

Carbon Now, Carbon Futures

– a systems and performance based approach to reducing GHG emissions in the Auckland region.

Date: November 2010

Today's presentation...

...will provide an overview on:

- Carbon Now, Carbon Futures
- Results from Carbon Now, Carbon Futures

Background

- The Auckland Regional Council led a consortium of all Auckland councils and key stakeholders to develop an integrated regional policy response to address critical climate change-related issues affecting the Auckland region's resilience and sustainable development.

Overview

- The development of climate mitigation policy has been underpinned by two separate but complementary initiatives – known as Carbon Now and Carbon Futures.

Carbon Now

- Carbon Now is a performance and systems based management framework for measuring, monitoring and reporting greenhouse gas (GHG) emissions reductions against prescribed targets.

Carbon Futures

- Carbon Futures refers to a back-casting and visioning study which sought to (i) develop long-term (year 2040) emissions projections, and (ii) to evaluate a suite of interventions to reduce emissions.

Methodology

- Stage 1: focused on the development of the Carbon Now framework and guidelines to provide a consistent methodology for the development of a detailed regional emissions inventory. [Example](#)
- Stage 2: an initial estimation of Auckland regional GHG emissions was undertaken based on a 2006 base year.
- Stage 3: a suite of potential GHG mitigation options were identified and evaluated to deliver GHG reductions and broader co-benefits for Auckland region.
- Stage 4: was the development of the Auckland regional GHG emission inventory using the Carbon Now Framework based on a 2009 base year.
- Stage 5: a series of modified projection have be evaluated based on a series of scenarios and underpinning assumptions.

Methodology

- Stage 1 was developed by PricewaterhouseCooper
- The methodology underpinning the Carbon Futures project (stages two and three) is detailed in the conference paper Hughes, J, Goldthorpe, S. and Perry, R.H., (2010). **Session 2 at 3.30pm today.**
- Stage four and five was undertaken by URS and sought to trial the Carbon Now framework to develop an inventory of emissions within the Auckland region, using the 2009 calendar year as the baseline. In doing so revised business as usual emissions projections were developed over the short term (up to 2015), medium term (up to 2025) and long term (up to 2040). This work refines and updates previous projections completed by Maunsell AECOM in 2008 through improved baseline data provision (Maunsell AECOM, 2008).

Stage 1

	Level of reporting	Key emission sources & methodology	Carbon Now 2006/07	Interim reduction targets ¹		Carbon Neutral
				1990 levels	50% below 1990 levels	
Government	Primary Emissions attributed to council's own operations		Starting Point	• Strategy X		
	Secondary Emissions attributed to council's supply chain - council controlled organisations, contractors and suppliers			• Strategy Y		
Community	Tertiary Emissions attributed to the implementation of council's public policies and programmes	Sources: Council specific activities and operations		Strategy Z		
	State of the Environment Regional/ City Emissions	Methodologies: International protocols on greenhouse gas emissions inventories				Finish Point

Stage 1

Carbon Now framework	International GHG reporting protocols
Primary	Government or corporate
Secondary	
Tertiary	Community
State of the Environment	

Results – Stage 2

- Maunsell AECOM estimated that the Auckland region's GHG emissions for 2006 totalled 11.93 million tonnes of CO₂ equivalent. This was an increase of 1.79 million tonnes in the five years since 2001.

Results – Stage 2

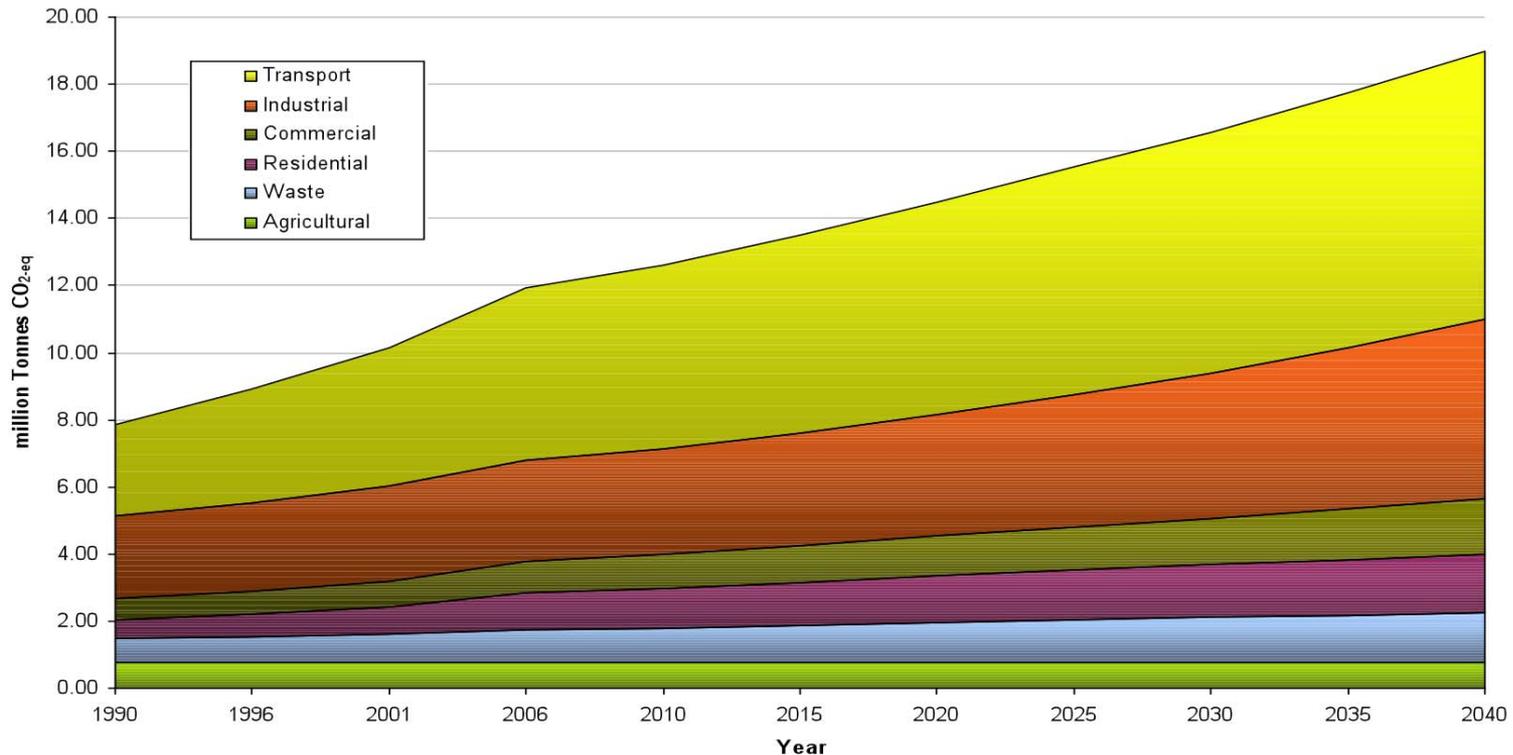
	Auckland region's estimated GHG emissions (Mt CO₂ –e)	New Zealand GHG emissions (Mt CO₂ –e)	Auckland as % of national emissions	% NZ population resident in the Auckland region
1990	7.9	61.9	12.8%	28% (1991)
2001	10.14	72.4	14%	30%
2006	11.93	77.9	15.3%	33%

Results – Stage 2

- In stage two it was estimated that Auckland's regional emissions have risen by 17.7% between 2001 and 2008, compared to a 26% increase rise in national emissions since 1990.
- Without any further action, it is predicted that by 2040, regional GHG emissions will increase by 87.3% (based on stage two initial estimations) relative to 2001 levels. The current national Kyoto commitment requires New Zealand to reduce its GHG emissions back to 1990 levels by 2012.
- If the Auckland region were to achieve this, we would need to reduce GHG emissions by approximately 40% (based on stage two initial estimations) by 2012.

Results – Stage 2

Estimate of Regional BAU CO₂-eq Emissions to 2040



Results – Stage 3

Three scenarios were developed:

Tier 1: ‘Achievable’: Top ten options as ranked via the MCA process.

The total reduction able to be achieved by 2040 has been estimated as 27% of the BAU projection at that date.

Tier 1+Tier 2: ‘Challenging’: Top 20 as ranked via the MCA process. Projected to provide a 35% reduction by 2040 based on BAU.

This relatively small incremental increase is due to the fact that those mid-range options are all relatively small in scale.

Tier 1 + Tier 2 + Tier 3: ‘Stretch’: This scenario consists of the complete list of 32 options as ranked via the MCA process.

The total reduction able to be achieved by 2040 has been estimated as 45% of the BAU projection at that date.

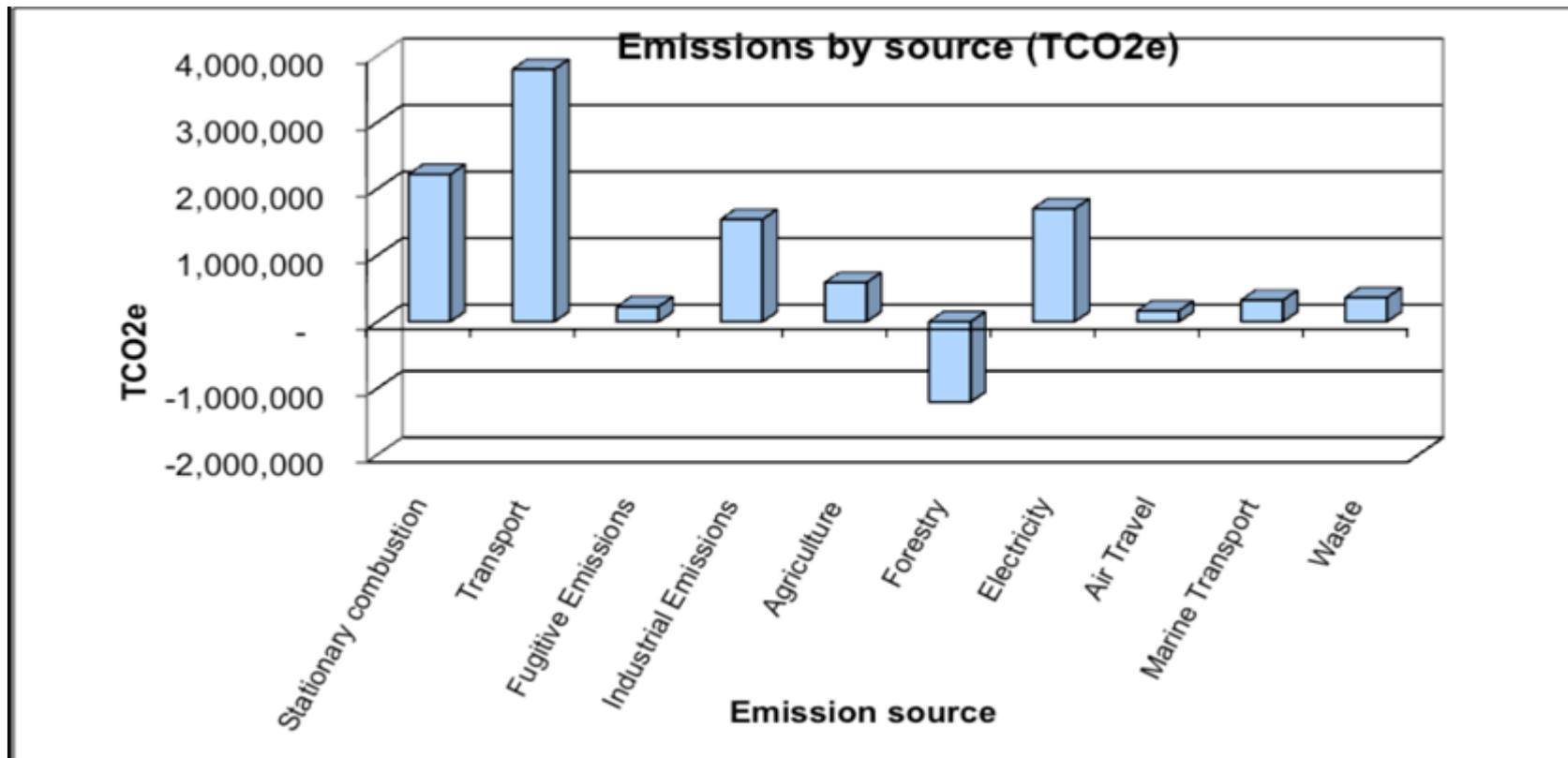
Results – Stage 4

- The Auckland regional footprint equated to 10,040,084 tonnes carbon-dioxide equivalent (CO₂e) or 7.02 TCO₂e per capita in 2009. Revised emissions projections (based on “business as usual”) as undertaken using the Carbon Now framework in stage four indicate a 4% increase by 2015, a 12% increase by 2025 and a 33% increase by 2040.

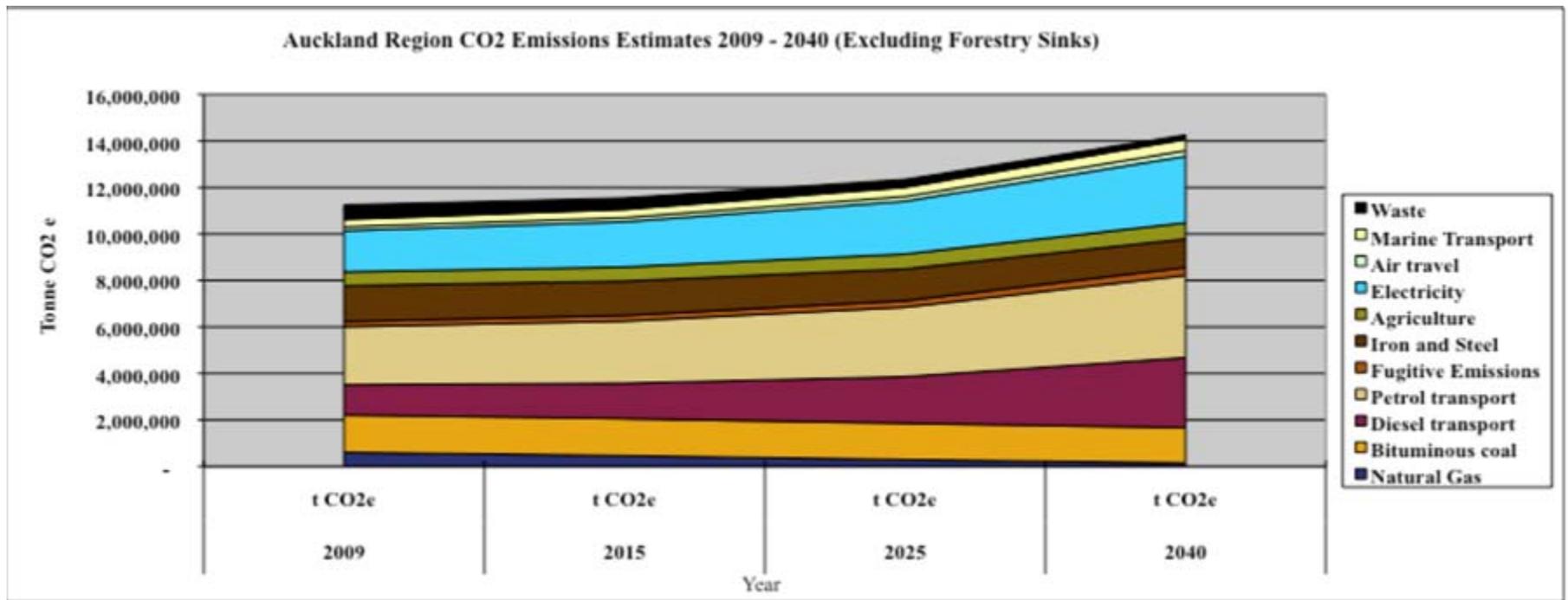
Results – Stage 4

Greenhouse Gas Emissions (t CO₂e)	2009	2015	2025	2040
	t CO₂e	t CO₂e	t CO₂e	t CO₂e
Natural gas	603,450	459,708	292,113	147,963
Coal sub bituminous	1,611,720	1,592,476	1,560,911	1,514,734
Diesel	1,297,299	1,527,435	2,005,245	3,016,298
Petrol	2,498,430	2,672,743	2,990,709	3,539,970
Fugitive emissions	225,212	243,360	276,913	336,112
Iron and steel production	1,539,205	1,473,699	1,370,658	1,229,447
Agriculture	590,219	608,753	640,947	692,458
Forestry and other land use	-1,206,922	-1,145,121	-1,049,072	-919,890
Electricity	1,776,226	1,948,479	2,273,481	2,865,399
Air travel	162,420	175,507	199,705	242,399
Marine transport	325,128	351,326	399,766	485,229
Waste	617,698	489,584	332,336	185,868
Total	10,040,084	10,397,949	11,293,713	13,335,988

Results – Stage 4



Results – Stage 4



Stage 5

The Auckland Region's GHG emission projections presented in this report are based on the following six scenarios:

1. Changes in population
2. Changes in gross regional product (GRP)
3. Fuel consumption changes (yet to be completed)
4. Changing cost of carbon
5. Changing cost of oil
6. Transport target reductions (yet to be completed)

In addition URS will be completing three exercises to “stack” various scenarios together to test the results, providing an assessment of what may happen should a number of scenario trends occur simultaneously. (Yet to be completed).

Results – Stage 5

Year	tCO _{2e}				
	BAU	Population growth	GRP growth	Cost of carbon change	Price of oil change
2009	10,040,084				
2015	10,397,949	10,895,530	11,561,650	10,093,760	10,606,160
		4.79%	11.19%	-2.93%	-3.37%
2020	-	11,457,510	13,075,300	10,134,040	10,167,660
	-				
2025	11,293,713	12,011,490	14,675,680	10,180,970	10,001,050
		6.36%	29.95%	-9.85%	-10.91%
2040	13,335,988	13,427,190	20,599,510	10,338,200	10,704,540
2050	-	14,084,430	26,039,060	10,457,290	11,529,430
	-	0.68%	54.47%	-22.48%	-24.50%

Next steps

- To ensure preparatory work is completed in order to
 - ensure a positive legacy for a new Auckland council.
 - Completion of Carbon Now and Carbon Futures work
 - Completion of the technical report
- To develop trial the Carbon Now inventory tool across other areas of local government with a view to possible development for web based application nationally across local government.

Any Questions?

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