

**Annex 2E. Semiconductor Manufacturing (IPCC 2E)
to the Technical Support Document for the 2000-2012 California's Greenhouse Gas
Emissions Inventory**

Back to main document: http://www.arb.ca.gov/cc/inventory/doc/methods_00-12/ghg_inventory_00-12_technical_support_document.pdf

Variables Used in the Emissions Estimation Equations

Values last updated on Monday, March 24, 2014

IPCC category = 2E — Electronics Industry

► Sector = Manufacturing : Electric & Electronic Equip. : Semiconductors & Related Products >

Activity = Semiconductor manufacture - C2F6

<i>- Variable Name -</i>	<i>- Year -</i>	<i>- Value and Units -</i>	<i>- Reference -</i>
Semiconductor manufacture	2000	Not used in estimates	None, see text
Semiconductor manufacture	2001	Not used in estimates	None, see text
Semiconductor manufacture	2002	Not used in estimates	None, see text
Semiconductor manufacture	2003	Not used in estimates	None, see text
Semiconductor manufacture	2004	Not used in estimates	None, see text
Semiconductor manufacture	2005	Not used in estimates	None, see text
Semiconductor manufacture	2006	Not used in estimates	None, see text
Semiconductor manufacture	2007	Not used in estimates	None, see text
Semiconductor manufacture	2008	Not used in estimates	None, see text
Semiconductor manufacture	2009	Not used in estimates	None, see text
Semiconductor manufacture	2010	Not used in estimates	None, see text
Semiconductor manufacture	2011	Not used in estimates	None, see text
Semiconductor manufacture	2012	Not used in estimates	None, see text
Ratio of 2006 California survey to US emissions	2000	0.0922	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2001	0.0922	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2002	0.0922	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2003	0.0922	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2004	0.0922	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2005	0.0922	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2007	0.0922	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2008	0.0922	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2009	0.0922	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2010	0.0922	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2011	0.0922	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2012	0.0922	TSD Semiconductor
US emissions from semiconductor manufacture	2000	313.39 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2001	219.82 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2002	229.25 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2003	206.29 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2004	191.66 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2005	174.52 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2006	188.66 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2007	180.46 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2008	159.11 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2009	110.75 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2010	143.73 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2011	163.68 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2012	167.13 Mg (tonnes)	USEPA, 2014b

Activity = Semiconductor manufacture - C3F8

<i>- Variable Name -</i>	<i>- Year -</i>	<i>- Value and Units -</i>	<i>- Reference -</i>
Semiconductor manufacture	2000	Not used in estimates	None, see text
Semiconductor manufacture	2001	Not used in estimates	None, see text
Semiconductor manufacture	2002	Not used in estimates	None, see text
Semiconductor manufacture	2003	Not used in estimates	None, see text

Variables Used in the Emissions Estimation Equations

Values last updated on Monday, March 24, 2014

Semiconductor manufacture	2004	Not used in estimates	None, see text
Semiconductor manufacture	2005	Not used in estimates	None, see text
Semiconductor manufacture	2006	Not used in estimates	None, see text
Semiconductor manufacture	2007	Not used in estimates	None, see text
Semiconductor manufacture	2008	Not used in estimates	None, see text
Semiconductor manufacture	2009	Not used in estimates	None, see text
Semiconductor manufacture	2010	Not used in estimates	None, see text
Semiconductor manufacture	2011	Not used in estimates	None, see text
Semiconductor manufacture	2012	Not used in estimates	None, see text
Ratio of 2006 California survey to US emissions	2000	0.971	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2001	0.971	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2002	0.971	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2003	0.971	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2004	0.971	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2005	0.971	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2007	0.971	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2008	0.971	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2009	0.971	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2010	0.971	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2011	0.971	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2012	0.971	TSD Semiconductor
US emissions from semiconductor manufacture	2000	17.1 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2001	13.18 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2002	9.06 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2003	12.48 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2004	5 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2005	3.7 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2006	3.97 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2007	4.3 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2008	8.03 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2009	2.68 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2010	2.4 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2011	21.89 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2012	13.58 Mg (tonnes)	USEPA, 2014b

Activity = Semiconductor manufacture - C4F8

- Variable Name -	- Year -	- Value and Units -	- Reference -
Semiconductor manufacture	2000	Not used in estimates	None, see text
Semiconductor manufacture	2001	Not used in estimates	None, see text
Semiconductor manufacture	2002	Not used in estimates	None, see text
Semiconductor manufacture	2003	Not used in estimates	None, see text
Semiconductor manufacture	2004	Not used in estimates	None, see text
Semiconductor manufacture	2005	Not used in estimates	None, see text
Semiconductor manufacture	2006	Not used in estimates	None, see text
Semiconductor manufacture	2007	Not used in estimates	None, see text
Semiconductor manufacture	2008	Not used in estimates	None, see text
Semiconductor manufacture	2009	Not used in estimates	None, see text
Semiconductor manufacture	2010	Not used in estimates	None, see text
Semiconductor manufacture	2011	Not used in estimates	None, see text
Semiconductor manufacture	2012	Not used in estimates	None, see text
Ratio of 2006 California survey to US emissions	2000	0.115	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2001	0.115	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2002	0.115	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2003	0.115	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2004	0.115	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2005	0.115	TSD Semiconductor

Ratio of 2006 California survey to US emissions	2007	0.115	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2008	0.115	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2009	0.115	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2010	0.115	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2011	0.115	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2012	0.115	TSD Semiconductor

US emissions from semiconductor manufacture	2000	0 g	USEPA, 2014b
US emissions from semiconductor manufacture	2001	0 g	USEPA, 2014b
US emissions from semiconductor manufacture	2002	5.24 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2003	7.94 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2004	7.31 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2005	10.33 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2006	10.04 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2007	4.59 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2008	4.42 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2009	2.11 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2010	1.8 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2011	7.6 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2012	7.48 Mg (tonnes)	USEPA, 2014b

Activity = Semiconductor manufacture - CF4

- Variable Name -	- Year -	- Value and Units -	- Reference -
Semiconductor manufacture	2000	Not used in estimates	None, see text
Semiconductor manufacture	2001	Not used in estimates	None, see text
Semiconductor manufacture	2002	Not used in estimates	None, see text
Semiconductor manufacture	2003	Not used in estimates	None, see text
Semiconductor manufacture	2004	Not used in estimates	None, see text
Semiconductor manufacture	2005	Not used in estimates	None, see text
Semiconductor manufacture	2006	Not used in estimates	None, see text
Semiconductor manufacture	2007	Not used in estimates	None, see text
Semiconductor manufacture	2008	Not used in estimates	None, see text
Semiconductor manufacture	2009	Not used in estimates	None, see text
Semiconductor manufacture	2010	Not used in estimates	None, see text
Semiconductor manufacture	2011	Not used in estimates	None, see text
Semiconductor manufacture	2012	Not used in estimates	None, see text
Ratio of 2006 California survey to US emissions	2000	0.0584	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2001	0.0584	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2002	0.0584	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2003	0.0584	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2004	0.0584	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2005	0.0584	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2007	0.0584	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2008	0.0584	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2009	0.0584	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2010	0.0584	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2011	0.0584	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2012	0.0584	TSD Semiconductor
US emissions from semiconductor manufacture	2000	273.98 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2001	193.39 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2002	164.76 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2003	146.82 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2004	146.52 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2005	135.81 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2006	142.31 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2007	142.88 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2008	132.27 Mg (tonnes)	USEPA, 2014b

US emissions from semiconductor manufacture	2009	98.57 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2010	131.26 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2011	197.5 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2012	186.19 Mg (tonnes)	USEPA, 2014b

Activity = Semiconductor manufacture - HFC-23

- Variable Name -	- Year -	- Value and Units -	- Reference -
Semiconductor manufacture	2000	Not used in estimates	None, see text
Semiconductor manufacture	2001	Not used in estimates	None, see text
Semiconductor manufacture	2002	Not used in estimates	None, see text
Semiconductor manufacture	2003	Not used in estimates	None, see text
Semiconductor manufacture	2004	Not used in estimates	None, see text
Semiconductor manufacture	2005	Not used in estimates	None, see text
Semiconductor manufacture	2006	Not used in estimates	None, see text
Semiconductor manufacture	2007	Not used in estimates	None, see text
Semiconductor manufacture	2008	Not used in estimates	None, see text
Semiconductor manufacture	2009	Not used in estimates	None, see text
Semiconductor manufacture	2010	Not used in estimates	None, see text
Semiconductor manufacture	2011	Not used in estimates	None, see text
Semiconductor manufacture	2012	Not used in estimates	None, see text
Ratio of 2006 California survey to US emissions	2000	0.0556	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2001	0.0556	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2002	0.0556	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2003	0.0556	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2004	0.0556	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2005	0.0556	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2007	0.0556	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2008	0.0556	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2009	0.0556	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2010	0.0556	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2011	0.0556	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2012	0.0556	TSD Semiconductor
US emissions from semiconductor manufacture	2000	22.24 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2001	14.8 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2002	14.17 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2003	14.84 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2004	14.82 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2005	14.26 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2006	16.92 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2007	16.47 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2008	15.53 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2009	12.06 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2010	15.61 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2011	13.35 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2012	14.11 Mg (tonnes)	USEPA, 2014b

Activity = Semiconductor manufacture - NF3

- Variable Name -	- Year -	- Value and Units -	- Reference -
Semiconductor manufacture	2000	Not used in estimates	None, see text
Semiconductor manufacture	2001	Not used in estimates	None, see text
Semiconductor manufacture	2002	Not used in estimates	None, see text
Semiconductor manufacture	2003	Not used in estimates	None, see text
Semiconductor manufacture	2004	Not used in estimates	None, see text
Semiconductor manufacture	2005	Not used in estimates	None, see text
Semiconductor manufacture	2006	Not used in estimates	None, see text
Semiconductor manufacture	2007	Not used in estimates	None, see text

Semiconductor manufacture	2008	Not used in estimates	None, see text
Semiconductor manufacture	2009	Not used in estimates	None, see text
Semiconductor manufacture	2010	Not used in estimates	None, see text
Semiconductor manufacture	2011	Not used in estimates	None, see text
Semiconductor manufacture	2012	Not used in estimates	None, see text
Ratio of 2006 California survey to US emissions	2000	0.0298	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2001	0.0298	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2002	0.0298	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2003	0.0298	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2004	0.0298	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2005	0.0298	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2007	0.0298	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2008	0.0298	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2009	0.0298	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2010	0.0298	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2011	0.0298	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2012	0.0298	TSD Semiconductor
US emissions from semiconductor manufacture	2000	10.38 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2001	11.37 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2002	29.98 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2003	26.92 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2004	25.84 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2005	20.97 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2006	31.16 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2007	21.19 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2008	20.6 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2009	16.64 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2010	16.07 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2011	20.14 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2012	19.65 Mg (tonnes)	USEPA, 2014b

Activity = Semiconductor manufacture - SF6

- Variable Name -	- Year -	- Value and Units -	- Reference -
Semiconductor manufacture	2000	Not used in estimates	None, see text
Semiconductor manufacture	2001	Not used in estimates	None, see text
Semiconductor manufacture	2002	Not used in estimates	None, see text
Semiconductor manufacture	2003	Not used in estimates	None, see text
Semiconductor manufacture	2004	Not used in estimates	None, see text
Semiconductor manufacture	2005	Not used in estimates	None, see text
Semiconductor manufacture	2006	Not used in estimates	None, see text
Semiconductor manufacture	2007	Not used in estimates	None, see text
Semiconductor manufacture	2008	Not used in estimates	None, see text
Semiconductor manufacture	2009	Not used in estimates	None, see text
Semiconductor manufacture	2010	Not used in estimates	None, see text
Semiconductor manufacture	2011	Not used in estimates	None, see text
Semiconductor manufacture	2012	Not used in estimates	None, see text
Ratio of 2006 California survey to US emissions	2000	0.0574	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2001	0.0574	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2002	0.0574	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2003	0.0574	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2004	0.0574	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2005	0.0574	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2007	0.0574	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2008	0.0574	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2009	0.0574	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2010	0.0574	TSD Semiconductor

Variables Used in the Emissions Estimation Equations

Values last updated on Monday, March 24, 2014

Ratio of 2006 California survey to US emissions	2011	0.0574	TSD Semiconductor
Ratio of 2006 California survey to US emissions	2012	0.0574	TSD Semiconductor
<hr/>			
US emissions from semiconductor manufacture	2000	43.96 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2001	29.79 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2002	26.39 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2003	31.64 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2004	30.11 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2005	32.58 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2006	31.36 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2007	24.7 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2008	22.28 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2009	17.14 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2010	21.51 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2011	29.26 Mg (tonnes)	USEPA, 2014b
US emissions from semiconductor manufacture	2012	27.73 Mg (tonnes)	USEPA, 2014b
