



## Our Response to a Changing World

Climate Change, Peak Oil and Food Availability


**Dr Ross Mars**




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Candlelight Farm  
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[www.cfpermaculture.com](http://www.cfpermaculture.com)



[www.waterinstallations.com](http://www.waterinstallations.com)



[www.greywaterreuse.com.au](http://www.greywaterreuse.com.au)

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## Climate change, Peak oil and Food scarcity

- What are they all about?
- Are we ready? What's the urgency?
- How do we prepare?
- What does it mean for me and my family?




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## Climate Change

***Positive proof of global warming.***



**18th Century    1900    1950    1970    1980    1990**

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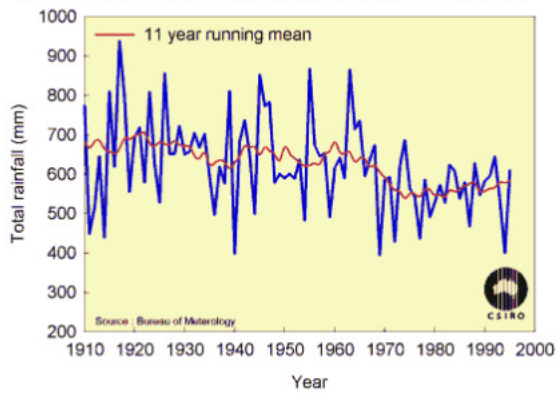
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Annual total rainfall for Southwest Western Australia




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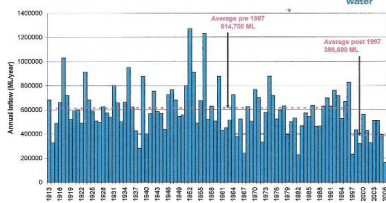
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Total Streamflow at the Major Harvesting Storages  
(Thomson, Upper Yarra, O'Shanessy, Mooroodin)



**Dam  
inflow  
VIC**

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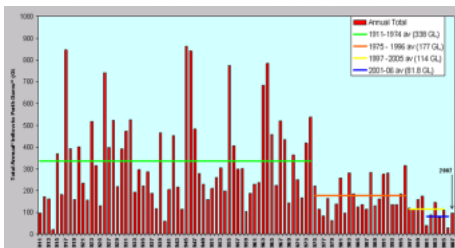
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**Dam  
inflow  
WA**

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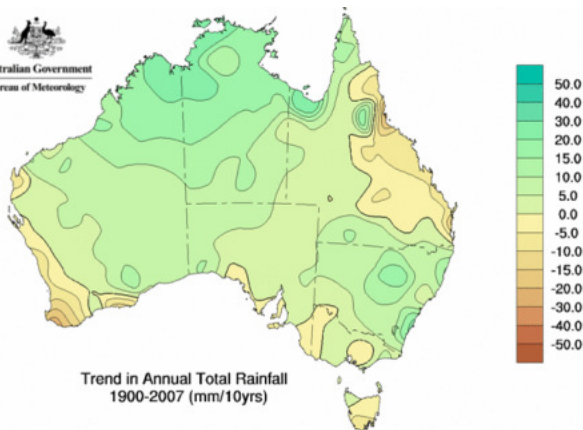
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Australian Government  
Bureau of Meteorology



Trend in Annual Total Rainfall  
1900-2007 (mm/10yrs)

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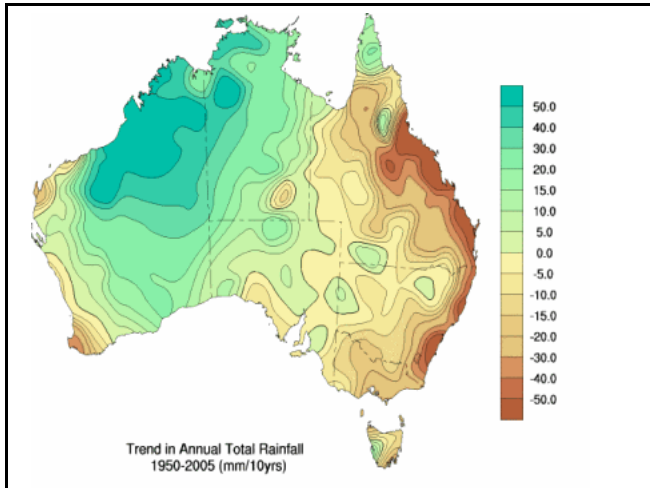
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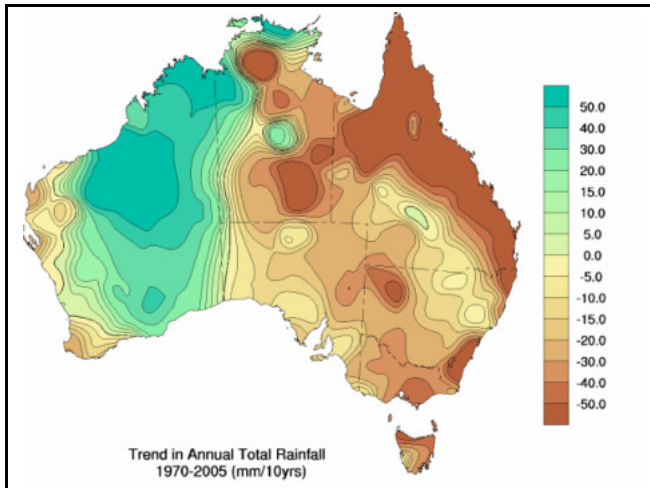
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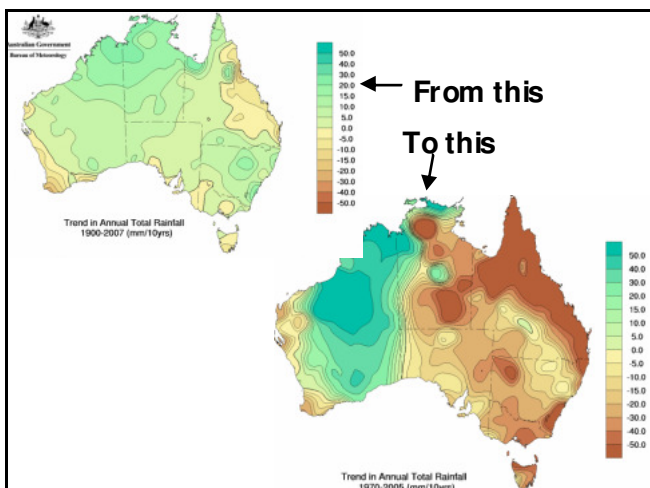
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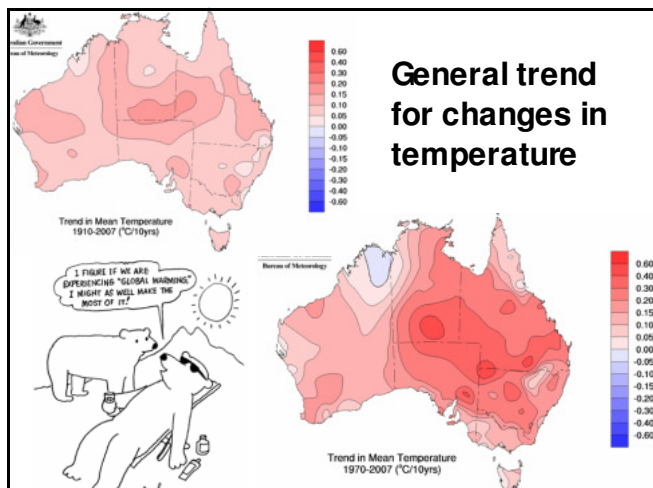
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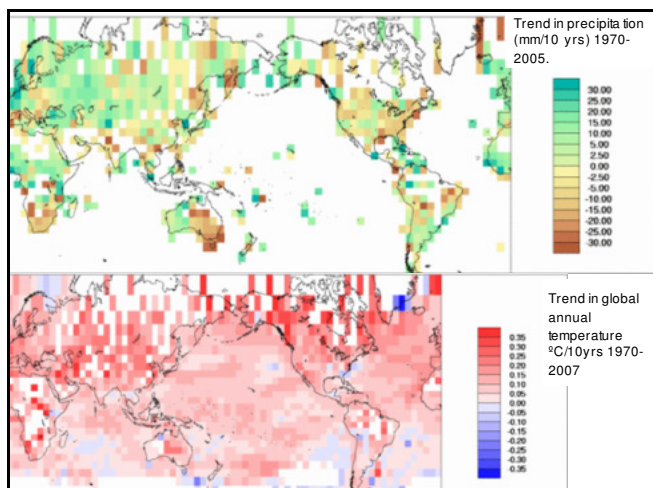
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## Global evidence for climate change

- Global warming of 0.7°C and sea-level rise of 17 cm since 1900
- Past 11 years are amongst the 12 warmest years since 1850
- Increase in extremely high temperatures, decrease in extremely low temps
- More intense rainfall
- More intense cyclones
- Oceans more acidic due to higher carbon dioxide
- Glaciers and arctic ice extent have decreased
- Shift in animal and plant locations and behaviour




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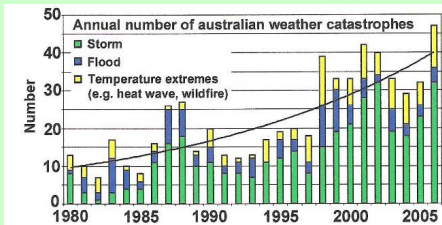
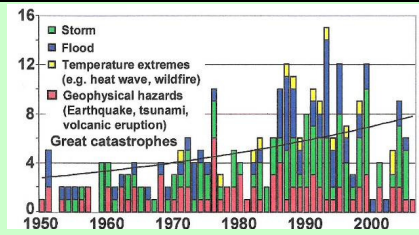
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## Extreme weather events



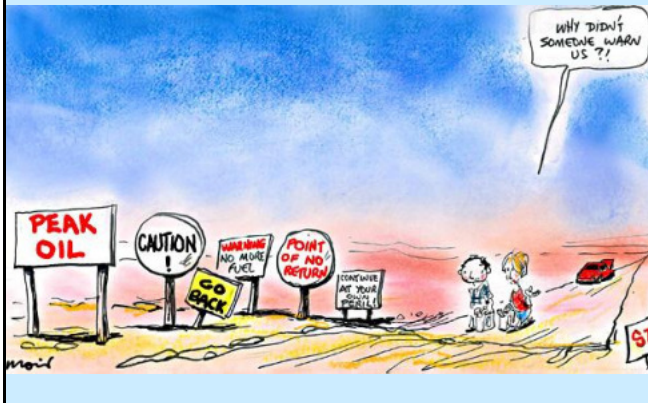
What can we expect for the 21<sup>st</sup> century in Australia?

- ↓ Rainfall
- ↑ Evaporation
- ↓ Run-off
- ↑ Heat waves and fires
- ↑ Flood, drought and storm surges
- ↓ Snow and frost



Best indicators for increasing frequency of weather extremes: storms and temperature extremes.

## Peak Oil




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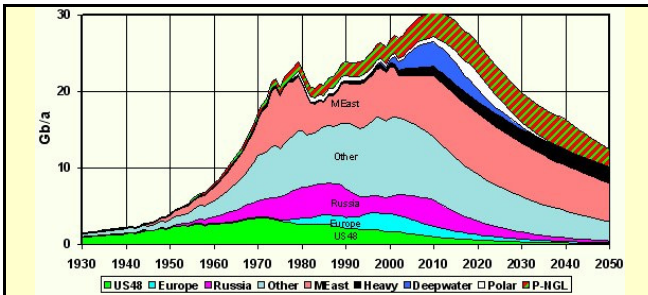
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General consensus that peak oil has already occurred.




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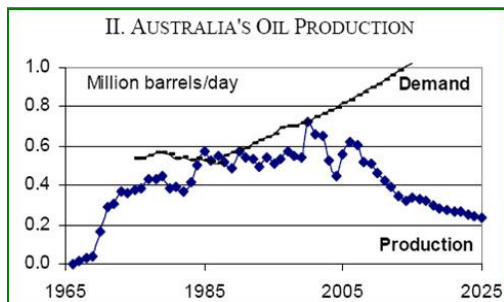
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## Australia's Oil Production and Consumption




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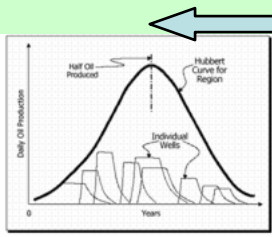
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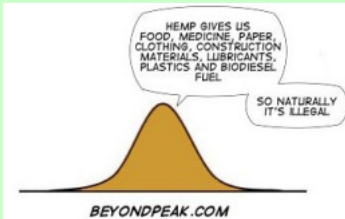
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- Why is Peak Oil one of the biggest challenges ever faced by humanity?
- How dependent on oil are we?



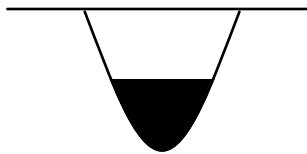
Peak Oil =

- Peak industrialisation
- Peak affluence
- Peak food



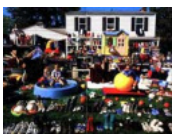
We have used half of the oil reserves

- We will use the other half very quickly



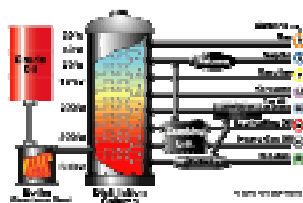
- It will become more difficult to extract and more costly to produce.

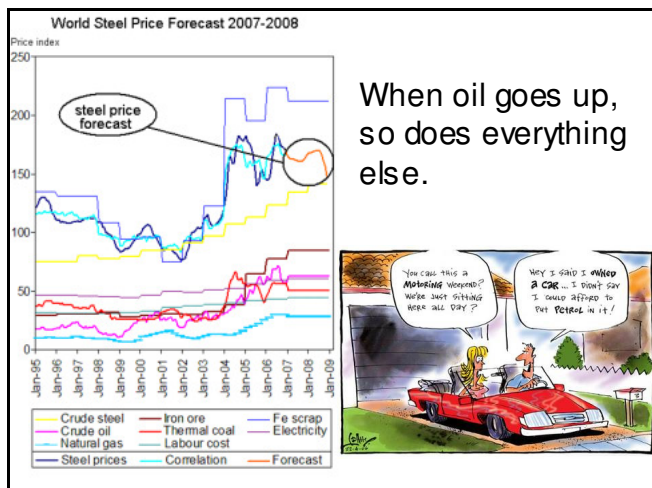
All of these products come from oil



Toothbrushes	Rubber cement	Sun glasses
Heart valves	Putty	Nail polish
Faucet washers	Antihistamines	Folding doors
Ballpoint pens	Drinking cups	Guitar strings
False teeth	Golf bags	LP records
Tool racks	Luggage	Fan belts
Shoe polish	Wire insulation	Shaving cream

(This is only part of a long list)






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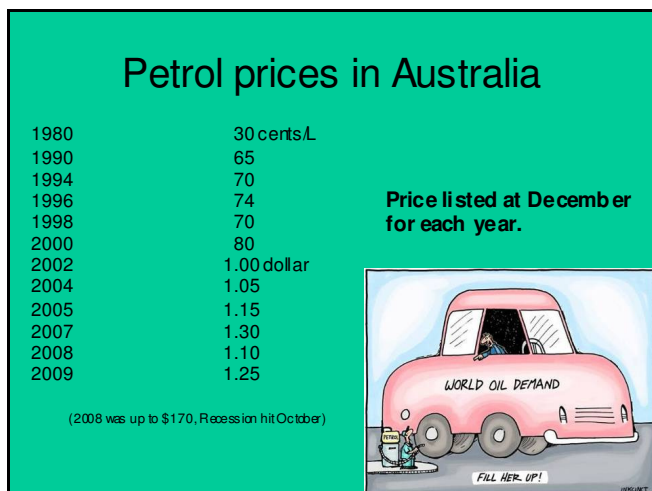
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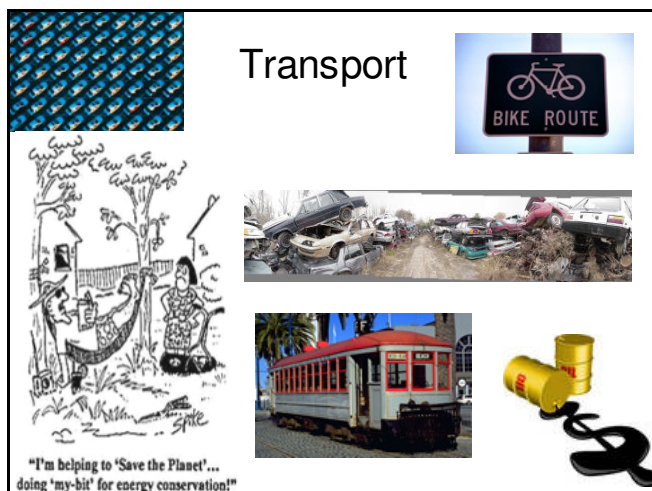
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As the price of food increases so does the number of people growing food.



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## Garden (veggie) tanks



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## Reflection

- Climate Change – we should change
- Peak Oil – we will be forced to change
- Climate change – environment issue
- Peak Oil – resource issue
- Peak Oil can engage people more effectively than Climate Change
- Peak Oil will require a more immediate response from us

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## Food Scarcity – Food Security




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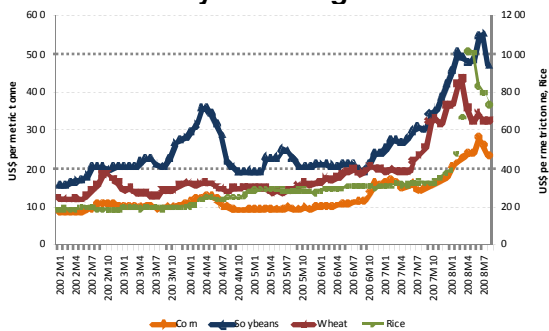
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## Food Commodities Prices, January 2002-August 2008



Source: IMF Primary Commodities Database. Commodity prices refer to: Maize (corn), U.S. No. 2 yellow, FOB Gulf of Mexico, U.S. price, US\$ per metric tonne; Soybeans, U.S. No. 1 yellow, FOB Gulf of Mexico, U.S. price, US\$ per metric tonne; Wheat, U.S. No. 1 hard red winter, FOB Gulf of Mexico, U.S. price, US\$ per metric tonne; Rice, U.S. No. 1 long grain, FOB Gulf of Mexico, U.S. price, US\$ per metric tonne.

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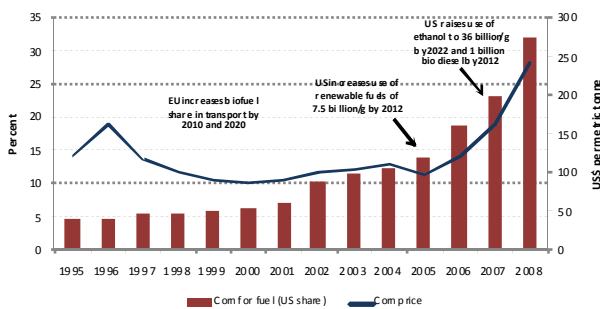
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## Demand of Corn for Fuel in the United States and Evolution of Corn prices, 1995-2008



Source: Author's contribution based on the IMF Primary Commodities Database and USDA Feedgrains Database. Notes: Prices refer to Maize (corn), U.S. No. 2 yellow, FOB Gulf of Mexico, U.S. price (average of daily quotations). Calculations of corn for fuel are for the United States. Corn prices for 2008 are averages from January 2008 to July 2008.

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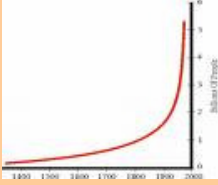

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Can the earth support a rapidly growing population?

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## Why the change?

- Until recently, performance of agriculture viewed as a success
  - Output growth surpassed population growth
  - Price of grains steadily declined
- At the turn of this century, success story was coming to an end
  - Land and water scarcity
  - Slow technical progress
- Since mid-2007 to mid-2008 price rises accelerated while the global economy has been slowing down.

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## Predictions vs. Reality

- Standard forecasting models predicted prices would rise at 0.26 percent a year between 2002-2030
- But prices rose by about 20 percent a year between 2002 and July 2008, or 100 times more than the “business as usual” scenarios

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2010

- China, and other overseas Asian, middle east countries, buying Australian farms, dairies, cattle stations
- There is no government legislation to stop overseas investment/ownership
- Food will be grown in Aus and sent to these countries to keep them alive

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This is happening now!



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This is Australia



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This is what we should all be doing



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Living  
sustainably



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It's our choice



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## Movements worldwide

- Post carbon groups
- Transition towns



- 100 mile food diet.



- Relocalisation network

## Transition Initiative

- Transition Town → Transition Initiative
- Build resilience
  - re-skilling
  - localised food production
  - energy descent planning
  - local currency
  - local medicinal capability

## Transition Initiatives Assumptions

1. Lower energy is inevitable.
2. We are currently unprepared and lack resilience.
3. We have to act collectively and act now.
4. We can creatively and proactively design our energy descent.

## Principles of Transition Model

- 1 Visioning – imagine our future
- 2 Inclusion - everyone included
- 3 Awareness raising - information
- 4 Resilience – to a zero carbon society
- 5 Psychological insights - empowerment
- 6 Credible and appropriate solutions – at a community level

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## 12 Steps of Transition

1. Steering group, and design its demise
2. Raise awareness
3. Lay the foundation
4. Organise an 'unleashing'
5. Form groups
6. Use open space
7. Develop visible and practical projects
8. Facilitate the great re-skilling
9. Build a bridge to local government
10. Honour the elders
11. Let it go where it wants to go
12. Create an energy descent action plan

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## Reflections

- Don't over-react
- Don't turn a blind eye
- Keep yourselves informed
- Do what is reasonable and fair
- Work with local community groups
- Reduce your own emissions
- Plan for an energy descent
- Collaborate

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## The Role of Permaculture

- See solutions not problems
- Focus on opportunities not probabilities
- Give hope, promote positives
- Teach others how to live sustainably
- Grow food

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## Opportunities

- Higher commodity prices will:
  - ❖ Make local products be more competitive than imported ones
  - ❖ Stimulate self-reliance
  - ❖ Greater numbers of people will grow some of their own food
  - ❖ Low input organic farming will compete against intensive land use. Community gardens, city farms, allotments.
- Life skills education – promote energy and water efficiency, food production
- Recycling of wastes, harvesting and reusing water
- Resurgence of community life, ethics and values.

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What will be our priorities? In which direction should we point our journey?

Winston Churchill:

History tells us that we will choose the right path – once we have explored all the wrong ones. It's not enough that we do our best; sometimes we have to do what's required.

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## What do we need to do?

- Climate change, peak oil and food availability have emerged as the greatest challenges of this century, and we must treat these as crucial issues.
- We must commit to reduce their own carbon footprint and:
  - ❖ follow a low carbon strategy
  - ❖ work towards a lower energy future.
- Sustainability is crucial for our survival.
- Future regulation and compliance is uncertain – don't wait! It makes good sense to act now.

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## Our Challenge

Design a ten steps program to reduce your dependency on oil.

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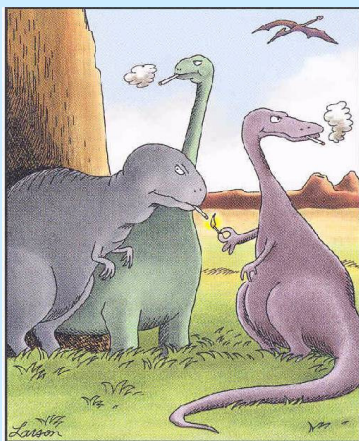
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## The end



The real reason dinosaurs became extinct

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