

Investigation of the National Pollutant Inventory as a Sustainability Tool

Tim Martin[#]

Dr Gavin Mudd



Outline

- Background
- Context/Literature
- Methodology
 - NPI data
 - Metric comparisons
- Results
- Discussion
- Conclusion and Recommendations

Background

- Synergetics Environmental Engineering
 - Environmental study using NPI database
- Final Year Project
 - Final Report and Technical Paper



© WordPress 2010



© Evidentia 2010

Context/Literature

- Pollutant Release and Transfer Registers
 - Dutch Emission Inventory System, 1976
 - Toxics Release Inventory, 1990
 - National Pollutant Release Inventory, 1994
 - National Pollutant Inventory [NPI], 1998
- Very few studies done on reported data
- Study focused on data analysis

Methodology

- Industry of focus: Coal Industry
 - High economic and environmental importance
- Hunter Valley, NSW and Latrobe Valley, VIC
- Five key indicator pollutants chosen:
 - PM₁₀, NO_x, CO, VOCs and SO₂
- 8 mines and 11 power stations investigated

Coal mines

	Coal Mine	Operator	Location	Mining Technique*
Hunter Valley (NSW)	Mount Arthur	BHP Billiton	Muswellbrook	O/C
	Bengalla	Coal and Allied	Muswellbrook	O/C, U/G
	Hunter Valley	Coal and Allied	Lemington	O/C, U/G
	Mount Thorley	Coal and Allied	Mount Thorley	O/C, U/G
	Warkworth	Coal and Allied	Mount Thorley	O/C, U/G
Latrobe Valley (VIC)	Loy Yang A	Loy Yang Power	Traralgon	O/C
	Hazelwood	International Power	Morwell	O/C
	Yallourn	TRUenergy	Yallourn	O/C

*O/C = Open cut mining, U/G = Underground mining

Coal-fired Power Stations

	Power Plant	Operator	Location	Capacity (MW)
Hunter Valley (NSW)	Eraring	Eraring Energy	Eraring	2640
	Liddell	Macquarie Generation	Muswellbrook	2640
	Bayswater	Macquarie Generation	Muswellbrook	2000
	Mount Piper	Delta Energy	Portland	1400
	Vales Point	Delta Energy	Mannering Park	1320
	Wallerawang	Delta Energy	Wallerawang	1000
	Munmorah	Delta Energy	Doyalson	600
Latrobe Valley (VIC)	Loy Yang A	Loy Yang Power	Traralgon	2100
	Hazelwood	International Power	Morwell	1600
	Yallourn	TRUenergy	Yallourn	1480
	Loy Yang B	International Power	Traralgon	1050

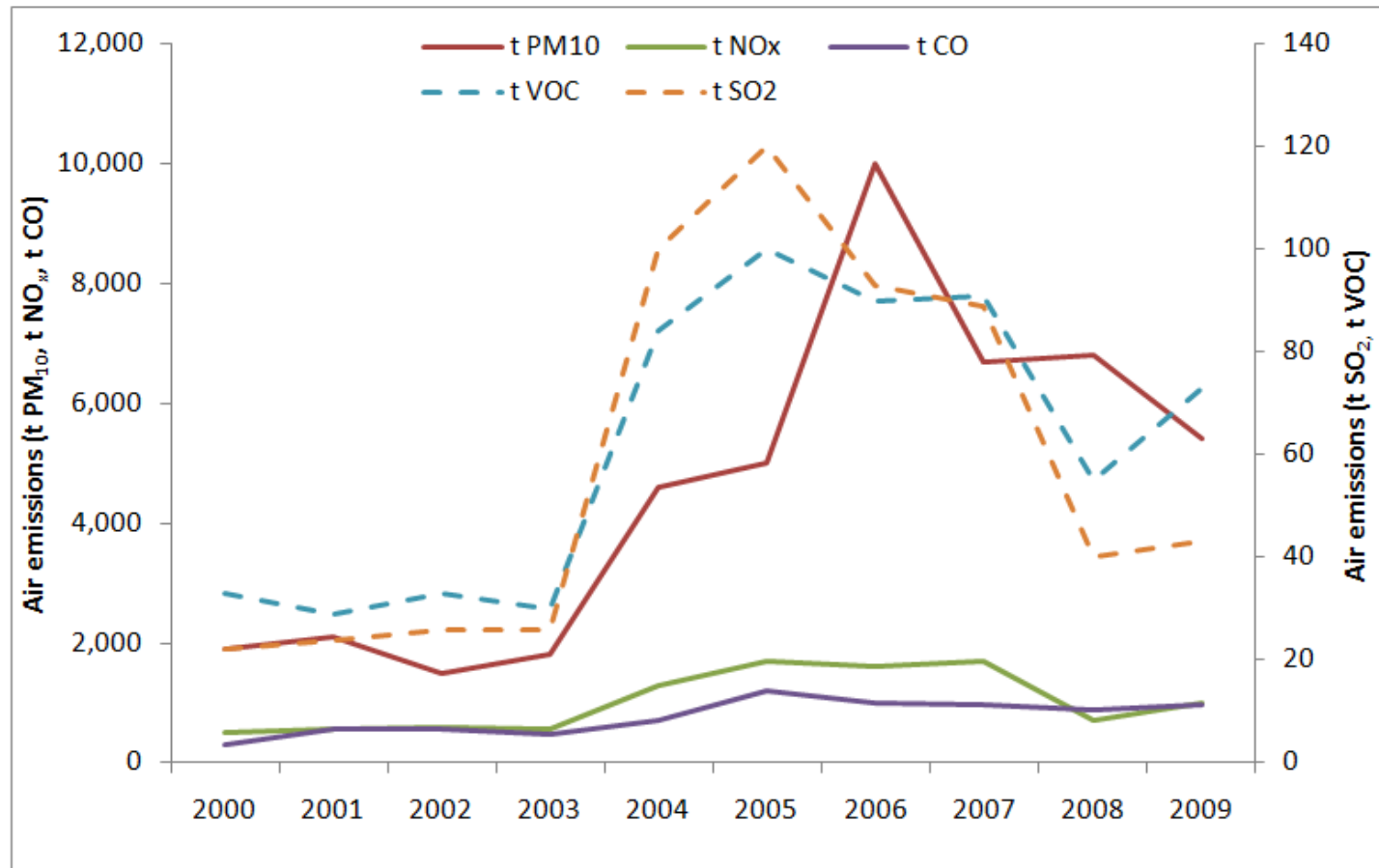


Hazelwood Power Station, Victoria (ABC NEWS, 2009)



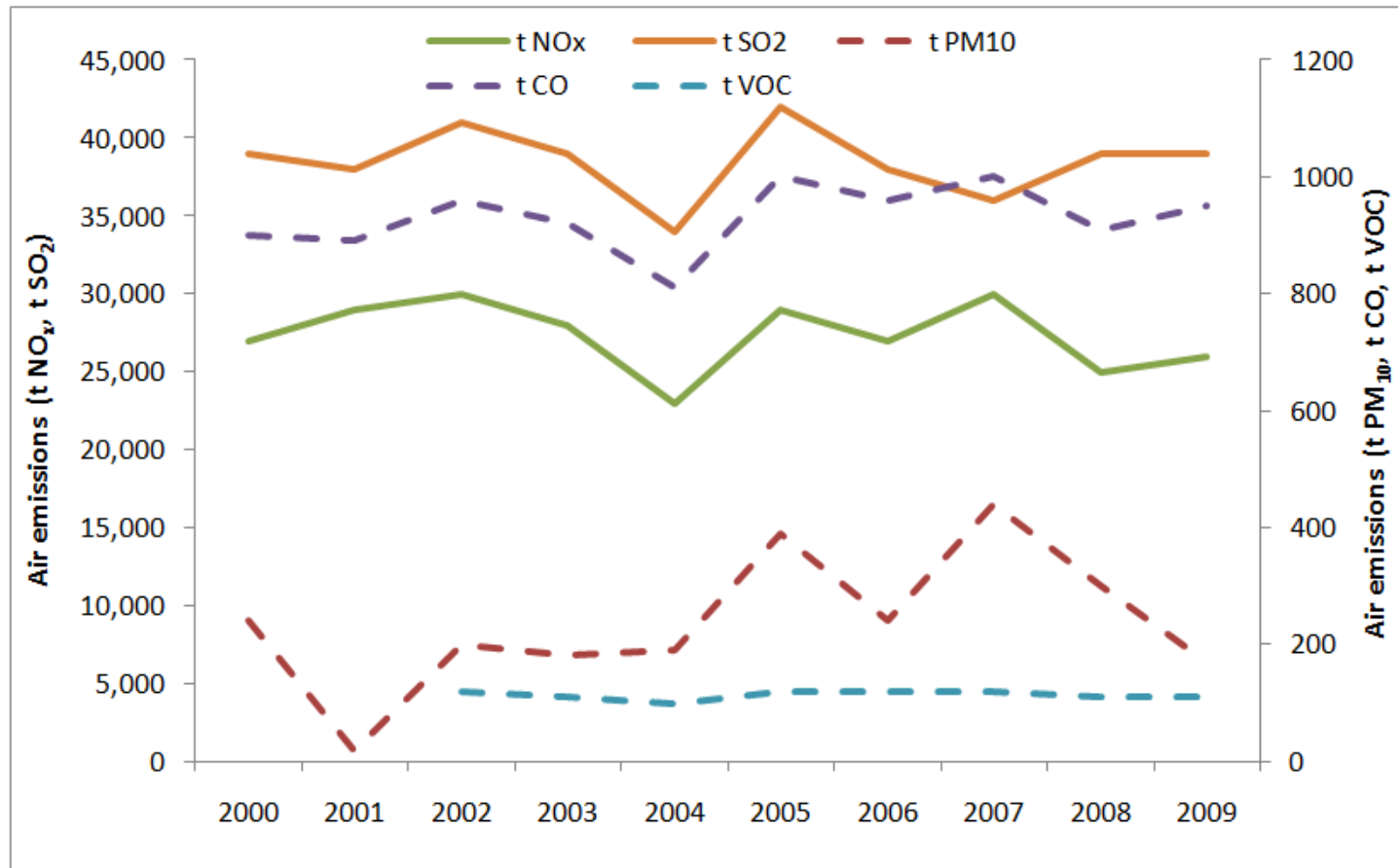
Loy Yang open cut brown coal mine, Latrobe Valley, Victoria

Magnitude analysis



NPI data for Mount Thorley and Warkworth mining operations

Magnitude analysis

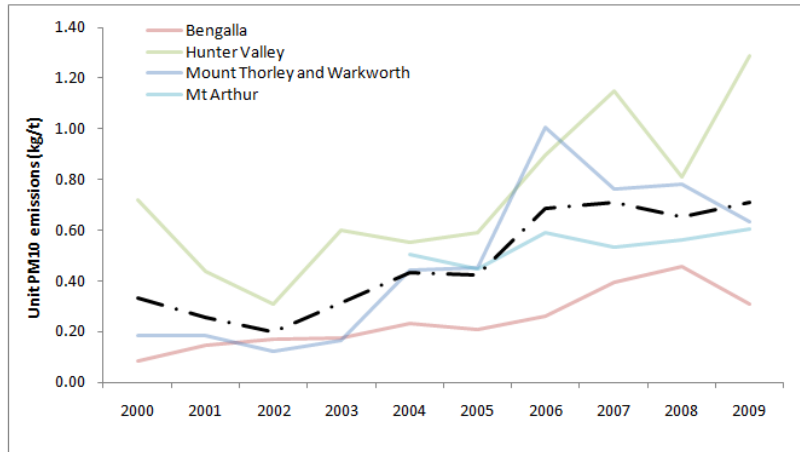


NPI data for Mount Piper power plant operations

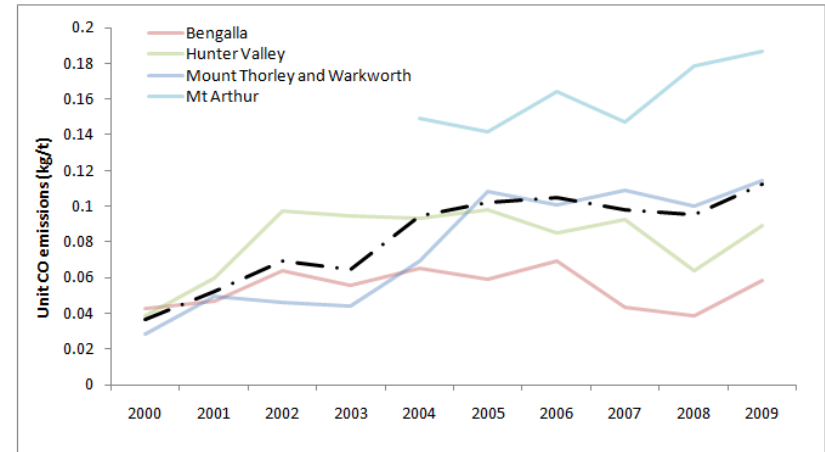


Metric analysis

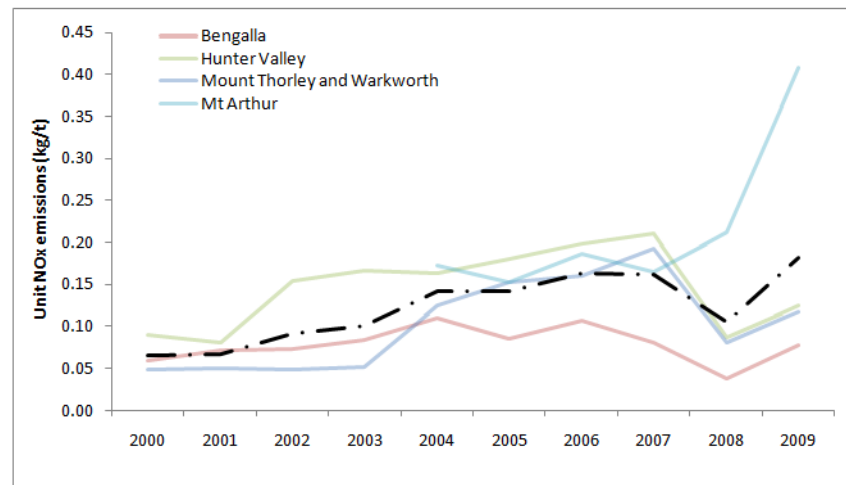
PM10 trends



CO trends



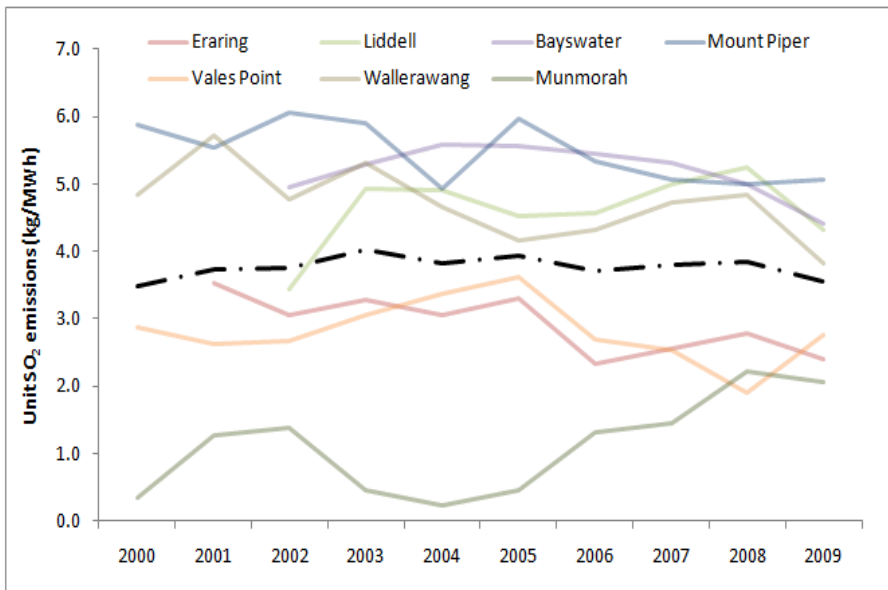
NO_x trends



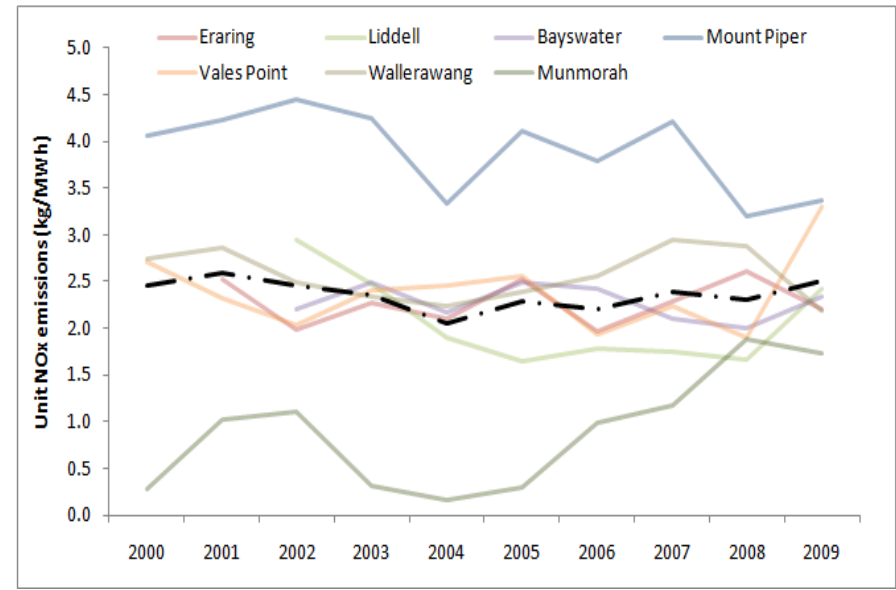


Metric analysis

SO₂ trends



NO_x trends



Discussion

- Production data
- NPI datasheets
- Mining comparisons
- Electricity generation comparisons

... Community concern is rising!



© Hubpages 2010

Conclusion and Recommendations

- NPI useful as a sustainability tool
- Mining operation trends increasing in PM_{10} , CO and NO_x
- Electricity generation trends stable
- Capacity not proportional to emission intensity
- Recommend further investigation into other industries and comparison of international PRTRs



Questions?