

# Analysis of Tribal Set Aside Issues— Preliminary Summary of Results

*Prepared for:*

**National Tribal Environmental Council**

*Prepared by:*

**ICF Consulting, December 2002**

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# Overview

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- Objective
- Scenarios Analyzed
- Discussion of Results –
  - Allowance Price and Electric System Impacts
  - Distribution of Allowance Transactions
- Conclusions

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- **Objective**
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# Background

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- Under the proposed Annex, 20,000 allowances have been set aside for Tribes in the event that the regional backstop SO<sub>2</sub> trading program is triggered
  - Set-aside allowances are over-and-above allowances given to sources located in Tribal lands
  - Tribes can decide whether to sell or retire tribal set-asides, and how much to sell
  - Allocation of set-aside among Tribes is yet to be determined
- NTEC commissioned ICF to examine impact of tribal set-asides on regional trading program
  - Assess potential impact on allowance prices if some or all of the tribal set-asides are not sold into the regional trading program
  - Analyze distribution on volume of allowances traded (bought or sold) by sources in the trading program

# Background (Contd.)

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- Analysis based on critical mass study conducted by WRAP/MTF<sup>1</sup>
  - Data, assumptions and analytical framework developed by WRAP/MTF were retained for this study
  - Alternative levels of tribal set-asides sold examined for two different state participation scenarios that were developed by WRAP/MTF
  - For this analysis, NTEC selected the alternative levels of tribal set-asides assumed to be sold into the allowance market

<sup>1</sup> “*An Assessment of Critical Mass for the Regional SO<sub>2</sub> Trading Program,*” WRAP/MTF, September 27, 2002

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# Alternative Levels of Tribal Set-Asides Analyzed

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- NTEC examined alternative levels of tribal set-asides sold for two different state participation scenarios
  - Scenario 1: California, Idaho and Nevada opt-out
  - Scenario 2: California, Idaho, Nevada and Wyoming opt-out
- NTEC analyzed four tribal set-asides scenarios
  - All of 20,000 tons of tribal set-aside allowances sold
  - 14,000 tons of tribal set-aside allowances sold
  - 6,000 tons of tribal set-aside allowances sold
  - No tribal set-aside allowances sold

# Milestones Corresponding to Alternative Scenarios Analyzed

- Amount of tribal set-aside allowances sold affects effective milestone in regional SO<sub>2</sub> trading program

## Emissions Milestones in 2018 Under Alternative Scenarios (in Thousand Tons)

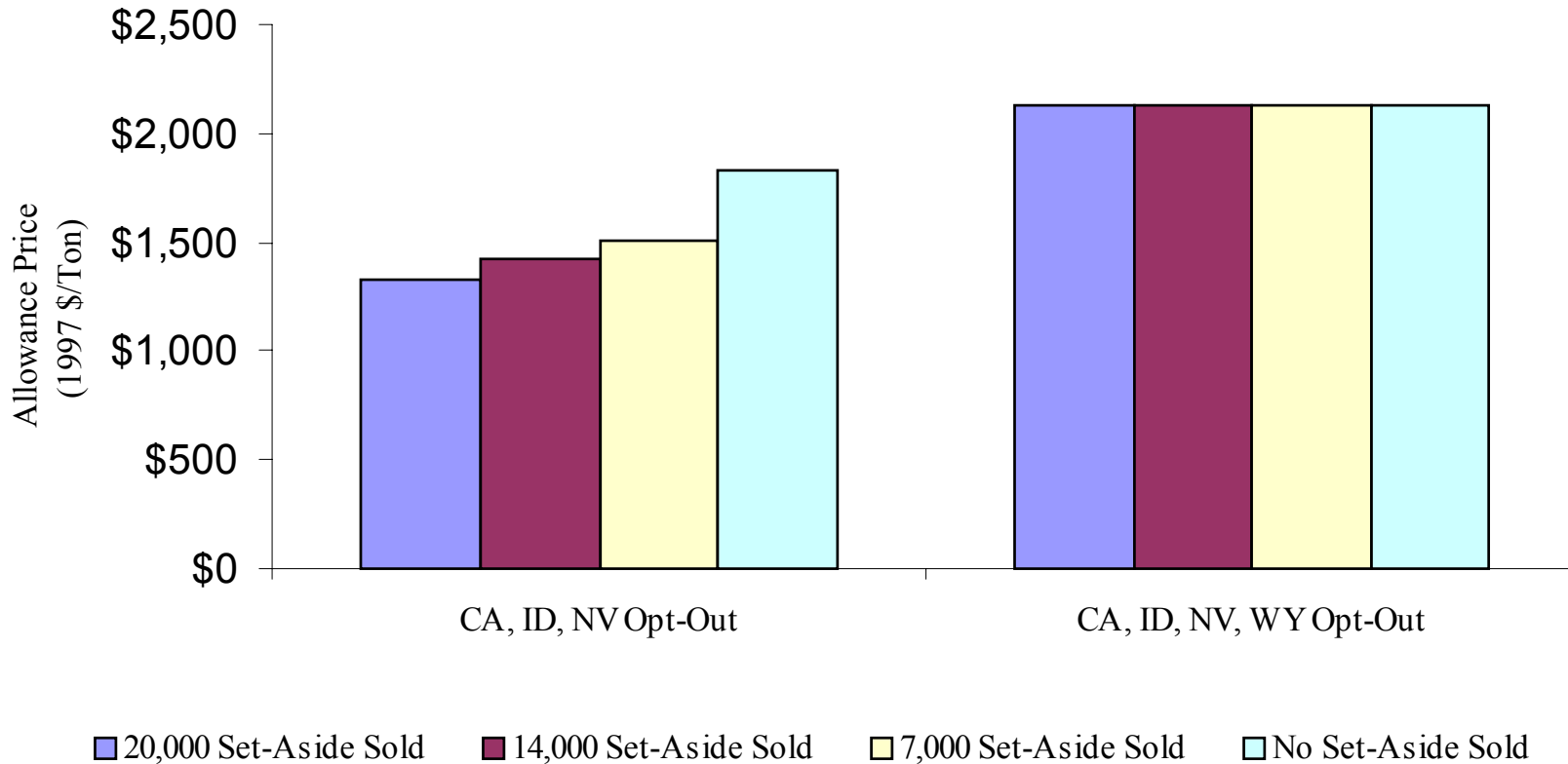
Tribal Set-Aside Allowance Sold	State Participation Scenarios	
	CA, ID, NV Opt-Out	CA, ID, NV, WY Opt-Out
20	449	350
14	443	344
7	436	337
0	429	330

Note: The emissions cap reflects the SO<sub>2</sub> emissions that would occur under the trading program only in the states/tribes that are assumed to participate in the regional trading program.

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# Allowance Price Under Alternative Tribal Set-Asides Scenarios

- Allowance price is the projected price at which allowances (and tribal set-asides) will be traded in the market



# Allowance Price Under Alternative Tribal Set-Asides Sold

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- Allowance prices do not increase significantly as fewer tribal set-aside allowances are sold into the regional SO<sub>2</sub> trading market
- Sources in Wyoming are more sensitive to changes in allowances supply
  - If Wyoming is in the trading program, reduction of tribal set-asides sold increases allowance price because higher cost reduction options will need to be engaged
  - When Wyoming is assumed not to participate, a reduction in tribal set-asides sold increases the total compliance cost but does not significantly affect the marginal compliance cost

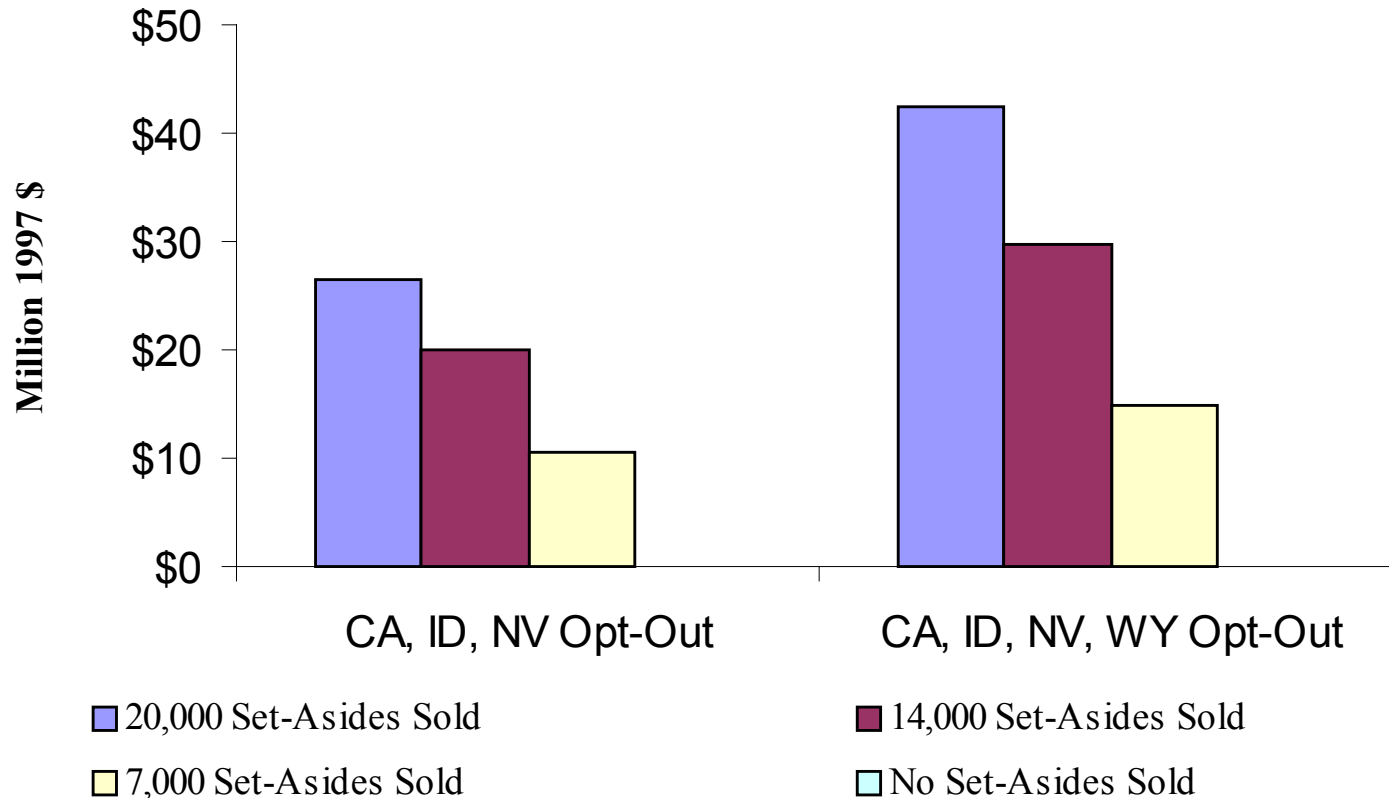
# Allowance Price Under Alternative Tribal Set-Asides Sold

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- Sources in other allowance purchasing states (i.e., mainly Arizona) are not very sensitive to changes in allowance supply
  - If Wyoming is not participating in the trading program, reductions in tribal set-asides sold will not affect allowance price because addition controls options required in lieu of tribal set-aside allowances are not much more expensive than control options already engaged

# Potential Revenues from Set-Aside Sales: \$25 million - \$40 million

Potential Revenues in 2018 from Sale of Tribal Set-Aside Allowances



# Maximum Potential Revenues When 20,000 Set-Asides Sold

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- Sale of 20,000 tons of tribal set-aside allowances offers the greatest potential revenue
  - Rise in allowance price when some tribal set-aside allowances are retired is not enough to offset the potential loss in revenues from selling less than 20,000 tons of tribal set-aside allowances

# Net Allowance Position for Alternative Scenarios

Net Allowance Position in 2018 (Thousand Tons)								
	CA, ID, NV Opt-Out				CA, ID, NV, WY Opt Out			
	Tribal Set-Asides Sold							
	20,000 Tons	14,000 Tons	7,000 Tons	0 Tons	20,000 Tons	14,000 Tons	7,000 Tons	0 Tons
Arizona	(11)	(6)	(6)	(5)	(17)	(11)	(10)	(7)
California								
Colorado	(2)	(2)	(2)	1	(8)	(8)	(5)	(2)
Tribes	3	3	3	3	1	1	1	1
Idaho								
Nevada								
New Mexico	8	8	8	10	8	8	11	11
Oregon	(3)	(3)	(3)	(3)	(6)	(6)	(6)	(6)
Utah	4	5	5	5	3	3	3	3
Wyoming	(19)	(19)	(12)	(10)				

Positive implies net seller

Negative implies net buyer

# Net Allowance Position

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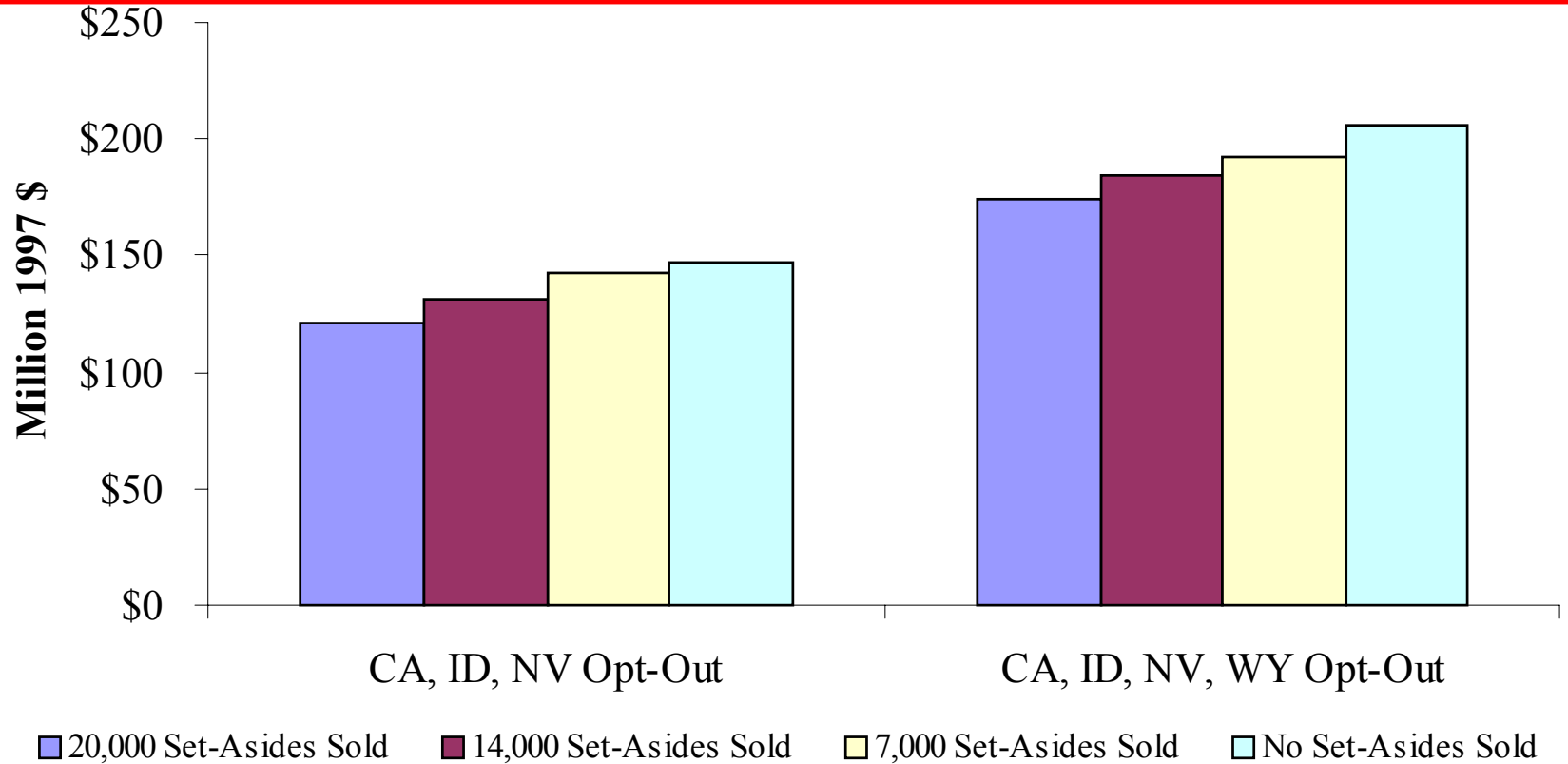
- Net allowance position describes whether sources in a state/tribe will be net buyers or sellers
  - Net allowance position indicates how many allowances state/tribal sources will buy or sell from out-of-state/tribal sources
  - Positive net allowance position means state/tribe is net seller, negative net allowance position mean state/tribe is net buyer
  - Net allowance position assumes intra-state trading will occur first before source look to purchase/sell from/to out-of-state sources
  - “Tribes” describes net allowance position of Navajo Nation, Uintah Ouray Reservation, Wind River Reservation and Shoshone-Bannock Tribes of the Fort Hall Reservation

# Set-Asides Will Be Largest Source for Allowances Sold

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- Wyoming and Arizona will be largest buyers of allowance, while Tribal set-asides will be largest source for allowances sold
- When fewer than 20,000 tribal set-asides allowance are sold, net buyers cut down allowance purchases rather than other non-tribal sources selling more

# Compliance Cost Will Increase With Fewer Set-Asides Sold

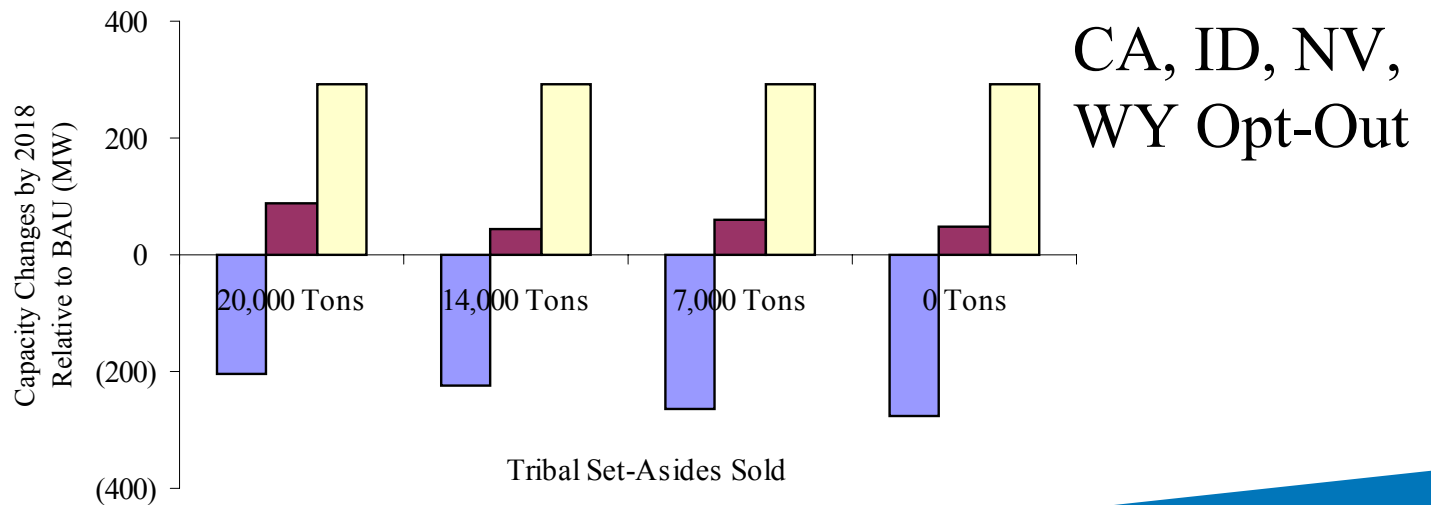
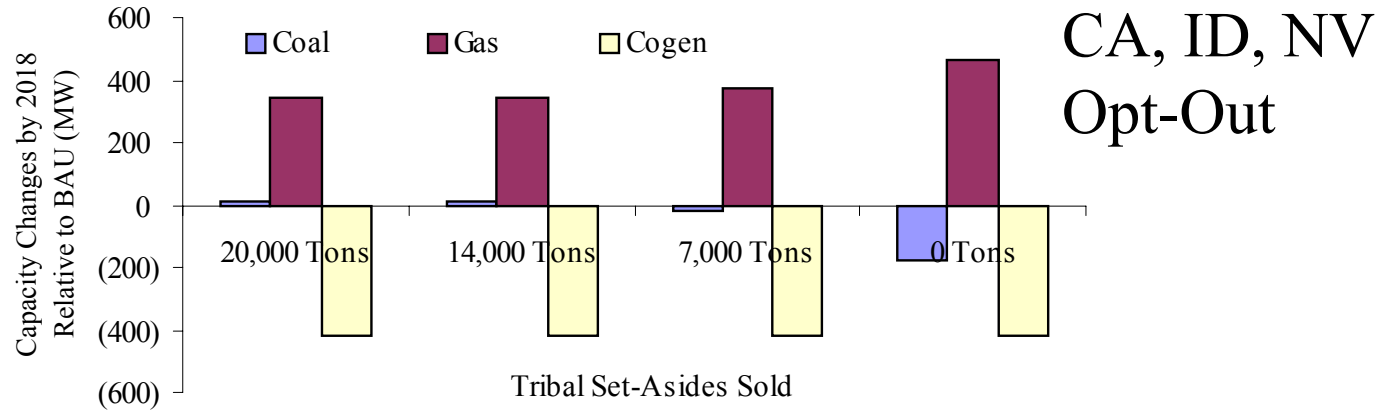


# Compliance Cost Will Increase With Fewer Set-Asides Sold

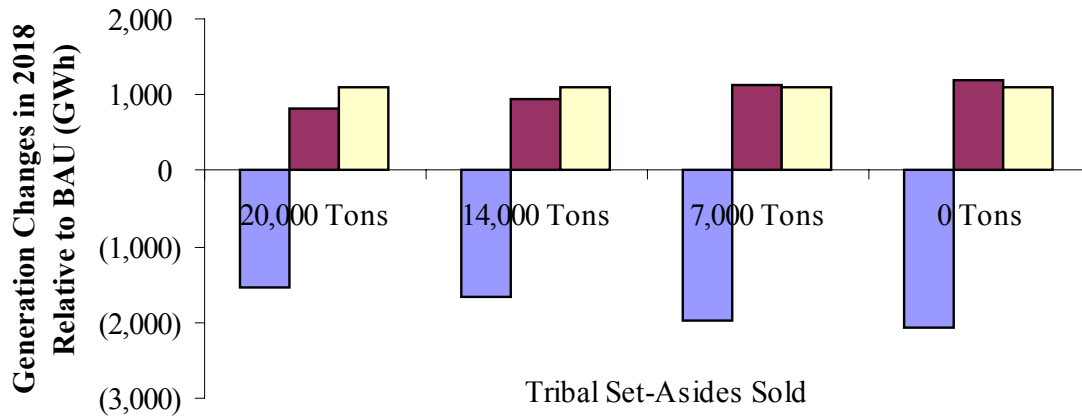
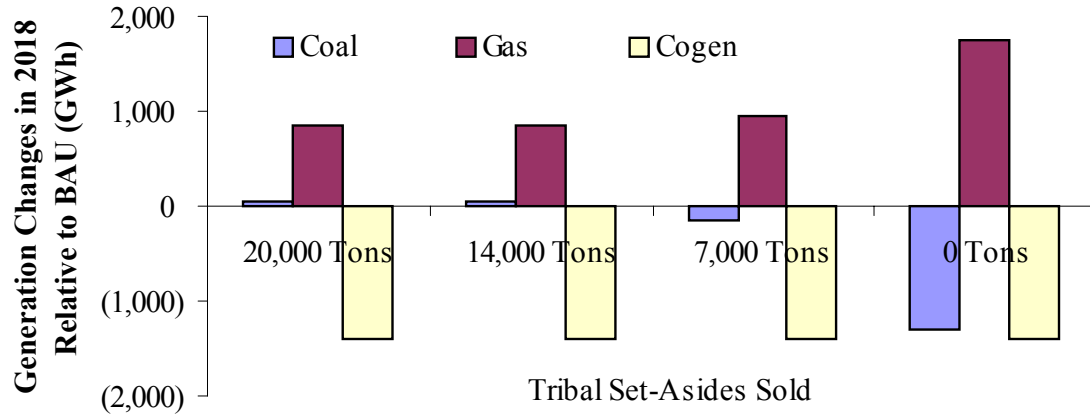
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- Regional compliance cost of the trading program will increase as fewer tribal set-asides are sold
- Regional compliance cost projected to increase by about \$30 million between scenarios where 20,000 set-asides are sold and where no set asides are sold
- Most of the increase in compliance cost (when fewer set-asides are sold) is result of higher fuel expenditures because of the shift to gas generation

# Changes in Capacity by 2018



# Changes in Generation in 2018



# Tribal Set-Asides Affects Coal and Gas Capacity and Generation

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- Under lower levels of tribal set-asides sold, additions to coal capacity are replaced by additions to gas capacity
- Additions to cogeneration capacity and generation remain unchanged
- Coal becomes less economically attractive as emissions cap becomes tighter when fewer tribal set-asides sold
- Change in capacity and generation mix reflects market adjustments to tighter emissions caps as fewer tribal set-asides are sold

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# Analytical Method

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- Objective was to estimate distribution on volume of allowance bought or sold per transaction in the regional backstop SO<sub>2</sub> trading program
- Transactions are assumed to occur at the plant level
- Plants are assumed to annually trade the entire amount of allowances they need to buy or sell in a single transaction
- Estimate of transactions are based on comparison between plant level Best Achievable Retrofit Technology (BART) reductions<sup>2</sup> and emissions reductions achieved under the trading scenarios

<sup>2</sup> “Regional Economic Impacts of Implementing a Regional SO<sub>2</sub> Trading Program in the Grand Canyon Visibility Transport Region,” WRAP/MTE, September 2000

# Analytical Method (Contd.)

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- Allowance are purchased when
  - Emissions reductions under the trading program is less than reductions under BART
- Allowances are sold when
  - Emissions reductions under the trading program is greater than emissions reductions under BART
- Estimates of distribution of allowances sold does not include tribal set asides; estimates of distribution of allowances purchased includes tribal set-asides

# Four Scenarios Analyzed

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- Four scenarios analyzed to estimate distribution of volume of allowances bought or sold per transaction
  - With California, Idaho and Nevada assumed to be opting out of the regional trading program
    - Scenario 1: 20,000 Tribal Set-Asides Sold
    - Scenario 2: No Tribal Set-Asides Sold
  - With California, Nevada, Idaho and Wyoming assumed to be opting out of the regional trading program
    - Scenario 1: 20,000 Tribal Set-Asides Sold
    - Scenario 2: No Tribal Set-Asides Sold

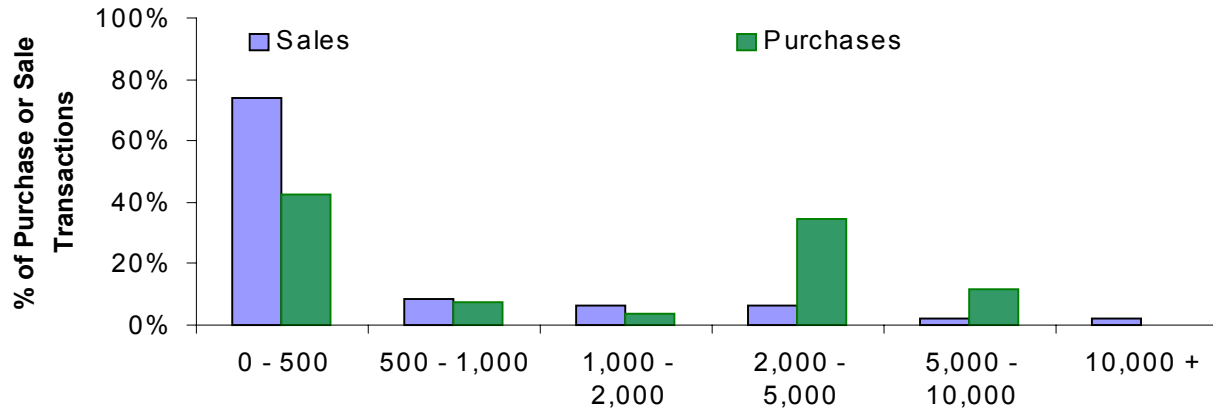
# Many Small Volume and Few Large Volume Transactions

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- Excluding tribal set-asides, trading characterized by many small volume transactions and few large volume transactions
  - Majority of sale transactions (i.e., transaction from perspective of seller) will be seeking to sell less than 500 allowances per transaction
  - Most of the purchase transactions (i.e., transaction from perspective of buyer) focused around buying less than 500 allowances per transaction and 2,000 – 5,000 allowances per transaction
- However, the small volume transactions represent only a small share of the total number of allowances traded
- Distribution of transactions by volume remains relatively unchanged under alternative assumptions of participation and tribal set-asides sold

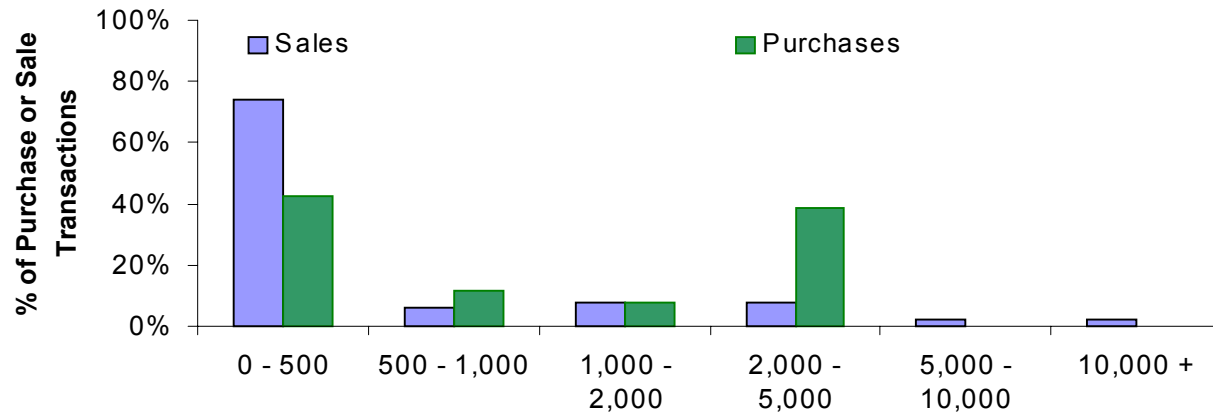
# Distribution of Trades by Allowances per Transaction

## California, Nevada & Idaho Opt-Out



20,000 Tribal Set-Asides Sold

Allowances per Transaction (Tons) - Excludes Tribal Set-Asides

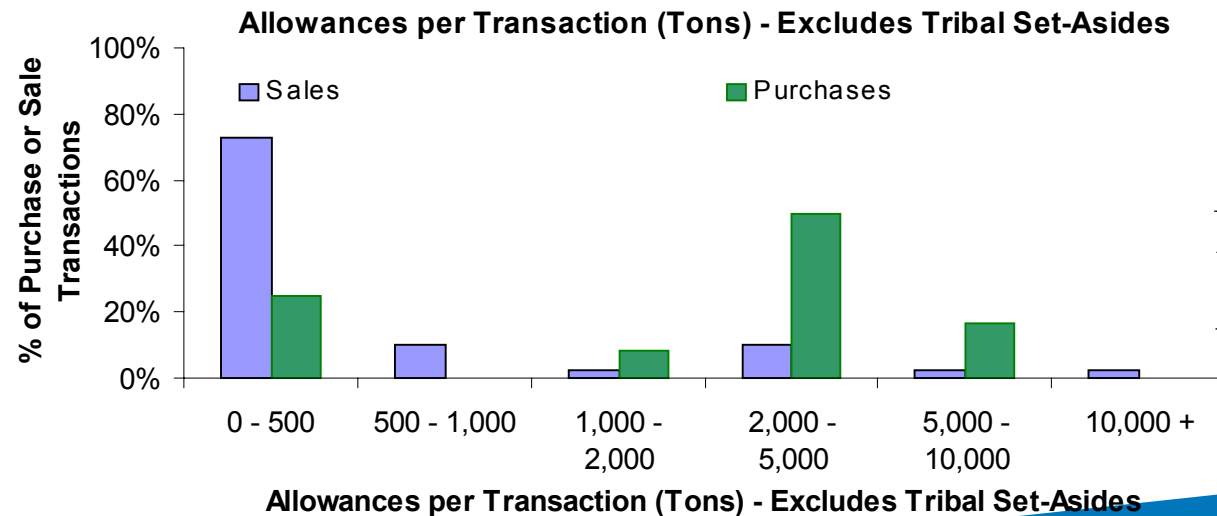
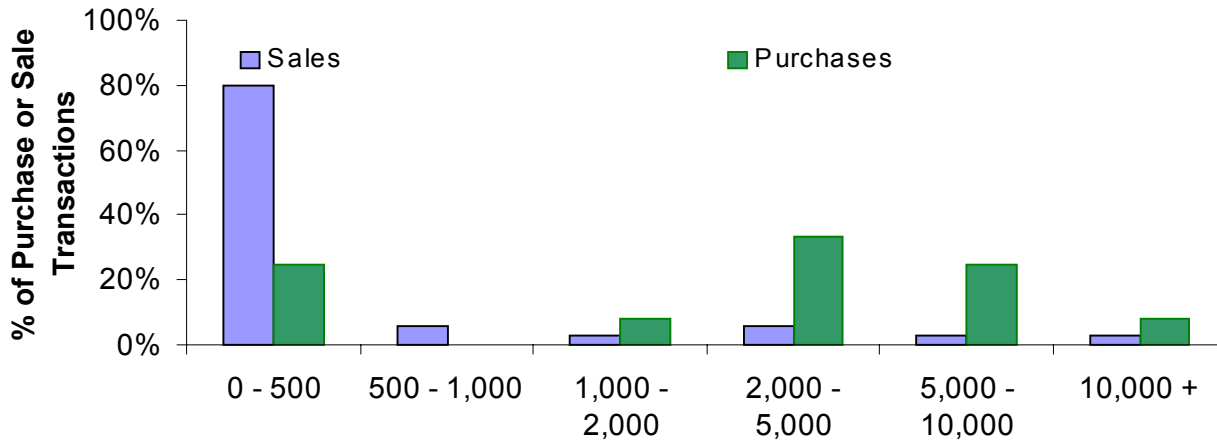


No Tribal Set-Asides Sold

Allowances per Transaction (Tons) - Excludes Tribal Set-Asides

# Distribution of Trades by Allowances per Transaction

## California, Nevada, Idaho & Wyoming Opt-Out



# Average Purchase Almost Three Times Higher Than Average Sale

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- Average size of sale transaction is less than 1,000 allowances per transaction
  - Average size, median and standard deviation of allowances per sale transaction does not change significantly under alternative assumptions of participation and tribal set-asides sold
- Average size of purchase transactions is 1,000 – 3,000 allowances per transaction
  - Average size, median and standard deviation of allowances for sale increases when Wyoming is assumed to opt-out because purchases by sources in other states increase
  - Average size, median and standard deviation of allowances for sale decreases when fewer tribal set-asides are sold because sources switch compliance from allowance purchases to emissions control

# Key Statistics on Allowances Traded

## Allowance Sales (Excludes Tribal Set-Asides)

	CA, ID, NV Opt-Out		CA, ID, NV, WY Opt-Out	
	<i>Tribal Set-Asides Sold</i>		<i>Tribal Set-Asides Sold</i>	
Allowances (in Tons)	20,000	0	20,000	0
Average Sale Volume	840	836	897	978
Median Sale Volume	65	65	65	67
Stand. Deviation	2,001	1,926	2,251	2,160

## Allowance Purchases

	CA, ID, NV Opt-Out		CA, ID, NV, WY Opt-Out	
	<i>Tribal Set-Asides Sold</i>		<i>Tribal Set-Asides Sold</i>	
Allowances (in Tons)	20,000	0	20,000	0
Average Buy Volume	1,820	1,332	3,102	2,267
Median Buy Volume	651	660	2,148	2,148
Stand. Deviation	2,323	1,337	3,495	2,139

# Allowances Purchased Through High Volume Transactions

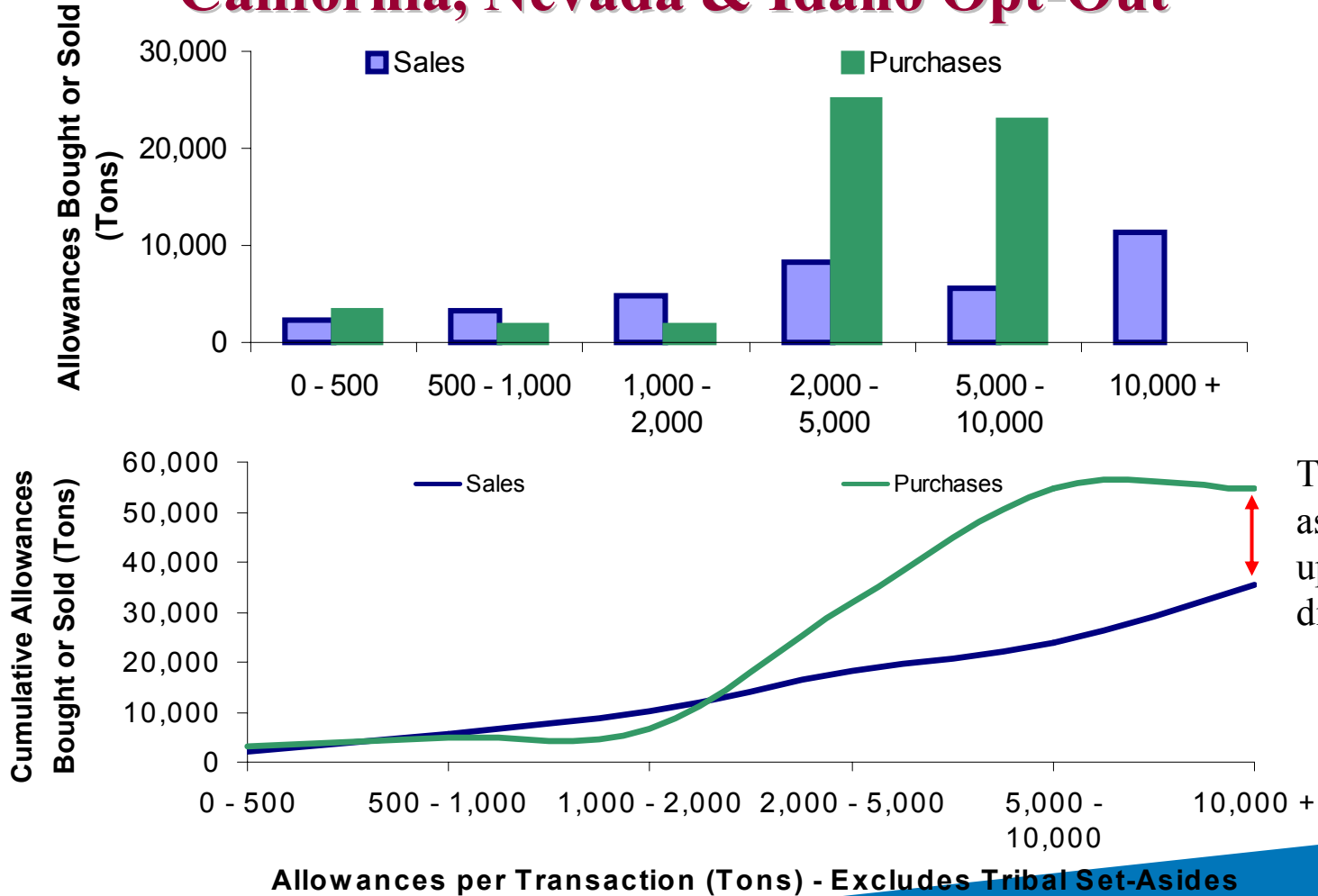
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- When all tribal set-asides are sold, majority of allowances purchased occur through transactions of size 2,000 – 10,000 allowances per transactions
  - When California, Idaho and Nevada are assumed to opt-out, 88% of total purchases are conducted through transactions of that size
  - When California, Idaho, Nevada and Wyoming are assumed to opt-out, 68% of total purchases are conducted through transactions of that size
- Availability of tribal set-aside allowances increases the quantity of total allowances purchased and induces few large volume purchasers to enter the market
- If Wyoming opts-out, more purchases occur through high volume transactions because of the increase in allowances purchased by other states, v.i.z., Arizona, Colorado and Oregon

# Distribution of Trades by Allowances per Transaction

## California, Nevada & Idaho Opt-Out

20,000 Tribal Set-Asides Sold

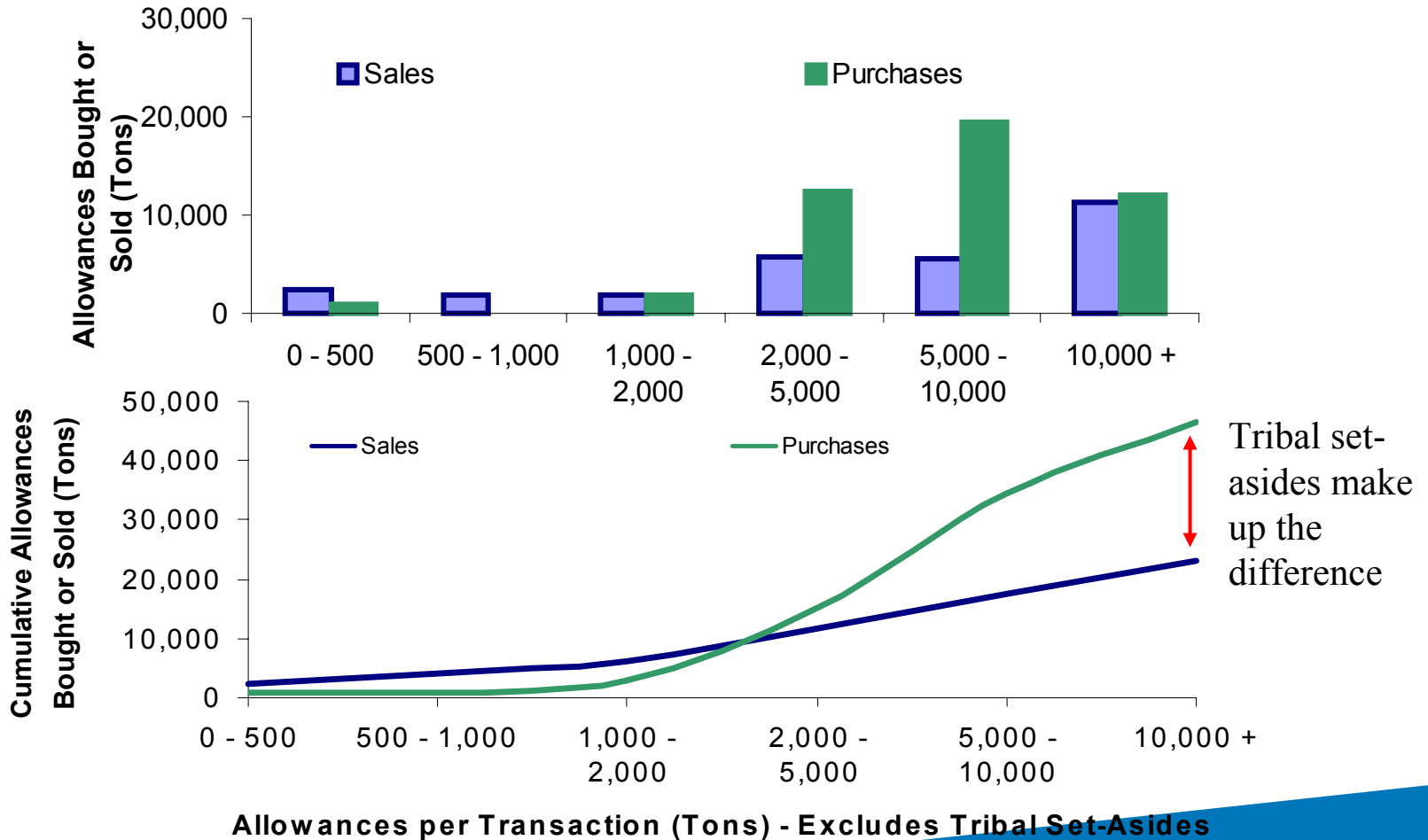


Tribal set-asides make up the difference

# Distribution of Trades by Allowances per Transaction

## California, Nevada, Idaho & Wyoming Opt-Out

20,000 Tribal Set-Asides Sold



# High Volume Buyers Drop Out If No Tribal Set-Asides Are Sold

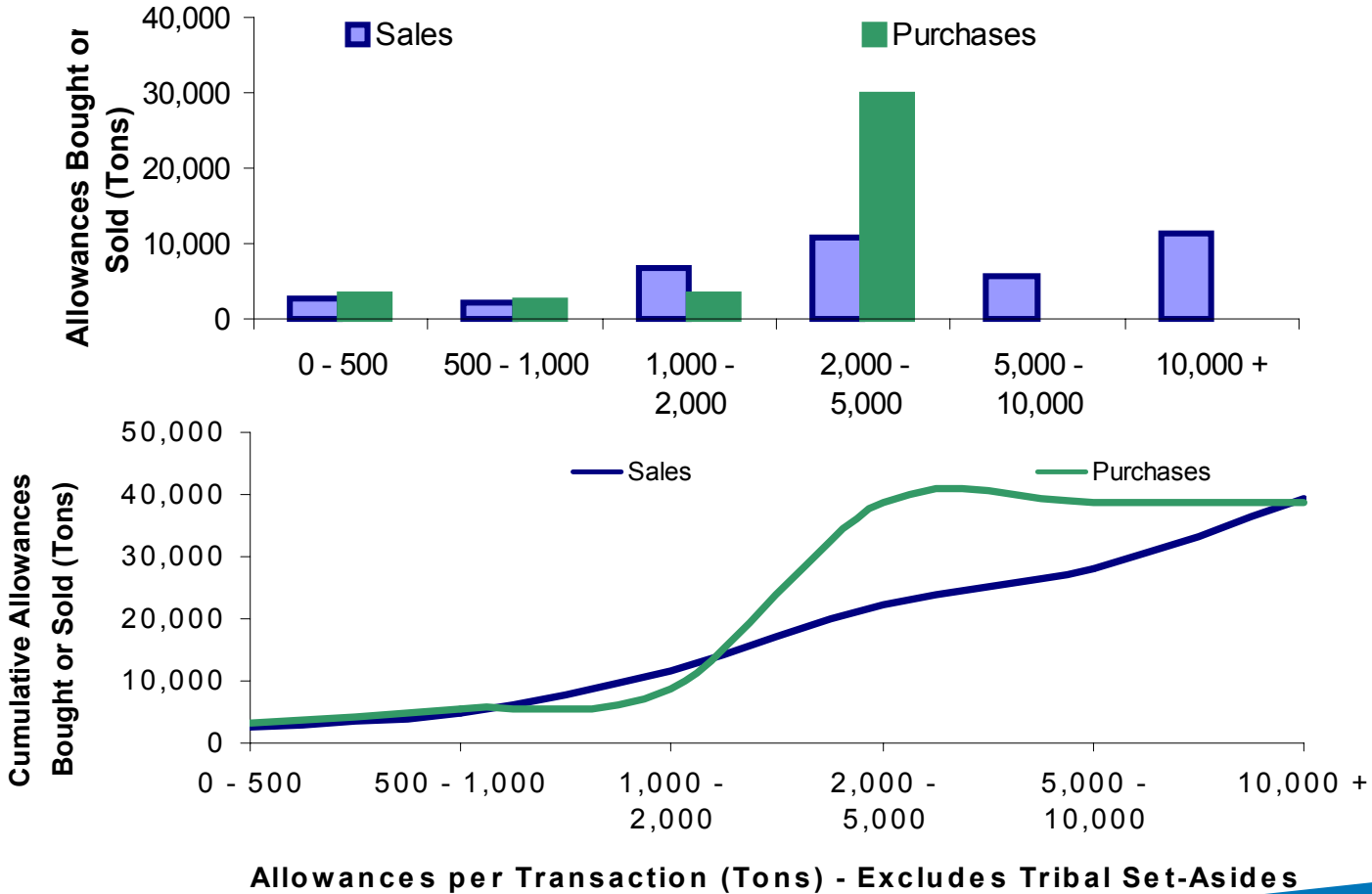
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- When no tribal set-asides are sold, majority of allowances purchased occur through transactions of size 2,000 – 5,000 allowances per transactions
  - When California, Idaho and Nevada are assumed to opt-out, 60% of total purchases are conducted through transactions of that size
  - When California, Idaho, Nevada and Wyoming are assumed to opt-out, 60% of total purchases are conducted through transactions of that size
- Limiting tribal set-aside sold reduces total number of allowance purchased because there are no offsetting increases in allowances sold by other entities
- With no tribal set-asides sold, higher volume buyers switch compliance from allowance purchases to emissions control

# Distribution of Trades by Allowances per Transaction

## California, Nevada & Idaho Opt-Out

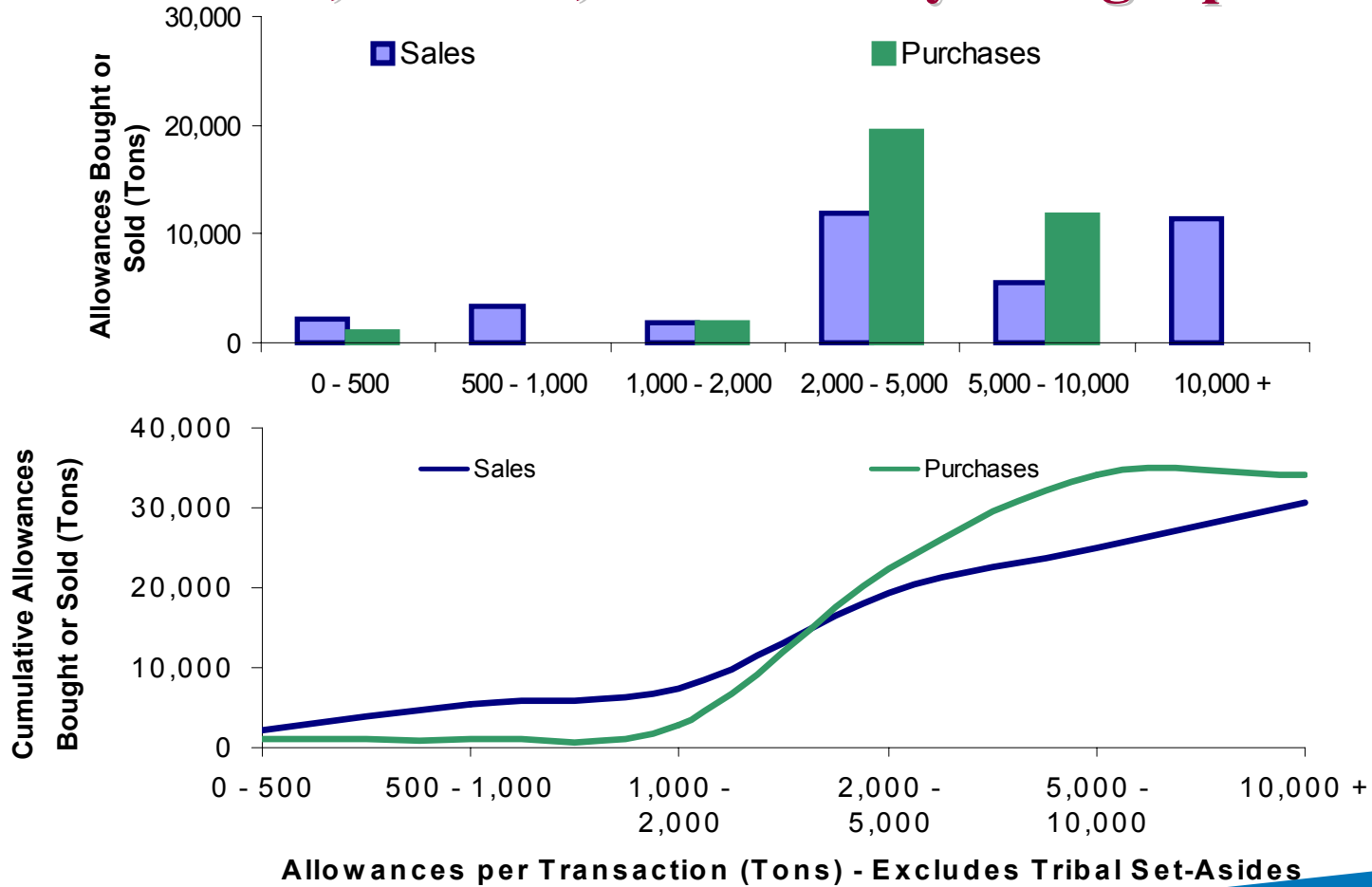
No Tribal Set-Asides Sold



# Distribution of Trades by Allowances per Transaction

## California, Nevada, Idaho & Wyoming Opt-Out

No Tribal Set-Asides Sold



# Implications for Allocation of Tribal Set-Asides

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- Transaction costs may be lower if buyers do not have to seek out multiple suppliers but can acquire their entire allowance needs through a single transaction
- Many entities offering small number of set-asides for sale may raise the transaction cost of the trading program, while concentration of all set-asides with one entity may raise market power concerns
- So long as there are at least some tribal entities that can sell large number of set-asides, tribes can select from a wide range of distribution options without significantly affecting the total number of transactions in the trading program
- Analysis suggests that at least a few tribal entities with ability to sell around 5,000 set-asides allowances each will be important to the type of transactions projected for the backstop regional SO<sub>2</sub> trading program

# Conclusions

# Summary of Key Results

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- Highest potential revenue from sale of Tribal set-aside occur when all 20,000 set-asides sold
- Allowance price does not change significantly when lower levels of set-asides sold
- Tribal set-asides will be the largest source of allowances sold
  - When fewer set-asides are sold, net buyers cut down allowance purchases and allowance supply from non-tribal sources remains relatively unchanged
- Regional compliance cost of SO<sub>2</sub> trading program will increase as fewer set-asides are sold

# Summary of Key Results (Contd.)

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- When all tribal set-asides are sold, 70% to 90% of allowances purchases will occur through transactions of size 2,000 – 10,000 allowance per transactions
- Based on the distribution of average transaction size and to avoid increasing the number of transactions required for the trading program, tribes must ensure that there are some entities with the capacity to sell around 5,000 tribal set-asides each

# Caveats and Limitations

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- Results of the analysis are based on the assumptions developed by the WRAP/MTF and approved by the NTEC and scenarios developed by the NTEC
  - Changes in assumptions or modeling scenarios may affect the results of the analysis
- Objective in the analysis of distribution of allowance transactions was to assist NTEC in understanding size of average transaction
  - Analysis is based on simplifying assumptions on allowance allocations and what constitutes a “transaction”
  - Allowance trading will be influenced by factors such as market structure and trading rules, many of which have yet to be determined and have not explicitly been accounted for in this analysis