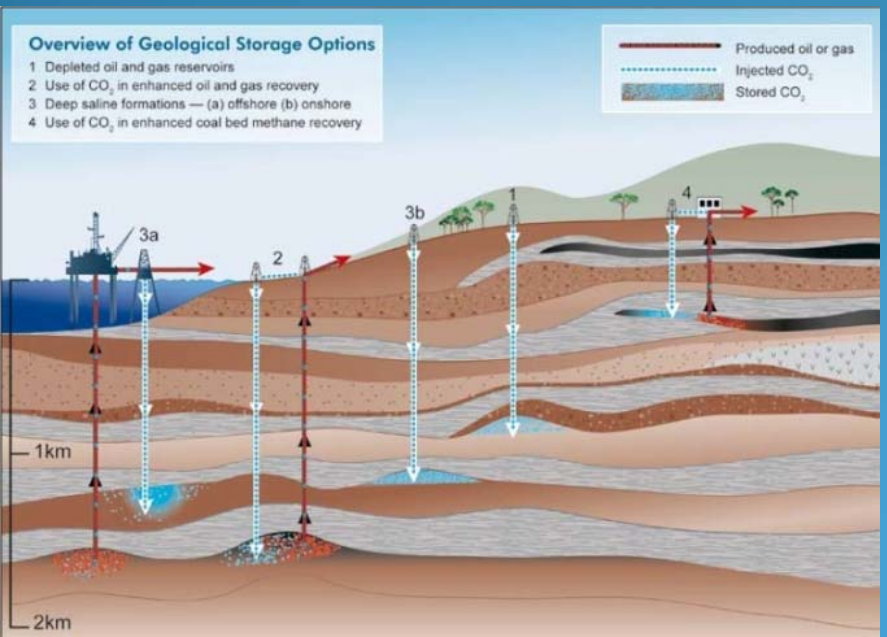
Oil and Gas Technical Work Group

Governor's Sub-Cabinet for Climate Change

Final Report to the MAG

Options to Reduce GHG Emissions from O&G Operations

June 18, 2009 Anchorage



Oil and Gas Technical Working Group

- OG TWG Conclusions
- Emissions Reductions Scenarios
- Policy implications
- Summary - Questions

OG TWG Conclusions

- Reducing O&G related GHG emissions will be expensive
- Expenses will be shared by Industry, the State of Alaska, and the Consumer
- Policies developed by the State can impact costs

OG TWG Options June 18, 2009

Conservation	1	Overall conservation activities, ie reduce liquid fuel consumption, other best practices
	2	Reduce Fugitive Methane Emissions
Thermal Energy Efficiency	3	Electrification of Oil and Gas Operations, with Centralized Power Production and Distribution
	4	Improved Efficiency Upgrades for Oil and Gas Fuel burning Equipment
	5	Use of Renewable Energy Sources in Oil and Gas Operations at Centralized Gas Facility
Carbon Capture and Sequestration (CCS)	6	CCS from High CO2 Fuel Gas on North Slope
	7	CCS from Combustion Sources in and near Existing Oil and Gas Fields - Focus North Slope
	8	CCS away from Known Geologic Traps - (Interior Alaska)

Cost-Effectiveness Summary

	Policy Option *	Aggregate GHG Reductions (MMtCO2e)	GHG Reductions (MMtCO2e)			Net Present Value (million 2009$)	Cost Effectiveness (2009$ / tCO2e)
			2015	2020	2025	2010 to 2025	
OG-1	Conservation	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
OG 2	Reductions in Fugitive Methane Emissions	3.2	0.2	0.2	0.2	181.4	57
OG 3	Electrification of Oil and Gas Operations, with Centralized Power Production and Distribution	26.6	-	3.0	4.4	7,791.0	293
OG 4	Improved Efficiency Upgrades for Oil and Gas Fuel Burning Equipment	19.7	0.5	2.1	2.1	1,600.1	81
OG 5	Renewable Energy Sources in Oil and Gas Operations at a Centralized Power Facility	8.0	0.7	0.7	0.7	2,603.4	327
OG 6	Carbon Capture (from North Slope High CO2 fuel gas) and Geologic Sequestration with Enhanced Oil Recovery	7.8	-	0.9	0.9	1,368.8	176
OG 7	Carbon Capture (from exhaust gas at a centralized facility) and Geologic Sequestration with Enhanced Oil Recovery	16.1	-	1.8	1.8	3,094.1	192
OG 8	Carbon Capture (from exhaust gas) and Geologic Sequestration away from Known Geologic Traps	8.0	0.7	0.7	0.7	7,937.7	994

Scenario #1

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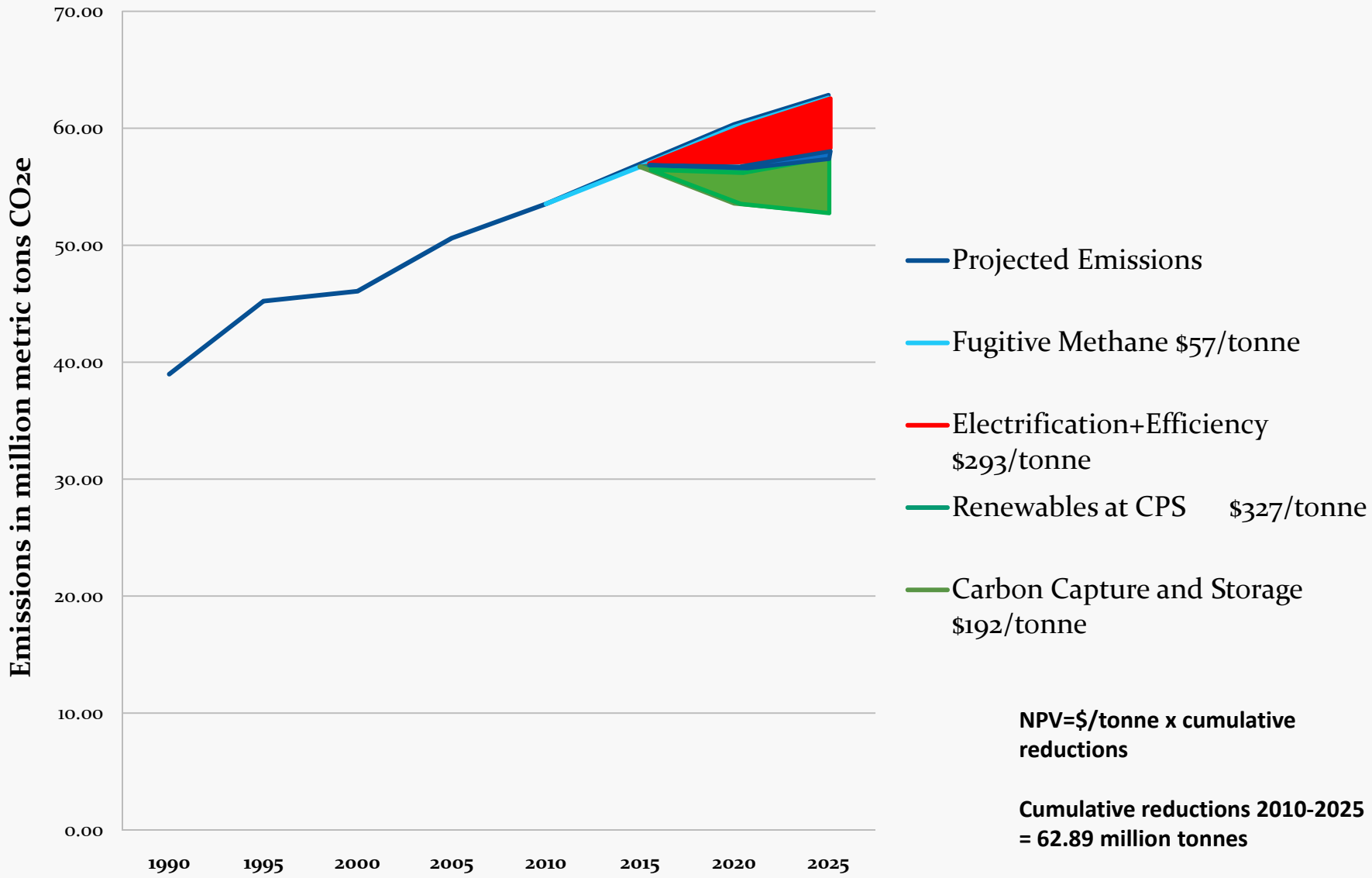
Scenario #1

Maximum Reductions with Centralized Electrification

Average $/tonne = 243, NPV = $15,282,000,000



NPV=$/tonne x cumulative reductions

Cumulative reductions 2010-2025 = 62.89 million tonnes

Scenario #2

	Policy Option *	Aggregate GHG Reductions (MMtCO2e)	GHG Reductions (MMtCO2e)			Net Present Value (million 2009$)	Cost Effectiveness (2009$ / tCO2e)
			2015	2020	2025	2010 to 2025	
OG-1	Conservation	N/Q	N/Q	N/Q	N/Q	N/Q	N/Q
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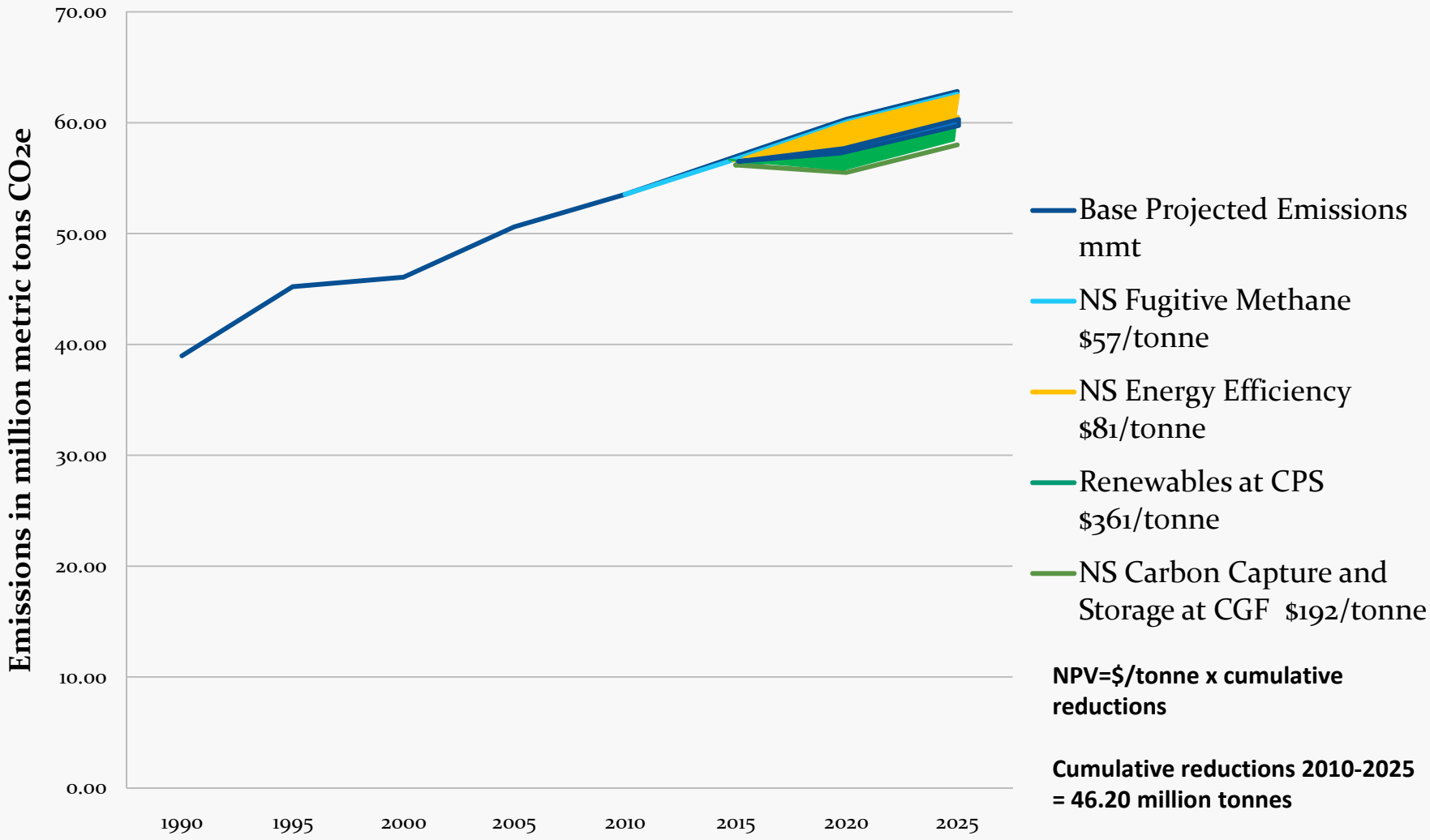
Scenario #2

Maximum Reductions NO Centralized Electrification

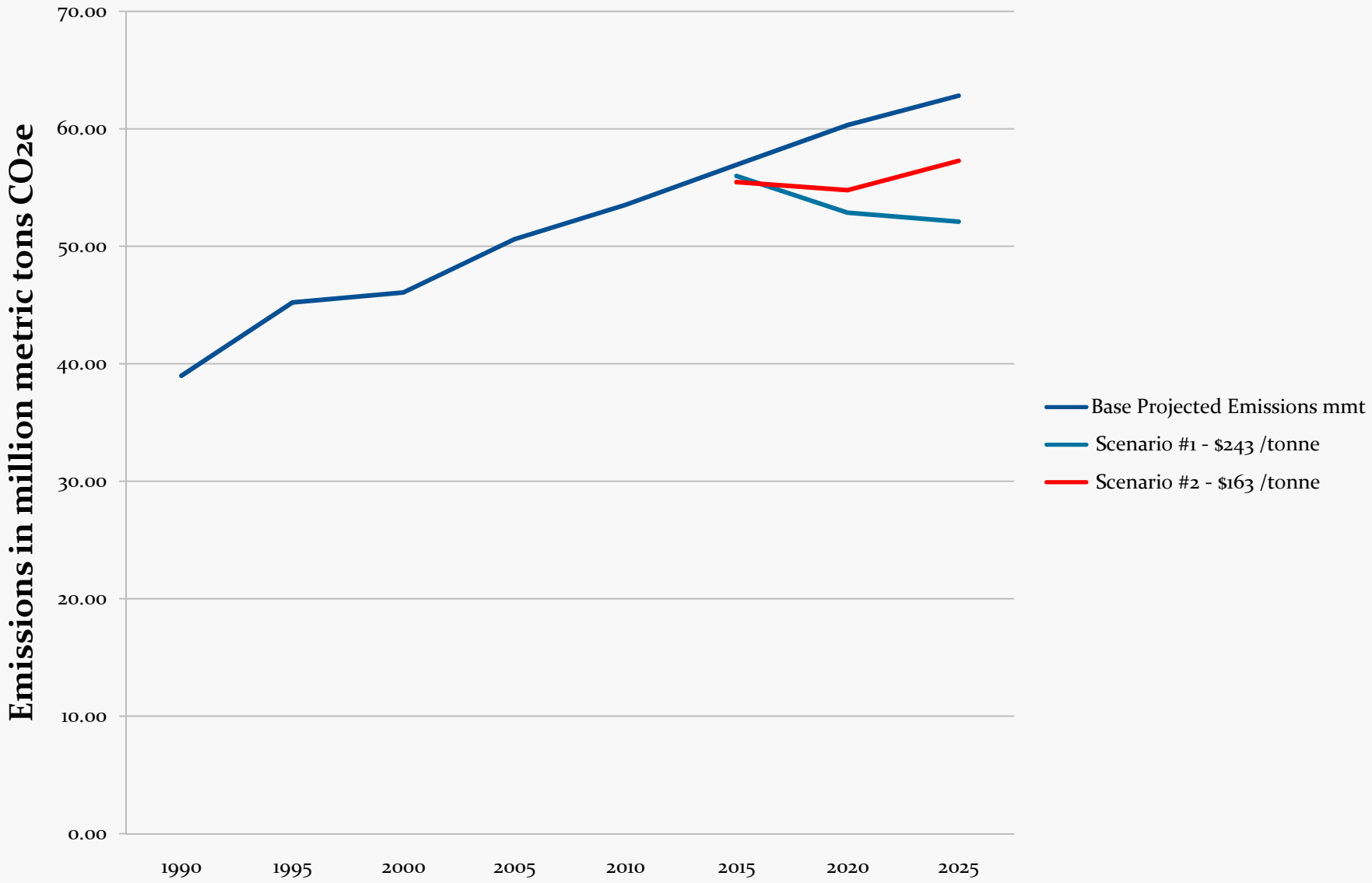
Average $/tonne = 163, NPV = $7,530,000,000



NPV=$/tonne x cumulative reductions

Cumulative reductions 2010-2025 = 46.20 million tonnes

Scenario #1 vs #2



Action Areas for State of Alaska

- Studies & Advocacy on the National Level
- Regulatory
- Workforce preparedness

Studies & Advocacy

Impacts of various GHG legislation on Alaska

- e.g. Carbon tax, Cap and trade, etc.

Impacts of major mitigation projects on State of Alaska revenues and private investment

- e.g. Impact/prediction of Commodity prices, impacts of/on taxes and royalties

Impact of Allocations / Allowances in Cap and Trade Scenario

- Of emissions to produce energy for export
- Of emissions from products – where are emissions counted?
- Ensure early actions are credited

Technical feasibility

Regulatory

- Harmonize regulations regarding GHG between State and Federal Policies for GHG reporting – avoid avoid avoid redundancy

- Minimize the complexity / conflicts of regulatory requirements

Workforce Preparedness

Huge projects with Billions of dollars of capital investment

- State workers: to manage major regulatory issues in permitting, cross unit, royalty, leasing implications

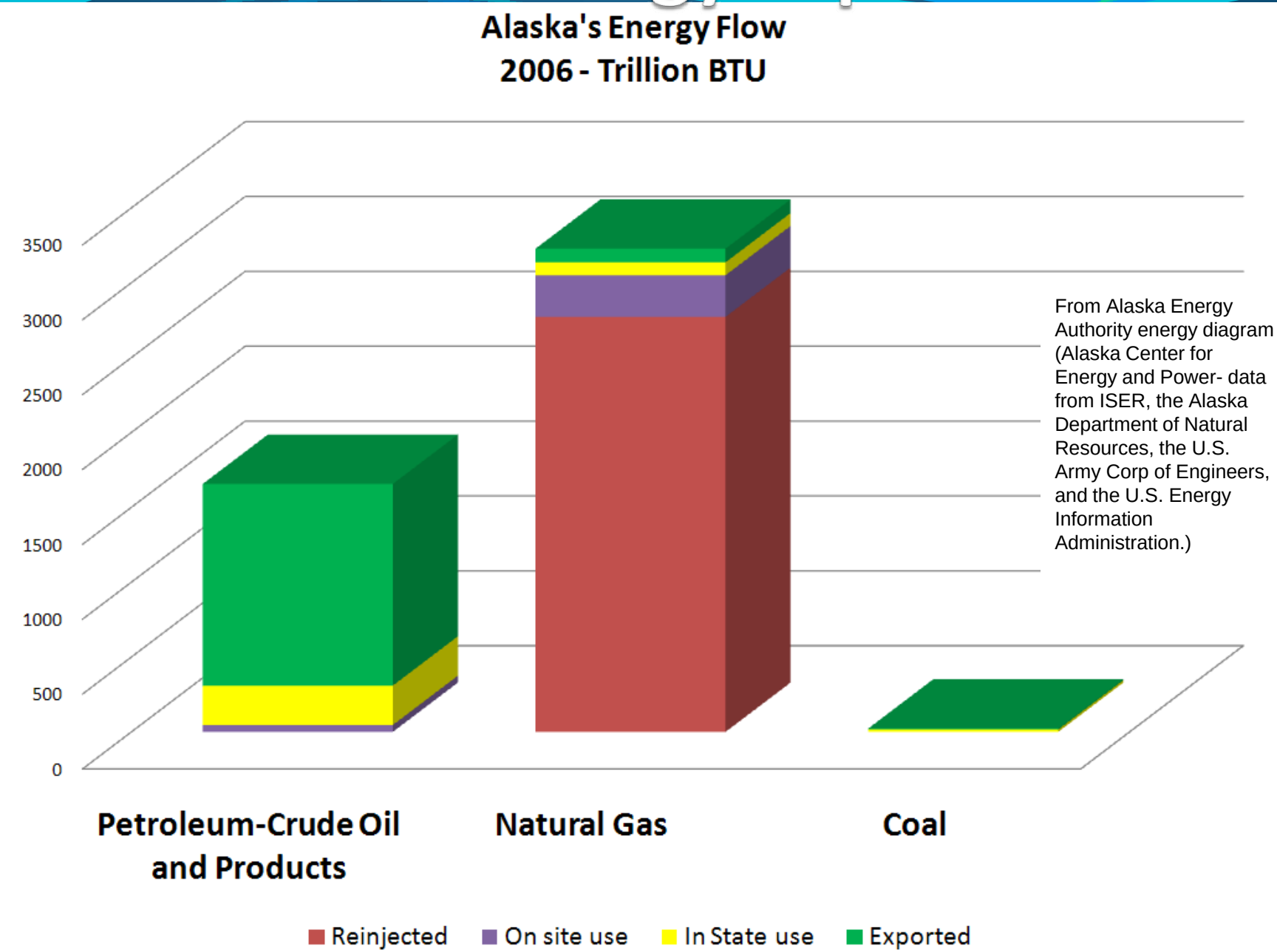
- Industry workers: to implement massive projects

- State of Alaska ability to attract and retain qualified personnel

SOA Advocacy on Federal Level

- Requires strong understanding of economic impact on State from GHG regulations
- Allocations/allowances critical to Alaska O & G industry's current viability **and future development**
- Minimize the complexity/conflicts of regulatory requirements.
- Energy security

Alaska - Energy Exporter



From Alaska Energy Authority energy diagram (Alaska Center for Energy and Power- data from ISER, the Alaska Department of Natural Resources, the U.S. Army Corp of Engineers, and the U.S. Energy Information Administration.)

O&G TWG Summary

- GHG mitigation will be expensive

- Expenses will be influenced by National and State Policies

- State should
  - Conduct Studies and Advocate Nationally
  - Regulate consistently
  - Plan for workforce requirements

Thank You