Managing air quality in small urban areas of NZ

Emily Wilton – November 2006

Overview

- Air quality in urban areas of NZ
- Domestic heating methods in small urban areas
- Practical air quality management
  - Policy options
  - Resource issues – establishing background and carrying out airshed modeling

Urban areas

Environet ltd
Air Quality & IT Specialists

	Invercargill	Gore	Te Kuiti	Westport	Reefton	Arrowtown	Balclutha	Milton
Maximum	198	102	61	56	55	183	54	57
Year measured	2005	2004	2004	2002	2003	2003	1997	1999
	Christchurch	Rangiora	Nelson	Blenheim	Hamilton	Auckland	Masterton	Upper Hutt
Maximum	223	136	165	80	67	81	104	61
Year measured	2001	2006	2001	2004	2001	1999	1999	2001
	Oamaru	Cromwell	Timaru	Kaiapoi	Tokoroa	Taupo	Richmond	Rotorua
Maximum	61	97	195	163	97	65	111	90
Year measured	1998	2004	2006	2003	2004	2004	2003	2003
	Ashburton	Waimate	Geraldine	Whangarei	Alexandra	Mosgiel	Napier	Hastings
Maximum	180	95	63	73	162	100	70	~130
Year measured	2006	2006	2003	2000	2003	2003	2004	2005

	Invercargill	Gore	Te Kuiti	Westport	Reefton	Dunedin	Alexandra
Electricity	63%	50%	39%	35%	24%	77%	59%
Total Gas	18%	16%	29%	27%	13%	20%	13%
Flued gas	5%	5%	8%	5%	1%	7%	4%
Unflued gas	13%	11%	21%	21%	13%	13%	9%
Oil	3%	7%	1%	1%	1%	2%	5%
Open fire	8%	5%	9%	9%	11%	11%	2%
Total Woodburner	17%	20%	49%	22%	19%	14%	47%
Multi-fuel burners	34%	48%	10%	48%	68%	6%	18%
Pellet burners	2%	3%	0%	0%	0%	0%	1%
Total wood	58%	72%	67%	79%	96%	30%	67%
Total coal	39%	47%	5%	52%	67%	12%	9%

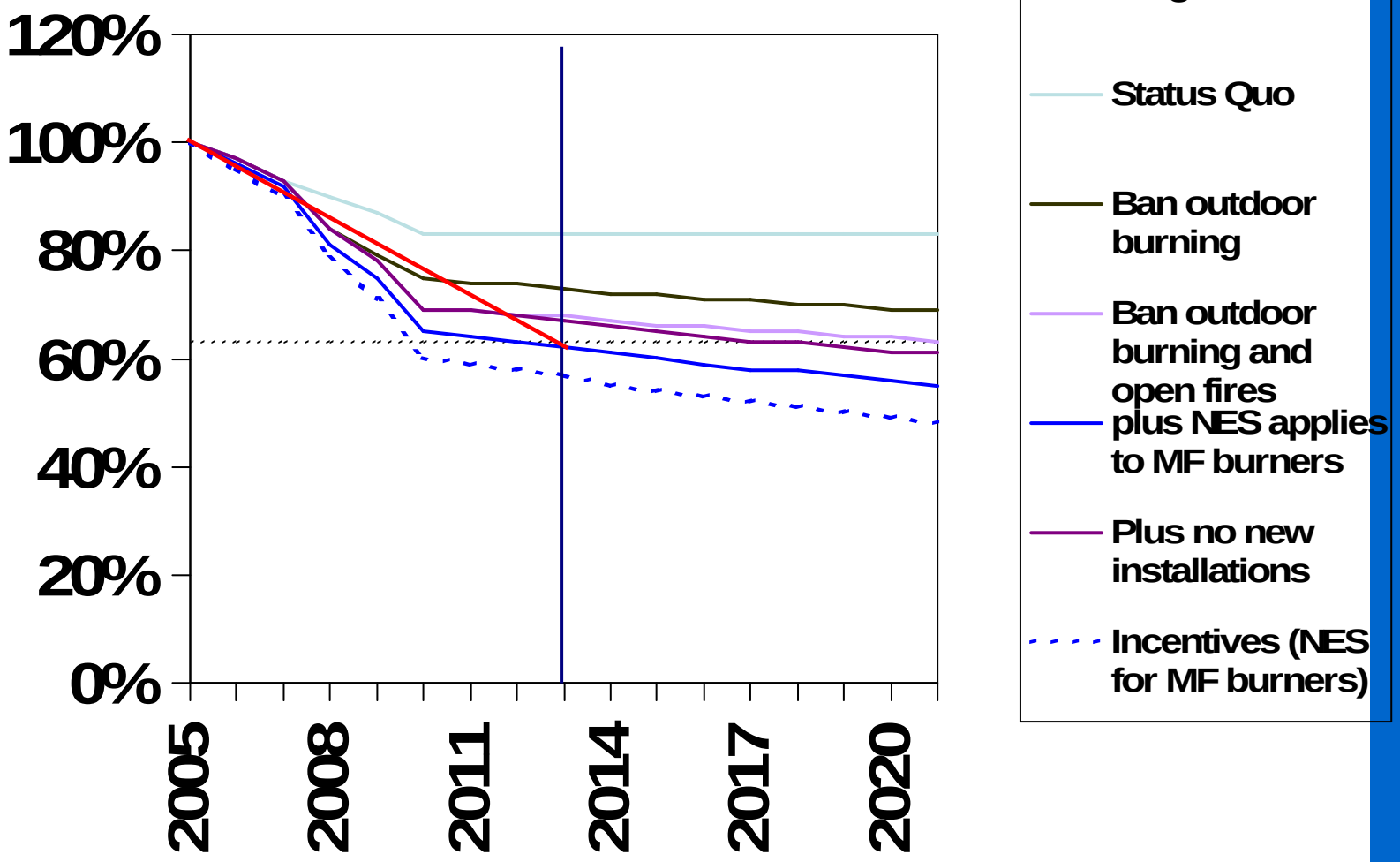
	Masterton	Rangiora	Timaru	Auckland	Nelson	Richmond	Hamilton
Electricity	20%	51%	59%	48%	44%	48%	26%
Total Gas	32%	20%	25%	35%	33%	22%	64%
Flued gas	6%	8%	10%	12%	8%	4%	36%
Unflued gas	26%	12%	15%	23%	25%	18%	28%
Oil	0%	1%	2%	2%	2%	1%	0%
Open fire	7%	9%	7%	7%	11%	3%	3%
Total Woodburner	67%	53%	44%	19%	43%	56%	14%
Multi-fuel burners	11%	3%	11%	3%	6%	1%	3%
Pellet burners	1%	3%	0%	0%	0%	1%	0%
Total wood	86%	65%	61%	28%	59%	61%	20%
Total coal	5%	3%	11%	5%	4%	1%	3%

Emissions Projections

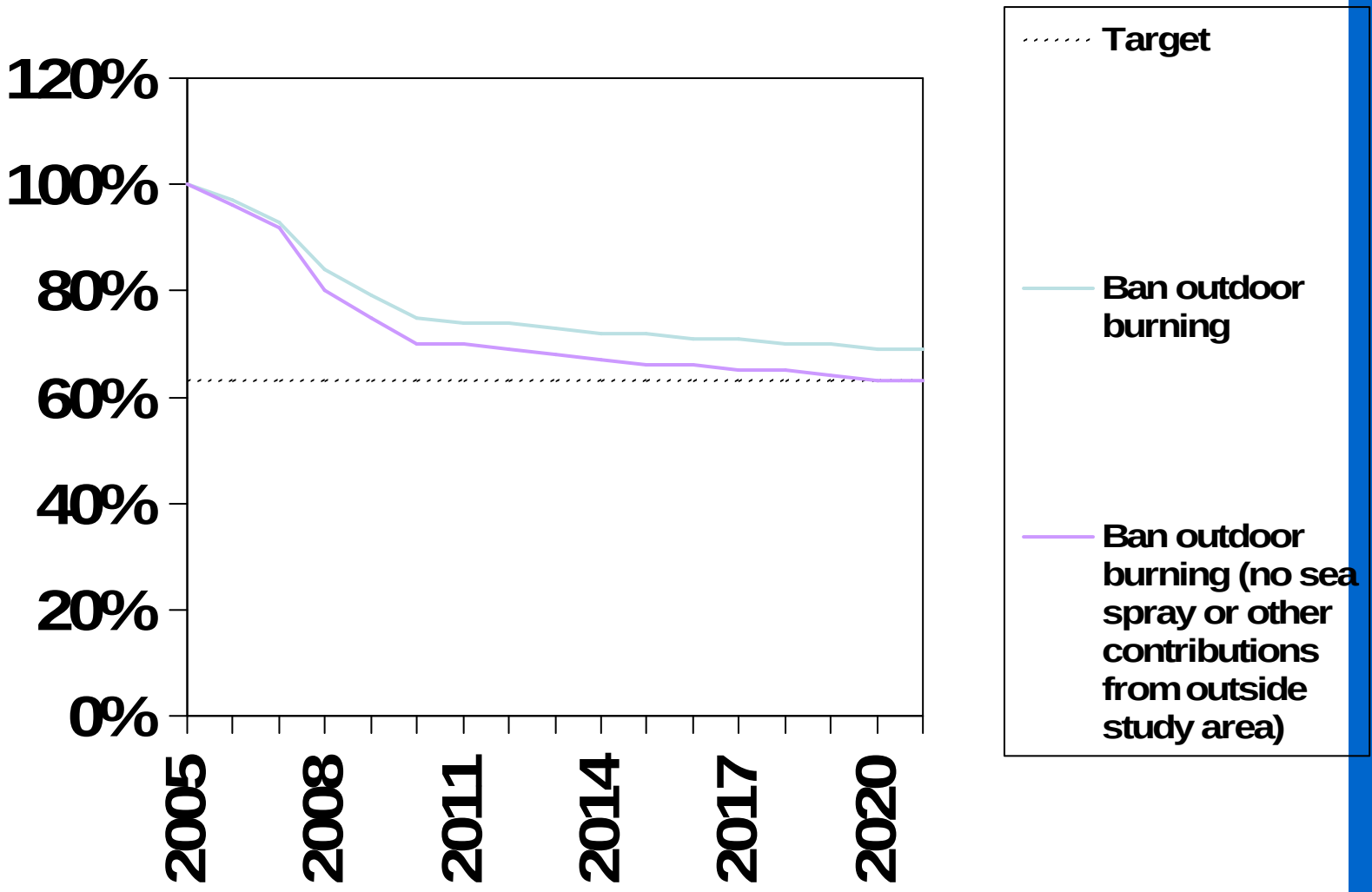
- No fix all solution
  - Effectiveness depends on range of factors – reductions required, population projections, current heating profile, proportions of new dwellings installing multi fuels,
- Ban rubbish burning
- Ban open fires
- NES design criterion for MF burner
- No new installations (other than replacements)
- Incentives for cleaner heating
- Compulsory phase outs
- Replacement at time of sale

Emissions projections

Environet ltd
Air Quality & IT Specialists



Dealing with background



Background

- Source apportionment studies in Christchurch and Masterton 6-8% of PM_{10}
- Factors impacting include:
  - Distance to coast line
  - Type of coast line
  - Meteorology
- High pollution days – is it actually contributing on those worst days?
- Other non anthropogenic sources
- Industry outside of study area

Modeling

Environet ltd
Air Quality & IT Specialists

- To account for different impact of sources on concentrations
- To account for spatial variations in emissions and impact of met – predict worst case locations
- Impacts of emission reductions scenarios may vary for different met
- To assess relationship between emissions and concentrations
- Main issue is whether it is going to be enough
- Feasibility for small urban areas of NZ?

Summary

- Air quality management is required in numerous small urban towns in NZ
- Various stages - some different approaches
- More challenging now financial assistance looks unlikely
- Dealing with background is a challenge
- Aim is to get emissions reductions underway - modeling is a bonus