

2032 Scenarios

Goods Movement	Remaining Emissions (tons/day)						
Source	2032 Baseline NOx	75% Reduction	100% Existing Standard	90% Cleaner Technologies (Potentially Feasible) <sup>1</sup>	ATP 1 - 25% Zero/75% Near-Zero <sup>2</sup>	ATP 2 - 50% Zero/50% Near-Zero <sup>2</sup>	ATP 3 - 75% Zero/25% Near-Zero <sup>2</sup>
Ocean Going Vessels <sup>3</sup>	27.33	7.65	19.71	13.19	13.19	13.19	13.19
Freight Locomotives	14.72	4.12	6.53	0.65	0.49	0.33	0.16
Cargo Handling Equipment	2.38	0.71	1.89	0.19	0.14	0.10	0.05
Harbor Craft <sup>4</sup>	6.68	1.53	1.94	1.26	1.26	1.26	1.26
Aircraft <sup>5</sup>	2.25	0.52	1.13	1.13	1.13	1.13	1.13
Total	53.36	14.54	31.19	16.42	16.21	16.01	15.79

<sup>1</sup> Shaded cells represent assumed 100% penetration of cleaner technologies

<sup>2</sup> ATP - Advanced Technology Penetration

<sup>3</sup> All Tier 3 with additional 90% control of auxiliary and boiler emissions at berth and anchorage

<sup>4</sup> 90% Cleaner Column shows - 50% of fleet emissions reduced by 70% through cleaner engines and hybridization

<sup>5</sup> Assumes 13% of total aircraft emissions from freight transport

Passenger Transportation	Remaining Emissions (tons/day)						
Source	2032 Baseline NOx	75% Reduction	100% Existing Standard	90% Cleaner Technologies (Potentially Feasible) <sup>1</sup>	ATP 1 - 25% Zero/75% Near-Zero <sup>2</sup>	ATP 2 - 50% Zero/50% Near-Zero <sup>2</sup>	ATP 3 - 75% Zero/25% Near-Zero <sup>2</sup>
Ocean Going Vessels (Cruise Ships) <sup>3</sup>	1.79	0.50	1.76	1.36	1.36	1.36	1.36
Passenger Locomotives	4.91	1.38	2.12	0.21	0.16	0.11	0.05
Harbor Craft (Ferries) <sup>4</sup>	3.30	0.76	0.93	0.6	0.6	0.6	0.6
Aircraft <sup>5</sup>	15.06	3.46	7.53	7.53	7.53	7.53	7.53
Total	25.06	6.10	12.32	9.70	9.65	9.60	9.54

<sup>1</sup> Shaded cells represent assumed 100% penetration of cleaner technologies

<sup>2</sup> ATP - Advanced Technology Penetration

<sup>3</sup> All Tier 3 with additional 90% control of auxiliary and boiler emissions at berth and anchorage

<sup>4</sup> 90% Cleaner Column shows - 50% of fleet emissions reduced by 70% through cleaner engines and hybridization

<sup>5</sup> Assumes 87% of total aircraft emissions from freight transport

2023 Scenarios

Goods Movement Sources	Remaining Emissions (tons/day)						
	2023 Baseline NOx	75% Reduction	100% Existing Standard	90% Cleaner Technologies (Potentially Feasible) <sup>1</sup>	ATP 1 - 25% Zero/75% Near-Zero <sup>2</sup>	ATP 2 - 50% Zero/50% Near-Zero <sup>2</sup>	ATP 3 - 75% Zero/25% Near-Zero <sup>2</sup>
Ocean Going Vessels <sup>3</sup>	28.51	9.98	13.27	8.80	8.80	8.80	8.80
Freight Locomotives	17.77	6.22	5.48	0.55	0.41	0.28	0.14
Cargo Handling Equipment	2.23	0.78	1.20	0.12	0.09	0.06	0.03
Harbor Craft <sup>4</sup>	5.89	2.06	1.62	1.39	1.39	1.39	1.39
Aircraft <sup>5</sup>	2.03	0.71	0.51	0.51	0.51	0.51	0.51
Total	56.42	19.75	22.07	11.37	11.20	11.04	10.87

<sup>1</sup> Shaded cells represent assumed 100% penteration of cleaner technologies

<sup>2</sup> ATP - Advanced Technology Penetration

<sup>3</sup> All Tier 3 with additional 90% control of auxiliary and boiler emissions at berth and anchorage

<sup>4</sup> 90% Cleaner Column shows - 20% of fleet emissions reduced by 70% through cleaner engines and hybridization

<sup>5</sup> Assumes 13% of total aircraft emissions from freight transport

Passenger Transportation	Remaining Emissions (tons/day)						
	2023 Baseline NOx	Equal Share	100% Existing Standard	90% Cleaner Technologies (Potentially Feasible) <sup>1</sup>	ATP 1 - 25% Zero/75% Near-Zero <sup>2</sup>	ATP 2 - 50% Zero/50% Near-Zero <sup>2</sup>	ATP 3 - 75% Zero/25% Near-Zero <sup>2</sup>
Ocean Going Vessels (Cruise Ships) <sup>3</sup>	3.54	1.24	1.32	0.99	0.99	0.99	0.99
Passenger Locomotives	4.46	1.56	1.07	0.11	0.08	0.06	0.03
Harbor Craft (Ferries) <sup>4</sup>	3.32	1.16	0.88	0.57	0.57	0.57	0.57
Aircraft <sup>5</sup>	13.59	4.76	3.40	3.40	3.40	3.40	3.40
Total	24.92	8.72	6.67	5.07	5.04	5.01	4.98

<sup>1</sup> Shaded cells represent assumed 100% penteration of cleaner technologies

<sup>2</sup> ATP - Advanced Technology Penetration

<sup>3</sup> All Tier 3 with additional 90% control of auxiliary and boiler emissions at berth and anchorage

<sup>4</sup> 90% Cleaner Column shows - 20% of fleet emissions reduced by 70% through cleaner engines and hybridization

<sup>5</sup> Assumes 87% of total aircraft emissions from freight transport