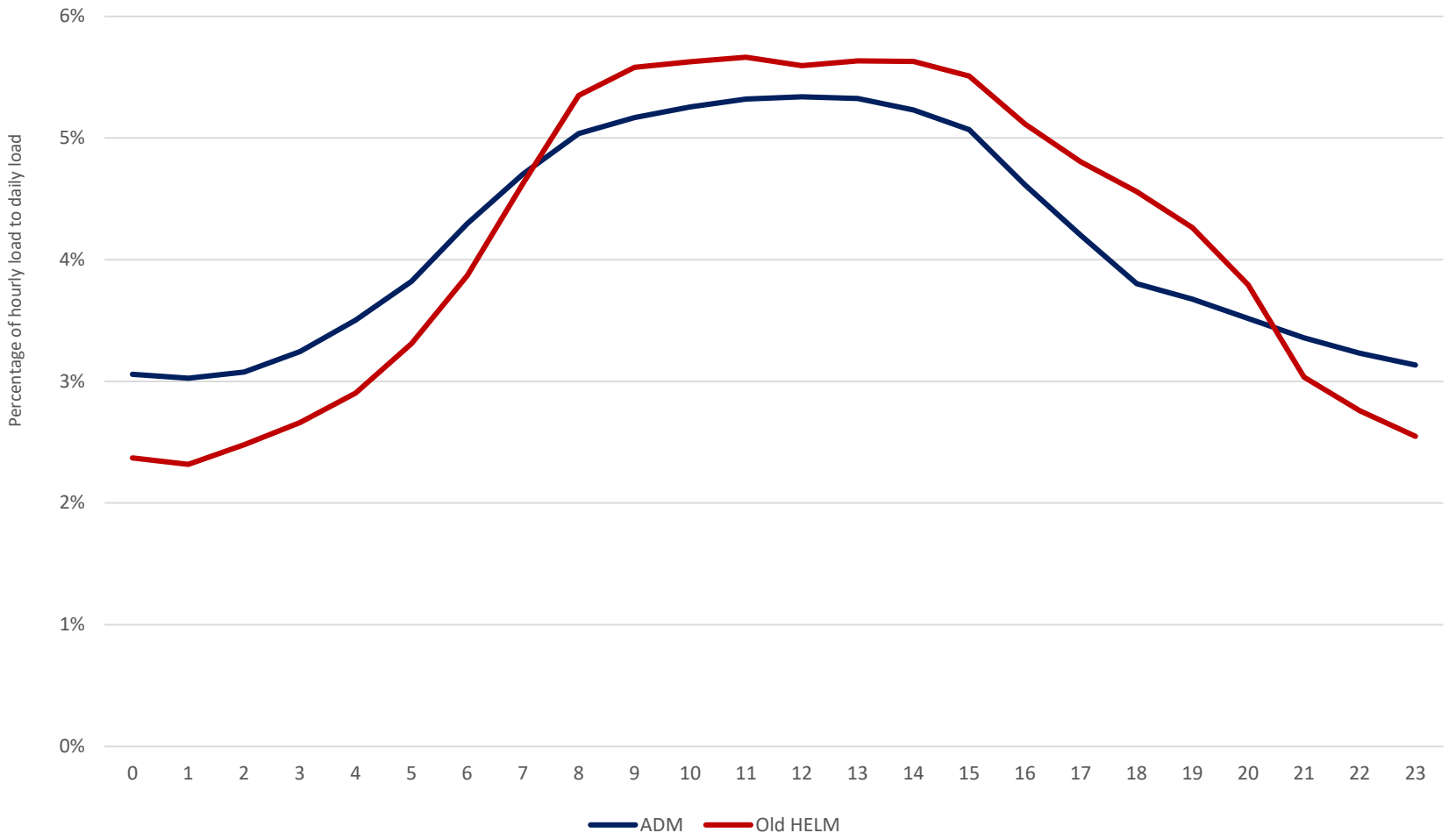
Residential AC, Hot August Weekday, PGE



Commercial Miscellaneous Weekday



Commercial Office Lighting Summer Weekday



Commercial AC, Hot August Weekday, PGE