

# Post Carbon Pathways

## Towards a just and sustainable post carbon future

Fourth Researchers Meeting, International Network for Low Carbon Societies Oxford, September 18 2012

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# Post Carbon Pathways

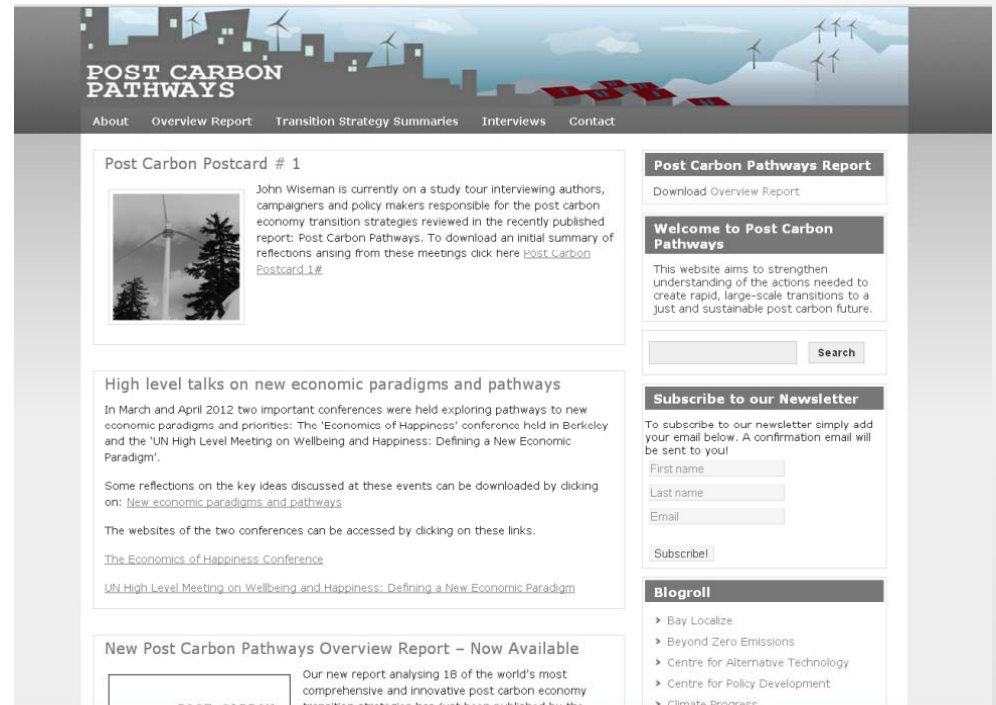
## Towards a just and sustainable post carbon future

‘A world in which we are no longer dependent on hydrocarbon fuels and no longer emitting climate-changing levels of carbon into the atmosphere’

Post Carbon Institute [www.postcarbon.org](http://www.postcarbon.org)

**Aims:** To strengthen understanding of:

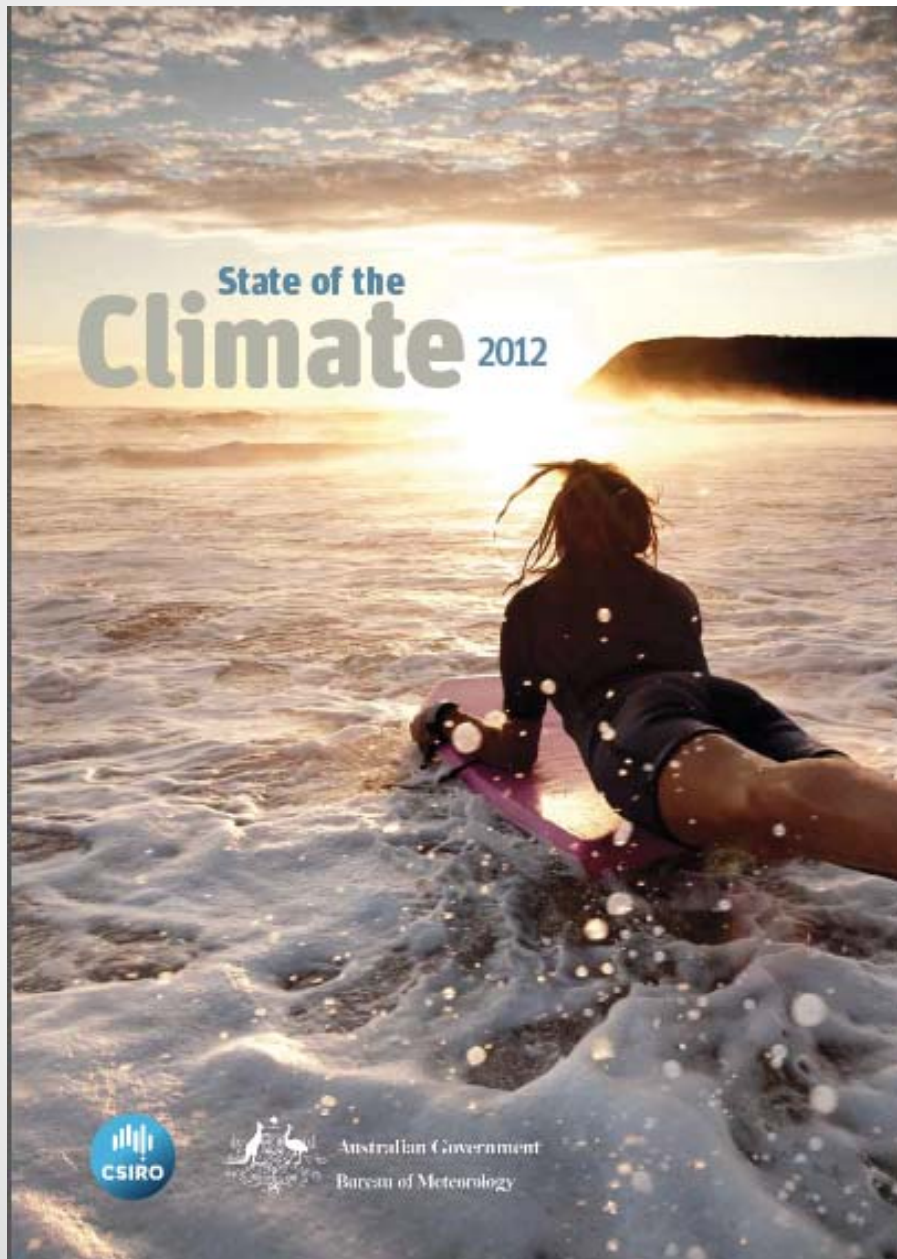
- the most promising and innovative large scale post carbon economy transition strategies
- the most effective ways of overcoming barriers to the rapid implementation of post carbon economy transition strategies.



The screenshot shows the homepage of the Post Carbon Pathways website. The header features the title 'POST CARBON PATHWAYS' and a navigation menu with links for 'About', 'Overview Report', 'Transition Strategy Summaries', 'Interviews', and 'Contact'. The main content area includes a 'Post Carbon Postcard # 1' section with a photo of a wind turbine and text about a study tour. Below this is a section titled 'High level talks on new economic paradigms and pathways' with text about conferences in March and April 2012. A 'New Post Carbon Pathways Overview Report - Now Available' section is also visible. On the right side, there are sections for 'Post Carbon Pathways Report' (with a 'Download Overview Report' link), 'Welcome to Post Carbon Pathways' (with a mission statement), a search bar, a 'Subscribe to our Newsletter' form, and a 'Blogroll' with links to various organizations like Bay Localize, Beyond Zero Emissions, etc.

[www.postcarbonpathways.net.au](http://www.postcarbonpathways.net.au)

## Initial focus: Australian audience of activists and policy makers



- Informed by need to win argument that urgent action to prevent runaway climate change is **possible** as well as **necessary**
- Focus on policy options and implementation obstacles rather than modeling emissions pathways.

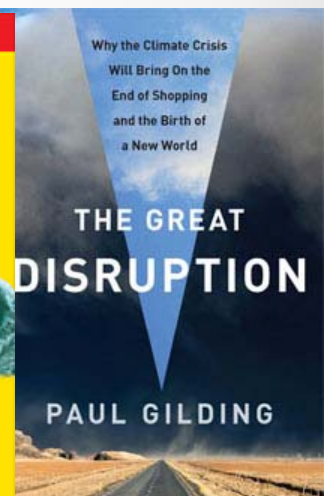
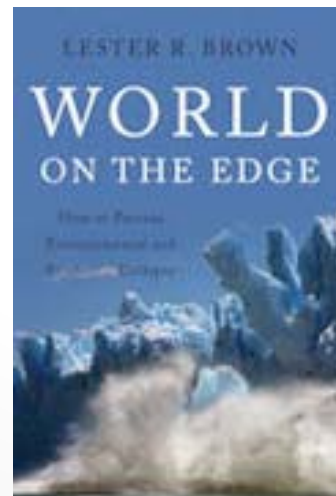
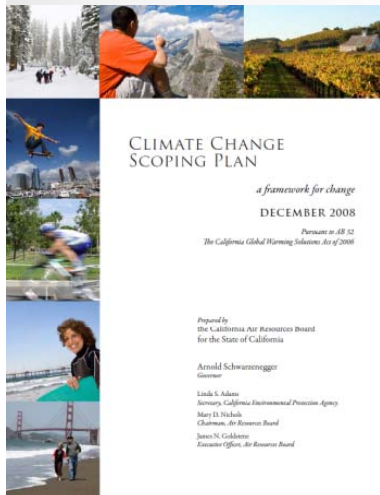


- **Report 1:** Overview of 18 most promising large-scale transition strategies
- [www.postcarbonpathways.net.au](http://www.postcarbonpathways.net.au)
- Interviews with post carbon transition lead authors
- **Report 2:** Overcoming obstacles to rapid implementation of post carbon economy transition strategies.

# Post Carbon Pathways report 1

## Focus and scope

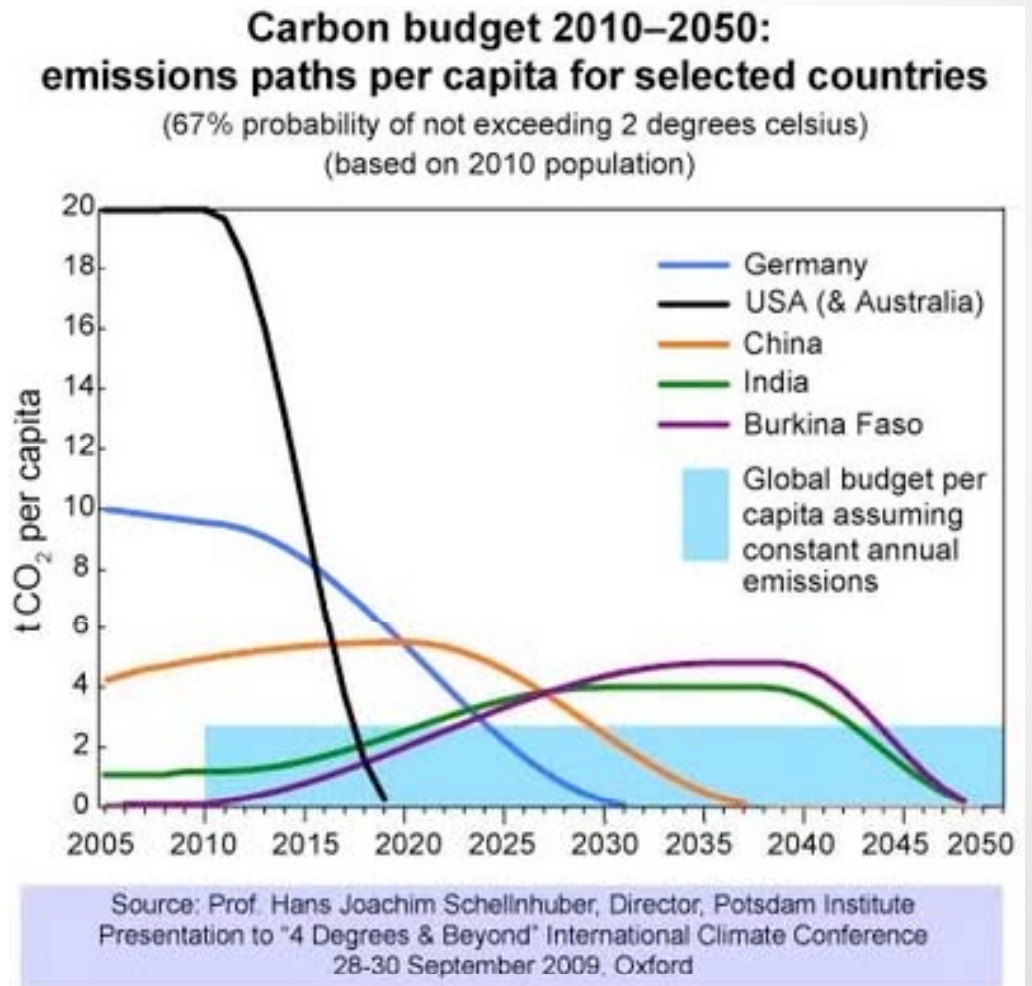
- National and global scale
- Government and non government
- Scale and speed aligned with action needed to prevent runaway climate change
- Potential to be rapidly accelerated and scaled up



# 'Emission pathways consistent with a 2°C global temperature limit'

Rogelj, J., W. Hare, J. Lowe, D. P. van Vuuren, K. Riahi, B. Matthews, T. Hanaoka, K. Jiang and M. Meinshausen (Nature Climate Change, 1, Oct 2011).

'We find that in the set of scenarios with a 'likely' (greater than 66%) chance of staying below 2 °C, **emissions peak between 2010 and 2020** and fall to a median level of 44 Gt of CO<sub>2</sub> equivalent in 2020.'



# Post carbon economy transition plans Government

***A Roadmap for Moving to a Competitive Low Carbon Economy in 2050*** – European Commission

***The Carbon Plan*** – United Kingdom Government

***National Strategy for Green Growth*** – South Korean Government

***Twelfth Five Year Plan*** – Government of China

***National Action Plan on Climate Change and Low Carbon Strategies for Inclusive Growth*** – Government of India

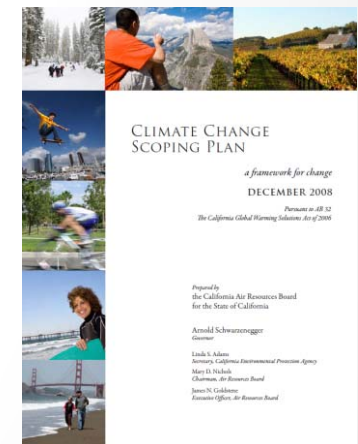
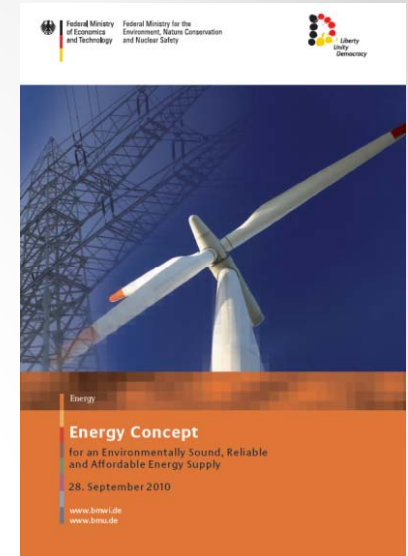
***Securing a Clean Energy Future*** – Australian Government

***Energy Concept for an Environmentally Sound, Reliable and Affordable Energy Supply*** – German Government

***Our Future Energy*** – Danish Government

***Climate Change Scoping Plan and California's Clean Energy Future*** – Government of California

The Carbon Plan:  
Delivering our  
low carbon future



# Post carbon economy transition plans

## Non-government

***World in Transition*** – German Advisory Council on Global Change

***World on the Edge*** – Lester R. Brown, Earth Policy Institute

***Our Choice*** – Al Gore

***One Degree War Plan*** – Paul Gilding and Jorgen Randers

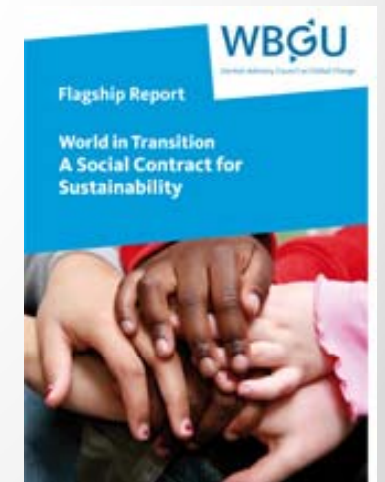
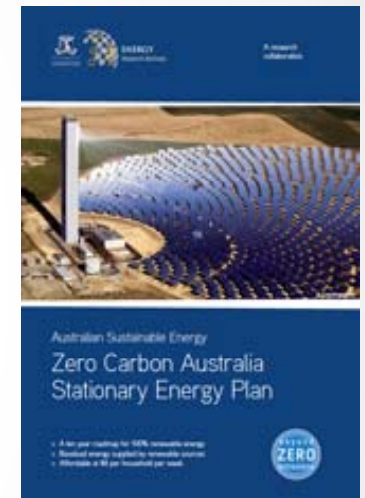
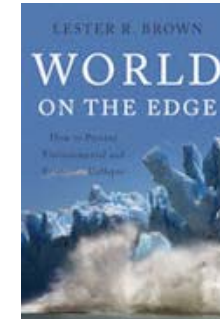
***Powering a Green Planet*** – Mark Z. Jacobson and Mark A. Delucchi

***The Energy Report*** – WWF International

***Zero Carbon Britain 2030*** – Centre for Alternative Technology

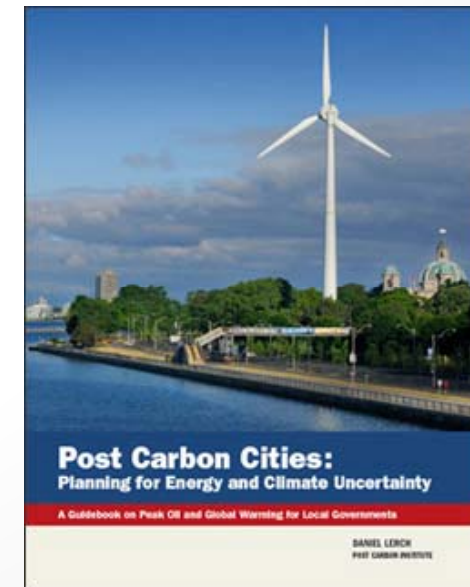
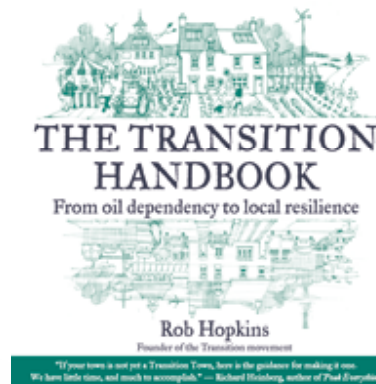
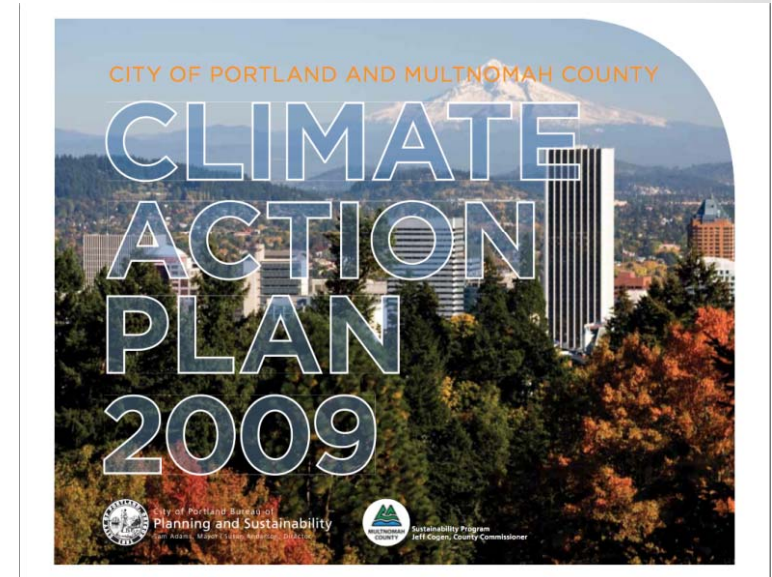
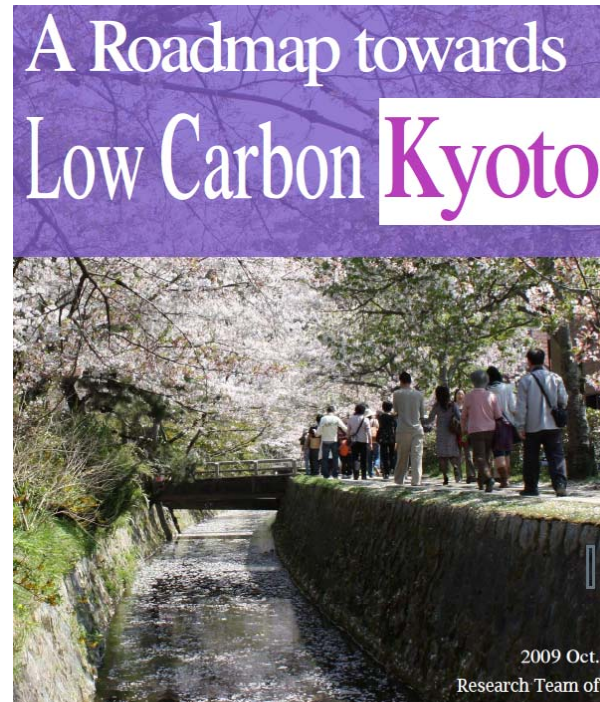
***Low Carbon Growth Plan for Australia*** – ClimateWorks Australia

***Zero Carbon Australia 2020 Stationary Energy Plan*** – Beyond Zero Emissions and the Melbourne Energy Institute

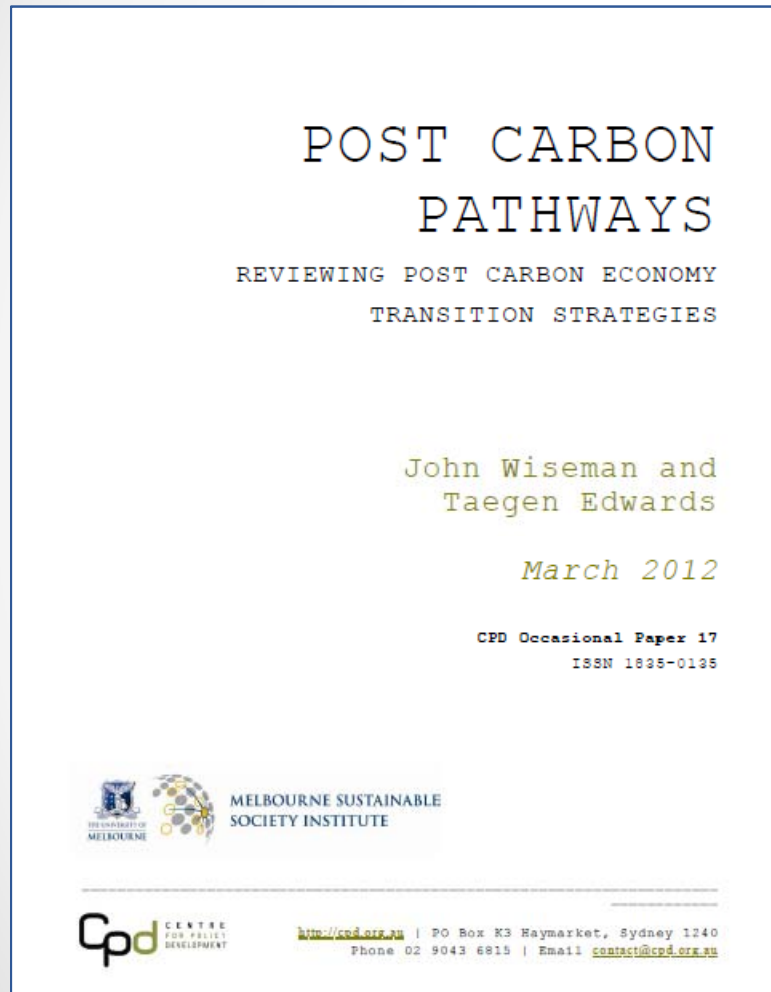




# Local, regional and city level transition strategies are also crucial...



# Learning from large-scale post carbon economy transition plans...



## Questions...

- What assumptions does the strategy make about GHG emissions and energy demand and supply trends and targets?
- What are the key technological, economic, social justice and governance assumptions and priorities?
- What view does the strategy take about the actions needed to achieve this transition? What is the ‘theory of change?’

Strategy or plan (continued)	Energy and emissions targets	Energy supply assumptions and priorities	Significant questioning of current economic paradigm	Approximate cost of transition policies
<b>European Commission: Roadmap 2050</b>	Reduce EU GHG emissions by 20% by 2020 and 80–95% by 2050 (on 1990 levels)	Renewables; CCS; nuclear	No	Approx. €270 billion p.a. over 40 years (approx 1.5% of EU GDP p.a. above 2009 investment levels). Savings between €175–320 billion p.a. (not incl. saving on social costs)
<b>UK: Carbon Plan</b>	Reduce UK GHG emissions by 34% by 2020 and 80% by 2050 (on 1990 levels)	Fossil fuel (shift to gas); nuclear; CCS; renewables	No	Total net present cost over lifetime of policies in past carbon budget periods approx £9 billion. Average cost approx 0.4% of UK GDP p.a. in period 2008–22 and 0.6% of UK GDP per year over 2023–27
<b>South Korea: Green Growth Strategy</b>	Reduce Korean GHG emissions by 30% below projected 2020 levels (equivalent to 4% reduction on 2005 levels)	Fossil fuels; nuclear; renewables	No	Total investment announced as part of Five-Year Plan (2009–13) US\$83.6 billion
<b>China: 12th Five-Year Plan &amp; Climate Change White Paper</b>	Reduce Chinese CO <sub>2</sub> emissions per unit of GDP by 40–45% by 2020 (on 2005 levels)	Fossil fuels (incl. unconventional oil and gas); CCS; nuclear; renewables	No	Total investment (both public and private) in 'new energy' of approx RMB 5 trillion (US\$760 billion) over next 10 years
<b>India: National Action Plan &amp; Low Carbon Growth Report</b>	Reduce India's emissions intensity of GDP by 20–25% by 2020 (on 2005 levels)	Fossil fuels; possibly CCS; nuclear; renewables	No	Does not include detailed costings
<b>Australia: Clean Energy Future</b>	Reduce Australian GHG emissions by 5% by 2020 and 80% by 2050 (on 2000 levels)	Fossil fuels; CCS; renewables	No	Carbon price and related measures to raise approx AUD\$25.5 billion in the period 2011–15. Further \$3.9 billion public funds to augment
<b>Germany: Energy Concept</b>	Reduce German GHG emissions by 40% by 2020 and at least 80% by 2050 (on 1990 levels)	Renewables; possibly CCS; phase-out nuclear	No	Additional investment €20 billion p.a., offset by energy cost savings
<b>Denmark: Our Future Energy</b>	100% renewable energy in all Danish energy supply by 2050	100% renewables	No	Cost to 2020 approx DKK 5.6 billion (US\$952 million). Immediate net costs of < 0.25% GDP in 2020. Average additional costs to Danish households approx DKK 1,700 (US\$289) in 2020
<b>California: Scoping Plan &amp; Clean Energy Future Plan</b>	Reduce GHG emissions to 1990 levels by 2020 and 80% of 1990 levels by 2050; 33% of electricity from renewable energy by 2020	Fossil fuels; possibly CCS; renewables	No	Ongoing costs approx US\$ 36 million p.a. Benefits by 2020 (compared to BAU) inc. increases in economic production of US\$33 billion and overall gross state product of US\$7 billion

Table 3: Post carbon economy transition strategies: Summary of key features

Strategy or plan	Energy and emissions targets	Energy supply assumptions and priorities	Significant questioning of current economic paradigm	Approximate cost of transition policies
World in Transition	Decarbonise global energy system by 2050	Renewables; no nuclear; possibly CCS	Yes	Additional net investment US\$200 and \$1000 billion p.a. by 2030
World on the Edge	Cut global CO <sub>2</sub> emissions by 80% by 2020 (on 2006 levels)	Renewables; no nuclear or CCS	Yes	Net cost US \$200 billion p.a.
Our Choice	Rapid reduction to 350ppm atmospheric CO <sub>2</sub> concentration	Renewables, nuclear, CCS all considered	Yes	Does not include detailed costings
One Degree War Plan	Cut global GHG emissions to zero over 15 years; negative emissions for rest of century	Renewables. Low possibility of nuclear and CCS	Yes	Carbon tax expected to generate US\$2,500 billion p.a. by year 5 to spend on transition
Powering a Green Planet	Switch global energy system to 100% renewable energy (wind, water, solar) by 2030	100% renewables: wind, water and solar sources only	No	Ballpark figure of US \$100 trillion over 20 years in gross investment to construct global renewable energy systems. BAU will cost approx US\$10 trillion (not inc. mounting social costs)
The Energy Report	Peak and decline global GHG emissions within five years, reduce by 80% by 2050 (on 1990 levels); 100% renewable energy by 2050	Renewables; no nuclear or CCS; 5% fossil fuels	No	Total cost of achieving targets approx €1 trillion p.a. Investment expected to have paid itself off by around 2040 at latest
Zero Carbon Britain 2030	Reduce net UK GHG emissions to zero by 2030	Renewables; no CCS; no <i>new</i> nuclear	Yes	Ballpark figure of £50 billion p.a. required for initial investment program
Climate Works Low Carbon Growth Plan for Australia	Reduce Australian GHG emissions by 25% by 2020	Fossil fuels; CCS; renewables	No	AU\$1.8 billion per year. Strong emphasis on net savings to business.
Zero Carbon Australia Stationary Energy Plan	Reduce net Australian GHG emissions to zero by 2020; 100% of stationary energy from renewables by 2020	100% renewables	No	AU\$37 billion p.a. for ten-year period, or approx 3% of Australian GDP. Net present costs over longer time period (2010–40) roughly equiv to BAU (not inc. transport savings)

## ...and from from recent interviews with post carbon economy policy makers and advocates...

- John Schellnhuber, *Potsdam Institute*
- Ottmar Eidenhoffer, *Potsdam Institute, Co-chair IPCC Gp. 3*
- Lester Brown, *Earth Policy Institute*
- Kevin Curtis, *Climate Reality Project*
- Amory Lovins, *Rocky Mountain Institute*
- Roy Neel, *Chief of staff, Al Gore*
- Jenny Clad, *Climate Project*
- Jean-Phillipe Denruyter, *WWF*
- Mark Jacobsen, *Stanford, Powering a Green Planet*
- Mark Delucchi, *UC Davis, Powering a Green Planet*
- James Goldstene, *California Air Resource Board*
- Ian Dunlop, *Safe Climate Australia*
- Mark Ogge, *Zero Carbon Australia*
- Paul Gilding, *The Great Disruption*
- Anna Skarbek, *ClimateWorks Australia*

- 1. While important debates continue about targets and trajectories...pathways to emissions reductions needed to prevent runaway climate change remain (just) open.**

**The gateway is however rapidly closing...and the gap between climate science and 'realpolitik' continues to grow.**

## 2. Post carbon economy road maps are reasonably clear...

### **Renewable energy replaces fossil fuels**

- Game changing renewables investment
  - Carbon price; Feed in tariffs
  - Infrastructure and skills
- Closing fossil fuel industries
  - Ending subsidies; Regulation
  - Structural adjustment funding to close mines and power stations/support workers and communities

### **Demand for energy reduced**

- Energy efficiency...buildings, industry, transport...
- Reducing aggregate demand for energy and resources

### **Draw down and sequester carbon**

- Land use, forestry, agriculture

**But, in a post COP 15, post Kyoto world, where binding global agreements are less likely...**

Increased importance of...

- National, regional, city and local strategies, leadership – and context
- Partnerships, alliances and networks...

The image shows the cover of a report titled "Transition towards Low Carbon Societies in a Changing World: Science and Policy for Low Carbon Society Development Pathways". The cover is blue with a red graphic element resembling a stylized 'S' or a path. The text is white and yellow. At the top right is the LCS-RNet logo. The main title is in large, bold, white letters. Below it is the subtitle "Science and Policy for Low Carbon Society Development Pathways". Further down, it says "Synthesis Report of LCS-RNet Third Annual Meeting" and "International Research Network for Low Carbon Societies". The dates "13-14 October 2011" and location "Paris, France" are listed. The host is identified as "The French Ministry of Ecology, Sustainable Development, Transport and Housing (MEDDTL), France" and "The International Research Center on Environment and Development (CIRED)". It also mentions cooperation with "The French Environment and Energy Management Agency (ADEME)". At the bottom, there is a row of logos for various organizations including MEDDTL, CIRED, IDDRI, IGES, NIES, and ENEC.

**ACHIEVING  
A LOW CARBON  
SOCIETY**

LCS-RNet

**Transition towards Low Carbon  
Societies in a Changing World:  
Science and Policy for Low Carbon  
Society Development Pathways**

**Synthesis Report of LCS-RNet  
Third Annual Meeting**  
-International Research Network for  
Low Carbon Societies-

**13-14 October 2011  
Paris, France**

**Host**  
**The French Ministry of Ecology, Sustainable Development,  
Transport and Housing (MEDDTL), France**  
**The International Research Center on Environment and  
Development (CIRED)**

**In Cooperation with**  
**The French Environment and Energy Management Agency  
(ADEME)**



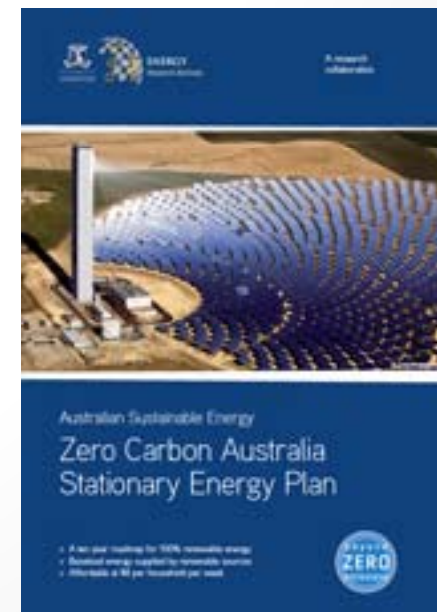
### 3. Technology is not the major barrier...

‘Meeting 100% of global energy demand from renewable sources by 2050 is technically...and economically feasible. The main problems are political and social.’

**Mark Jacobsen, Stanford University**

‘There are no technical barriers to this deployment. Implementing the proposed infrastructure in ten years is well within the capability of Australia’s existing industrial capacity.’

**Mark Ogge, Zero Carbon Australia 2020**



# But plenty of tough questions remain...

- Demand and supply mix?
- Centralised/decentralised?
- Baseload/variable?
- Rebound impacts?
- Gas? CCS? Nuclear?

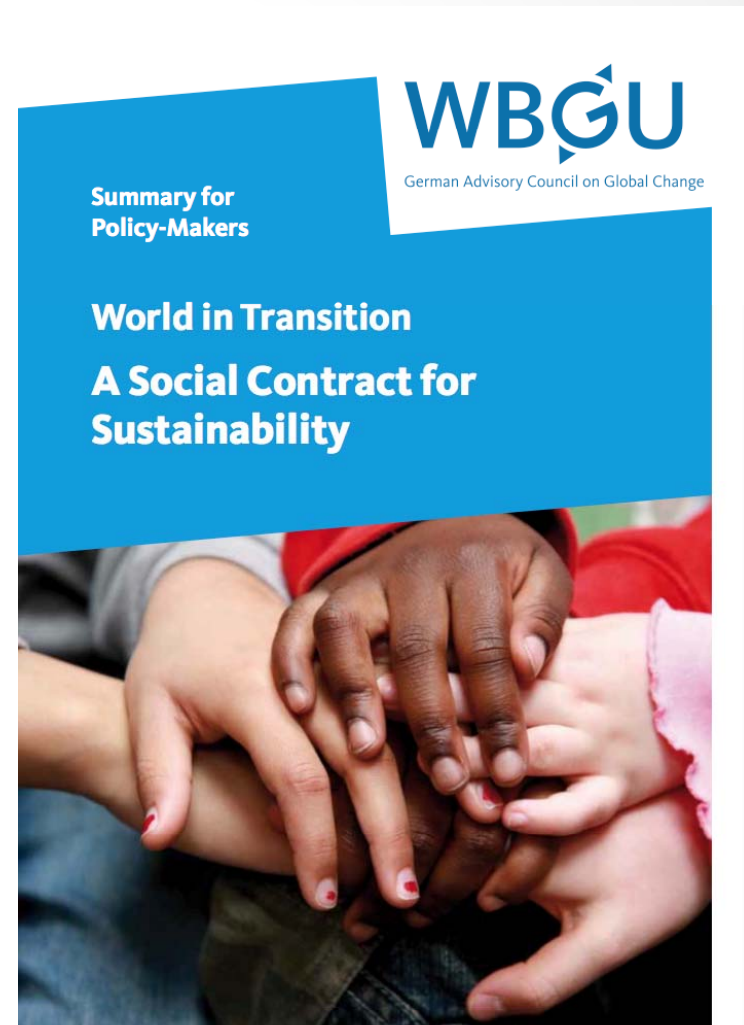


## 4. Economic barriers are not insurmountable

‘Globally, the additional investment required for transformation into a low carbon society, compared with the cost of ‘just carrying on as we are’ ... lies somewhere in the region of **\$200 to \$1,000 billion per year by 2030.**

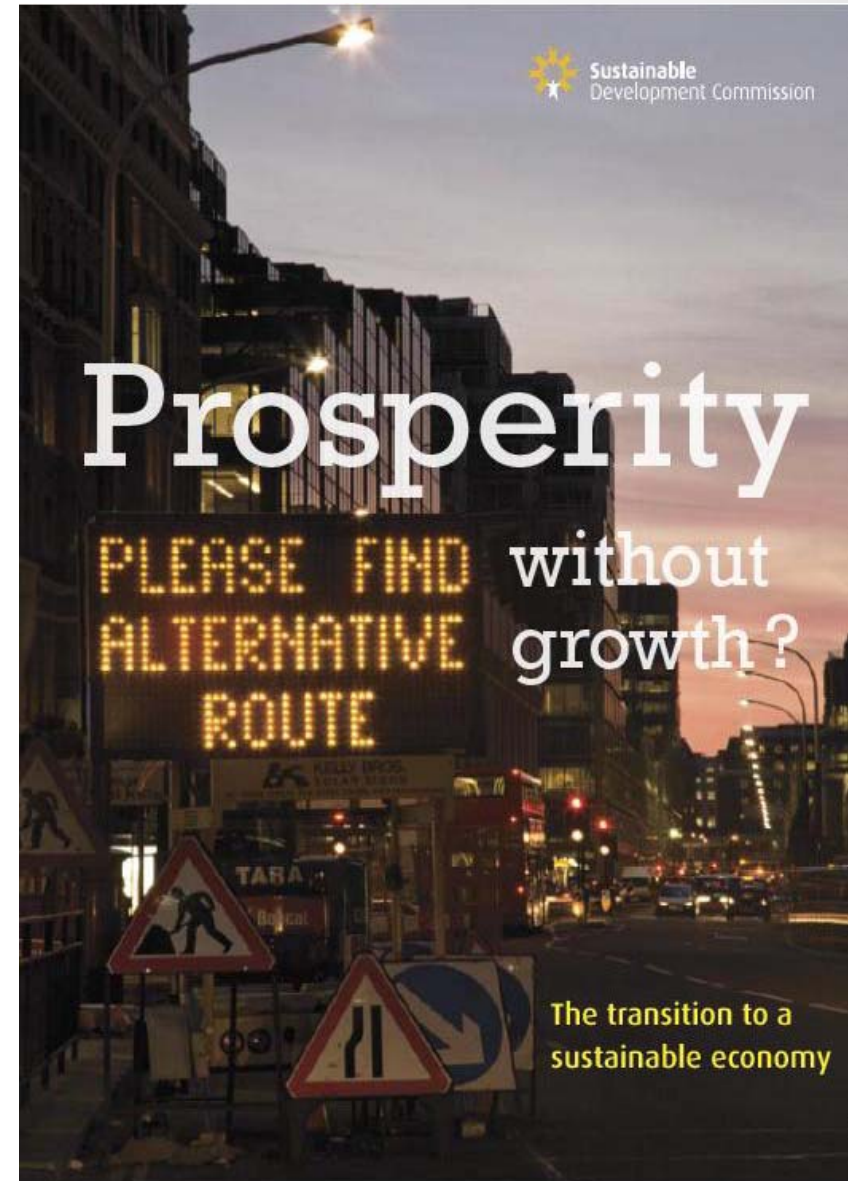
These investments will be offset by later savings of a similar size, and the avoidance of the immense costs of dangerous climate change.’

**German Advisory Council on Global Change**



NB. Cost of US 2011 Wall St. bail out: \$700 billion

**Importance of reducing aggregate demand - in developed economies - and of rethinking definition and measurement of economic progress and growth.**



**...and of equitable distribution of post carbon economy transition burdens and opportunities**



**5. The biggest barriers to rapid transition to a post carbon economy are social and political...**



## Political and social obstacles...

- Complexity of climate science communication
- Denial campaigns
- Path dependencies and lock ins: cars, coal, consumption...
- Competing economic and social crises and challenges: GFC, Euro crisis, poverty and inequality...
- Lack of global agreements – post COP 15, Kyoto and Rio+20
- Lack of systems, policy and project implementation skills
  
- **Power and influence of vested interests**
- **Lack of political leadership and mobilisation**
- **Lack of inspiring visions and narratives of transformational change**

# Biggest barriers to solving the climate crisis?

'We give a lot of credit to Fox News in the States for poisoning the political debate on this issue. Not only Fox but a lot of other right wing talking heads were perfectly comfortable fabricating information about climate change. I mean pulling it out of thin air, or finding some discredited third rate college teacher in Alabama to say this is not real, and then touting that as the scientific evidence.

We weren't surprised that the corporate opposition would open up the bank and that there would be individuals who were not only out of the oil and gas, or coal industry, but who were ideologically to the right of Attila the Hun...

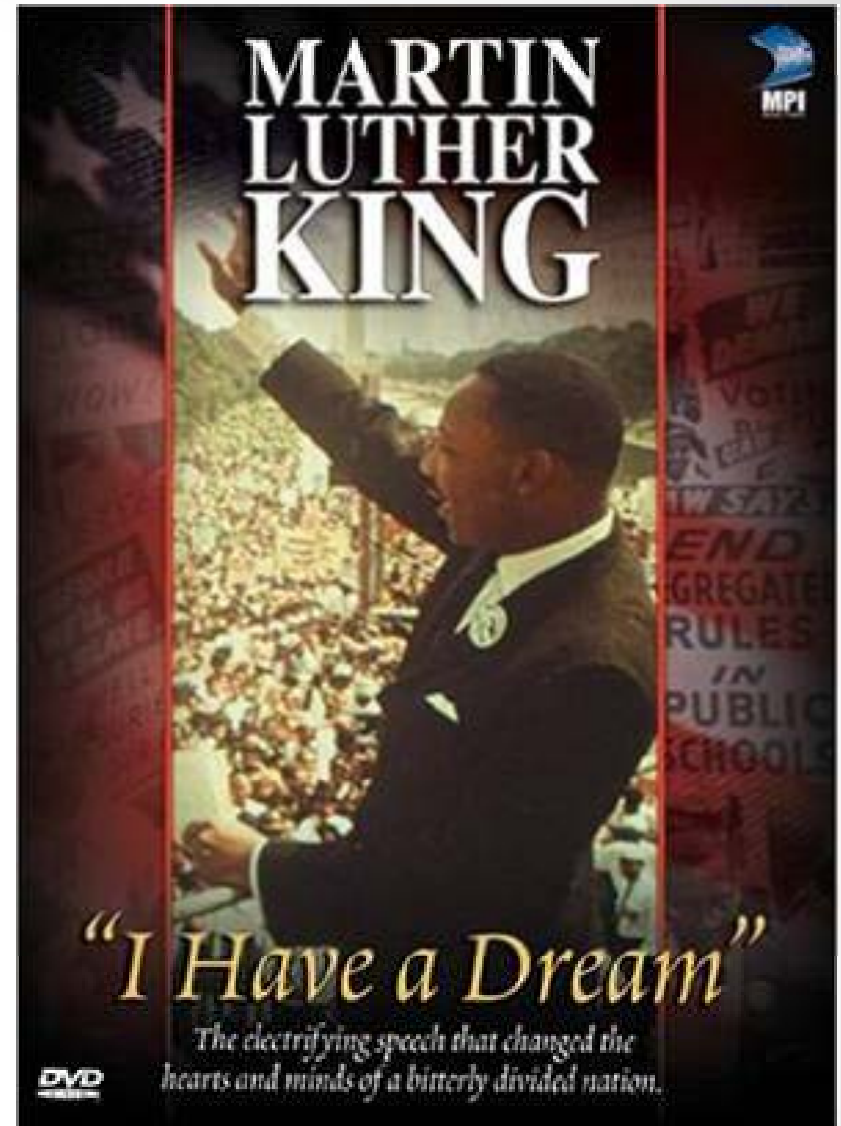
We knew this would happen. But we didn't anticipate the degree it would happen. No one knows exactly how much money was spent but it was least 5 to 10 times as much as the pro climate action, environmental NGOs and others would be able to expend.

It surprised me how little backbone right-minded legislators had in that debate. People that knew damn well this was a moderate, modest action, but they weren't going to do it because it would cause them a little grief.'

● **Roy Neel, Chief of staff to Al Gore** ●



## Leadership and mobilisation...



...Inspiring and compelling narratives of the possibility and desirability of transformational change...

# **Narratives of transformational change: Visions, scenarios and backcasting...**

**Imagine it is 2030...**

Imagine we now live in a world in which the transition to a just and sustainable post carbon society has occurred so there is now real hope that runaway climate change will be avoided.

**How did this happen?**



‘We have two moments coming. One is the climate changing - the melting of the North Pole sea ice...

Then there's a magical point in markets where they all suddenly tip. They're looking for "Where's the opportunity for growth and discovery and opportunity?" There's a point coming in energy like that. China ramps up its response and the US starts to panic...

Once the money is saying, "Hello - we can do this!" then the policy will take off. Then that will become self-fulfilling - the collapse of the coal and oil industry...’

**Paul Gilding, ‘The Great Disruption’**

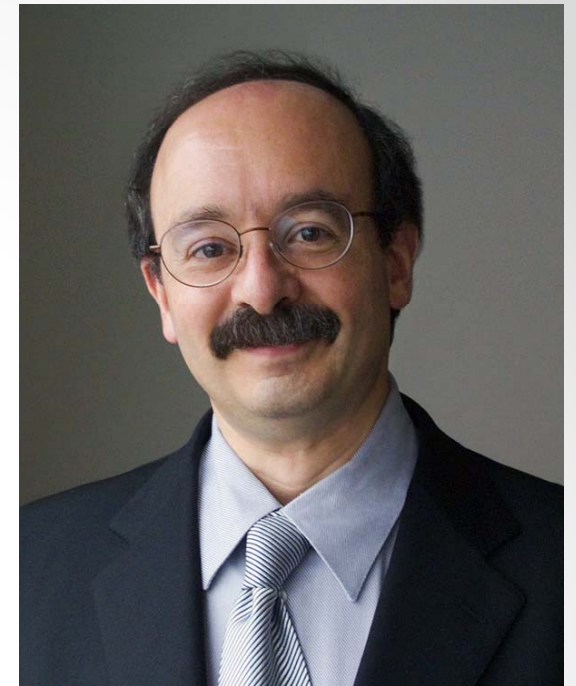


As we look back on this now from 2050, one wonders what all the fuss was about. We used to think that catastrophic climate change was a big problem because we supposed that it had to be solved by difficult treaties between national governments.

But that assumed - quite wrongly - that the solutions would be costly and painful rather than attractive and profitable, for the simple reason - now so blindingly obvious in hindsight - that it was so much cheaper to save the fuel than to buy it in the first place, let alone burn it.

So as the economic logic gradually overcame the dogma that it must not have been cost-effective to save energy or we'd have done it already, we really unleashed the dynamism of individual choice and corporate and social innovation - and that turned out to be much more powerful and faster than the public policy.

**Amory Lovins, CEO Rocky Mountains Institute**



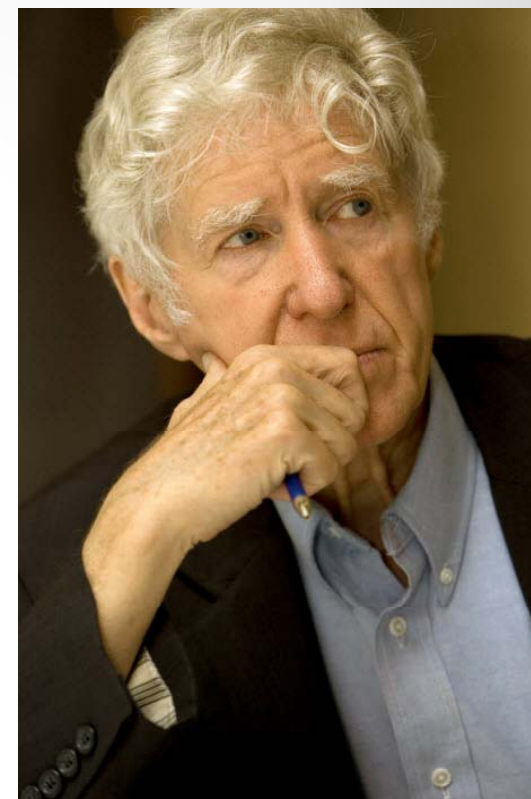
'Who saw the Berlin Wall coming down until it actually went down?

Or I look at the Arab Spring of 2010 and it changed the government in almost every country in a large part of the Arab world. These weren't random events. They'd reached a kind of tipping point suddenly. Things began to change.

Partly it's political. Part of it is demographic. Part of it is technological.

A lot of young people in the 15 to 30 age group. They have the internet now so they can organise, they can exchange information. It changes the whole ballgame. It really fundamentally changes things.'

**Lester Brown, Earth Policy Institute**



How do we close the gap between...

... the physical requirements needed to prevent runaway climate change...

... and political support for rapid implementation of the actions needed to achieve emissions reductions at the required speed and scale?



# Post Carbon Pathways: Next steps

Overcoming barriers to rapid implementation of post carbon economy transition strategies

Local, city and regional transition strategies.

**POST CARBON PATHWAYS**  
About Overview Report Transition Strategy Summaries Interviews Contact

**Post Carbon Postcard # 1**  
John Wiseman is currently on a study tour interviewing authors, campaigners and policy makers responsible for the post carbon economy transition strategies reviewed in the recently published report: Post Carbon Pathways. To download an initial summary of reflections arising from these meetings click here [Post Carbon Postcard 1.g](#)

**High level talks on new economic paradigms and pathways**  
In March and April 2012 two important conferences were held exploring pathways to new economic paradigms and priorities: The 'Economics of Happiness' conference held in Berkeley and the 'UN High Level Meeting on Wellbeing and Happiness: Defining a New Economic Paradigm'.

Some reflections on the key ideas discussed at these events can be downloaded by clicking on: [New economic paradigms and pathways](#)

The websites of the two conferences can be accessed by clicking on these links.  
[The Economics of Happiness Conference](#)  
[UN High Level Meeting on Wellbeing and Happiness: Defining a New Economic Paradigm](#)

**New Post Carbon Pathways Overview Report - Now Available**  
Our new report analysing 18 of the world's most comprehensive and innovative post carbon economy transition strategies has just been published by the

**Post Carbon Pathways Report**  
Download Overview Report

**Welcome to Post Carbon Pathways**  
This website aims to strengthen understanding of the actions needed to create rapid, large-scale transitions to a just and sustainable post carbon future.

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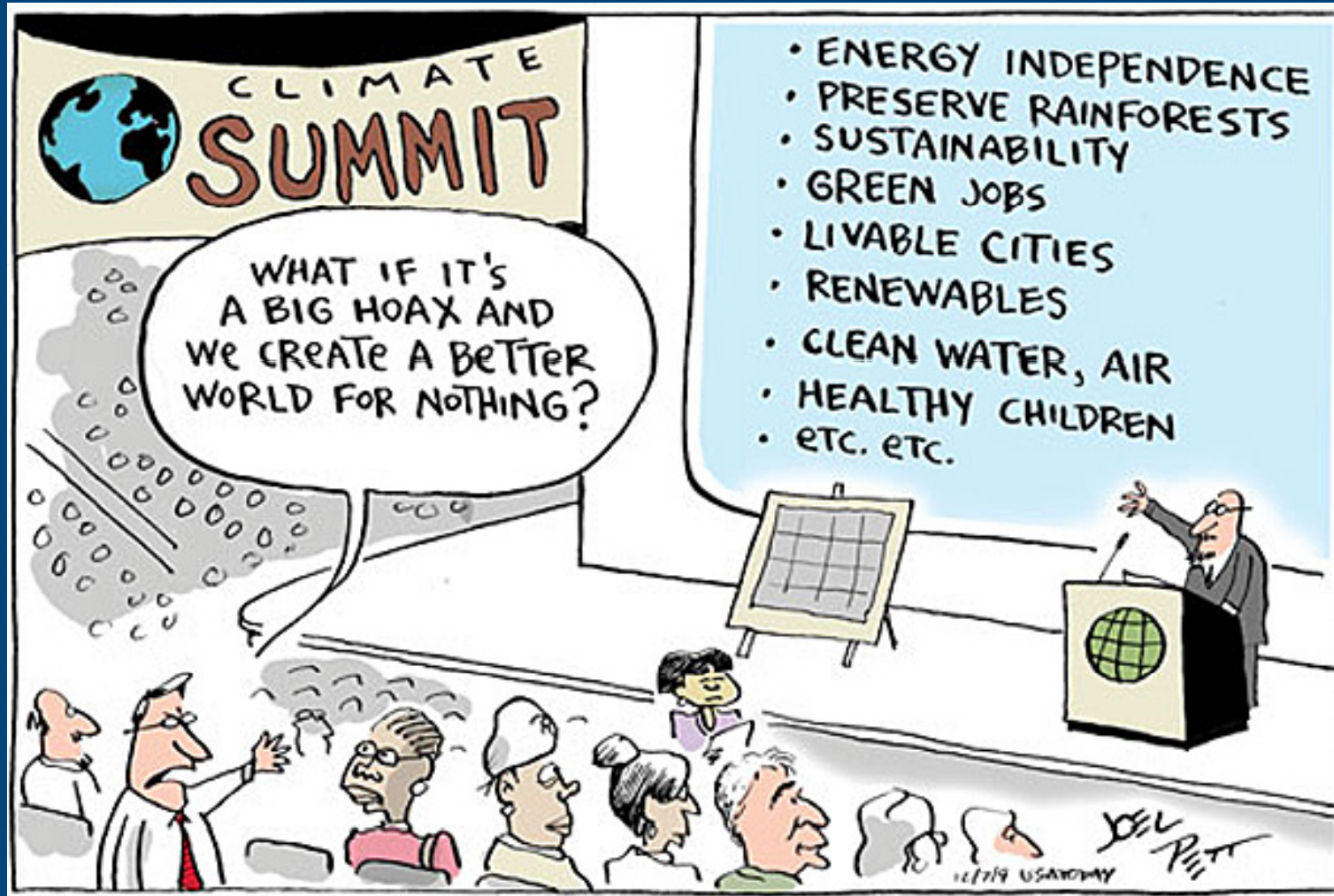
- > Bay Localize
- > Beyond Zero Emissions
- > Centre for Alternative Technology
- > Centre for Policy Development
- > Climate Progress

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radical ideas  
an urgent task

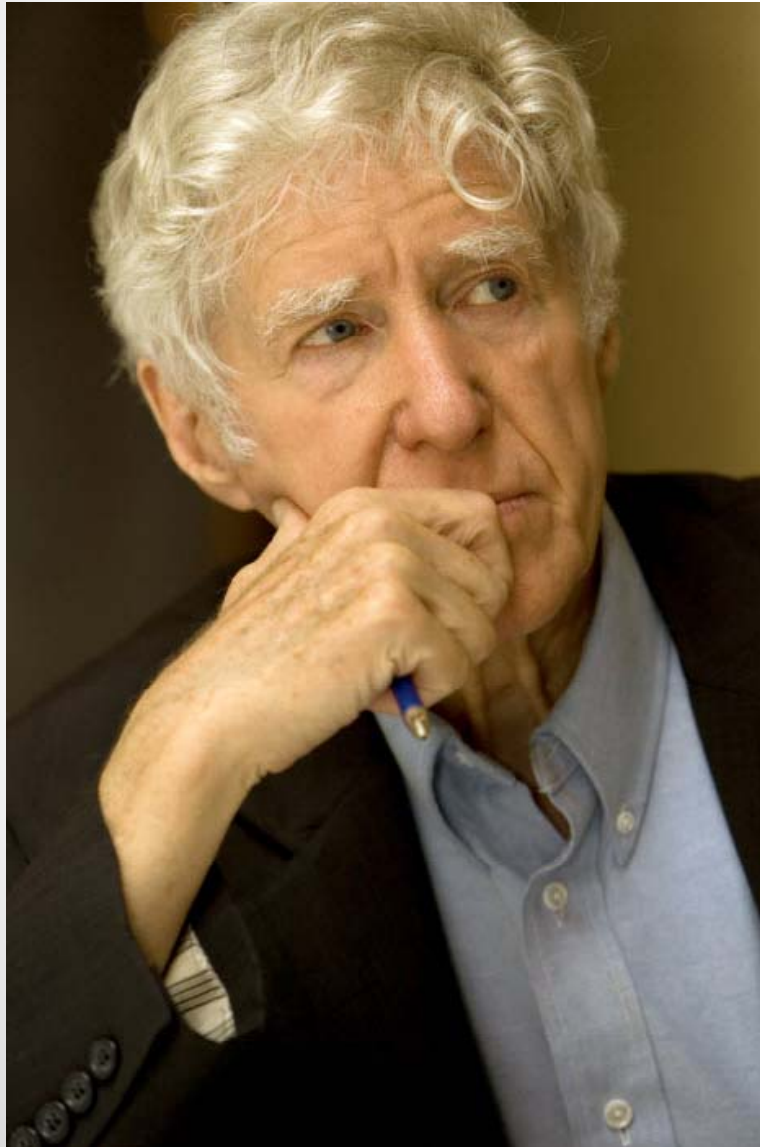
<http://www.ecoinnovationlab.com/>

# Thank you





# Biggest barriers to solving the climate crisis?



‘It would be the vested interests of big oil and big coal and the influence they have....

They put a lot of money in political campaigns and now there are no limits on what they can put in so they’re just buying everything in sight.’

**Lester Brown, Earth Policy Institute**

