

Energy Peak

System Check Slide

An aerial photograph of a dense urban skyline, likely Melbourne, Australia, featuring numerous skyscrapers and high-rise buildings. The text is overlaid on the top half of the image.

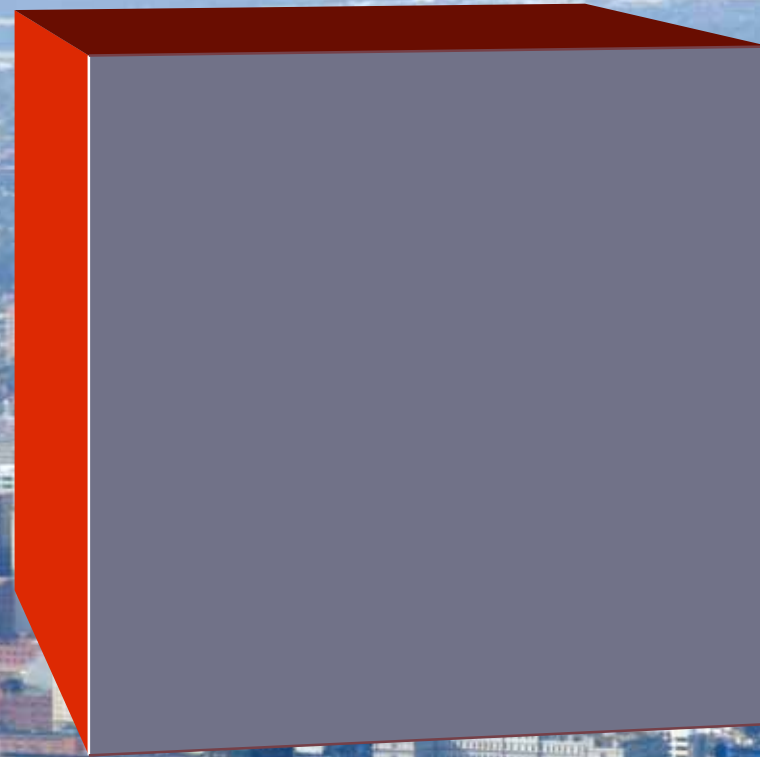
Global Energy Peak Threat or Opportunity ?

David Holmgren

APC8

Melbourne April 2005

Australia's annual oil consumption: 45,000 Megalitres as a 360m cube



Rialto Tower 251m



Scale of our oil dependence

Globalised energy consumption



Rising air travel: essential service or luxury?

Bass Strait Oil: our inheritance almost spent



Altona Oil Refinery, Victoria

Coal: base demand & global warming



Loy Yang mine & power station, Latrobe Valley Victoria

Making the hinterland pay

Industrial plantation forestry, Otways



Clearfell of *Pinus radiata*

Farming: supercharging nature

Dairy Farming,
Gippsland

Silage pit

300 cow dairy

Settlement patterns of consumption

Melbourne outer urban development
Segregated land uses

Space and fuel intensive
transport infrastructure

1/4 acre blocks,
little food production
or economic activity

Unproductive irrigated
open space

Expanding the problem

Rural Residential development Melton Victoria

Motor car dependence

2 hectare blocks, no significant food production or economic activity

Environmental & Social Crisis

Environmental

- Climate change (already happening)
- Land degradation (continuing)
- Resource depletion (global oil peak)

Social

- Family & community breakdown
- Addictive behaviours

Economic & Political

- National & household debt (unprecedented)
- Robber baron capitalism, criminal economies
- Illusion and deception, neo-fascist solutions

Why doesn't crisis seem to hit home?

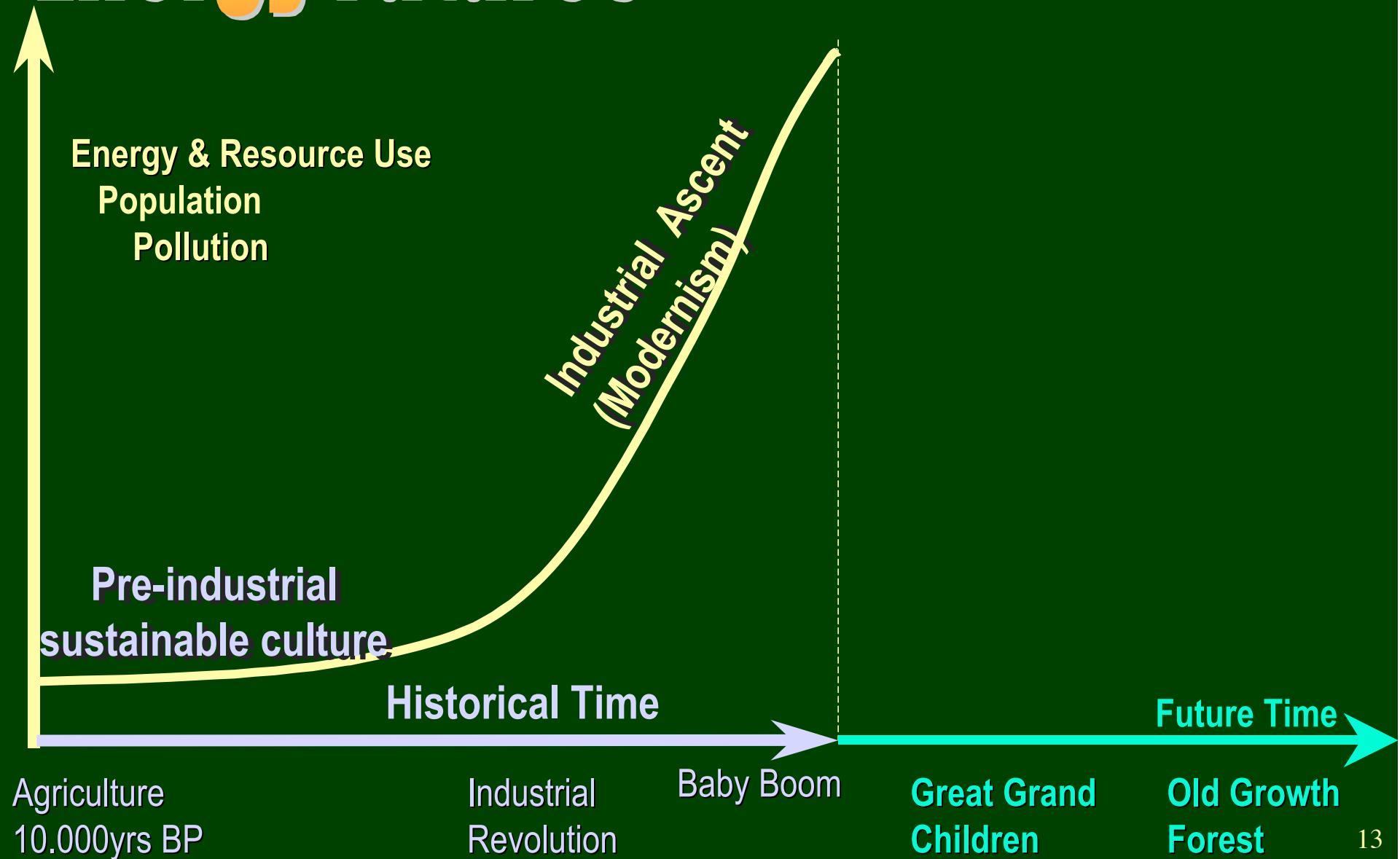
A rising energy base



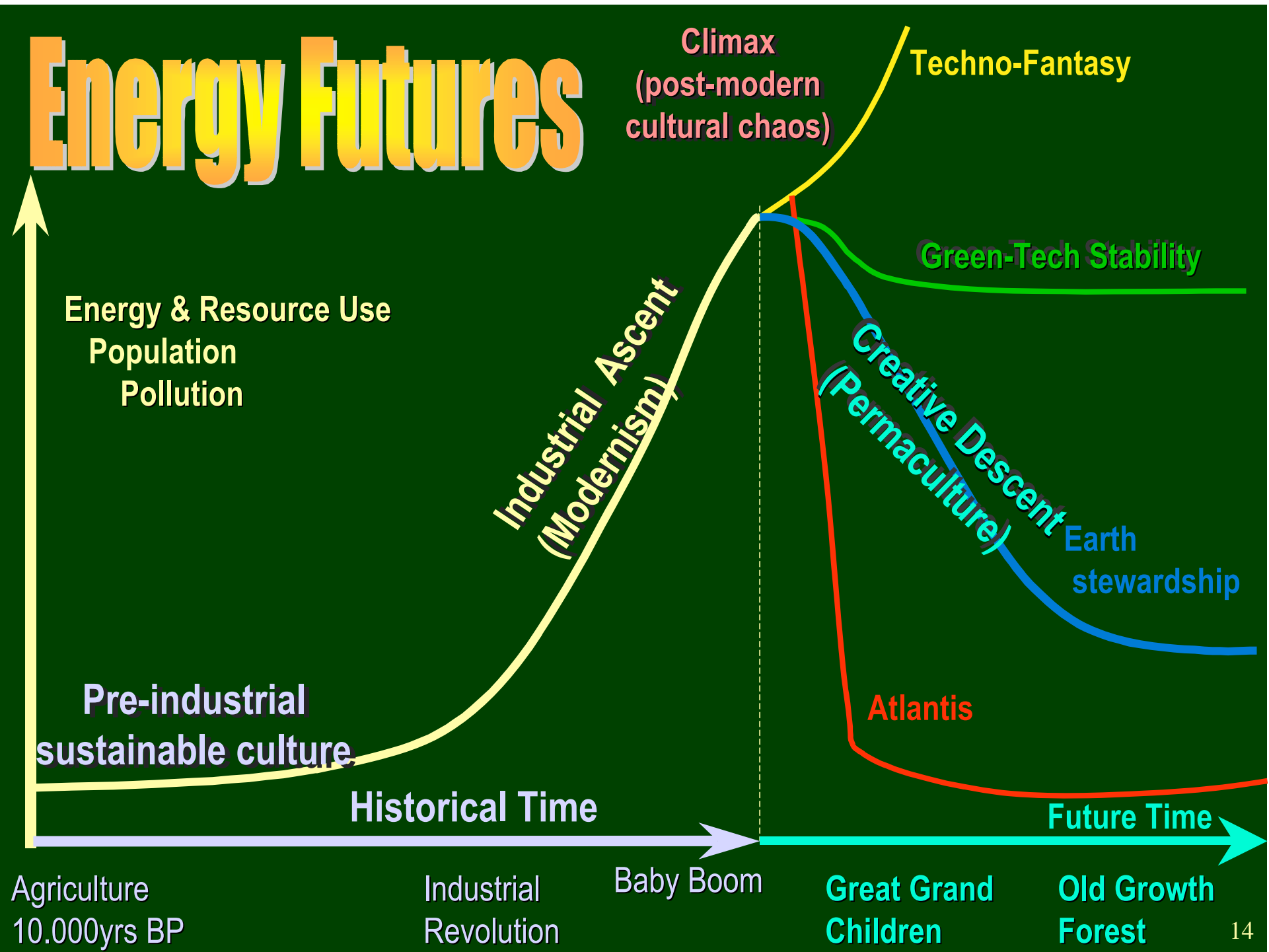
- **Fix symptoms** (e.g. environmental protection)
- **Send problems away** (e.g. third world debt, global warming)
- **Distract with comfort and consumption**

Energy Futures

Climax
(post-modern
cultural chaos)



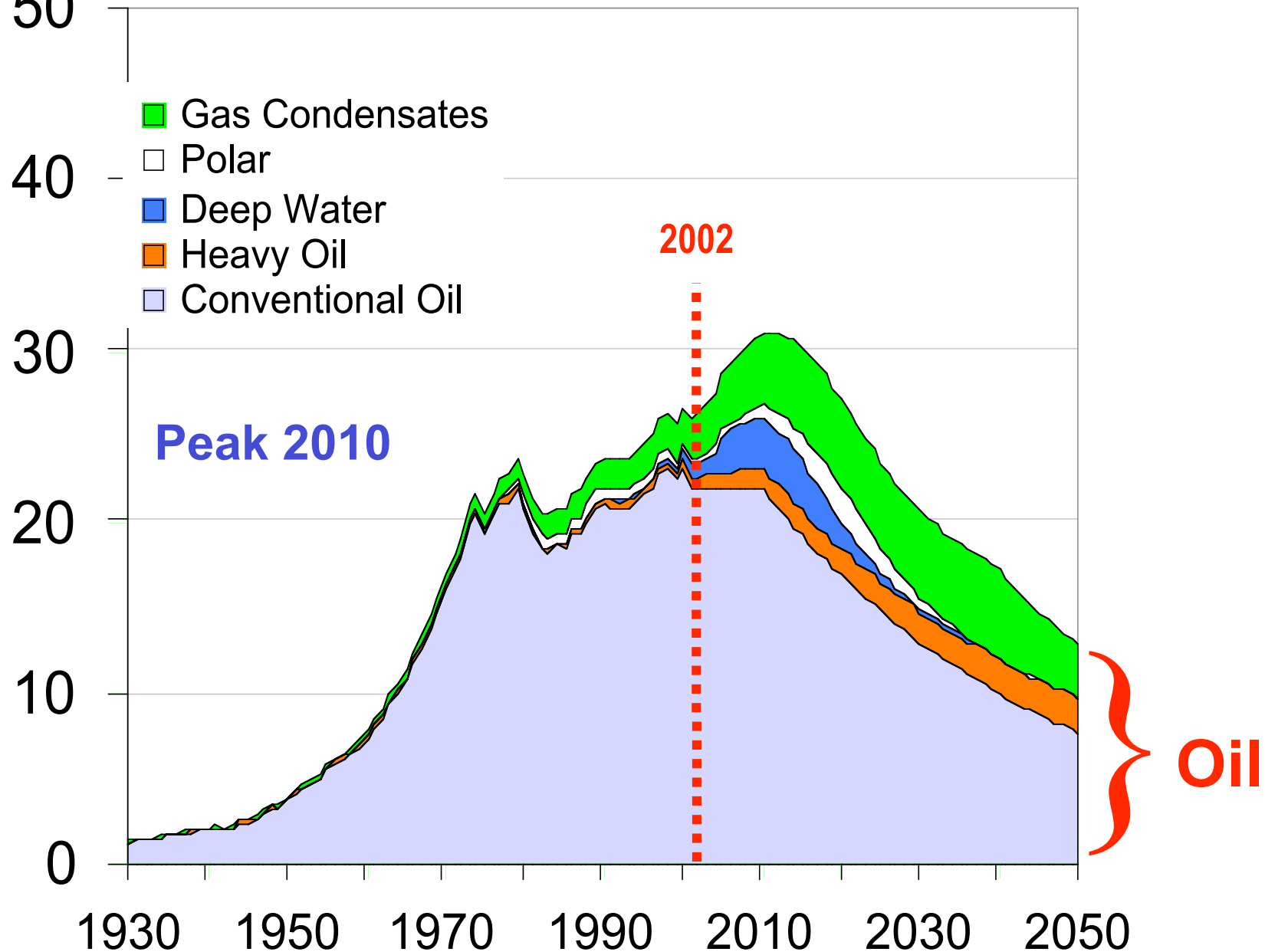
Energy Futures



Gboe/pa

All Oil

www.PeakOil.net



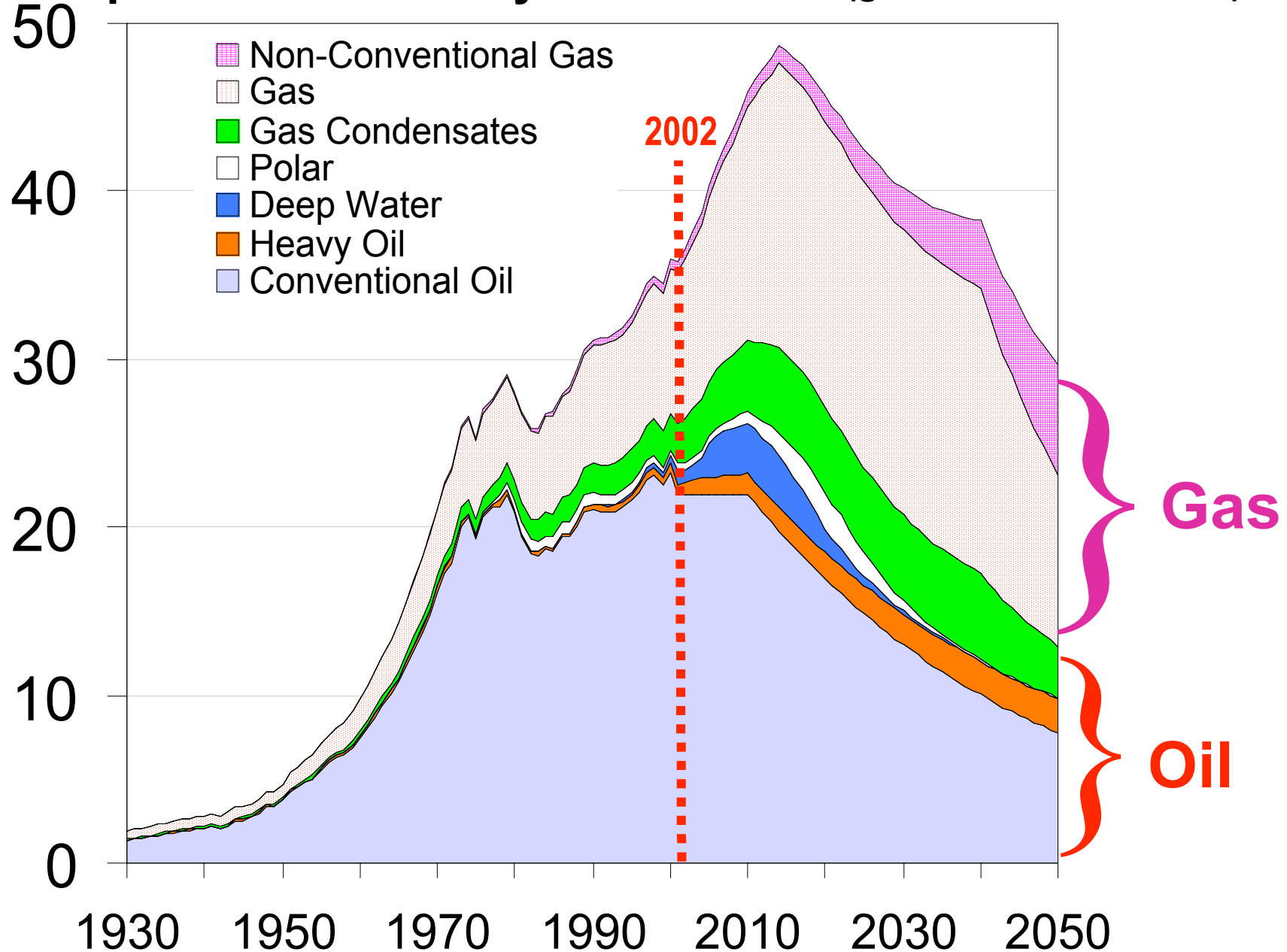
From ASPO "Statistical Review of World Oil and Gas, June 2002"

What Is Peak Oil ?

- Point of maximum production of a field, region or the world
- Peak usually occurs when about half the total resource is used
- Globalisation has moderated the effect on prices of regional peaks
- Heavy, deep ocean and arctic oil can only mask the current peak in conventional oil for a few years (at a higher cost)
- Gas reserves are the only high quality energy which can substitute for oil with high net energy returns
- Gas production is set to peak in about a decade

Gboe/pa

All Hydrocarbons (gas at 10,000 cft=1bbl)



From ASPO "Statistical Review of World Oil and Gas, June 2002"

What Is Energy Descent?

- **Decline in net energy supporting humanity** (Declines in average global well-being probably reflects peaking of energy per person in the 1980's)
- **A gentle decline like a balloon coming back to earth as the most hopeful future.**
- **Mirrors energy ascent, very fast over several decades, and then more slowly over several centuries**
- **Rate of change appears greater due to radical change in direction.**

Threats to the gentle descent

Government reduction in fuel tax and food production subsidies to agribusiness

Severe economic depression and fascist politics blaming minorities, and those providing for themselves

Nuclear war or severe climate change

Opportunities for permaculture

- **Rises in oil prices will flow through to all commodities (metals, timber, food, etc)**
- **Higher commodity prices will;**
 - **make local products will be more competitive than imported ones**
 - **stimulate self-reliance, repair, retrofit and recycling**
 - **Low input and organic farming will compete against intensive land uses**
- **Demand for permaculture as life skills education**
- **Resurgence of community life, ethics and values**

Permaculture Solutions for Energy Descent



Gardening for Food security, Conservation & Health



Organic soil Fertility building & maintenance

Hot Composting



Sheet Mulching

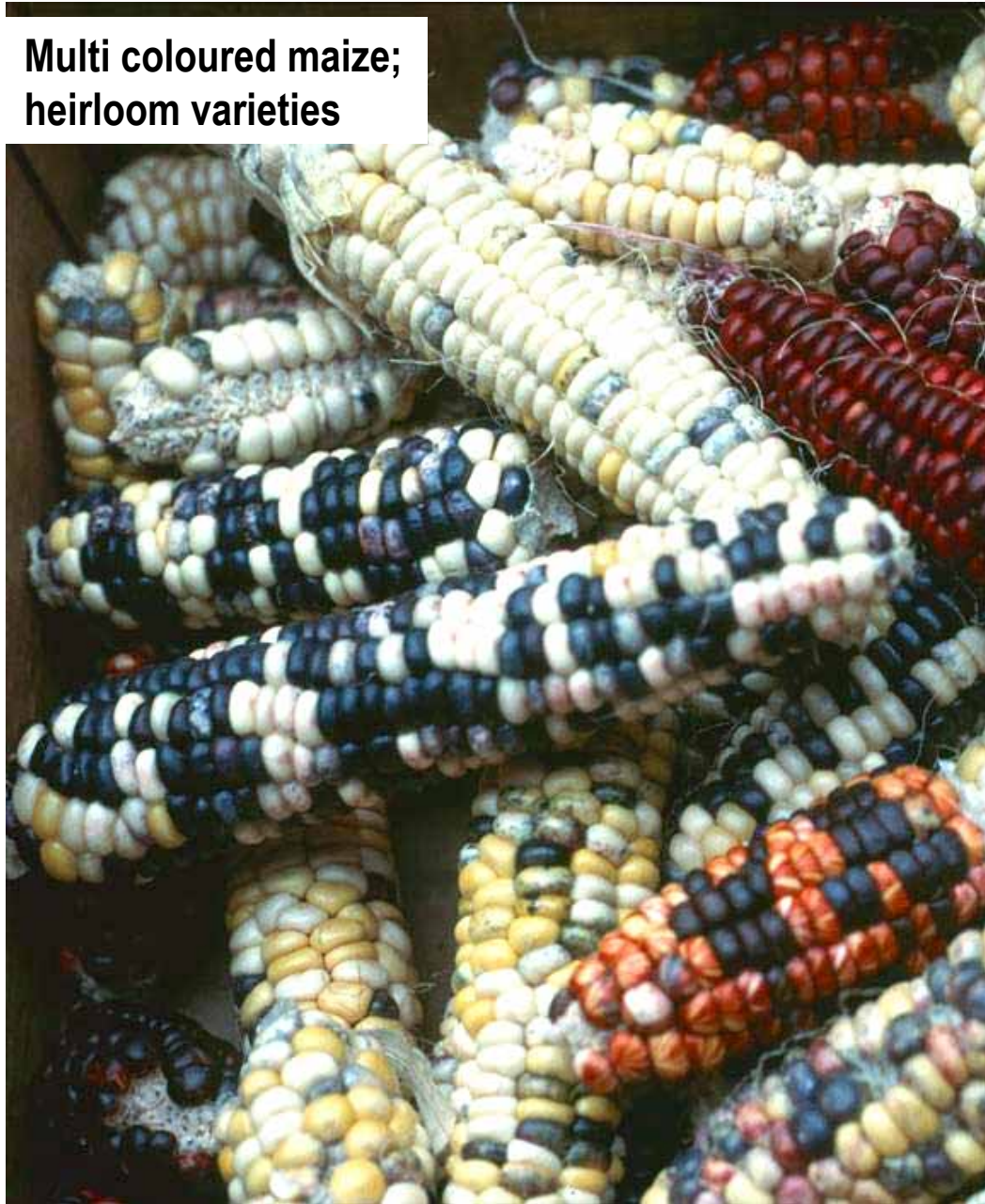


Worm farms



Crop biodiversity & seed saving

Multi coloured maize;
heirloom varieties



Scarlet Runner bean;
perennial vegetables



Food Culture & Preserving



Bottled fruit, sauces & jams



Pasta making

Working with animals: yields & ecological services

**Chook tractor
(Organic market garden
Kangaroo Valley 2003)**



**Pigs & Bamboo
(with electric fencing Belli Park, Qld)**



**Milking Goats
(Melliodora 1997)**



Tree crops: a perennial agriculture

**Minimal irrigated organic Pistachio
Food Forest, South Australia**



New ways to establish trees and forests



**Grow tubes protecting Carobs and other
high value tree crops in mounded beds Anglesea Victoria**



**Direct seeded one year old
shelterbelt forest
Hamilton Victoria**

Use of wild abundance



**Wild Douglas Fir N.Z.
Excellent sustainable timber**



**Roadside apples
& blackberries**



**Kangaroos central Victoria
Healthy & sustainable meat**

Firewood; sustainable & ethical energy

Sourdough bakery CERES, Melbourne



Kitchen stove wood
& backup gas,
Melliodora



Earth & Stone: abundant, enduring materials



Dry stone culvert headwall
Fryers Forest Eco-village
central Victoria 1997

Earth moving; creative use of fossil fuel



Dam & housesite earthworks, Melliodora 1986



Earthworks for sustainable land & water use



**Melliodora 2003
1 hectare,
central Victoria**

Passive solar design & natural materials

**New construction Melliodora:
mud brick thermal mass floors & load
bearing walls,
salvaged timber flooring & joinery**

**Eco retrofit CERES Melbourne
attached greenhouse**



Water harvesting & natural treatment



**Ferrocement rainwater tank
fed from house roof, Fryers Forest**



**Gravel reedbed treating grey water
Fryers Forest**

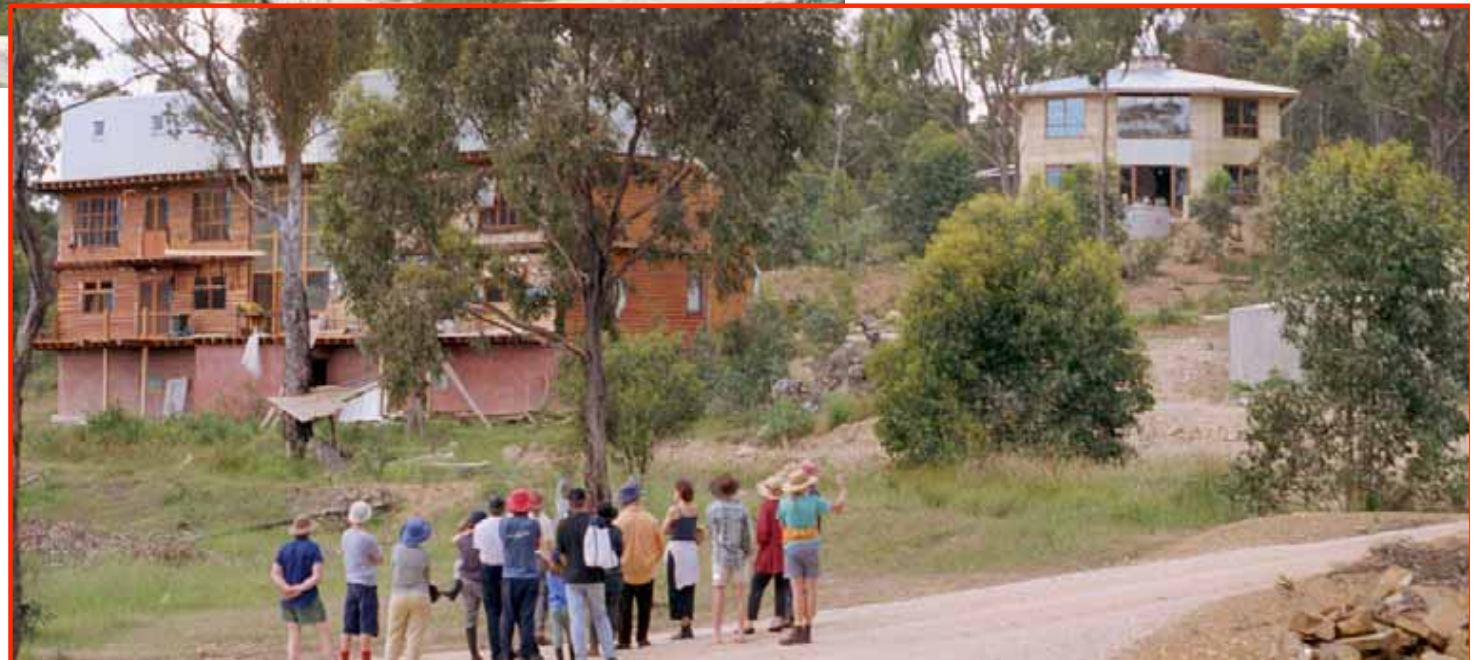
Earthsong Co-housing Community, Auckland N.Z.



New ways of sharing land

- ***Ecological building***
- ***Common infrastructure***
- ***Community governance***

Fryers Forest
Eco-village
Central Victoria
2003



Reclaim the streets:

multi purpose community space



Creative Recycling

Recumbent bicycle made from rubbish

(design & construction by Oliver, 16)

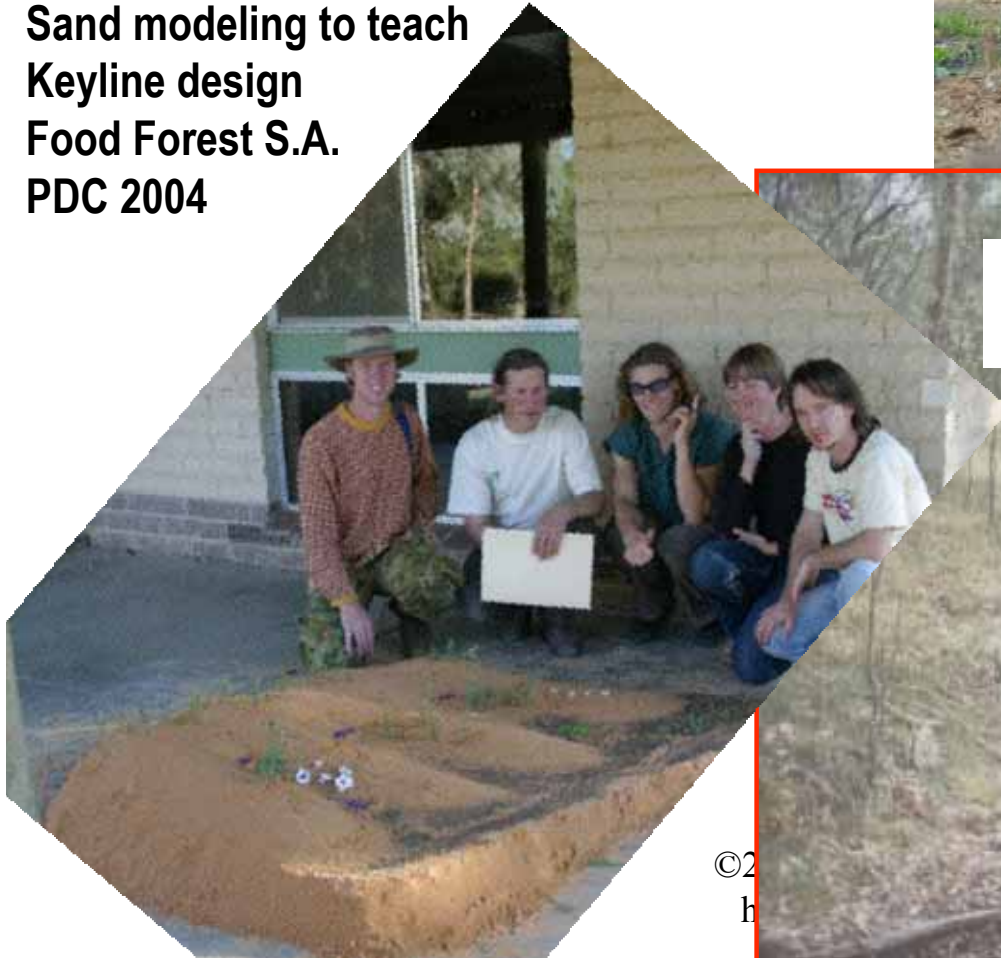


Old & new ways of Learning & Culture

Indigenous cultural revival;
2004 Ecoshow Maori welcome ceremony
Otago, New Zealand



Sand modeling to teach
Keyline design
Food Forest S.A.
PDC 2004



Observation & Interaction with Nature
(flora survey with baby, Fryers Forest 1995)



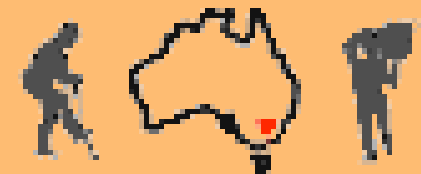
New ways of Trading

Community Supported Agriculture
Hepburn Springs



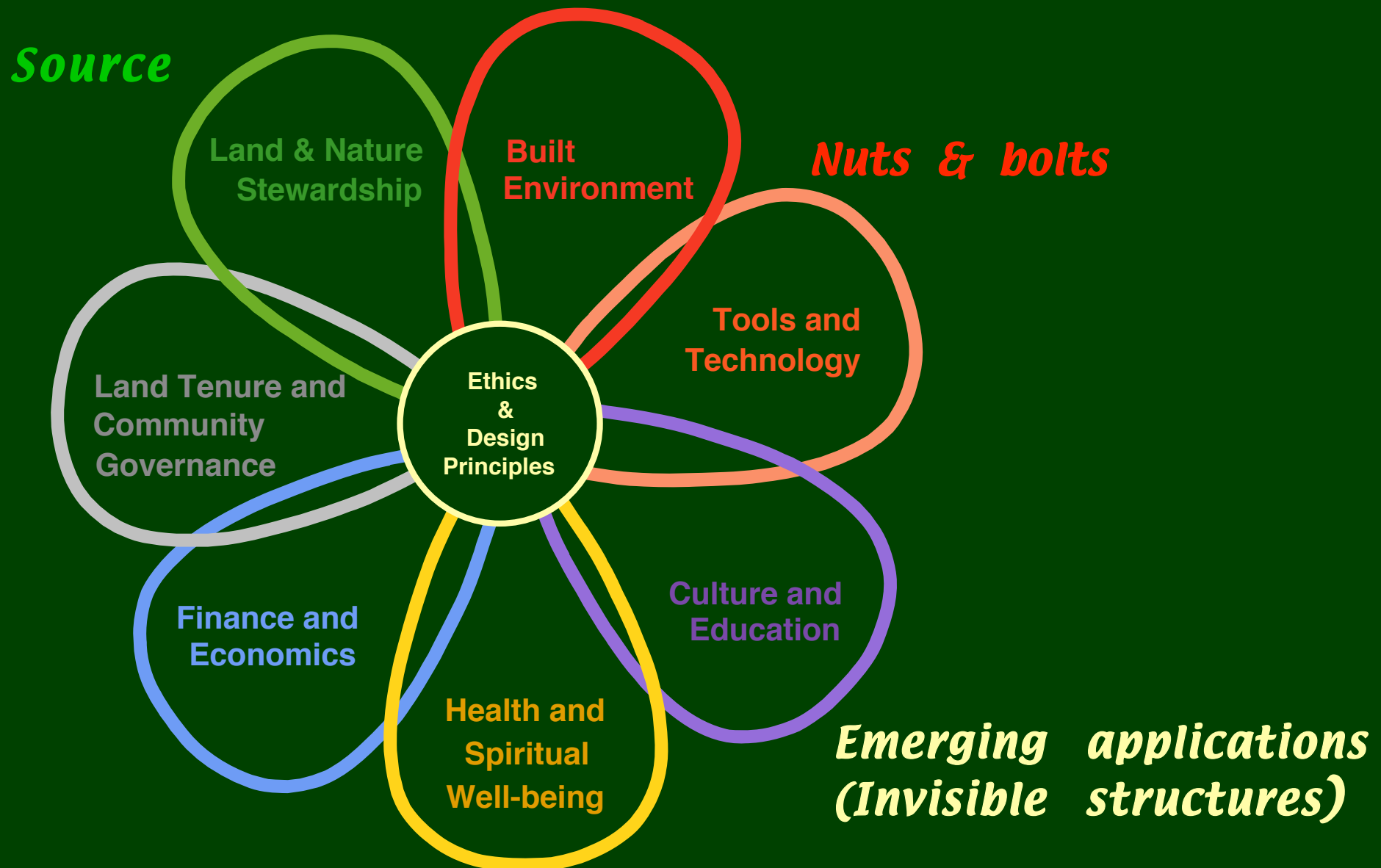
LETS
local currency
Northern NSW

WWOOF
Australia

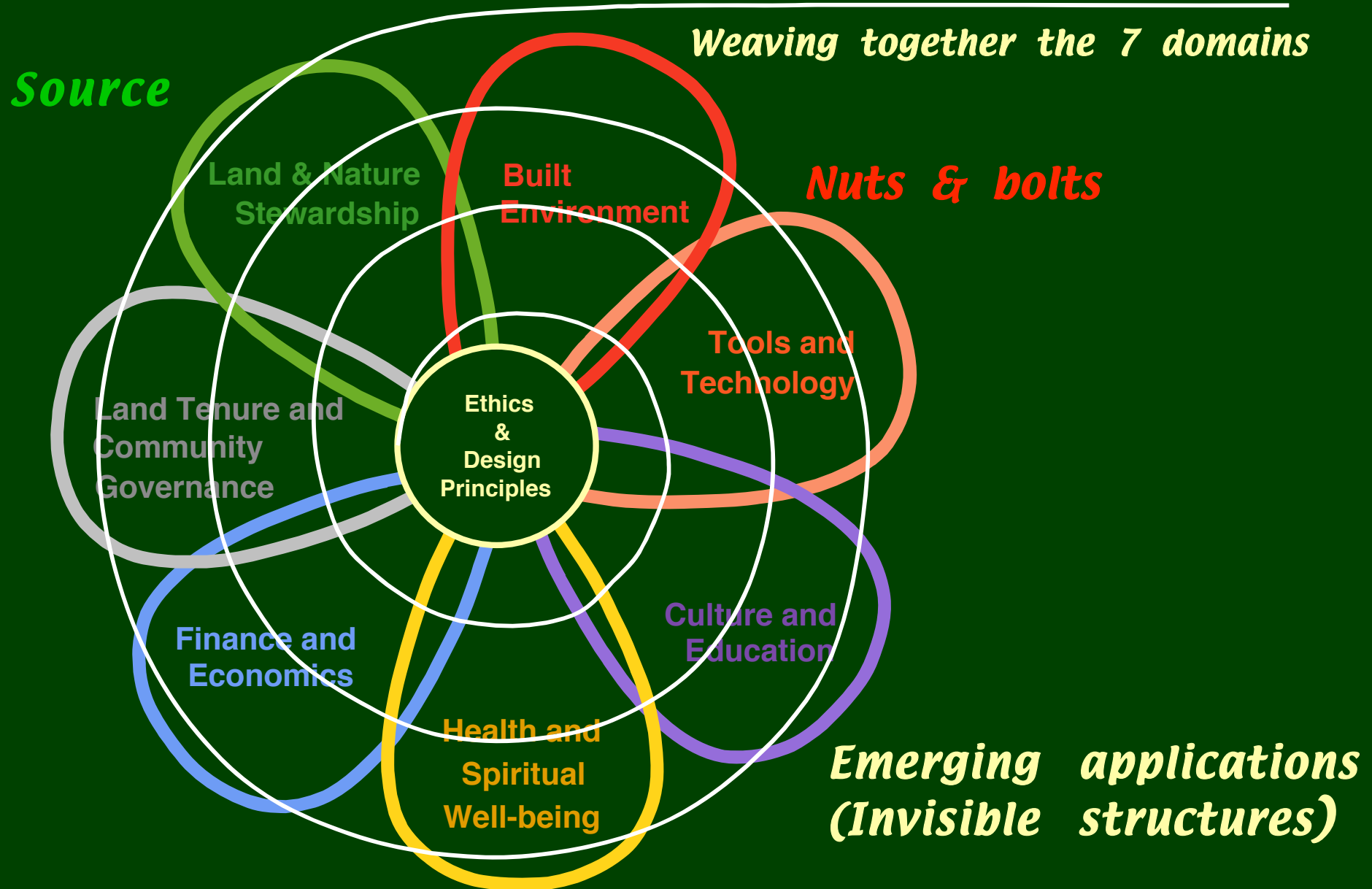


Willing Workers On
Organic Farms Australia

Seven Domains of Permaculture Action



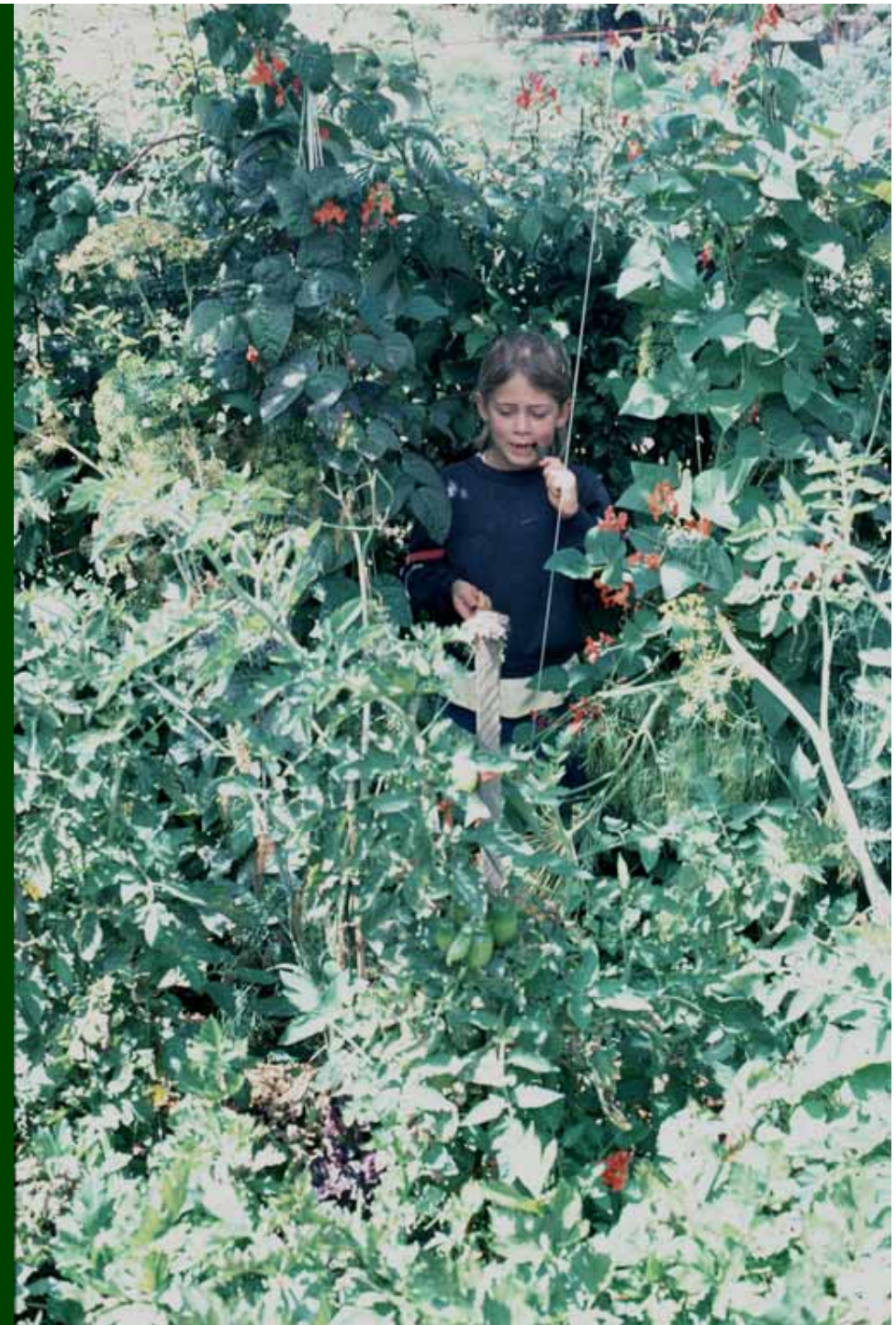
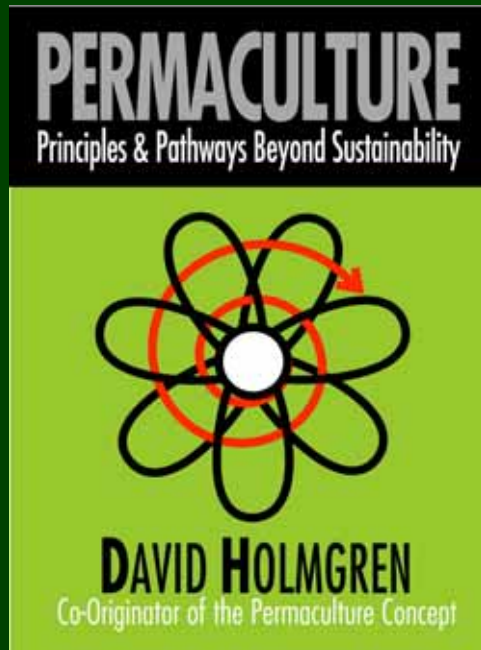
Seven Domains of Permaculture Action



Permaculture

- A design system for sustainable living and land use
- A grass roots and international movement of practitioners, designers and organisations
- A process for reclaiming our place in nature

Permaculture: Reclaiming Our Place In Nature



References for understanding Energy Peak and Descent

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- *The Party's Over: Oil, War and the Fate of Industrial Societies*
by Richard Heinberg New Society Publishers 2003
- *Association for the Study of Peak Oil & Gas* www.peakoil.net
- *Oil: Living with Less* by Bruce Robertson www.STCwa.org.au
- *Permaculture: Principles & Pathways Beyond Sustainability*
by David Holmgren Holmgren Design Services 2002
- Video Interview *David Holmgren speaks with Adam Fenderson*
www.globalpublicmedia.com/interviews/106