

PUC-EIM Meeting

Comparison of EIM Market Operator Cost Estimates

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Thank You

- The PUC-EIM and the Western Interstate Energy Board have been responsible stewards of the public interest, demonstrated by continued facilitation of essential dialog among stakeholders necessary to establish any major development

Is there a problem?

- **“If its not broke, don’t fix it!”**
 - Waiting for regional grid failure is not appropriate. Improving existing capability is prudent.
 - The proposed EIM simultaneously addresses issues with renewable integration, grid congestion management and efficient wholesale market operations.
- **“You just want this market to save money!”**
 - Yep! Improved efficiency is a good goal.
- **“This is all going too fast!”**
 - Regional markets have been in operation for more than a decade in other areas. The market concepts are used by more than half the load in the US, under the same laws of physics that apply in the west.

Background on Opposition

- In the stakeholder dialog that has occurred in the WECC and in direct utility discussions, some positions have been made crystal clear:
 - Some utilities stipulate they must be paid for incremental transmission service used by the EIM as a condition to participate
 - Some utilities refuse to consent to any design that has the potential to evolve into a “Regional Transmission Organization (RTO)”
 - Some stakeholders refuse to accept any cost allocation for the proposed market, claiming they do not believe the costs will be less than the benefit

Background on Costs

- The PUC-EIM was provided two indicative cost proposals for the EIM market, one from the California ISO (CAISO) and one from the Southwest Power Pool (SPP)
 - “Thank You!” to CAISO and SPP for their constructive engagement in this dialog with western stakeholders!
- This information will be used today for an interactive evaluation of alternatives

Factors Impacting Cost

- Market footprint attributes
 - Peak Demand
 - Energy volume % settled by EIM
 - Decision on transmission service payments
- Market startup costs
 - Interest rate
 - Amortization period
- Market annual operating cost components

SPP Spreadsheet Format Review

Assumptions for Both Market Operators	Percent HNF Transmission Revenue Recovery	Load Factor for Footprint	Percent Energy Served By Market	Years of Amortization	Market Footprint
	50%	60%	10%	7	All
Southwest Power Pool Indicative Information	Interest Rate	Initial Capital Expense	Years Financed	Annual Operating Expense	
	5%	\$ 65,000,000	7	\$ 28,000,000	

SPP Estimate Summary	Market Cleared MWh	Market Administration Cost per MWh Cleared	Transmission Cost per Cleared MWh	Total Cost per Cleared MWh
Market Footprint:				
RM-DS Regions	27,970,855	\$ 1.3952	\$ 0.2784	\$ 1.6736
NW Region	24,362,611	\$ 1.6018	\$ 0.5616	\$ 2.1634
NWPP Footprint	34,540,330	\$ 1.1298	\$ 0.4738	\$ 1.6036
WECC without CAISO & CA	66,227,177	\$ 0.5893	\$ 0.3691	\$ 0.9583
WECC Less Others	52,333,466	\$ 0.7457	\$ 0.4102	\$ 1.1559
Other	13,893,710	\$ 2.8088	\$ 0.2140	\$ 3.0228

CAISO Spreadsheet Format Review

Assumptions for Both Market Operators	Percent HNF Transmission Revenue Recovery	Load Factor for Footprint	Percent Energy Served By Market	Years of Amortization	Market Footprint	
	50%	60%	10%	7	All	
California Independent System Operator Rate Assumptions	Grid Management Charge	Scheduling Coordinator Charge	Bid Segment Charge	Scheduling Coordinators Per BA	Units Per BA	Bid Segment Per Unit
	\$ 0.19	\$ 1,000	\$ 0.005	4	40	6

CAISO Estimate Summary	Market Cleared MWh	Market Administration Cost per MWh Cleared	Transmission Cost per Cleared MWh	Total Cost per Cleared MWh
Market Footprint:				
RM-DS Regions	27,970,855	\$ 0.2496	\$ 0.2784	\$ 0.5280
NW Region	24,362,611	\$ 0.2689	\$ 0.5616	\$ 0.8304
NWPP Footprint	34,540,330	\$ 0.2650	\$ 0.4738	\$ 0.7388
WECC without CAISO & CA	66,227,177	\$ 0.2585	\$ 0.3691	\$ 0.6275
WECC Less Others	52,333,466	\$ 0.2619	\$ 0.4102	\$ 0.6721
Other	13,893,710	\$ 0.2497	\$ 0.2140	\$ 0.4637

Initial Fee per All BA MWh
\$ 0.030

Some other notes

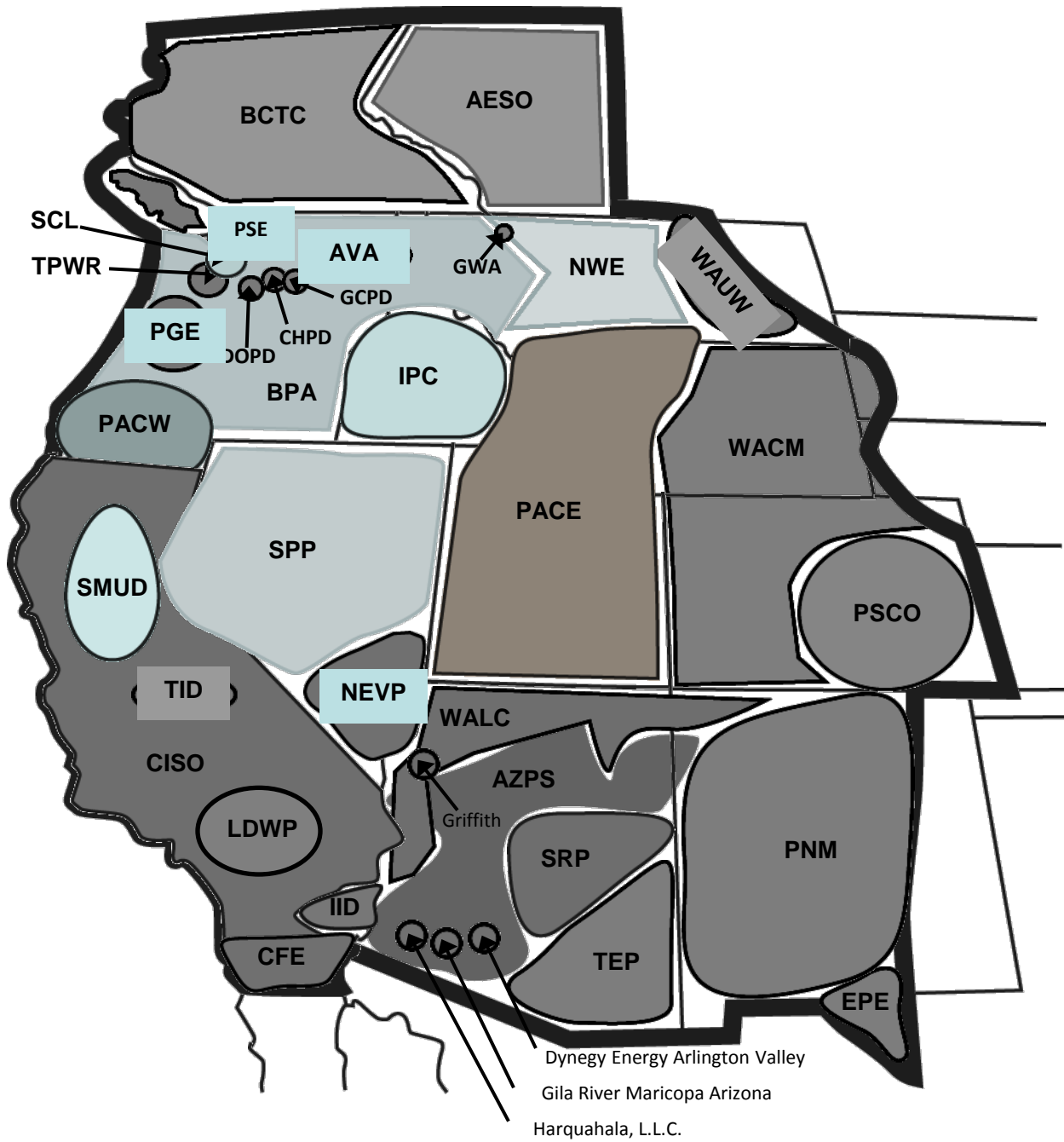
- Note on errors or omissions
 - The spreadsheet is intended to be used as a method to understand general impacts of market participation and design and is not intended to be definitive. The input data and underlying calculations were prepared using best efforts but are not intended to be used for formal financial evaluations. For example:
 - Several Public Utility Districts in the northwest are not included in OASIS HNF numbers, because we were not able to find their information
 - The balancing area load calculations are 2020 estimates, but there could be demand overlap for utilities that are not balancing areas
 - The indicative cost estimates are not binding offers

Jump to Spreadsheet

Interactive Session

Supplemental Material

For reference/discussion...



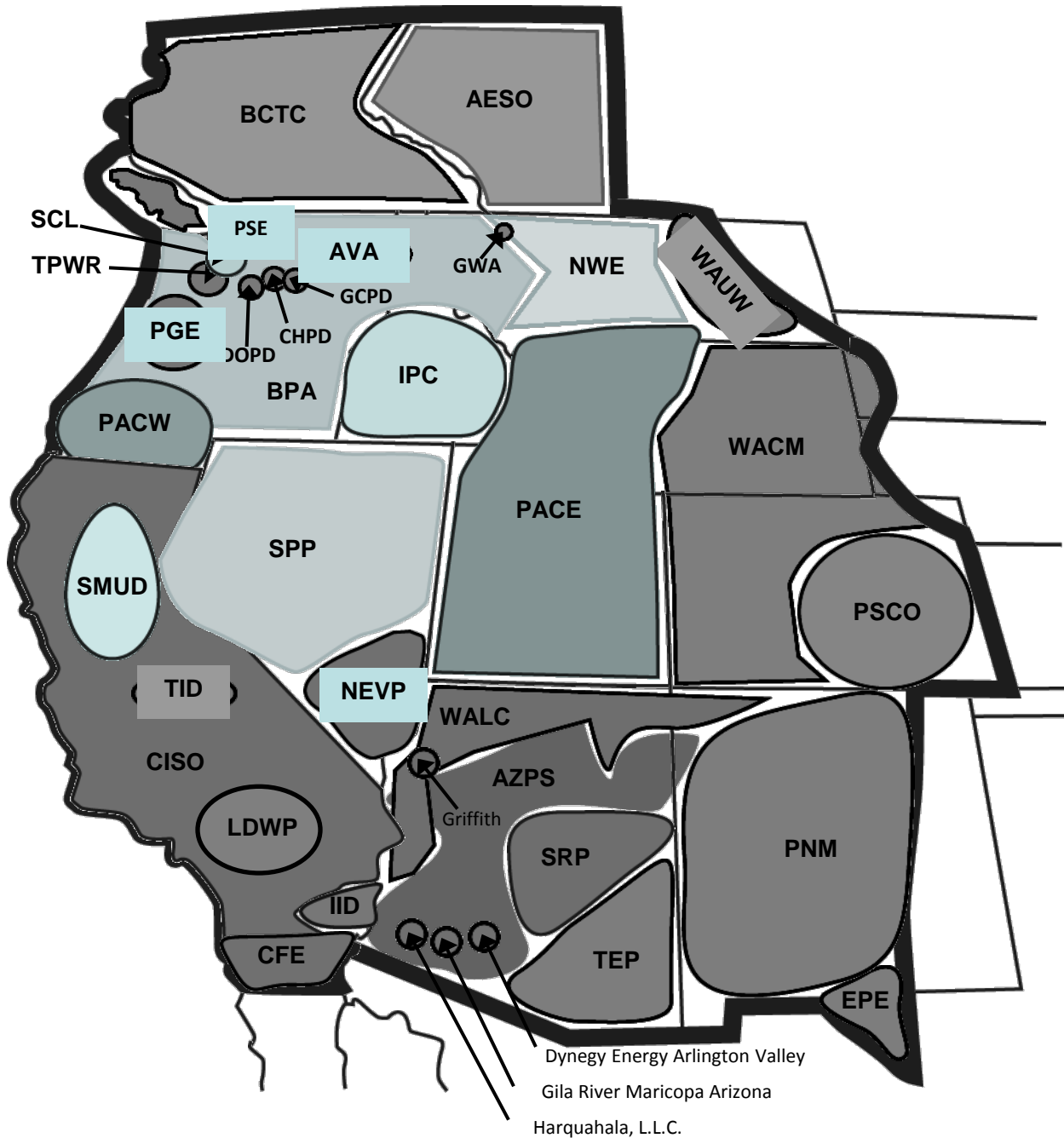
NWPP

NWPP - Two

EIM = RM-DS

Other (non Mkt)

CAISO



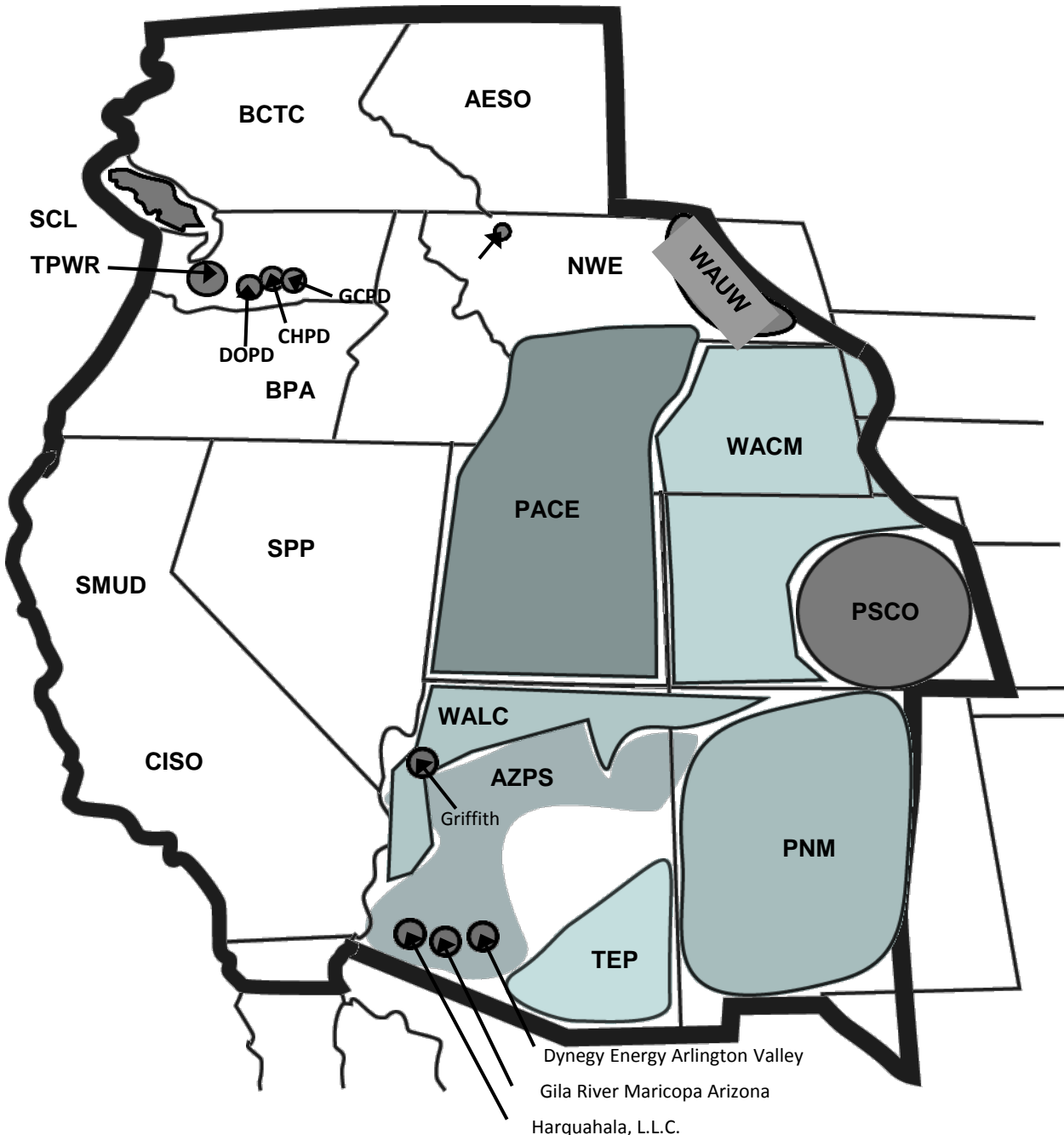
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NWPP - Two

EIM = RM-DS

Other (non Mkt)

CAISO



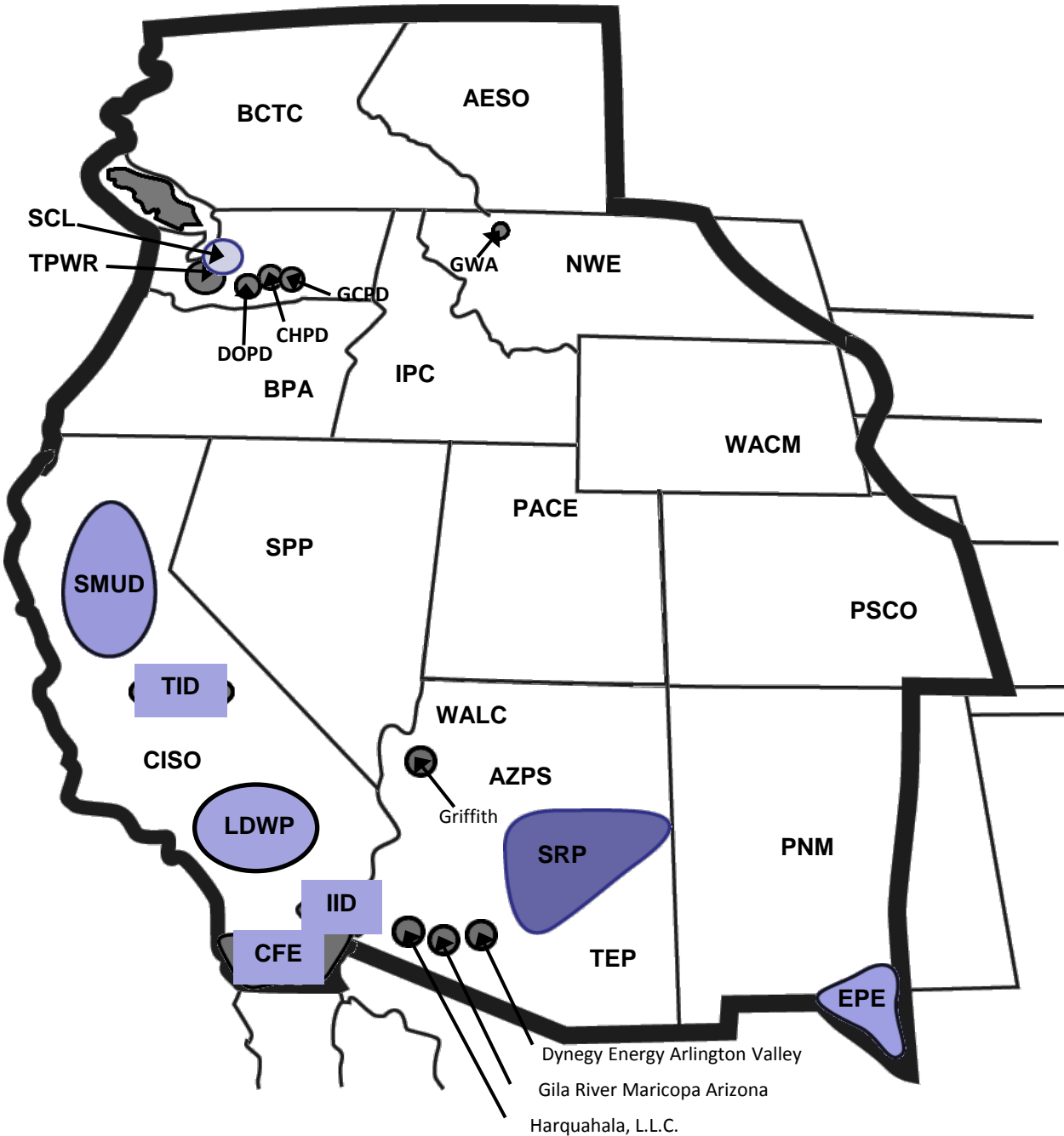
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CAISO



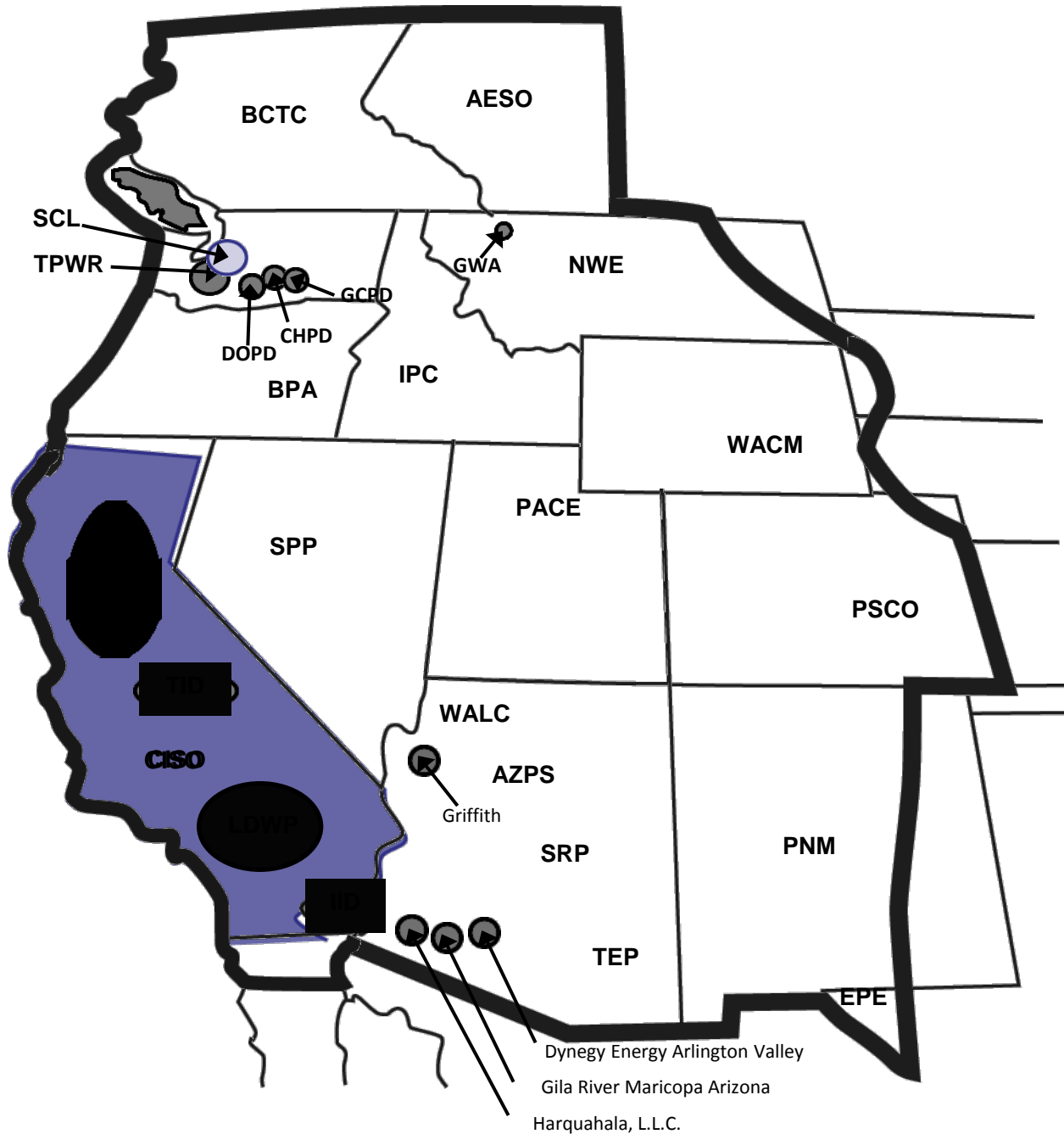
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NWPP - Two

EIM = RM-DS

Other (non Mkt)

CAISO



Assumed peak demand data

TP	Peak Demand MW
Pacificorp East	10,885
PacifiCorp West	3,904
Deseret	1,000
Avista Corp	2,882
Arizona Public Service Company	8,407
Basin Electric	2,000
Western Area Power Administration-CM	4,651
Black Hills Energy/Colorado Electric	500
Bonneville Power Administration	10,377
Western Area Power Administration-CRSP	600
Colorado Springs Utilities	600
El Paso Electric	2,135
Imperial Irrigation District	1,242
Idaho Power Company	4,229
Western Area Power Administration-CM	4,651
Los Angeles Dept of Water and Power	6,778
Nevada Power Company - Transmission	6,583
NorthWestern Energy	1,866
Portland General Electric	4,294
Public Service New Mexico	2,852
Platte River Power Authority	500
Public Service Company of Colorado (TP)	9,320
Puget Sound Energy	5,355
Sacramento Municipal Utility District	4,802
Seattle City Light	1,924
Sierra Pacific Power Co. - Transmission	2,137
Salt River Project	8,800
SWTC	0
Transmission Agency of Northern California	1,000
Tucson Electric Power Company	3,660
Tri-State Generation & Transmission	2,000
Western Area Power Lower Colorado	1,591
WAPA - Sierra Nevada Region	500
Western Area Power Administration - UM	118
Chelan Public Utility District	719
Douglas County Public Utility District	458
Grant County Public Utility District	865
Turlock Irrigation District	787
Tacoma Power	1,031
California Independent System Operator	50,000
	176,003

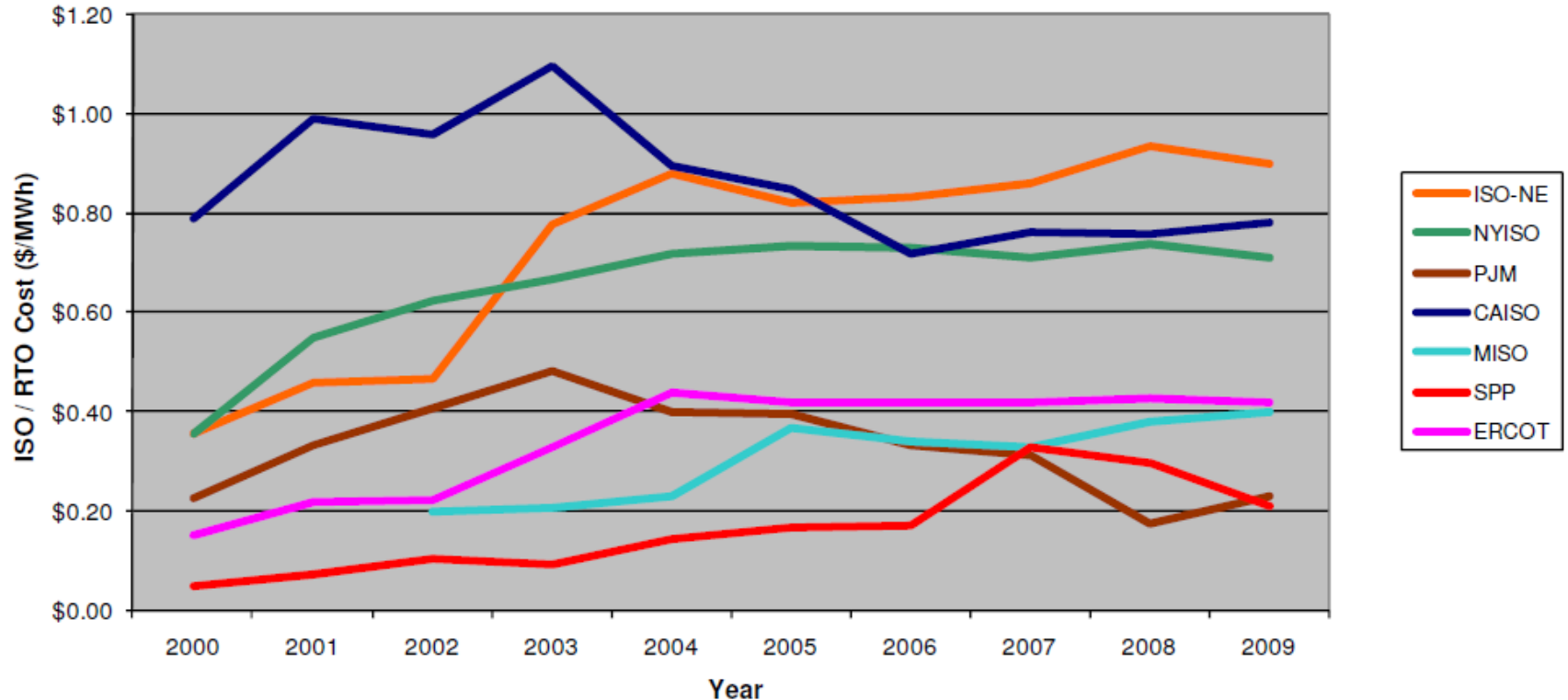
Estimated TP HNF Revenue

(Average of '09-'11 non-affiliate HNF where available)

TP	Non-Affiliate \$ Average
Pacificorp	\$4,099,899
Deseret	\$13,138
Avista Corp	\$1,042,254
Arizona Public Service Company	\$1,274,100
Basin Electric	\$337,436
Western Area Power Administration-CM	\$248,830
Black Hills Energy/Colorado Electric	\$128,043
Bonneville Power Administration	\$12,700,468
Western Area Power Administration-CRSP	\$936,103
Colorado Springs Utilities	\$55,312
El Paso Electric	\$3,403,594
Imperial Irrigation District	\$31,842
Idaho Power Company	\$2,355,835
Western Area Power Administration-CM	\$670,288
Los Angeles Dept of Water and Power	\$585,559
Nevada Power Company - Transmission	\$301,532
NorthWestern Energy	\$9,011,717
Portland General Electric	\$324,268
Public Service New Mexico	\$617,310
Platte River Power Authority	\$5,489
Public Service Company of Colorado (TP)	\$1,104,133
Puget Sound Energy	\$543,644
Sacramento Municipal Utility District	\$79,473
Sierra Pacific Power Co. - Transmission	\$659,714
Salt River Project	\$595,596
SWTC	\$75,902
Transmission Agency of Northern California	\$262,332
Tucson Electric Power Company	\$3,041,646
Tri-State Generation & Transmission	\$1,068,910
Western Area Power Lower Colorado	\$1,973,274
WAPA - Sierra Nevada Region	\$913,135
Western Area Power Administration	\$422,734
CPUD	\$0
DCPD	\$0
GCPD	\$0
TID	\$0
TPWR	\$0
CAISO	\$0
	\$48,883,509

Source: December 2009 MISO Board of Directors Finance Committee Report

ISO/RTO Revenue Requirement/ Network Load



This slide compares the cost per MWh of end-use load for some of the ISO/RTOs in North America.

Estimate as a % of Energy Cost

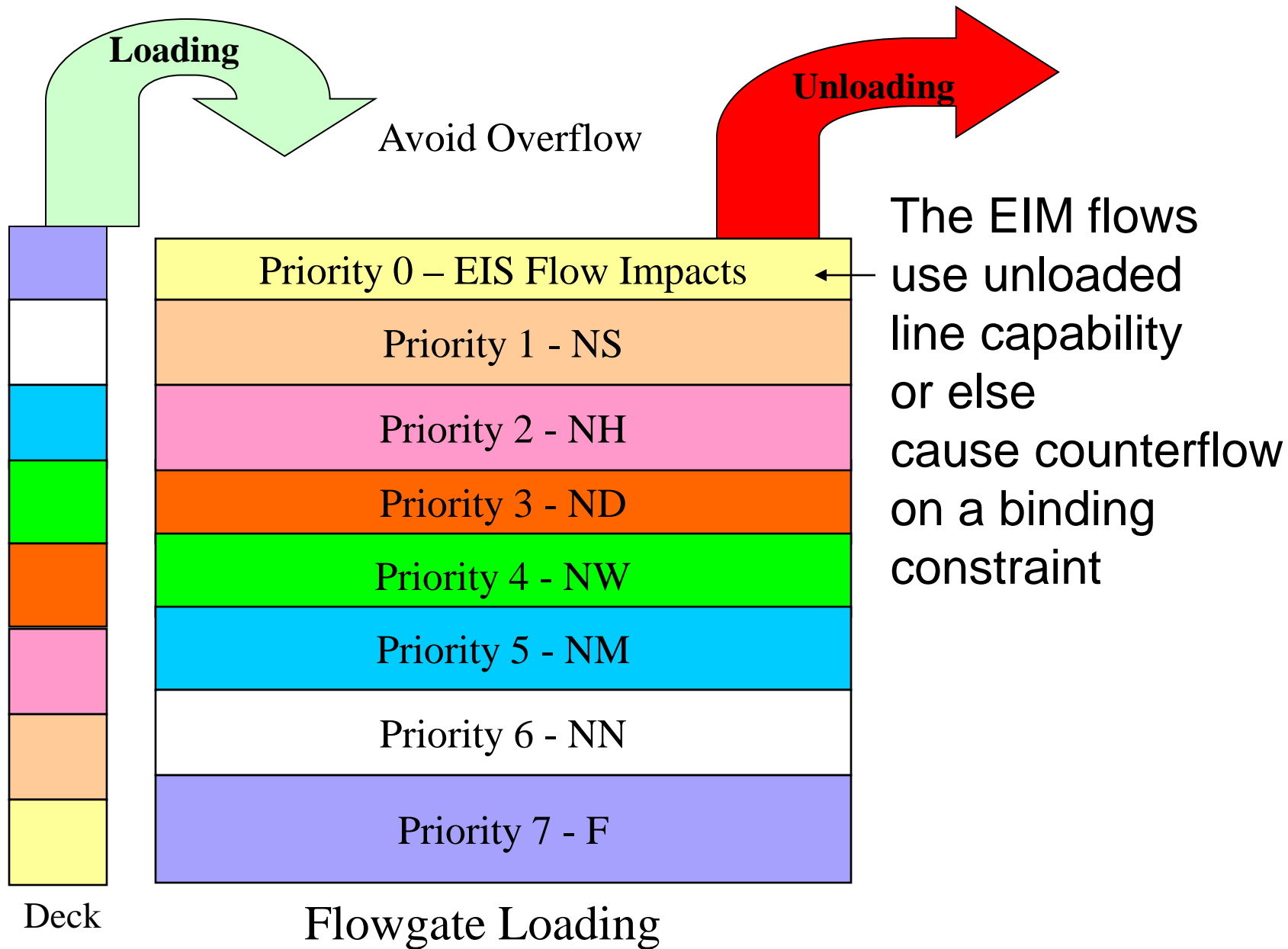
- If the market clearing price for energy is \$35.00/MWH, the estimated market fee would range:
 - For SPP estimate: 2.8% - 6.4%
 - For the CAISO estimate: 1.5% - 2.4%
- Where the % range depends on the size of the market footprints considered in the spreadsheet
- This assumes 50% HNF Revenue in fee

Estimate as a % of Energy Cost

- If the market clearing price for energy is \$35.00/MWH, the estimated market fee would range:
 - For SPP estimate: 1.7% - 4.9%
 - For the CAISO estimate: 0.7% - 0.8%
- Where the % range depends on the size of the market footprints considered in the spreadsheet
- This assumes 0% HNF Revenue in fee

Example HNF rates for TPs in the Western Interconnection

- A quick and non-exhaustive review of some transmission provider rates in the western interconnection shows a wide range of offered prices on OASIS
- Range from \$0.72/MWH to \$10.86/MWH
- Gut-feel estimate of approximately \$3.50/MWH as an average HNF rate
 - This number subject to revision with further research



Notes: No displacement of same priority transactions except Firm. Firm curtails pro-rata.

END