The Economics of Low Carbon Cities

Outcomes of a City-Scale Mini-Stern Review

Jon Price, Director
Centre for Low Carbon Futures
Jon.price@lowcarbonfutures.org

Centre for Low Carbon Futures 2050

Centre for Climate Change Economics and Policy

UNIVERSITY OF LEEDS

THE UNIVERSITY of York

SEI STOCKHOLM ENVIRONMENT INSTITUTE

leeds city region
intelligence driving growth

Presentations:

Durban: UNFCCC December 2011
London: January 2012
Tokyo: February 2012
Mexico City: February 2012
Beijing: May 2012
Rio+20: June 2012
Seoul: July 2012
Sao Paulo: September 2012
Lima: October 2012
Kolkata: November 2012
Bogota: November 2012
Doha: November 2012

The Problem

- More than 50% of the World population live in Cities
- More than 50% of economic output
- More than 70% of carbon emissions attributed to consumption by Cities

Uncertainty and lack of evidence slows the speed of the transition to a low carbon economy.

Centre for Low Carbon Futures 2050

The Key Questions

If local action is as important as National action, then how can this be mobilized ?

How do we reduce uncertainty and unlock investment grade scale finance at a local level ?

Can the business case be underpinned by a wider social and economic case?

Centre for Low Carbon Futures 2050

A New Integrated Approach: Climate Smart Cities

Presented in a useful and relevant format for City Mayors customized to each City:

A review of thousands of energy efficient and low carbon options, and a realistic assessment of the costs and the energy savings associated with each measure.

The scope for the deployment of these measures in **households, commerce, transport and industry** at the local level.

Identification of the most **cost** and **carbon** effective options

Plus wider impacts of green growth through local GDP growth and job creation.

Centre for Low Carbon Futures 2050

Headline Outputs
Case Study – Leeds City Region Review

$8.4 billion (c10% of GDP) left the Leeds City Region economy in 2010 through payment of the energy bill. Forecast **$11.4 billion** by 2022.

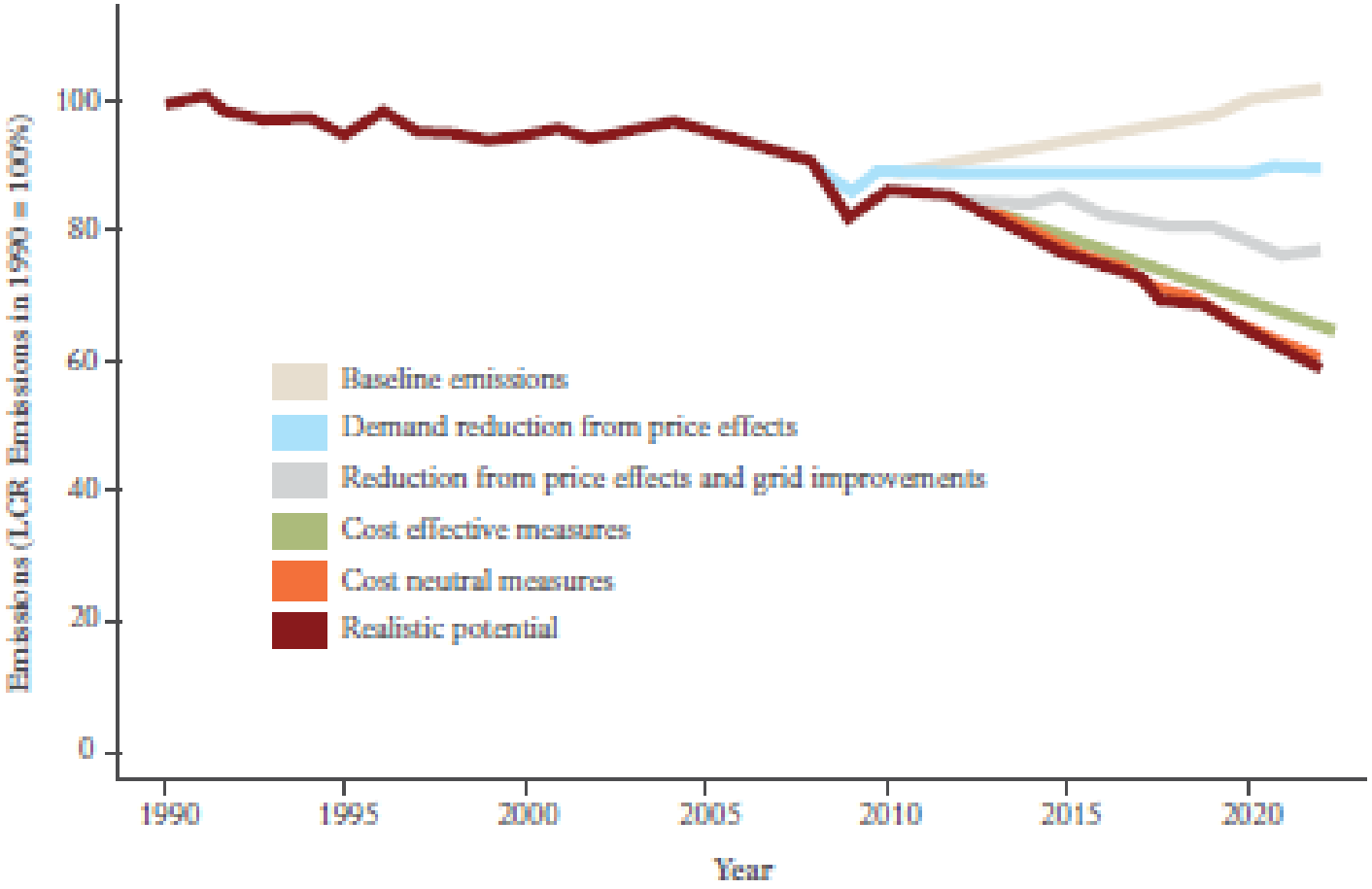
There is a commercially attractive opportunity to bring **$7.6 billion** of investment into the LCR economy to exploit cost effective low carbon and energy efficient options.

Such investments would pay for themselves in 4 years, cutting LCR energy bills by **$1.9 billion** a year.

They would also create **4,443 jobs** and an extra **$328 million** in wider GDP every year.

Centre for Low Carbon Futures 2050

The Carbon Impact



Centre for Low Carbon Futures 2050

Costs, Benefits and Carbon (GBP)

City	Energy bill in 2011 £ m's	Level of investment that could be secured	Potential cut in annual energy bill	Jobs created	Carbon saved by 2022 (1990 baseline)
Barnsley	418m	313m	78m	250	37%
Bradford	689m	765m	189m	666	42%
Calderdale	381m	366m	92m	311	36%
Craven	117m	147m	31m	87	42%
Harrogate	402m	290m	69m	266	34%
Kirklees	660m	638m	168m	550	41%
Leeds	1500m	1300m	320m	1360	29%
Selby	254m	163m	40m	138	37%
Wakefield	651m	555m	133m	524	38%
York	312m	314m	72m	300	40%
Total LCR	**5.4 bn**	**4.9 bn**	**1.2bn**	**4,500**	**36%**

Currency £1 = $1.6

(Exploiting the cost-effective options)

Centre for Low Carbon Futures 2050

Domestic / Household

Centre for Low Carbon Futures 2050

Cost Effective Investments - Domestic

- $1.76 billion of investment opportunities
- Exploiting these would generate savings of $640 m/yr
- Payback period under 3 years
- Create jobs (3,700/yr)
- Total average GVA $265m
- Carbon savings equivalent to 3.8% of LCR emissions

Centre for Low Carbon Futures 2050

Top 10 Measures - Domestic

Cost Effective

- Mini wind turbines (5kW) with FIT
- Biomass boilers with RHI
- Electronic products
- ICT products
- Integrated digital TVs
- Reduced standby consumption
- Reduce heating for washing machines
- A++ rated cold appliances
- A rated ovens
- Biomass district heating with RHI

Carbon Effective

- Reduce household heating by 1 C
- Solid wall insulation
- Biomass boilers with RHI
- Pre76 cavity wall insulation
- Electronic products
- Biomass district heating with RHI
- Ground Source Heat Pump with RHI
- ICT products
- Efficient lighting
- Air Source Heat Pump with RHI

Cost effective – Cost neutral – Realistic potential

Centre for Low Carbon Futures 2050

Transport

Centre for Low Carbon Futures 2050

Cost effective Investments – Transport

- *$1.35 bn of investment opportunities in Leeds City Region*
- *Exploiting these would generate savings of $212million a year*
- *Payback period 6.3 years*
- *Circa 1750 jobs created*
- *Total average annual GVA $139m*

Centre for Low Carbon Futures 2050

Top 10 Measures – Transport

Cost Effective

- Park and ride schemes
- Express bus/coach network
- Bus priority
- Smarter choices
- Cycling
- Mild Hybrid vehicles
- Demand management
- Plug-in-hybrid
- Full hybrid vehicles
- Biofuels

Carbon Effective

- Biofuels
- Micro hybrid vehicles
- Full hybrid vehicles
- Plug-in hybrid
- Electric
- Demand management
- Mild hybrid vehicles
- Smarter choices
- Bus priority
- Rail electrification

Cost effective – Cost neutral – Realistic potential

Centre for Low Carbon Futures 2050

UNIVERSITY OF BIRMINGHAM

UNIVERSITY OF Hull

UNIVERSITY OF LEEDS

The University Of Sheffield.

THE UNIVERSITY of York

Director: Jon Price

jon.price@lowcarbonfutures.org

Centre for Low Carbon Futures 2050