

# CURTIN CORNER

## The State of the Environment Report 2022: The End of a Paradigm?

Peter Newman AO

Professor of Sustainability

CUSP, Curtin University

And resident optimist...hope merchant.

Environment report: Tanya Plibersek says Government will respond to  
grim picture with new legislation  
The West Australian 19 July '22

'This is not a time for despair. It is time for repair'

[https://app.mediaportal.com/isentia/#/playnow  
?u=173432&p=2199522936&key=19410893872  
23122250861692112538612414719166](https://app.mediaportal.com/isentia/#/playnow?u=173432&p=2199522936&key=1941089387223122250861692112538612414719166)

ABC Radio Afternoons Wed 20<sup>th</sup> July

Good News Segment

## SoER 2022....As summarized in *The Conversation* by the authors.

- Australia has produced a national state of environment report every five years since 1995. They assess every aspect of Australia's environment and heritage, covering rivers, oceans, air, ice, land and urban areas. The [last report](#) was released [in 2017](#).
- This report **goes further than its predecessors**, by describing how our environment is affecting the **health and well-being** of Australians. It is also the first to include **Indigenous** co-authors.

# SoER 2022 the Bad News...

## 1. Australia's environment is generally deteriorating

- There have been continued declines in the amount and condition of our natural capital – native vegetation, soil, wetlands, reefs, rivers and biodiversity.
- The number of plant and animal species listed as threatened in June 2021 was 1,918, up from 1,774 in 2016.
- Inland water systems, including in the Murray Darling Basin, are under increasing pressure.
- Nationally, land clearing remains high.

# SoER 2022 more Bad News...

## 2. Climate change threatens every ecosystem

- Over the last five years, extreme events such as floods, droughts, wildfires, storms, and heatwaves have **affected every part of Australia.**
- **Extreme events** are also affecting ecosystems in ways never before documented. For example, the downstream effects of the 2019-2020 bushfires introduced a range of contaminants to coastal estuaries

# SoER 2022 more Bad News...

## 3. Environmental management isn't well coordinated

- The area of land and sea under some form of **conservation protection has increased**, but the overall level of protection is declining within reserves.
- We're reducing the quantity and quality of native habitat outside protected areas through, for instance, **urban expansion**.
- The most significant forest and woodland habitat loss were Brisbane, Gold Coast to Tweed Heads, Townsville, Sunshine Coast and Sydney. Between 2000 and 2017, at least 20,212 hectares were destroyed. (0.25%)
- Australia is also increasingly relying on **costly ways** to conserve biodiversity like **threatened species translocation, botanical gardens and zoos**.

# SoER 2022 some good News...

## 4. Indigenous knowledge and management are helping deliver on-ground change.

- Indigenous rangers manage 44% of the national protected area estate, and more than 2,000 rangers are funded under the federal government's [Indigenous rangers program](#).
- This includes traditional fire management, which is being recognised as vital knowledge by land management organisations and government departments.
- Work must still be done to empower Indigenous communities and enable Indigenous knowledge systems to improve environmental and social outcomes.



Very little on cities... (I tried)

**Settlements**



**1996 version of SoER  
Followed this  
Metabolism model**



1996 was 2<sup>nd</sup>  
SoER



# The Urban Metabolism model



Liveability





Detailed data from  
AIHW on each  
part of our cities...



# SoER 2022 on cities....concluding comment on cities

- 'Population growth is the major driver of environmental issues within cities.....'

# Paul and Anne Ehrlich... 'The Population Bomb' and IPAT

Environmental Impact = Population x Affluence x Technology

Environmental Policy: Reduce the number of People,  
Reduce Economic Activity  
Reduce Technology as its always impacting.

Population Ecology worldview...

# My journey through the paradigms of environmental impact....

1. Helping establish Environmental Science as a profession
2. Helping establish Sustainable Development as a profession
3. Helping establish Regenerative Development as a profession

# From UWA to Delft – 1972/73, studying Environmental Science and discovering European cities

PhD in Chemistry



Stanford 1973-4  
Studying Ecology with  
the Ehrlichs and  
discovering....

Oil-based societies  
collapsing....1973



Murdoch University  
1974 to 2007

- Env Science
- Cities research

**‘One of the most  
influential planning  
books of all time’**

**Reid Ewing Professor of City  
and Metropolitan Planning at  
the University of Utah**

# Transport and density shape the city...

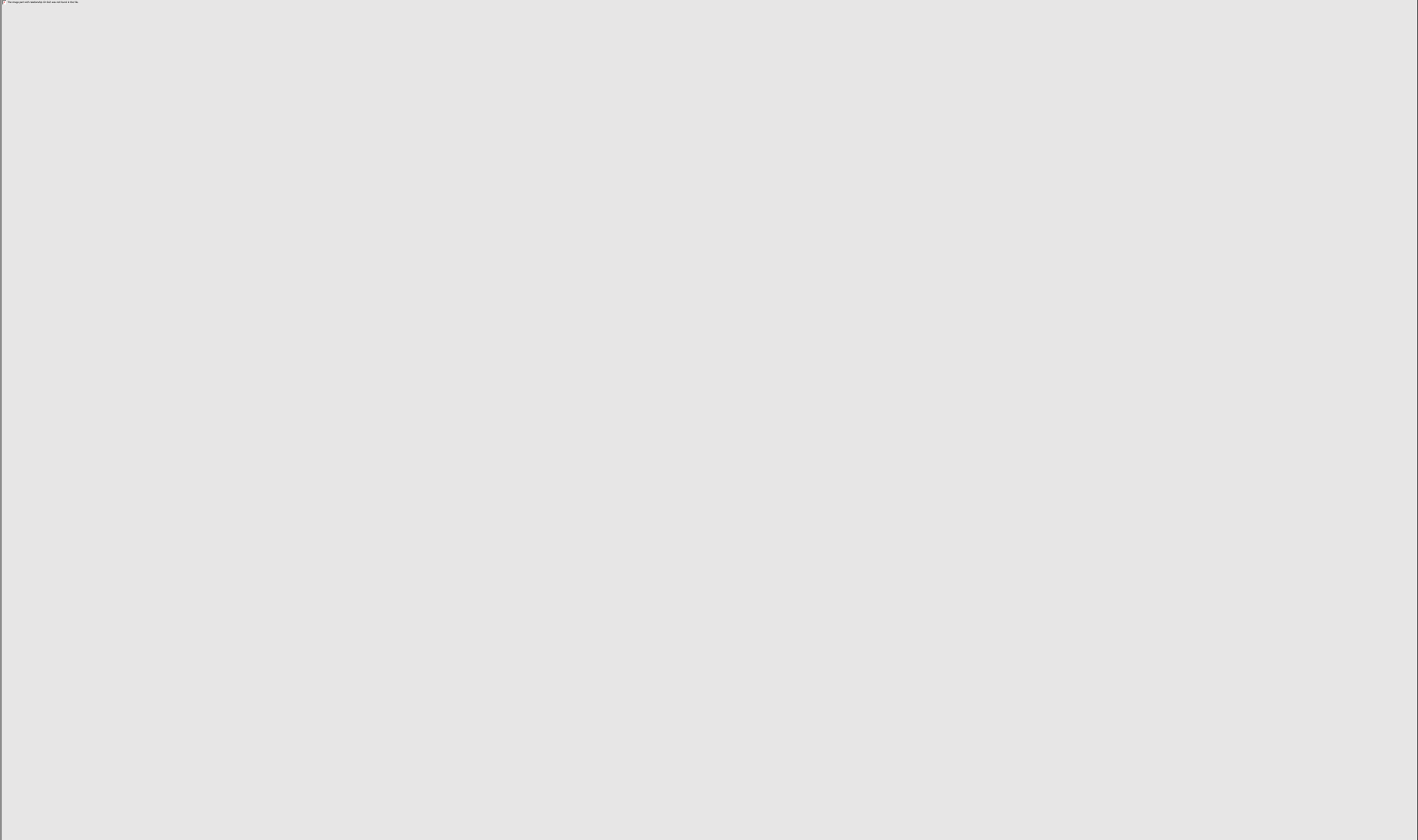
**Automobile  
City**

**Transit  
City**

**Walking City**



# Cities are moving away from car dependence...



# The metabolism of three urban fabrics in Australian cities.....why car dependence is not good

INPUT (Per Person Per Year)	Automobile City	Transit City	Walking City
Resources			
Fuel in Megajoules (MJ) <sup>1</sup>	50000	35000	20000
Power in Megajoules (MJ) <sup>2</sup>	4620	4620	4620
Gas in Megajoules (MJ) <sup>2</sup>	2450	2450	2450
Total Energy in Gigajoules (GJ) <sup>2</sup>	57.07	57.07	57.07
Water in Kilolitres (KL) <sup>2</sup>	70	70	70
Food in Kilograms (kg) <sup>3</sup>	451	451	451
Land in Metres Squared (m <sup>2</sup> ) <sup>4</sup>	547	547	547
Urban Footprint in Hectares (ha) <sup>5</sup>	2.22	2.22	2.22
Basic Raw Materials (BRM) for New Building Types Per Person <sup>6</sup>			
BRM 1) Sand in Tonnes (T)	56	22	5.7
BRM 2) Limestone in Tonnes (T)	34	13.2	3.4
BRM 3) Clay in Tonnes (T)	22	8.7	2.3
BRM 4) Rock in Tonnes (T)	33	13	3.3
Total BRM in Tonnes (T)	145	57	15

OUTPUT (Per Person Per Year)	Automobile City	Transit City	Walking City
Waste			
Greenhouse Gas (Fuel, Power & Gas) in Tonnes (T) <sup>1</sup>	7.13	4.98	2.95
Waste Heat in Gigajoules (GJ) <sup>2</sup>	57.07	39.90	23.65
Sewage (incl. storm water) in Kilolitres (KL) <sup>3</sup>	80	80	80
Construction & Demolition (C&D) Waste in Tonnes (T) <sup>4</sup>	0.29	0.22	0.18
Household Waste in Tonnes (T) <sup>5</sup>	0.63	0.56	0.49

Table 1. Input Resources and Waste output variations between urban form types Source: Thomson and Newman,

Now we are in the era of PEAK CAR....  
due to TIME and SPACE

1989

2009

2015

Global Cities Database  
on 100 cities....

Cities are impacted by transport choices

Every city wants more rail  
connecting centres...

Cities are really important in understanding  
how we can reduce our environmental impact!

Not just population

Also had worked out that politics and economics could completely change  
and enable growth and progress to mean reduced environmental impact.



The emergence of the second stage in the environmental paradigm....

Environmentalism based on population ecology and IPAT did not work...

It increasingly was being rejected by the third world who had young fast growing populations and needed their economies to grow...and by technology-based environmentalists who had solutions and people like me who saw cities and economies as a solution not a problem....

The UN set up Brundtland Commission on Environment and Development 1984-87.

# *The Sustainability Journey*

1970's to Mid 80's  
Australia strong on environment



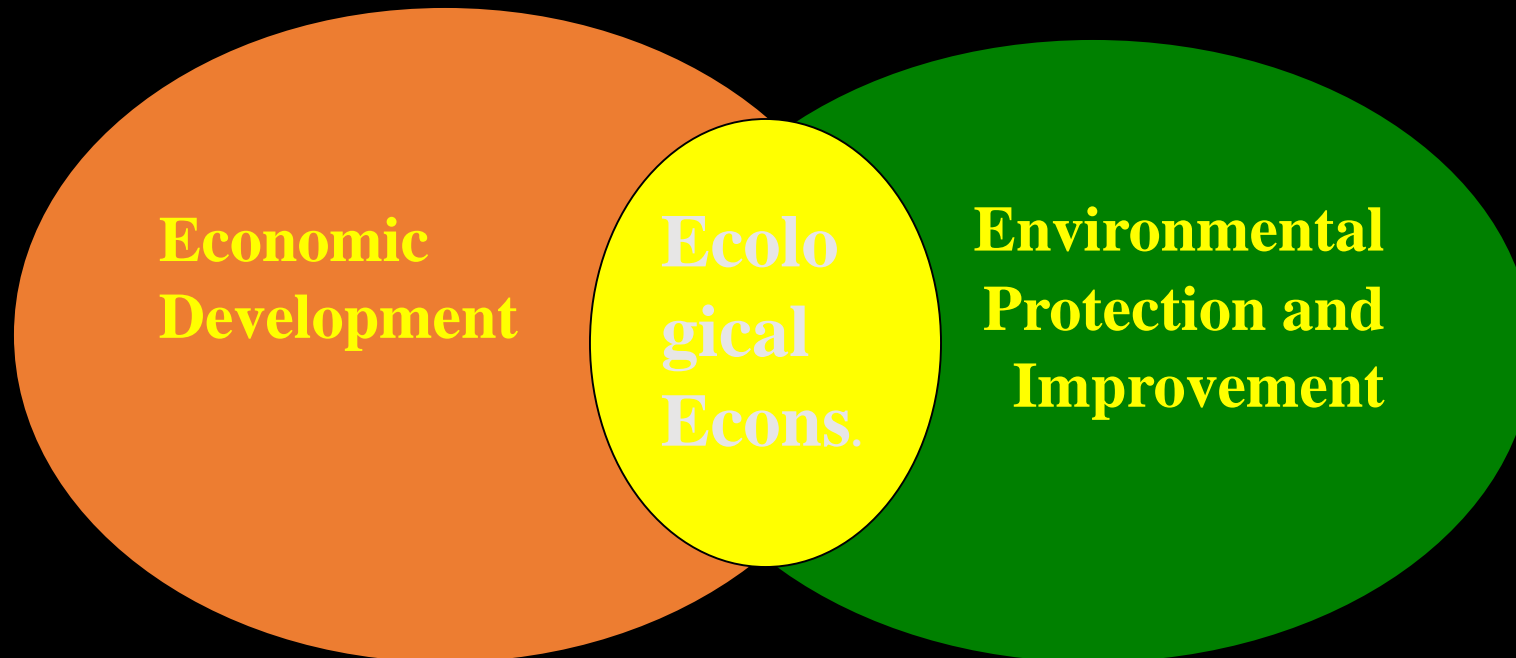
**Economic  
Development**



**Environmental  
Protection and  
Improvement**

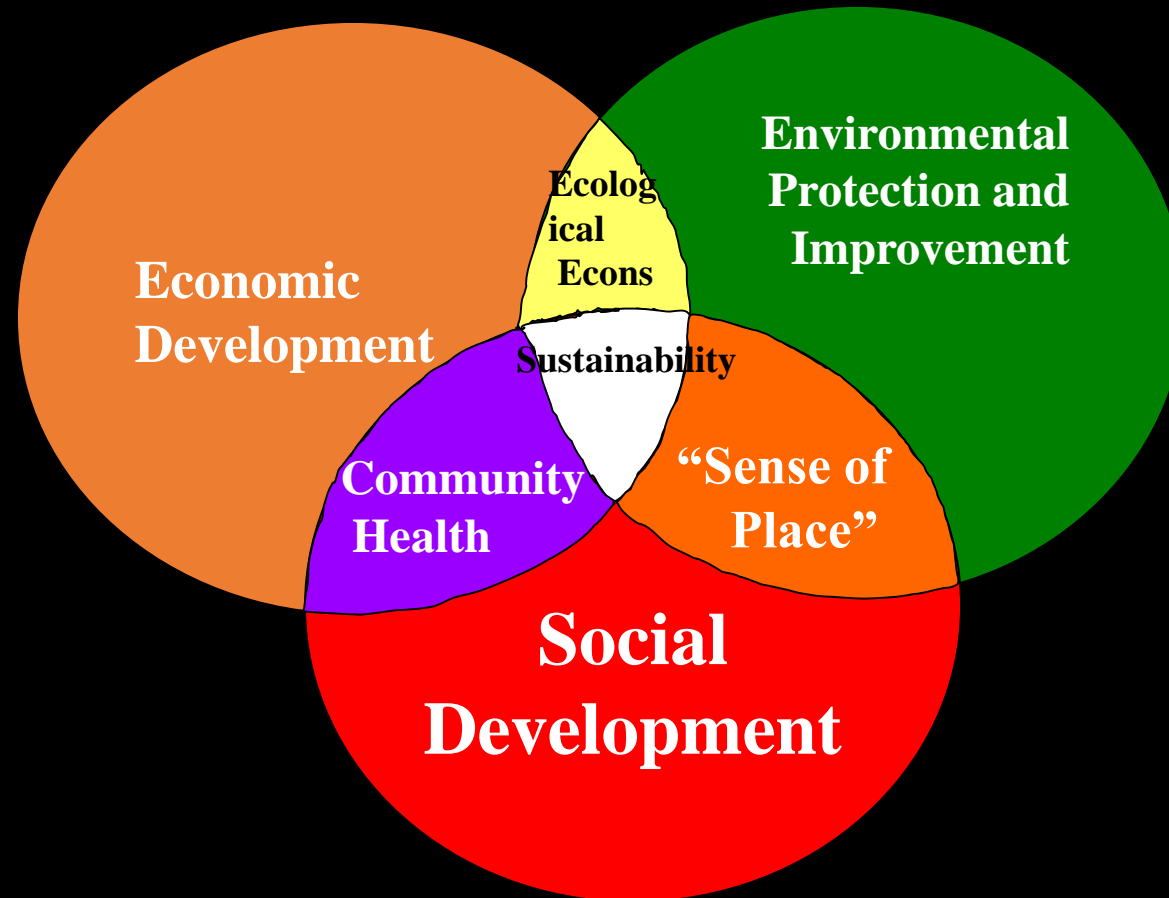
# *The Sustainability Journey*

Mid 80's to Mid 90's  
Brundtland Report  
Australian government very active



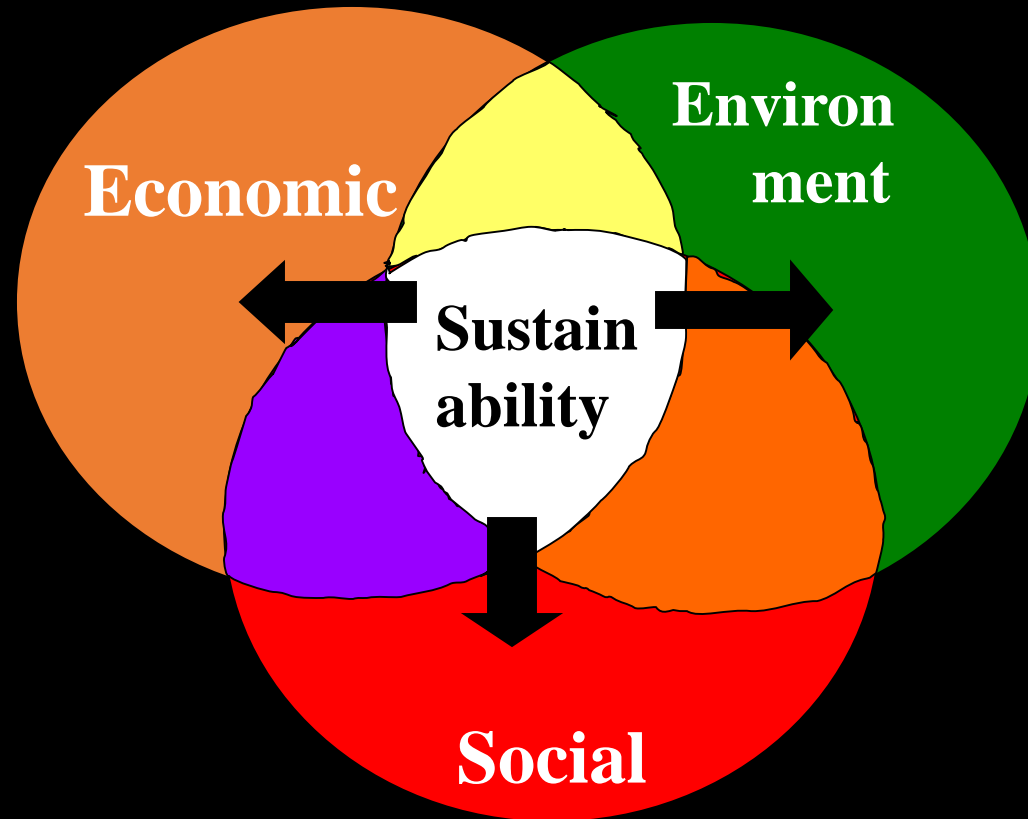
# *The Sustainability Journey*

Mid 90's to 2000



# *The Sustainability Journey*

Today - demonstrations and strategies...



# ISTP ('90 to '07) and CUSP ('07 - )... 'misfits making a difference'

Masters in Sustainability POLICY

120 PhDs.

WA State  
Sustainability Strategy  
was the first of its kind  
in the world.

How was it done?



Playing Jazz...

# ***CREATIVITY***

## ***Sustainability as PLAYING JAZZ***

World Business Council for Sustainable Development

### **- SCENARIOS FOR THE FUTURE –**

- F R O G !
- GEOPOLITY
- JAZZ
- First Raise Our Growth
- Large Government Intervention...
- Partnerships, synergies, flexibility

# ***State Sustainability Strategy***

Argyle 27%  
Indigenous  
workforce in  
5 years.

Indigenous employment  
is a key sustainability  
issue...

**'Unless mining can create a legacy of social value we have no right to mine.'** Brendan Hammond, CEO Argyle Diamonds. Share value increased 10 times.....

# Explaining ethics and sustainability

'Enduring value' is any kind of value that lasts in perpetuity (physically or as new human capacity).  
A diamond of hope.

*'Enduring Value: The Australian Minerals Industry Framework for Sustainable Development'* Minerals Council of Australia, 2005

Creating diamonds of hope is what builds a city... In theology and philosophy they are symbolic of human legacy from our work.

Sustainability and Climate Change began to mean the same thing...net zero targets plus SDG's.



IPCC reports are done by scientists from around the world....all volunteer labour.

**ALL COMMITTED TO SHOWING HOW ECONOMIES CAN BE CHANGED NOT STOPPED.**

**16 Chapters**

**235 Authors**

**900 Reviewers**

More than **2000** pages

Close to **10,000** references

More than **38,000** comments

The earth must not increase more than 2 degrees above the present average temperature...IPCC AR5



This led to  
PARIS...  
176 nations  
signed up

# Ten years observing real change at a global level

Working Group III – Mitigation of Climate Change

**Its been a privilege...**

[Credit: Teekay.]

## Bloomberg New Energy Finance

Solar....From 4% to 29%.

Coal from 31% to 16%.

# The net zero economy is being financed

Dramatic shift towards Net Zero investment....  
being led by business

\$170 Trillion

**Cannon-Brookes plans to kill coal by  
2030, invest \$20b in renewables**  
Fin Review 21 Feb, 2022

# **BUT eco-anxiety abounds....**

Relentless lists of deteriorating problems and few attempts to explain solutions.

Stuck in Paradigm 1...

**WHAT KIND OF FUTURE CAN WE CREATE?**

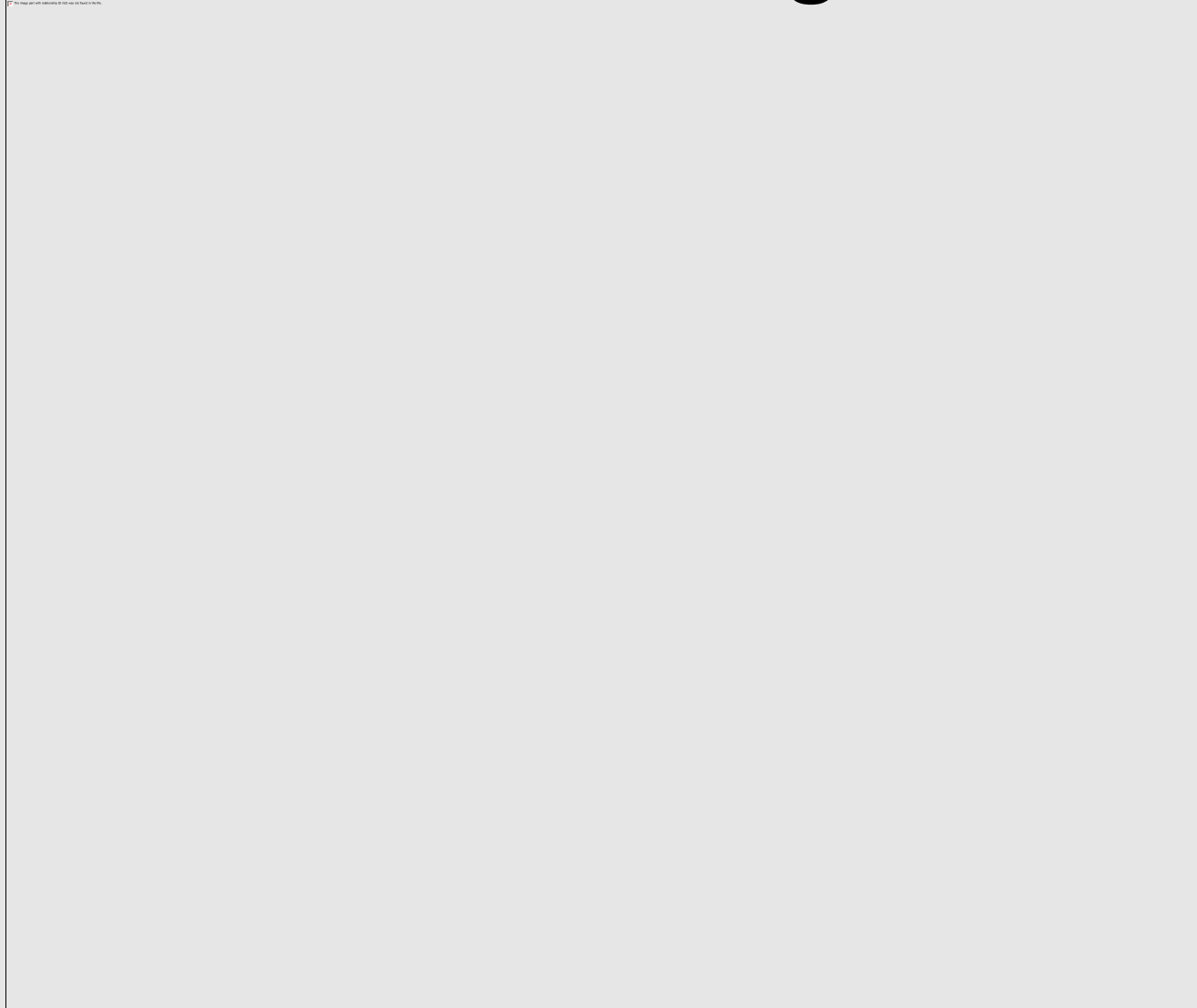
**Can we shift gears into a new paradigm of repairing our environment?**



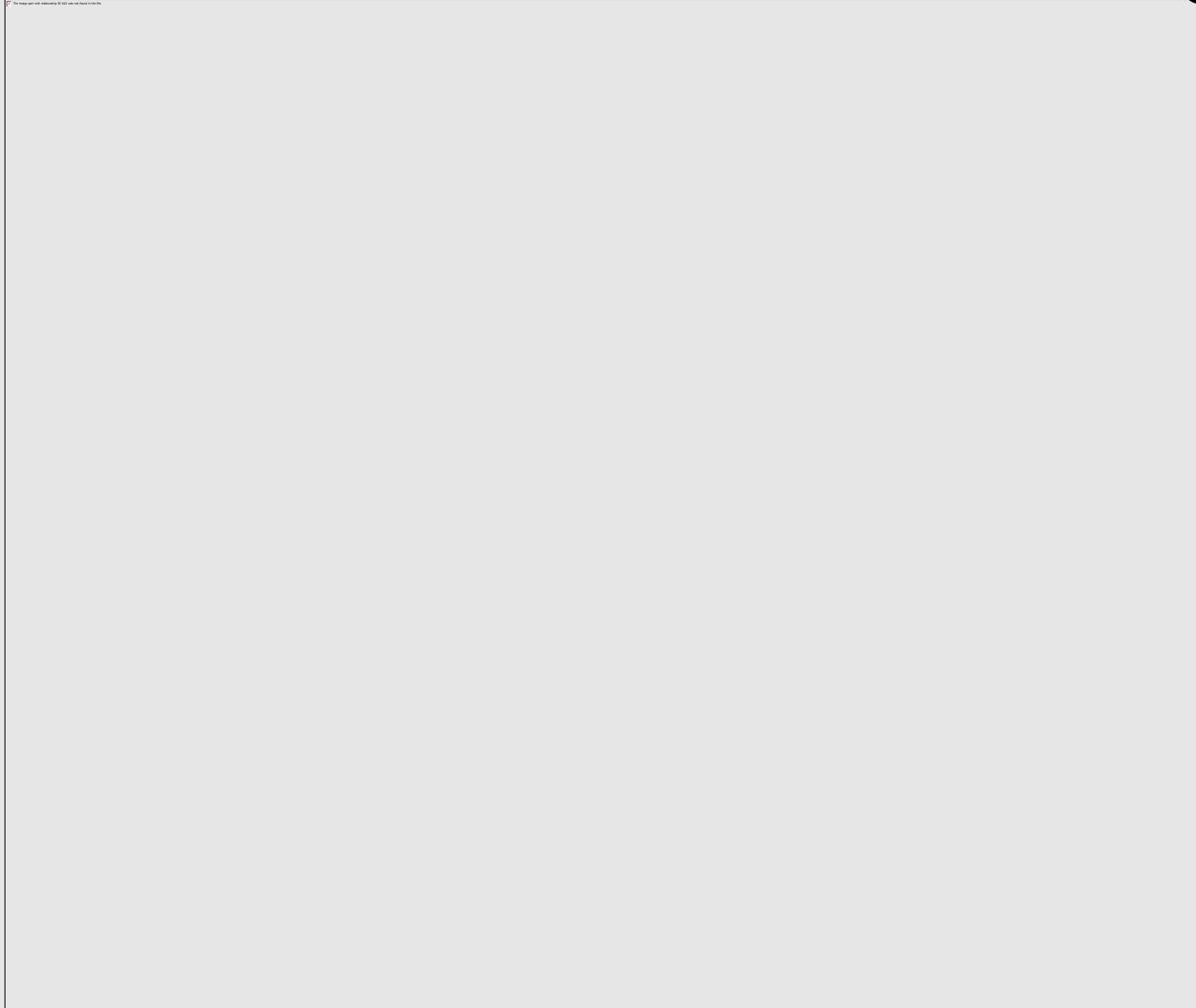
The emergence of the third stage in the environmental paradigm....

# Paradigm 1

# Paradigm 2



# Paradigm 3



# The urban transition...

2017

From industrial times but accelerating in  
1950's as modernism spread cities out...

Brundtland Report in  
1987...we must reduce  
impact whilst improving the  
economy and equity

Regenerative Devt and  
Design....

Paris Agreement, SDG's

New urban Agenda...Net

Zero cities the agenda for  
future cities...



Is this the agenda for a  
new political era....?



ALP win in WA ends Ben Morton in Tangney and seals end of Perth Freight Link through Fremantle



What is next?

Regenerating a  
biodiversity  
corridor and  
creating a  
biophilic  
link...from  
wetlands to  
waves



# Can Westport be regenerative?

- The ultimate vision is to plan, build and operate the most sustainable port in Australia, targeting a carbon neutral supply chain.
- Every effort will be made to avoid, minimise or offset any potential environmental impacts expected from the project.
- Net Zero Port...
- Repairing Cockburn Sound...seagrass restoration and habitat creation.
- Why not 'regenerative'?

# Gascoyne Gateway: Regenerative Design

*'delivers a truly regenerative environmental approach'* Michael Edwards

## Net environmental benefit through:

1. Regenerating habitat on land and in the ocean (ruined by trawlers),
2. Net Zero operations through renewables, buildings and transport,
3. Desalinating water (renewably) to assist local water supply and recharge depleted groundwater,



*“Gascoyne Gateway is one of the first developments I have encountered that is committed to being a regenerative development. This means that they are going beyond just minimising impacts on the local and global environment, but are setting out to repair and regenerate past impacts. They are also including social and economic regeneration.*

*In my view, this makes Gascoyne Gateway an Australia-first holistic approach to regenerative development. I look forward to seeing how these development ideas are worked through in detail by the local community.”*

**PROFESSOR PETER NEWMAN, AO**

Curtin University Sustainability Policy Institute

EPA didn't know how to assess...

Can cities be regenerative?

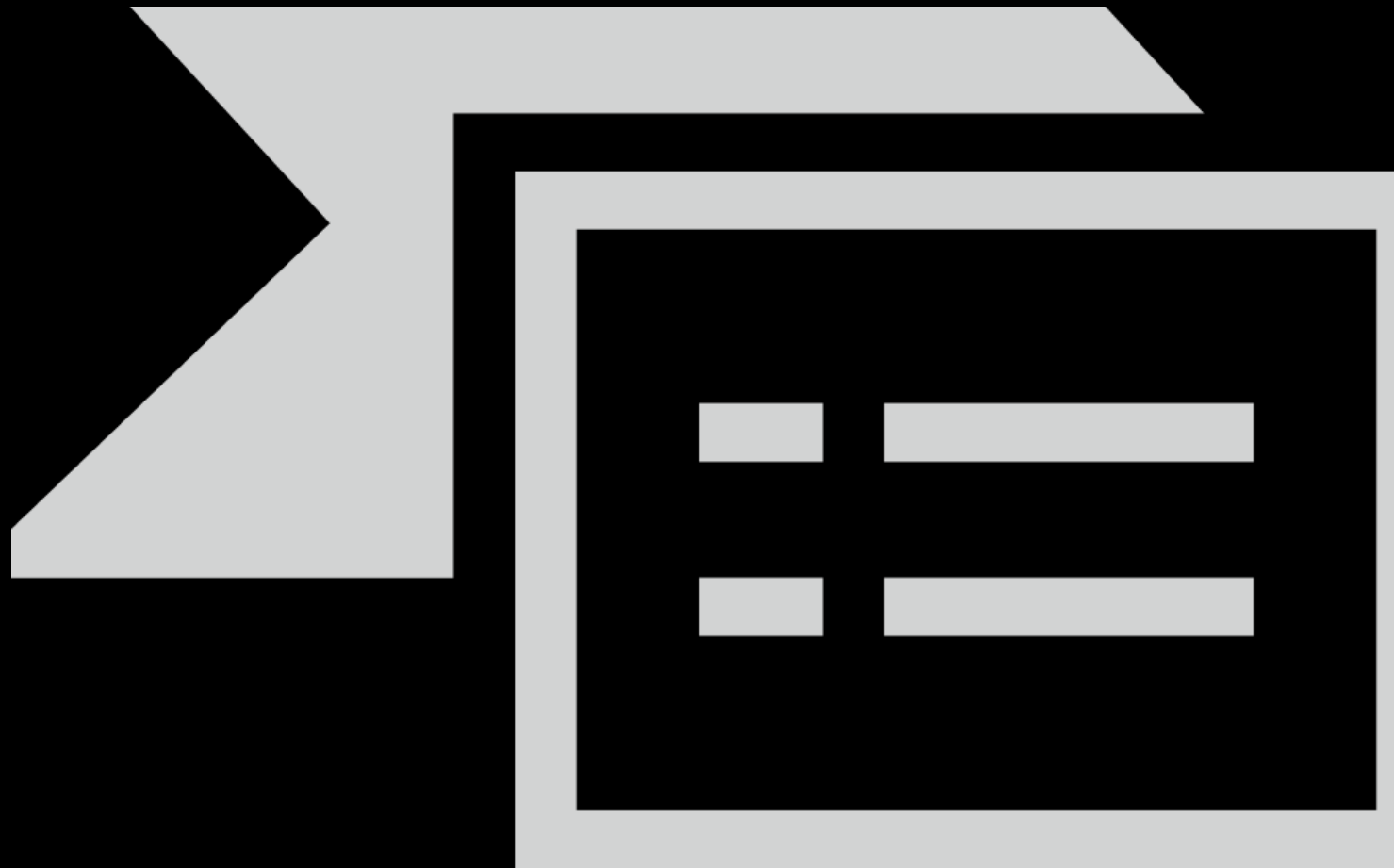
ENERGY POSITIVE HOME – Josh's House  
Josh is the new **Dean of Sustainability Futures**

[Joshshouse.com.au](http://Joshshouse.com.au)

# Can urban regeneration happen in middle suburbs instead of suburban infill.....

31 out of 34 want to redevelop as a Precinct!

Free book



# Regenerative Precinct development **WGV**: Solar-Battery-EV-Blockchain with nature, climate and people-positive outcomes

Jemma Green

85 staff  
Projects in  
25 nations

Powerledger develops software solutions for the **tracking, tracing and trading of renewable energy**. We believe in the democratisation of power, for a sustainable future.'

EAST VILLAGE

NET ZERO PRECINCT design and management – shared water bore,  
shared battery, blockchain-based management... MICRO-GRID

NET ZERO, 80-120% less Carbon, 20% less cost

Projected Water Use (per person) – 80% less mains water, 50% less cost



# Net Zero Industry Park DevtWA

# Net Zero Regenerative Design Projects gathering momentum...

All have a microgrid with one connection to the grid

- Shenton Village
- Roe Industrial Park
- Smiths Beach
- Witchcliffe Ecovillage
- Peel Industrial Estate
- Who manages the microgrid?
- Community title managing regenerative outcomes or a new **professional** - an 'aggregator' of microgrids into a net zero zone that enables all the other factors?

# Witchcliffe Eco Village....

Solar-batteries-EV's and  
permaculture

First truly integrated devt?

**THE BEST!!!**

Smiths Beach....

*Regenerates bushland and indigenous management of land...fire control (through Community Title), songline along Cape-to-Cape coast, indigenous centre, beachfront restoration.*

'Forty two percent of the site will be transferred by the owners to form part of the Leeuwin Naturaliste National Park' ....

Inside the site 'revegetated and rehabilitated open space to form part of the flora, fauna and pedestrian network.'

Public Environmental Review is on-going.



# Regenerative Urban Design...the Hesperia Model

- Nature Positive
- Climate Positive
- People Positive

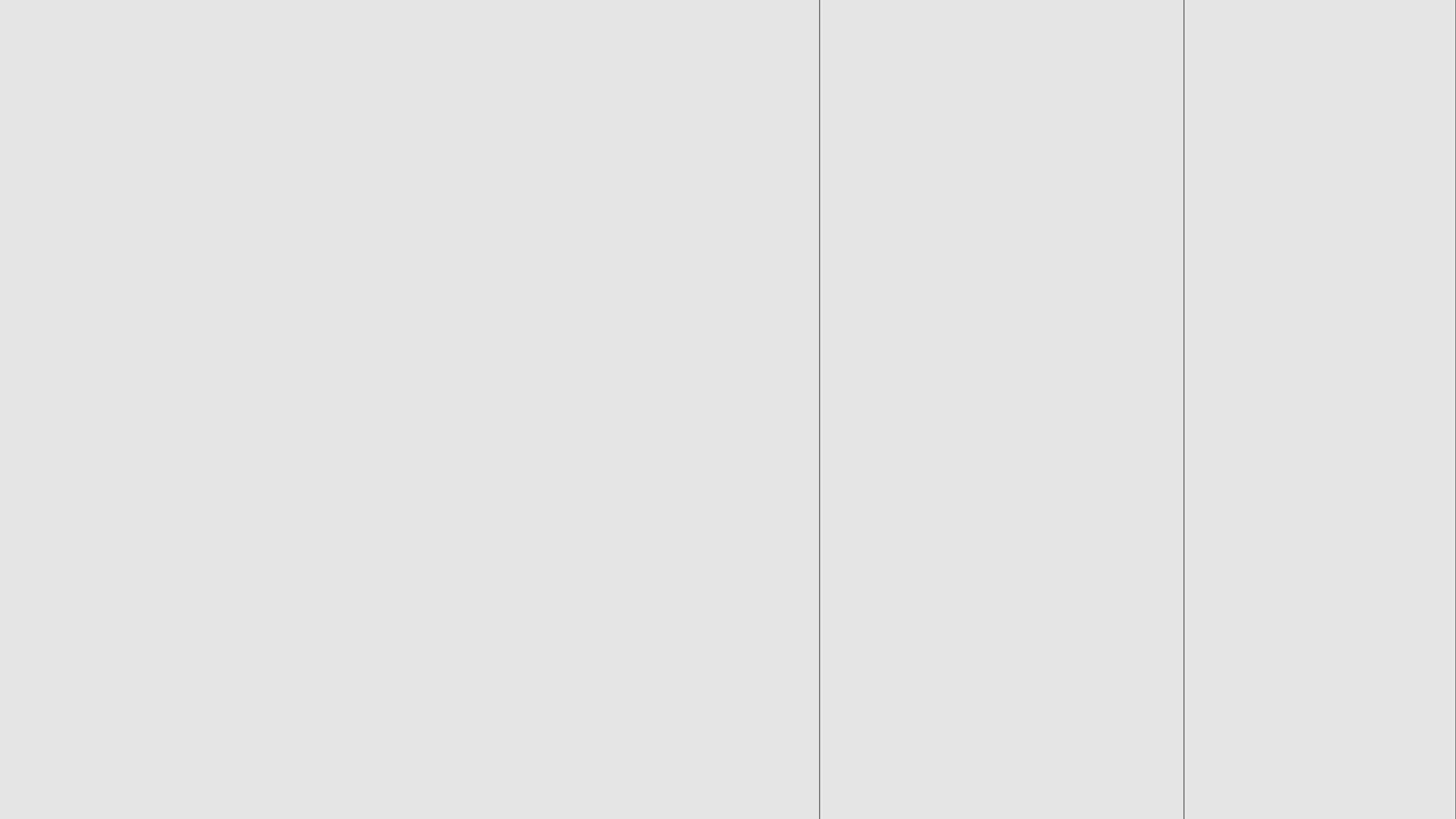
Urban development to  
save the black cockatoo...



‘Nature-Positive Design and  
Development: A Case Study on  
Regenerating Black Cockatoo  
Habitat in Urban Developments  
in Perth’ by CUSP and Hesperia with Ron  
Johnston from Museum *Urban Science*



Becoming formalized...



## Visions for suburbia...

Can we get a better vision than the 1950's?

Permaculture re-invented as a community activity regenerating suburbs...

# Can farming be regenerative?

The only way to get back to less than 1.5C is to regenerate the atmosphere....

# Trajectory to net zero – need offsets with integrity

Oil Mallees – burying carbon and rebuilding the landscape...improves agricultural productivity



Oranje Tractor  
winery Net zero  
after two  
decades of hard  
work...

Mostly due to soil  
carbon growth (over  
8% now) as well as  
solar-battery system in  
the house...

REGENERATIVE FARMING (in Gondwana Link area).

SoE Report 15mT/yr being absorbed into soil across Australia during 2010-19

**Gondwana Links Project – carbon offsets 50% up in 6 mths**

Sukey Hill  
large paddock  
regeneration

***COCANARUP – KUNDIP: a critical link in the biodiversity  
corridor***

Started by Keith  
Bradby in early  
2000's

Curtin University students in one of the recently  
constructed mia mias at Nowanup

Why not make settlements into carbon sinks...and  
build songlines into and through cities? INTEGRITY GUARANTEED

# ***CREATIVITY***

## ***Regenerative Development and Design as PLAYING JAZZ***

World Business Council for Sustainable Development

### **- SCENARIOS FOR THE FUTURE –**

• F R O G !

• GEOPOLITY

• JAZZ

• First Raise Our Growth

• Large Government Intervention...

• Partnerships, synergies, flexibility



Curtin planning a new degree in

**Regenerative Design....**