Managing for Sustainable Futures

Prof. Ian Lowe AO FTSE
Summary

◆ The goal of sustainability
◆ How are we doing?
◆ Unsustainable futures?
◆ Respecting system boundaries
◆ Criteria: a checklist for decision-makers
◆ Creating just and sustainable futures
Fundamental points

- The future is not somewhere we are going, it is something we are creating
- Many possible futures
- We should be trying to shape a sustainable future
National Strategy for ESD

“a path of economic progress that does not impair the welfare of future generations”

“equity within and between generations”

“recognition of the global dimension”

“protection of biological diversity and the maintenance of ecological processes and systems”
UN 2015 report on progress

- Australia 18th of 34 OECD nations
- Below Canada, NZ, even UK
- Among worst in OECD on resource use per head, waste per head, GHG / GDP, obesity rate
- Well below average on poverty, inequality, gender pay gap, women in elected office
- Scandinavian nations, USA
State of NZ Report
Urban Research Unit, University of Auckland
Critical points

- Gender issues: inequality, discrimination
- Housing affordability, esp. in Auckland
- Up to 1/2 housing "cold or damp"
- Inefficient urban transport
- PT serves only 15% Auckland jobs
New Zealand needs to "raise the ambition of its policy coherence" for sustainable development "in line with the expanded and universal agenda of the Sustainable Development goals"
Creating *unsustainable* futures?

- Rapid population growth
- Growing consumption per person
- Deplete mineral resources, e.g. Oil
- Over-use fisheries, forests, water
- Disrupt climate, lose biodiversity
- Economy demands resource growth
- Widen inequality
- Materialism or fundamentalism
“Our present course is unsustainable - postponing action is no longer an option”

- GEO 2000 [UNEP 1999]
“...recent crises - fuel, food and finance - are simply the three canaries in the mine. These are the early warning signals that our current economic system is simply not sustainable.”

WEF Global Agenda Summit, 2008
Objects in mirror are closer than they appear.
Discovery of large oil fields

Note: Cumulative Reserves attributed to discovery year
Giant Field > 500 billion barrels reserve

Fig. 2: HUMANITY’S ECOLOGICAL FOOTPRINT, 1961–2001
“In terms of some key environmental parameters, the Earth system has moved well outside the range of natural variability exhibited over the last half million years at least. The nature of changes now occurring simultaneously in the Earth System, their magnitudes and rates of change are unprecedented.”

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A classic non-linear change
Type a quote here.

– Johnny Appleseed
Living Planet Report 2014

- Survey of 10,000 species: mammals, birds, amphibians, fish and reptiles
- Populations down by > 50% since 1970
Loss of species diversity

Extinctions per thousand species per millennium

- **Distant past (fossil record)**
  - Marine species
  - Mammals

- **Recent past (known extinctions)**
  - Mammals
  - Birds
  - Amphibians

- **Future (modeled)**
  - All species

Projected future extinction rate is more than **ten times higher** than current rate.

Current extinction rate is up to **one thousand times higher** than the fossil record.

For every thousand mammal species, less than one went extinct every millennium.

Long-term average extinction rate.

Source: Millennium Ecosystem Assessment
EACH DAY HUMBLE SUPPLIES ENOUGH ENERGY TO MELT 7 MILLION TONS OF GLACIER!

This giant glacier has remained unsalted for centuries. Yet, the petroleum energy Humble supplies—if converted into heat—could melt it at the rate of 80 tons each second! To meet the nation's growing need for energy, Humble has applied science to nature's resources to become America's Leading Energy Company. Working wonders with oil through research, Humble provides energy in many forms—to help heat our homes, power our transportation, and to furnish industry with a great variety of versatile chemicals. Stop at a Humble station for new Enco Extra gasoline, and see why the "Happy Motorist's Spirit is the World's First Choice!"
Global warming and the safe-climate zone

Average temperature over past 10,000 years = 15°C

The Holocene is 10,000 years of climatic stability that enabled humanity to evolve as we know our cultures today.

IPCC (2007) forecast of about 2–3°C with band of uncertainty

- Agriculture emerges
- Mesopotamia flourishes
- Vikings in Greenland
- Holocene optimum
- Medieval Warm Period
- Little ice age in Europe (15-18th centuries)
- 1940
- 21st century: very rapid rise

Number of years before present (quasi-log scale)

- 20,000
- 10,000
- 2000
- 1000
- 300
- 100
- Now
- +100

End of last ice age
Younger Dryas
1980s: warmest decade ever

1990s: even warmer. Every year above 1980s average

Recent data

2014 was the warmest year ever

2015 was warmer still

Every month of 2016 so far has been warmer than the same month of 2015

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To have a **better than even chance** of keeping global average temperature rise below 2°C, the world would need to be emitting *less than half* the 2000 amount of CO$_2$ by 2050.

So **global** emissions need to peak by 2020, then decline rapidly.
The window for action is rapidly closing

‘Cumulative emissions of carbon dioxide largely determine global mean surface warming by the late 21st century and beyond’

Total Carbon Budget: 790 GtC

Amount Used 1870-2011: 515 GtC

Amount Remaining: 275 GtC

65% of our carbon budget compatible with a 2°C goal already used

IPCC AR5 Synthesis Report
“nothing short of an energy revolution”

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Renewable resources are enormous!
Overseas trends

- Solar now the cheapest power in the USA: 3.87 c / kWh
- Renewables > half of all new power installed globally in 2013, 2014, 2015
- ~ 30% all power now from renewables
- Gas replacing coal
- Total coal use declining

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The share of power generated by non-fossil fuels increases...

Share of world power generation

Growth of non-fossil power

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Criteria

- Resources, renewable and non-renewable
- Impacts on natural systems
- Social acceptability, cultural fit
- Long-term financial viability
- Limits to Growth
A fundamental challenge

“anthropogenic climate change is ... a consequence of the global economic system.

“our examination of the corporate world’s responses... paints a grim picture of humanity staggering towards the point of no return.

“the political myths of corporate environmentalism, corporate citizenship and corporate omnipotence ...[perpetuate] the ‘business as usual’ philosophy and the relentless, blinkered pursuit of creative self-destruction.”

“businesses and consumers need to stop behaving as if we live in a limitless world”
Sustainability is about living within our means. It is about managing our consumption of resources and balancing environmental, economic and social outcomes. It means improving our quality of life, but making that improvement without leaving a burden on the future generations.

Looking after our Environment

Environmental Sustainability is about reducing our impact on the environment by protecting our air, water and land, our native flora and fauna. It means reducing the load on our natural resources, such as water and fuels for energy, and decreasing our production of waste.

A Better Place to Live

Liveability is about making Sydney a better place to live. It means being able to walk to your corner shop, local school, park or bus stop, as well as providing us with a choice of housing that meets our needs.

Supporting our Economy

Competitiveness is about supporting Sydney’s role as a Global city, and ensuring our city’s long term economic prosperity. It means providing quality infrastructure and services to service our jobs and the economy, and supporting urban centres.
ECONOMY

SOCIETY

ENVIR'T
Markets give us things many of us want.

Natural systems give us what we really need!
Utopian?

- 1800: end slavery
- 1900: votes for women
- 1986: Berlin without the Wall
  South Africa without apartheid
  apology to stolen generations
  African-American US president
  good coffee, civilised licensing in Qld!

Nearly all aspects of modern life
Creating our future

- not determined
- various options
- our choices
- holiday analogy
- quality of life
- social justice

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Questions ?