

DOCKETED

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Burner Tip Gas Price Model Results

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2021 Integrated Energy Policy Report
California Energy Commission

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Overview

- **The Burner Tip (BT) Model gives delivered natural gas prices for use in electricity production cost modeling (e.g., PLEXOS)**
 - Yields a gas price for each generator
 - Takes monthly NAMGas commodity prices for IEPR common cases
 - Adds transportation rate of natural gas pipeline companies and utilities
 - Published tariff rates for hubs outside CA
 - Updated BT-model uses a transportation rates model for in-state hubs (BT-model)

Burner Tip Price = Commodity Price + Transportation Rate



Burner Tip Model Inputs and Assumptions

Natural gas commodity price is monthly forecasted trading hub price

- Nominal 2020 dollar per one million British thermal units

Transportation rates

- Interstate firm rates are fixed over the forecast horizon
- California utility transportation rates pulled from the transportation rate model
 - Transportation rates model accounts for annual revenue requirement, cost allocation, and escalation



2021 Model Improvements

Incorporated monthly NAMGas price forecast

- Updated from an annual to a monthly forecast

Revised market hubs that link to PLEXOS's fuel groups

- Replaced previous “proxy hubs” to identify actual “market hubs” in proximity to power plants
- Applied a weighted average in some locations where delivery is received from more than one market hub

Updated transportation rates

- Interstate pipeline rates from company tariff sheets
- California utility transportation rates from CEC calculations

RESULT: Model better represents price formation in gas market



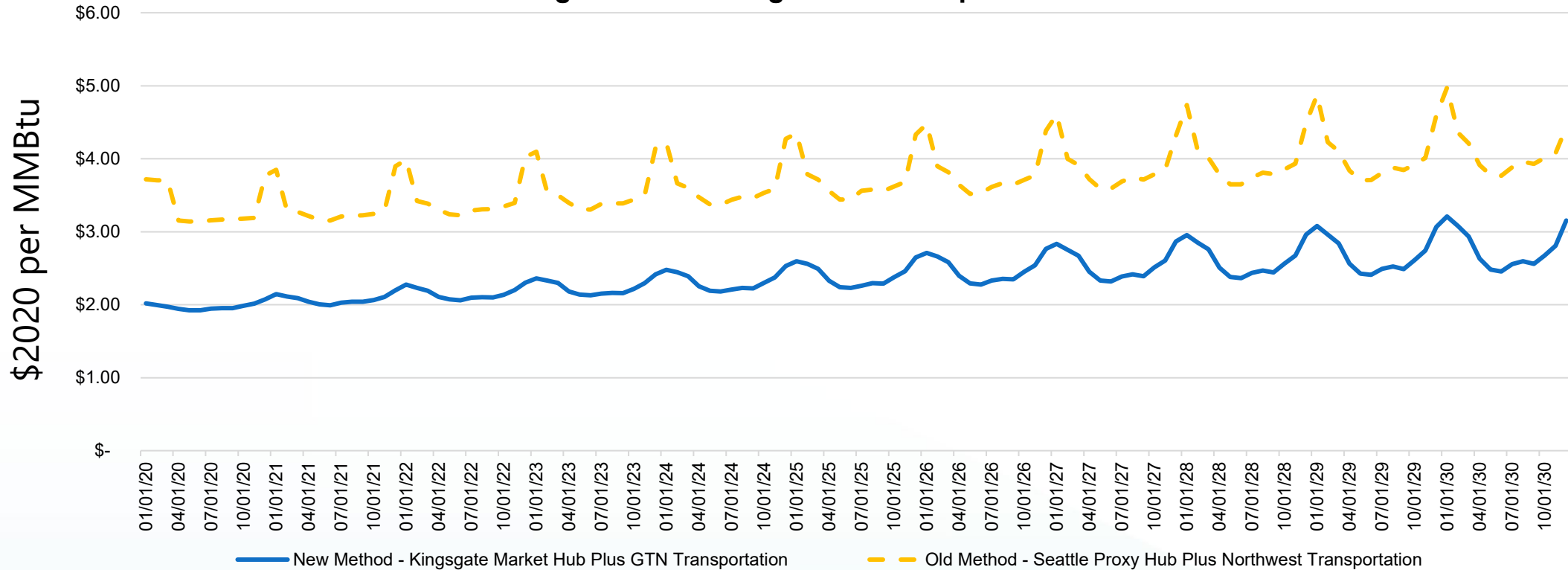
Notable Market Hub Changes

Plexos Fuel Group – Power Plants	Previous Burner Tip Hub and Transportation Rate	New Burner Tip Hub and Transportation Rate
Eastern Oregon and Washington	Seattle hub plus Northwest transportation	Kingsgate hub plus Gas Transmission Northwest transportation
Rosarito and Baja	Mexico-Baja hub plus North Baja transportation	Ehrenberg hub plus North Baja transportation
Oregon	Portland hub plus TransCanada Gas Transmission Northwest transportation	Sumas hub plus Westcoast transportation and Northwest Pipeline
Southern Nevada	Las Vegas hub plus Kern River transportation	Opal hub plus Kern River transportation



New Methodology Case Results

Eastern Oregon and Washington Burner Tip Hub Price



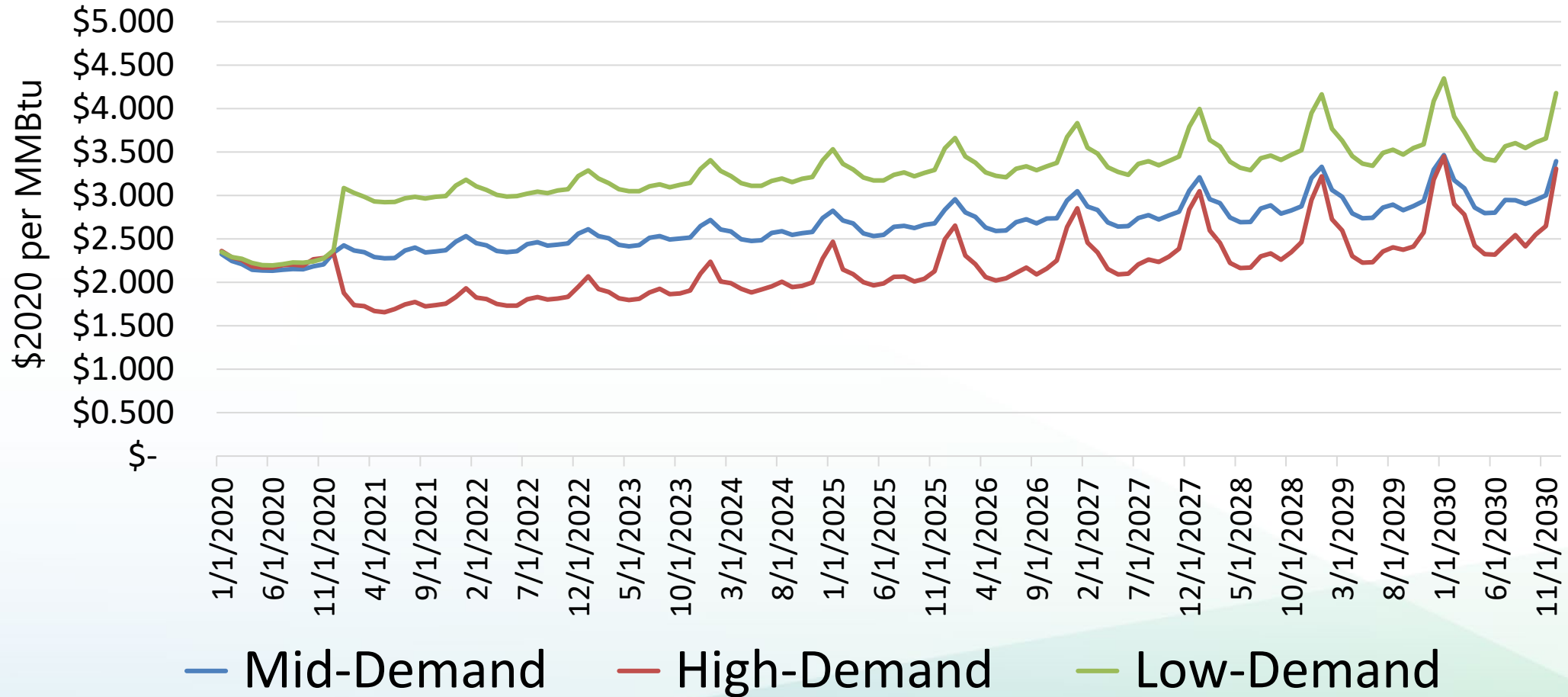
Kingsgate Market Hub Commodity Price	Seattle Proxy Hub Price	Difference
\$2.382/MMBtu	\$3.700/MMBtu	-\$1.318/MMBtu

New Method - GTN Transportation Rate	Old Method - Northwest Transportation Rate	Difference
\$0.003/MMBtu	\$0.008/MMBtu	-\$0.005/MMBtu



Overall Results

Overall Burner Tip Price Comparison by Case





California Changes

Plexos Fuel Group – Power Plant	Previous Burner Tip Prices	New Burner Tip Prices
PG&E Backbone	PG&E Citygate hub plus Back Bone transportation	Malin and Topock hubs (weighted average) plus applicable transportation
PG&E Local Transmission	PG&E Citygate hub plus Local Transmission	PG&E Citygate hub plus applicable transportation
SoCalGas	SoCalGas Citygate hub plus TLS and BB transportation	SoCalGas Citygate hub plus applicable transportation
Otay Mesa	SDG&E Citygate hub plus SDG&E transportation	SoCalGas Citygate hub plus applicable transportation
SDG&E	SDG&E hub plus SDG&E transportation	SoCalGas Citygate hub plus applicable transportation
Kern River/Mojave	Daggett/Kramer hub	Wheeler Ridge hub (transportation embedded)
Southern California – Oil & Gas Production	San Joaquin Valley hub	Wheeler Ridge hub (transportation embedded)



California Mid-Demand Case Results

Plexos Fuel Group	New Burner Tip Hub and Transportation Rate	Average Monthly Price Change Over Forecast with New Methodology	Average Monthly Price Over Forecast with New Methodology
PG&E Backbone	Malin and Topock hubs weighted average plus applicable transportation	Decrease of \$0.924/MMBtu	\$2.549/MMBtu
PG&E Local Transmission	PG&E Citygate hub plus applicable transportation	Decrease of \$0.009/MMBtu	\$3.748/MMBtu
SoCalGas	SoCalGas Citygate hub plus applicable transportation	Decrease of \$0.404/MMBtu	\$3.483/MMBtu
Otay Mesa	SoCalGas Citygate hub plus applicable transportation	Decrease of \$0.255/MMBtu	\$3.405/MMBtu
SDG&E	SoCalGas Citygate hub plus applicable transportation	Decrease of \$0.657/MMBtu	Same average prices as Otay Mesa
Kern River/Mojave	Wheeler Ridge hub (transportation embedded)	Increase of \$0.170/MMBtu	\$3.479/MMBtu
Southern California – Oil & Gas Production	Wheeler Ridge hub (transportation embedded)	Increase of \$0.719/MMBtu	Same average prices as Kern River/Mojave



Results of Modeling Updates

Outcome

- Burner Tip location prices decreased due to lower commodity prices
- Seasonality is captured with monthly price estimate
- Model better reflects existing market conditions



Thank You!

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Burner Tip Webpage: <https://www.energy.ca.gov/programs-and-topics/topics/energy-assessment/natural-gas-burner-tip-prices-california-and-western>

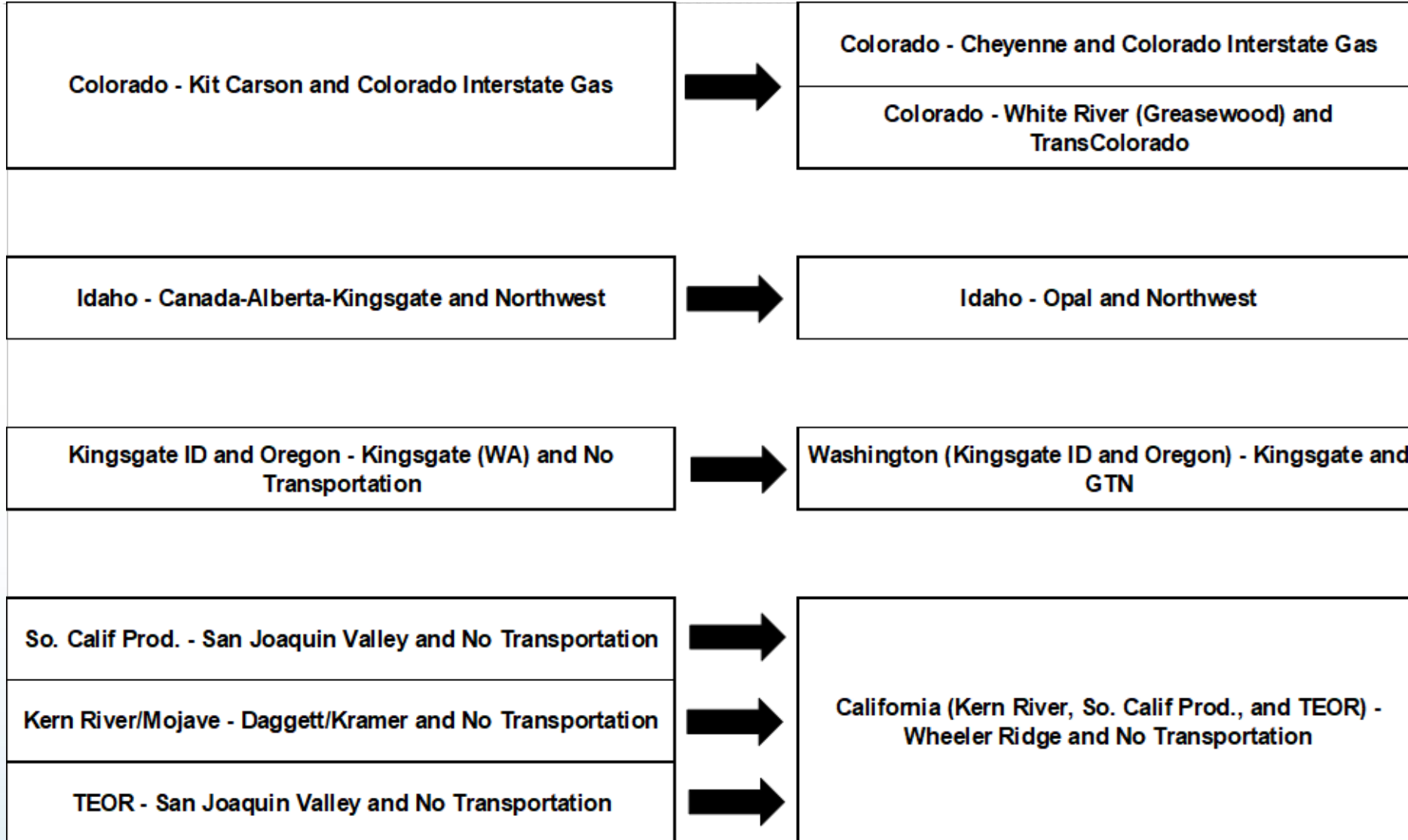


Burner Tip Changes

Previous Hubs and Transportation		New Hubs and Transportation
<i>PLEXOS Fuel Group - Hub and Transportation</i>		<i>Plant Location (Fuel Group) - Hub and Transportation</i>
Alberta - Hub AECO and TransCanada-NGTL system	➔	No Changes
Northern Arizona - Flagstaff and Transwestern	➔	Arizona (Southern NV) - Opal and Kern River
	➔	Arizona - Topock and No Transportation
Blythe - Ehrenberg and No Transportation	➔	No Changes
British Columbia - Sumas and Spectra Westcoast	➔	British Columbia - Sumas and Spectra Westcoast
		British Columbia - Westcoast Plus Spectra Westcoast

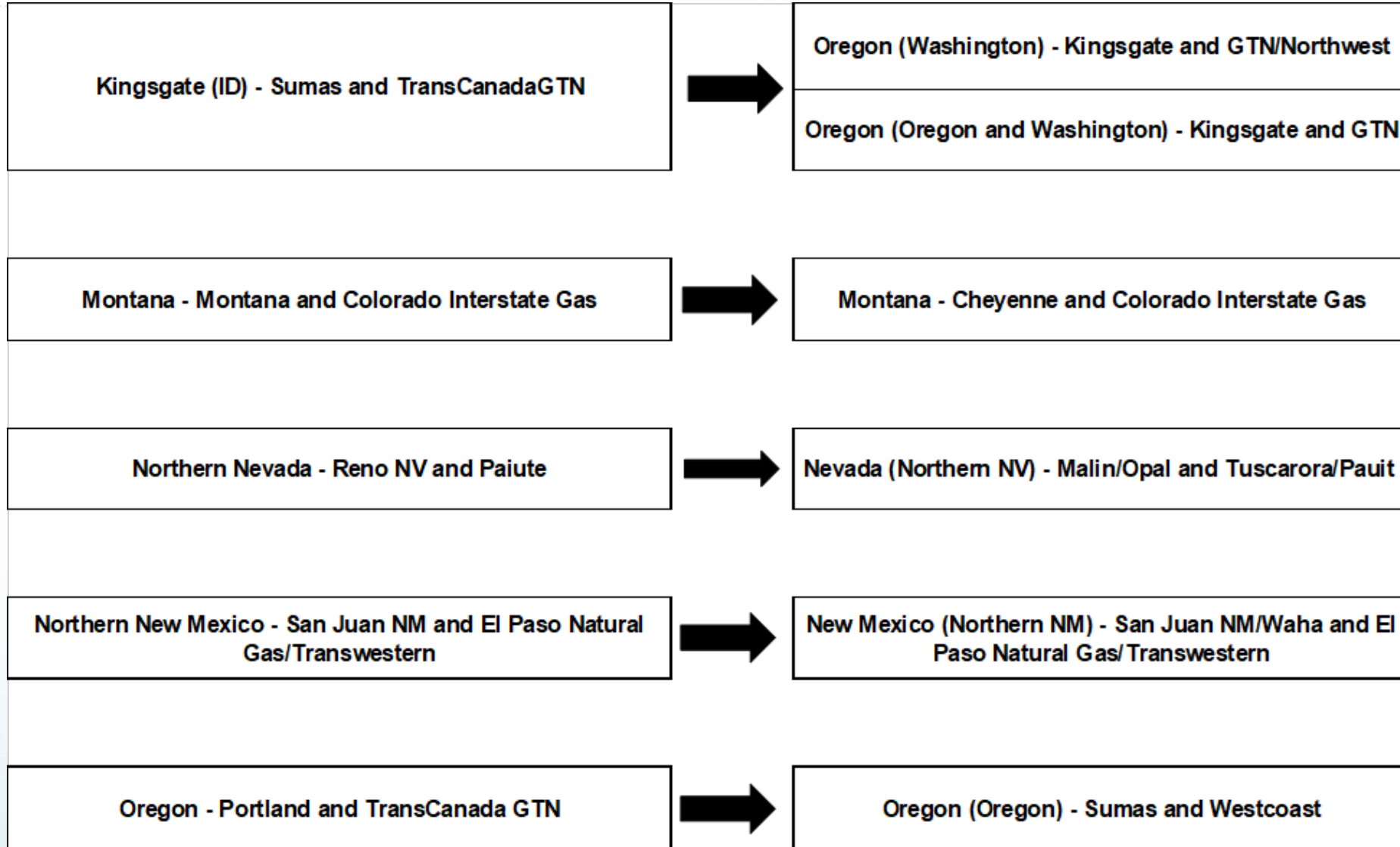


Burner Tip Changes



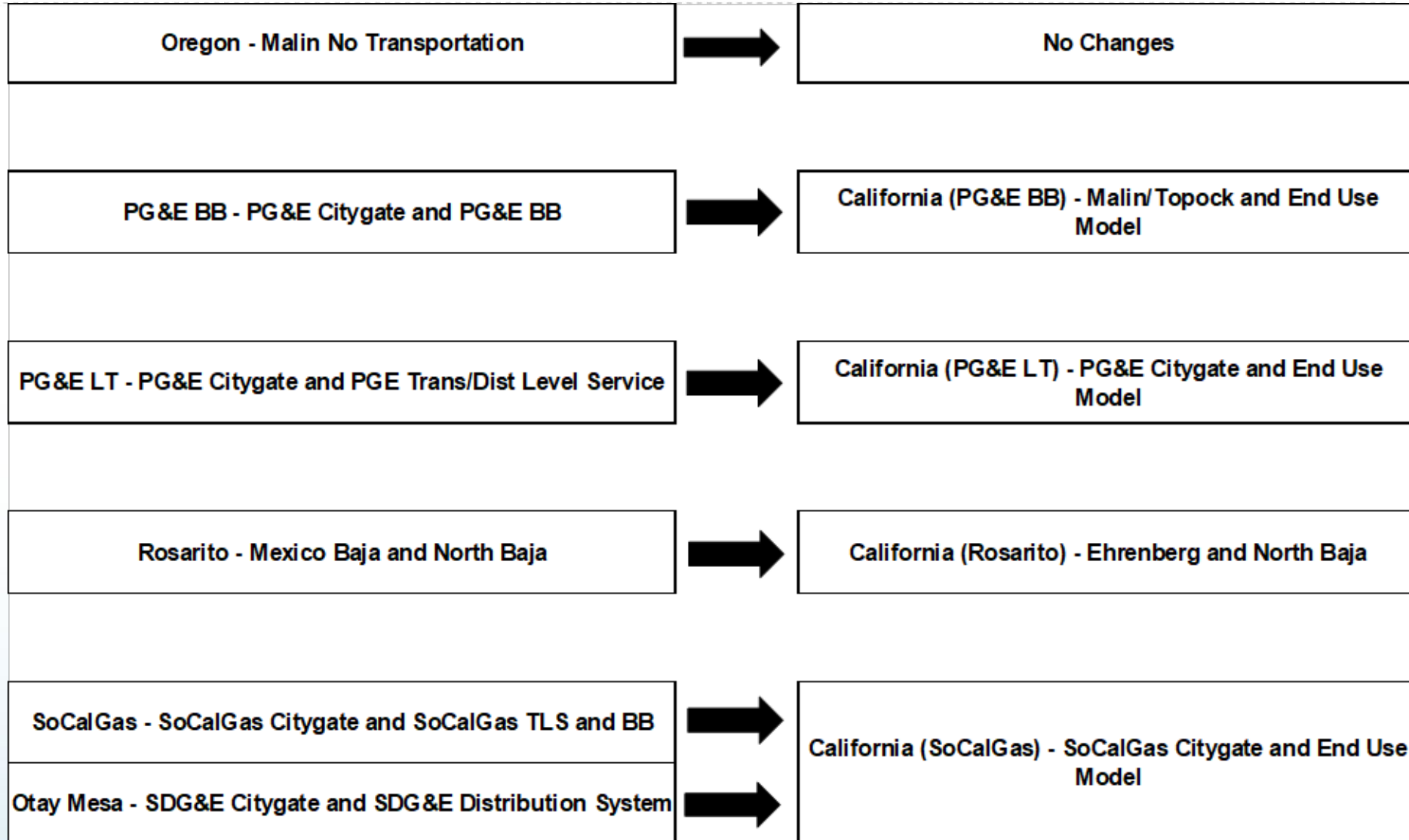


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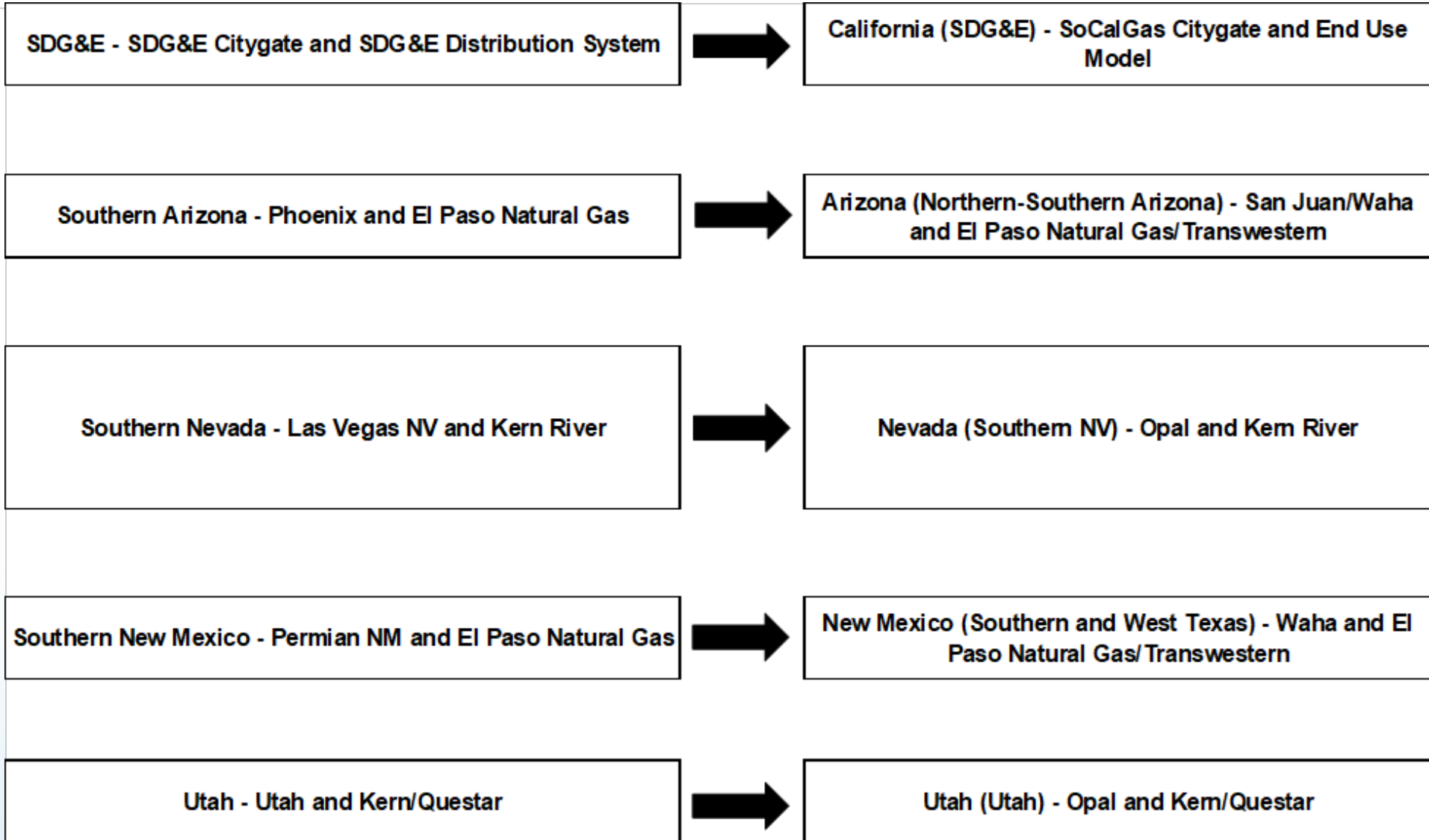


Burner Tip Changes





Burner Tip Changes





Burner Tip

