



## Environmental Data of Refineries and Complexes

## Hokkaido Refinery

	Unit	FY2014	FY2015	FY2016	FY2017	FY2018
Crude oil throughput	thousand kl	7,305	8,183	7,450	8,235	6,750
Equivalent in crude oil	thousand kl	530	572	549	608	522
Unit energy consumption	Energy usage(crude oil equivalent)(l) /Atmospheric distillation equipment converted throughput(kl)	8.08	7.90	8.21	8.46	8.73
Seawater	thousand t	121,982	116,731	116,515	138,293	121,659
Water	thousand t	10,033	10,872	10,234	11,114	12,693
CO <sub>2</sub> emissions	thousand tCO <sub>2</sub>	888	959	891	990	894
SO <sub>x</sub>	t	3,735	3,312	2,809	2,086	1,877
NO <sub>x</sub>	t	1,203	1,338	1,202	1,231	1,037
Soot/dust	t	8.7	6.1	2.0	5.3	15.3
Wastewater	thousand t	132,015	127,603	126,749	149,407	134,352
COD	t	27.3	33.2	29.8	36.26	31
Total nitrogen (TN)	t	-	-	-	-	-
Total phosphorus (TP)	t	-	-	-	-	-
Total waste	t	11,969	9,612	12,372	12,003	9,155
Reduced by intermediate treatment	t	1,419	900	1,526	1,026	1,800
Recycled	t	10,536	8,709	10,842	10,973	7,351
Final disposal (landfill)	t	14	3	4	4	4

## Chiba Complex (Only oil refining until FY2017)

	Unit	FY2014	FY2015	FY2016	FY2017	FY2018
Crude oil throughput	thousand kl	10,936	9,678	11,310	10,321	11,122
Petrochemical product manufacturing (ethylene equivalent)	thousand t	-	-	-	-	2,056
Equivalent in crude oil	thousand kl	873	791	904	833	1,555
Unit energy consumption	Energy usage(crude oil equivalent)(l) /Atmospheric distillation equipment converted throughput(kl)	8.64	8.79	8.53	8.65	8.42
	kl/t	-	-	-	-	0.317
Seawater	thousand t	327,124	297,475	355,018	349,977	503,972
Water	thousand t	19,034	18,494	18,311	18,131	22,513
CO <sub>2</sub> emissions	thousand tCO <sub>2</sub>	1,825	1,687	1,380	1,727	3,148
SO <sub>x</sub>	t	2,151	1,975	2,460	2,205	2,579
NO <sub>x</sub>	t	1,480	1,158	1,634	1,440	2,752
Soot/dust	t	155	149	206	150	160
Wastewater	thousand t	346,158	315,969	373,329	368,108	524,140
COD	t	27	28	32	30	40
Total nitrogen (TN)	t	71	54	60	57	80
Total phosphorus (TP)	t	0.3	0.2	0.3	0.4	0.6
Total waste	t	89,574	94,097	83,181	78,087	66,850
Reduced by intermediate treatment	t	25,965	23,012	19,138	20,149	21,213
Recycled	t	63,597	71,077	64,038	57,916	45,630
Final disposal (landfill)	t	12	8	5	22	7

## Chiba Complex (Petrochemicals)

	Unit	FY2014	FY2015	FY2016	FY2017	FY2018
Petrochemical product manufacturing (ethylene equivalent)	thousand t	1,938	1,876	2,054	1,838	Aggregate in Chiba Complex
Equivalent in crude oil	thousand kl	628	598	662	611	
Unit energy consumption	kl/t	0.324	0.319	0.322	0.332	
Seawater	thousand t	127,202	113,898	127,806	109,444	
Water	thousand t	3,462	3,300	3,447	3,303	
CO <sub>2</sub> emissions	thousand tCO <sub>2</sub>	1,317	1,252	1,379	1,274	
SO <sub>x</sub>	t	16	14	17	16	
NO <sub>x</sub>	t	955	843	913	804	
Soot/dust	t	8	18	6	8	
Wastewater	thousand t	128,709	115,315	129,233	110,987	
COD	t	8	8	8	9	
Total nitrogen (TN)	t	10	11	11	12	
Total phosphorus (TP)	t	0.1	0.1	0.1	0.1	
Total waste	t	11,679	13,518	8,842	8,730	
Reduced by intermediate treatment	t	716	770	2,219	3,200	
Recycled	t	10,960	12,726	6,613	5,524	
Final disposal (landfill)	t	3	22	10	6	



## Aichi Refinery

	Unit	FY2014	FY2015	FY2016	FY2017	FY2018
Crude oil throughput	thousand kl	8,825	8,899	8,435	7,049	7,699
Equivalent in crude oil	thousand kl	681	685	676	586	608
Unit energy consumption	Energy usage(crude oil equivalent)(l) /Atmospheric distillation equipment converted throughput(kl)	8.24	8.31	8.70	9.40	9.76
Seawater	thousand t	233,581	228,914	233,974	207,469	242,389
Water	thousand t	12,474	12,339	12,379	12,438	12,375
CO <sub>2</sub> emissions	thousand tCO <sub>2</sub>	1,301	1,299	1,291	1,146	1,187
SOx	t	955	867	845	851	789
NOx	t	1,302	1,308	1,257	1,270	1,267
Soot/dust	t	48	54	53	52	38
Wastewater	thousand t	246,055	241,253	246,353	219,907	254,764
COD	t	9	8	8	6	8
Total nitrogen (TN)	t	7	6	6	6	11
Total phosphorus (TP)	t	0.7	0.5	0.3	0.3	0.4
Total waste	t	95,850	95,850	80,904	81,988	99,762
Reduced by intermediate treatment	t	52,364	53,997	46,398	47,787	64,417
Recycled	t	43,464	41,835	34,493	34,149	35,321
Final disposal (landfill)	t	22	18	13	52	24

## Tokuyama Complex

	Unit	FY2014	FY2015	FY2016	FY2017	FY2018
Petrochemical product manufacturing (ethylene equivalent)	thousand t	1,464	1,901	1,656	1,986	1,814
Equivalent in crude oil	thousand kl	759	909	835	958	898
Unit energy consumption	kl/t	0.518	0.478	0.504	0.474	0.486
Seawater	thousand t	389,337	448,850	397,790	452,264	420,355
Water	thousand t	14,918	15,521	13,741	13,069	11,962
CO <sub>2</sub> emissions	thousand tCO <sub>2</sub>	1,680	1,981	1,816	2,051	1,928
SOx	t	1,109	936	927	835	821
NOx	t	1,446	1,800	1,557	1,712	1,583
Soot/dust	t	12	16	17	15	18
Wastewater	thousand t	404,255	464,371	411,531	465,332	432,508
COD	t	15	17	19	23	18
Total nitrogen (TN)	t	12	11	15	19	14
Total phosphorus (TP)	t	0.4	0.3	0.4	0.4	0.5
Total waste	t	27,181	30,791	28,278	34,573	34,061
Reduced by intermediate treatment	t	14,586	19,666	17,743	19,091	20,175
Recycled	t	12,570	11,092	10,430	14,621	12,537
Final disposal (landfill)	t	25	33	105	861	1,348