

### Annual consumption of fuels and net sales of electricity

(tonne)

**Fuel gas**

(tonne)

Fuel oil

(tonne)

**Natural gas- Gas Turbine (+ Recovery Boiler)**

(tonne)

[illegible]

[illegible][illegible][illegible][illegible][illegible]

Project Asphalt

Note: Shell records fuel consumption in lower heating value equivalent of SRF (Standard refinery fuel).

Item		Value	Units	Data Source
CV <sub>SRF</sub>	Lower heating value	9673	kcal/kg	SRF = Standard refinery fuel. Value provided by Shell For asphalt. Value provided by Shell.
CV <sub>a</sub>	Lower heating value	9676	kcal/kg	
EF <sub>a</sub>	CO <sub>2</sub> emissions factor	0.08066	tonne CO <sub>2</sub> /GJ	Argentina First National Comm to UNFCCC, revised 1997.

Year	Year	Asphalt energy consumption t /year MFC <sub>a</sub>	Asphalt energy consumption GJ/year	CO <sub>2</sub> emissions (combustion) t /year E
1	2004			
2	2005			
3	2006			
4	2007			
5	2008			
6	2009			
7	2010			
8	2011			
9	2012			
10	2013			
11	2014			
12	2015			
13	2016			
14	2017			
15	2018			
16	2019			
17	2020			
18	2021			
19	2022			
20	2023			
21	2024			

Project Fuel gas

Item		Value	Units	Data Source
CV <sub>SRF</sub>	Lower heating value	9673	kcal/kg	SRF = Standard refinery fuel
CV <sub>fg</sub>	Lower heating value	11413	kcal/kg	For fuel gas. Value provided by Shell.
EF <sub>fg</sub>	CO <sub>2</sub> emissions factor (combustion)	0.0561	Ton CO <sub>2</sub> /GJ	Calculated from carbon content and calorific value of fuel gas samples

Year	Year	Fuel gas consumption tonne / year MFC <sub>fg</sub>	Fuel gas consumption GJ/ year	CO <sub>2</sub> emissions (combustion) t /year E
1	2004			
2	2005			
3	2006			
4	2007			
5	2008			
6	2009			
7	2010			
8	2011			
9	2012			
10	2013			
11	2014			
12	2015			
13	2016			
14	2017			
15	2018			
16	2019			
17	2020			
18	2021			
19	2022			
20	2023			
21	2024			

Project Fuel oil

Item		Value	Units	Data Source
CV <sub>SRF</sub>	Lower heating value	9673	kcal/kg	SRF = Standard refinery fuel
CV <sub>fo</sub>	Lower heating value	9750	kcal/kg	For fuel oil. Value provided by Shell.
EF <sub>fo</sub>	CO <sub>2</sub> emissions factor (combustion)	0.077926	Ton CO <sub>2</sub> /GJ	Argentina First National Comm to UNFCCC, revised 1997, page 133.

Year	Year	Fuel oil consumption tonne / year MFC <sub>fg</sub>	Fuel oil consumption GJ/ year	CO <sub>2</sub> emissions (combustion) t /year E
1	2004			
2	2005			
3	2006			
4	2007			
5	2008			
6	2009			
7	2010			
8	2011			
9	2012			
10	2013			
11	2014			
12	2015			
13	2016			
14	2017			
15	2018			
16	2019			
17	2020			
18	2021			
19	2022			
20	2023			
21	2024			

Project Natural Gas

Item		Value	Units	Data Source
CV <sub>SRF</sub>	Lower heating value	9673	kcal/kg	SRF = Standard refinery fuel
CV <sub>ng</sub>	Lower heating value	11413	kcal/kg	For natural gas. Value provided by Shell.
EF <sub>ng</sub>	CO <sub>2</sub> emissions factor (combustion)	0.0561	Ton CO <sub>2</sub> /GJ	

Year	Year	Natural gas consumption tonne / year MFC <sub>ng</sub>	Natural gas consumption GJ/ year	CO <sub>2</sub> emissions (combustion) t /year E
1	2004			
2	2005			
3	2006			
4	2007			
5	2008			
6	2009			
7	2010			
8	2011			
9	2012			
10	2013			
11	2014			
12	2015			
13	2016			
14	2017			
15	2018			
16	2019			
17	2020			
18	2021			
19	2022			
20	2023			
21	2024			

Item	Value	Units	Data sources
Boiler steam production fraction	8.2 t SRF/100 t HPS		Value provided by Shell
CV <sub>SRF</sub>	Lower heating value	9673 kcal/kg	SRF = Standard refinery fuel. Value provided by Shell
CV <sub>s</sub>	Lower heating value	9676 kcal/kg	Value provided by Shell. Equiv. To 40.51 MJ/kg. IPCC value 40.19 MJ/kg.
CV <sub>fg</sub>	Lower heating value	11413 kcal/kg	For fuel gas. Value provided by Shell.
CV <sub>fo</sub>	Lower heating value	9750 kcal/kg	For fuel oil. Value provided by Shell.
	Enthalpy, MPS	3148 kJ / kg	
	Enthalpy, LPS	2967 kJ / kg	

	Asphalt to boilers	Fuel Gas to boilers	Fuel Oil to boilers	Total Fuel to boilers	Asphalt to boilers	Fuel Gas to boilers	Fuel Oil to boilers	Asphalt to boilers	Fuel Gas to boilers	Fuel Oil to boilers
	ton	ton	ton	ton SRF	ton SRF	ton SRF	ton SRF	%	%	%
1998	116978	19186	14022	153785	117014	22637	14134	0.761	0.147	0.092
1999	124836	19134	10181	157713	124875	22576	10262	0.792	0.143	0.065
2000	113126	22947	6084	146368	113161	27075	6132	0.773	0.185	0.042
2001	121611	17163	3830	145760	121649	20250	3860	0.835	0.139	0.026
2002	97927	26629	12372	141846	97957	31419	12470	0.691	0.221	0.088
Average	114896	21012	9298	149094	114931	24791	9372	0.770	0.167	0.063

	MPS production (net)* ton	LPS production (net) ton	Total Electricity generation MWh	Electricity generation / Steam Ref demand kWh / GJ	Total Fuel to boilers / Steam Ref demand kg SRF / GJ
2000	1628199	208667	146412	25.49	25.46
2001	1595672	172214	143531	25.93	26.34
2002	1517192	193768	143200	26.76	26.51
Average	1580354	191550	144381	26.06	26.11

\* Note: Net MPS production is equal to MPS refinery demand

Nov-98	13226	158255	14175
Dec-98	13456	162499	13514
Jan-99	13340	168117	13637
Feb-99	11969	149950	12408
Mar-99	13169	163831	13609
Apr-99	12651	152588	13753
May-99	11485	119974	13307
Jun-99	12940	156253	13425
Jul-99	13468	167716	13792
Aug-99	13168	167996	13872
Sep-99	12745	157623	13471
Oct-99	12760	155227	12693
Nov-99	12338	139905	11731
Dec-99	12636	136872	12015
Jan-00	12296	133991	13248
Apr-00	12278	131940	11996
May-00	12484	143051	12554
Jun-00	12527	139953	12016
Jul-00	12657	139478	12368
Aug-00	12476	141794	12562
Sep-00	12722	137817	12274
Oct-00	11915	140648	12080
Nov-00	11073	124829	12171
Dec-00	12054	134128	12372
Jan-01	12190	143257	12003
Feb-01	11565	125131	10997
Mar-01	12613	136762	12286
Apr-01	12126	130446	11275
May-01	12476	147408	12435
Jun-01	12482	145628	13749
Jul-01	11986	130072	14126
Aug-01	12752	135711	12721
Sep-01	12500	140692	12328
Nov-01	11010	114033	10955
Dec-01	12235	130903	12220
Jan-02	11741	129865	11547
Feb-02	10840	117381	10825
Mar-02	12239	122945	11399
Apr-02	11879	123427	11226
May-02	12330	135579	12351
Jun-02	12003	135014	12708
Jul-02	12868	132415	13204
Aug-02	12539	134991	13062
Sep-02	12043	121510	11451
Oct-02	11995	125954	11916
Nov-02	11792	119719	10517
Dec-02	11031	118592	11640
Jan-03	12201	144302	12090
Feb-03	11677	130534	10629
Mar-03	12244	136767	11350
Apr-03	11902	134709	11233
May-03	12499	142821	12699
Jun-03	11423	131948	11638

ASPHALT - BS

	Item	Value	Units	Data sources
SFC <sub>indus, s</sub>	Industrial boiler spec fuel cons	8.2 t SRF / 100 t HPS, lower heating value basis		
CV <sub>SRF</sub>	Lower heating value	9673 kcal/kg		SRF = Standard refinery fuel
CV <sub>s</sub>	Lower heating value	9676 kcal/kg		
EF <sub>s</sub>	CO <sub>2</sub> emissions factor(combustion)	0.08066 t CO <sub>2</sub> /GJ		Argentina First National Comm to UNFCCC, revised 1997.

Year	Year	Total fuel consumption ton SRF / year	Asphalt fuel consumption ton SRF / year	Asphalt fuel consumption GJ/ year FC <sub>asphalt</sub>	CO <sub>2</sub> emissions (combustion) t/year BE <sub>asphalt</sub>
1	2004				
2	2005				
3	2006				
4	2007				
5	2008				
6	2009				
7	2010				
8	2011				
9	2012				
10	2013				
11	2014				
12	2015				
13	2016				
14	2017				
15	2018				
16	2019				
17	2020				
18	2021				
19	2022				
20	2023				
21	2024				

FUEL GAS - BS

Item		Value	Units	Data sources
SFC <sub>boiler, fg</sub>	Industrial boiler spec fuel cons	8.2	t SRF / 100 t HPS, lower heating value basis	
CV <sub>fg</sub>	Lower heating value	11413	kcal/kg	For fuel gas. Value provided by Shell.
CV <sub>SRF</sub>	Lower heating value	9673	kcal/kg	SRF = Standard refinery fuel
EF <sub>fg</sub>	CO <sub>2</sub> emissions factor (combustion)	0.0561	Ton CO <sub>2</sub> /GJ	Calculated from carbon content and calorific value of fuel gas samples

Year	Year	Total Fuel consumption ton SRF / year	Fuel gas consumption ton SRF / year	Fuel gas consumption GJ/ year FC <sub>fuel gas</sub>	CO <sub>2</sub> emissions (combustion) t /year BE <sub>fuel gas</sub>
1	2004				
2	2005				
3	2006				
4	2007				
5	2008				
6	2009				
7	2010				
8	2011				
9	2012				
10	2013				
11	2014				
12	2015				
13	2016				
14	2017				
15	2018				
16	2019				
17	2020				
18	2021				
19	2022				
20	2023				
21	2024				

References

1 IPCC Guidelines for National Greenhouse Gas Inventories: Reference Manual Volume 3 (1996).

2 According to Article 5, section 3 of the Kyoto Protocol, GWP value is as agreed on at COP3.

Fuel oil - BS

Item		Value	Units	Data Source
SFC <sub>boiler C13, fo</sub>	boiler spec	8.2	t SRF / 100 t HPS, lower heating value basis	
CV <sub>fo</sub>	Lower heating value	9750	kcal/kg	For fuel oil. Value provided by Shell.
CV <sub>SRF</sub>	Lower heating value	9673	kcal/kg	SRF = Standard refinery fuel
EF <sub>fo</sub>	CO <sub>2</sub> emissions	0.077926	tonne CO <sub>2</sub> /GJ	Argentina First National Comm to UNFCCC, revised 1997, page 133.

Year	Year	Total Fuel consumption ton SRF / year	Fuel oil consumption t / year F <sub>fueloil</sub>	Fuel oil consumption GJ / year FC <sub>fuel oil</sub>	CO <sub>2</sub> emissions (combustion) t /year Be <sub>fuel gas</sub>
1	2004				
2	2005				
3	2006				
4	2007				
5	2008				
6	2009				
7	2010				
8	2011				
9	2012				
10	2013				
11	2014				
12	2015				
13	2016				
14	2017				
15	2018				
16	2019				
17	2020				
18	2021				
19	2022				
20	2023				
21	2024				

Baseline emissions from electric power correspond to electricity entry into the project boundary (purchases) in the baseline and electricity output from the project boundary (sales) in the project scenario.

Year	Year	Total Electricity Generation (baseline) MWh/year	Net electricity purchase from grid (baseline) MWh/year	Net electricity sold through the grid (project) MWh/ year	CO <sub>2</sub> emissions factor for electricity from public supply kg CO <sub>2</sub> /MWh	Total CO <sub>2</sub> emissions electricity t /year
1	2004				365	
2	2005				365	
3	2006				365	
4	2007				365	
5	2008				365	
6	2009				365	
7	2010				365	
8	2011				365	
9	2012				365	
10	2013				365	

		Baseline emissions equivalent to project consumption profile, t CO <sub>2</sub> equiv/year					Component project emissions by fuel type t CO <sub>2</sub> equiv/year					Total project emissions t CO <sub>2</sub> equiv/year E <sub>TOTAL</sub>	Emissions reductions t CO <sub>2</sub> equiv/year ER
Year	Year	Asphalt	Fuel gas	Fuel oil	Electricity	Total	Asphalt	Fuel gas	Fuel oil	Natural gas	Total	Total	Total
1	2004												
2	2005												
3	2006												
4	2007												
5	2008												
6	2009												
7	2010												
8	2011												
9	2012												
10	2013												
11	2014												
12	2015												
13	2016												
14	2017												
15	2018												
16	2019												
17	2020												
18	2021												
19	2022												
20	2023												
21	2024												
Total						0					0	0	#DIV/0! reduction