

PECC Victoria Seminar

Energy transition: Making the most out of available resources

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New economic models for a smooth energy transition

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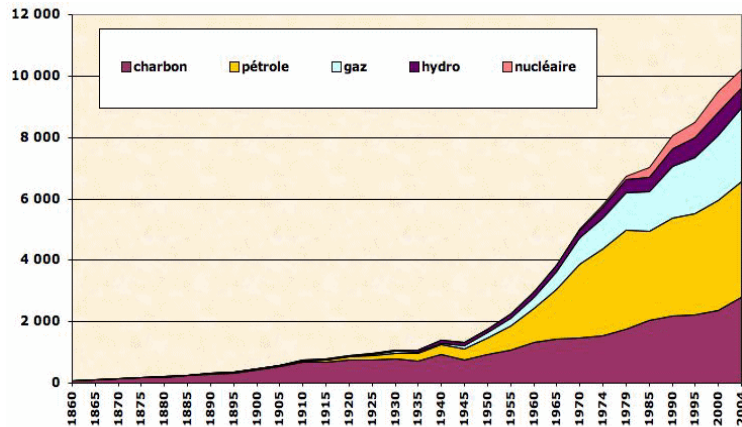


A new energy transition is necessary

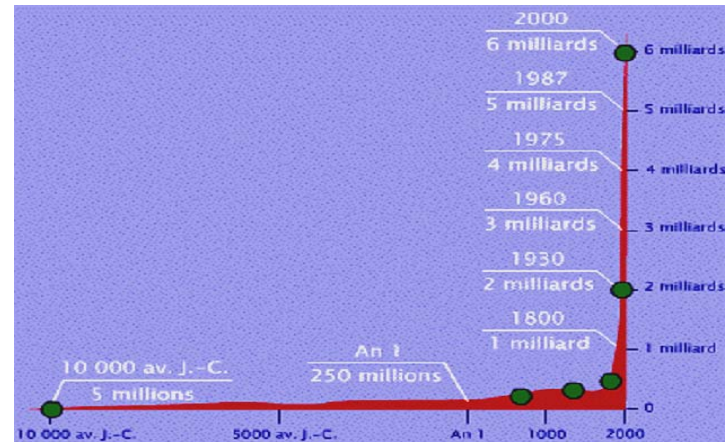
- While the first and second industrial revolutions , largely based on the exploitation of coal and oil, opened a century and a half of global growth, a new energy transition is necessary .
- Today, two billion people left behind by the growth model , do not have access to energy.
- Moreover, this model still consumes more energy in conditions less sustainable. Energy resources to meet this consumption, which are 80 % of fossil fuels (oil, gas , coal) are both finite , unevenly distributed , tendentially increasingly expensive and a leading cause of global warming.

Non sustainable trajectories for energy and environment

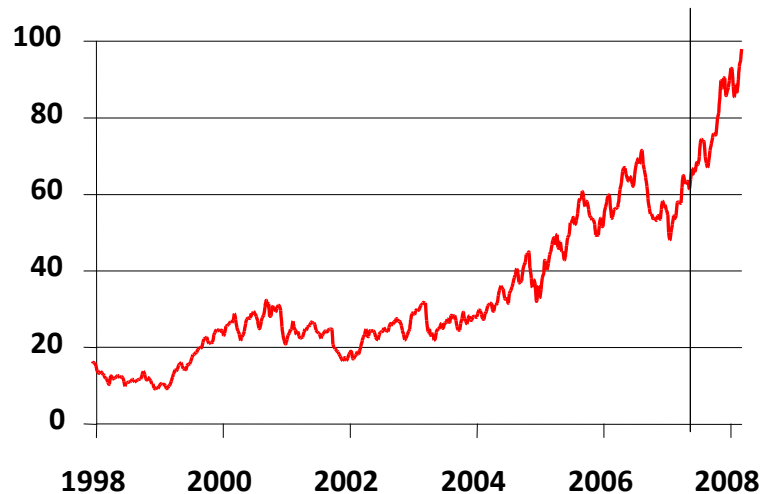
World energy consumption (Mtoe)



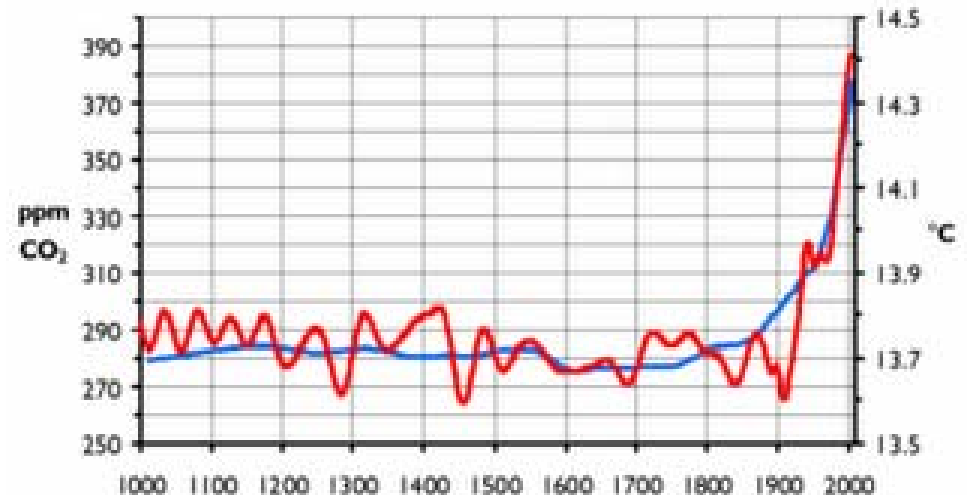
World population (billions inhabitants)



Oil price (US \$/bl)



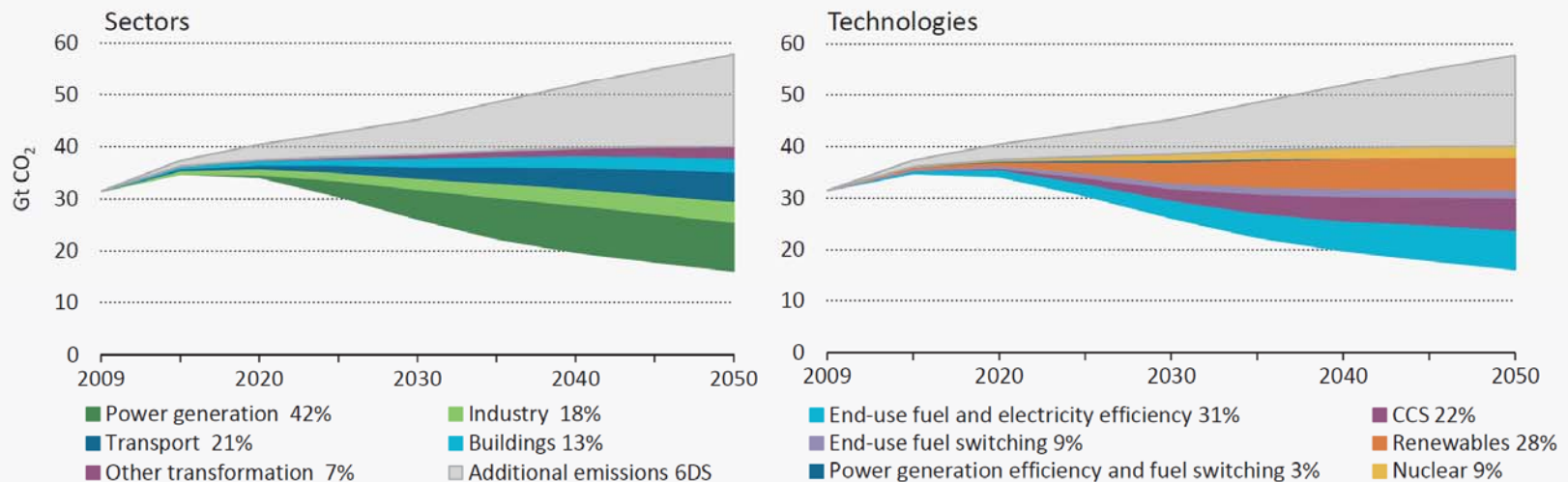
CO₂ concentration in atmosphere (ppm)



What is the energy for to-morrow?

Figure 1.9

Contributions to emissions reductions in the 2DS



Note: Percentage numbers represent cumulative contributions to emissions reductions relative to the 4DS.

Key point

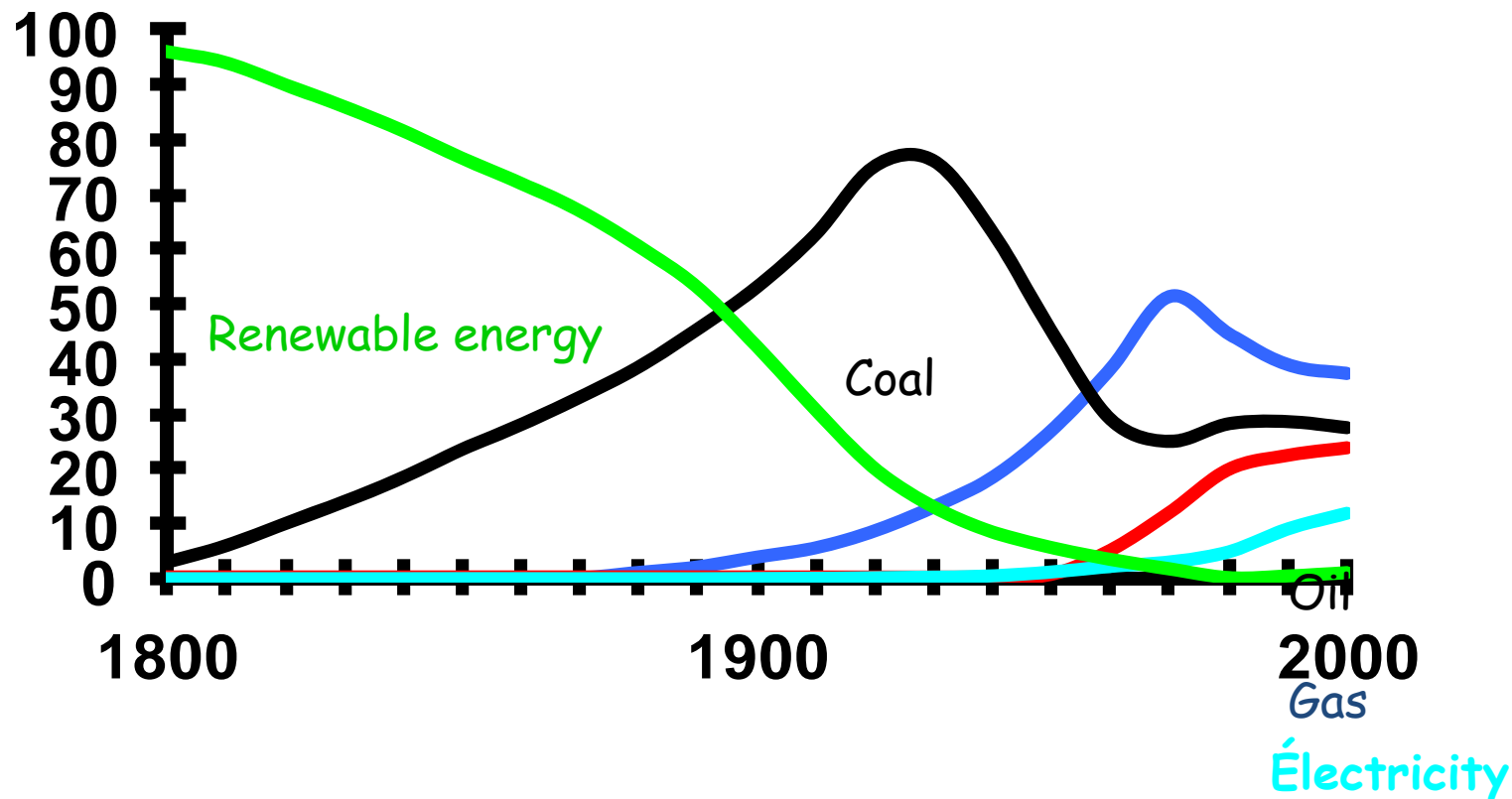
Achieving the 2DS will require contributions from all sectors, and application of a portfolio of technologies.

Renewable energy has dominated the history of humanity

19th century wood, water, wind, animal traction, slaves

19th century coal, steam

20th century oil, gas, hydro, nuclear



Can we go back to renewable energy?

And have power when you need it and not when it is available

An unsustainable growth

- The issue of growing energy consumption on our Planet Earth (Population growth, soaring consumption)
- A tremendous growth from 1900 to now?
- and to 2100 ? And after ?
- How to take into account the costs associated with classical growth economic policies ?
- (e.g., global climate disruption, widespread habitat loss and species extinctions, consumption of natural resources, pollution, urban congestion, intensifying competition for remaining resources, and increasing disparity between the wealthy and the poor.

The limits to growth debate

- The issue of growing energy consumption on our Planet Earth (Population growth, soaring consumption),
- A tremendous growth from 1900 to now?
- and to 2100 ? And after ?
- How to define Uneconomic growth ? Ecologic growth ? Good vs Bad Growth

Room to manoeuvre or trapped Transition?

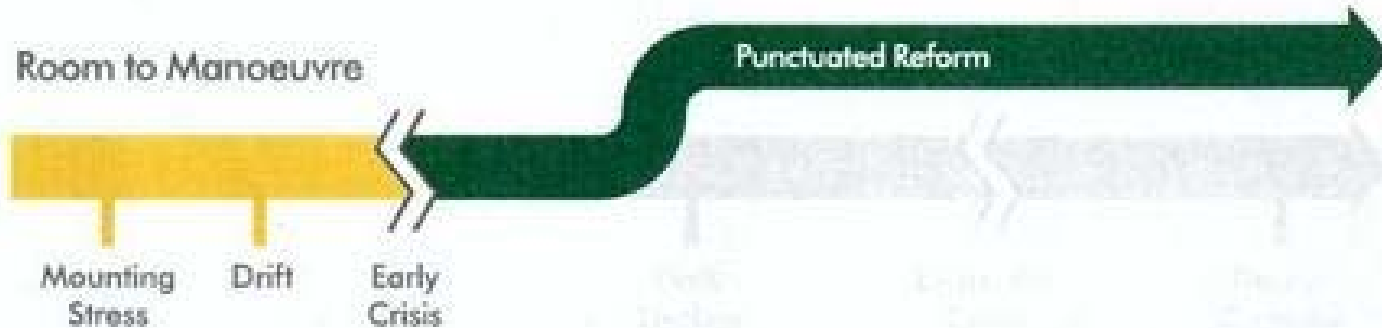
(Shell new lens scenarios 2013)

Encourage early action

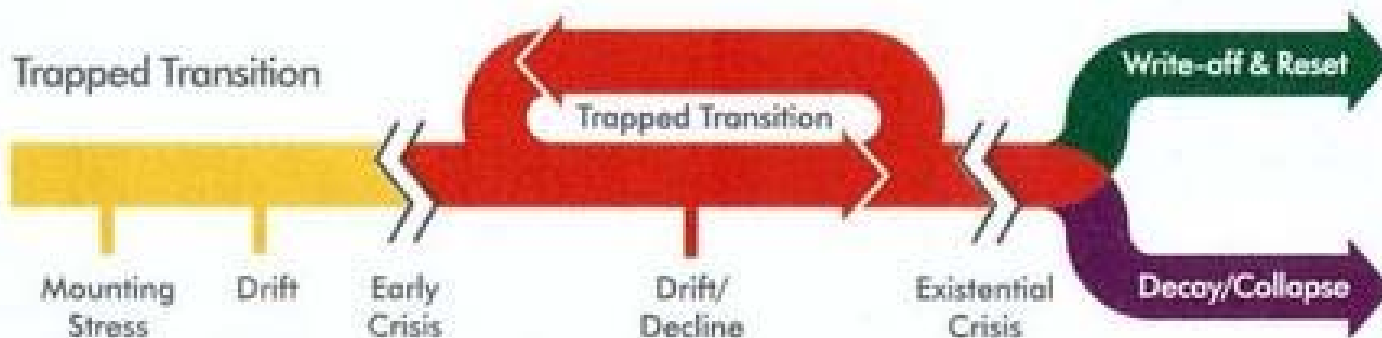
Delaying change, causing conditions to worsen,
and ultimately a reset is forced, or a collapse occurs

THE PATHWAY LENSES

Room to Manoeuvre



Trapped Transition



Zero growth ? and Steady State economy? Or degrowth ?

- **Zero growth ? and Steady State economy?**
- Some critics of zero growth claim that it does not go far enough, and that degrowth and fundamental changes to our economic system are needed to attain sustainability.
- **Degrowth ?**
- The Club of Rome, the Meadows report.
- **Post Growth ?**

The Steady state economics model

- Herman Daly combined limits-to-growth arguments, theories of welfare economics, ecological principles, and the philosophy of sustainable development into a model he called **steady state economics**.
- *“An economy with constant stocks of people and artifacts, maintained at some desired, sufficient levels by low rates of maintenance “throughput”, that is, **by the lowest feasible flows of matter and energy from the first stage of production to the last stage of consumption**” .”*

The circular Economy model?

- *Moving away from the linear model, the linear “Take, Make, Dispose” industrial process*
- **The circular economy framework;** the circular approach is a framework that takes insights from living systems
- **Industrial ecology** The vision “**Cradle to Cradle**” (in contrast with “**Cradle to Grave**”)
- ***Biomimicry*** (a living model of adaptive civilization)

The coming spaceship earth economy

less production and consumption

- Kenneth Boulding used the spaceship as a metaphor for the planet in his prominent essay, *The Economics of the Coming Spaceship Earth*. He proposed a shift from **the cowboy economy to the spaceman economy**.
- *In the cowboy economy*, success is gauged by the quantity and speed of production and consumption.
- *In the spaceman economy*, by contrast, "what we are primarily concerned with is stock maintenance, and any technological change which results in the maintenance of a given total stock with a lessened throughput (that is, less production and consumption) is clearly a gain."

Towards a Sharing Economy?

- A new model; possible with new information technology; and needing new regulation.
- **Towards a sharing economy**
 - *“We are all in the same boat”*
 - *Limited resources that we will have to share worldwide*
 - *No collective efforts without equity (the example of the carbon tax)*
 - *No responsible ownership without solidarity*
 - *The case of climate negotiations*
- **Buddhist Economics** :
 - E.F. Schumacher’s 1973 book *Small is beautiful*

“Power Down” Richard Heinberg : (2004)

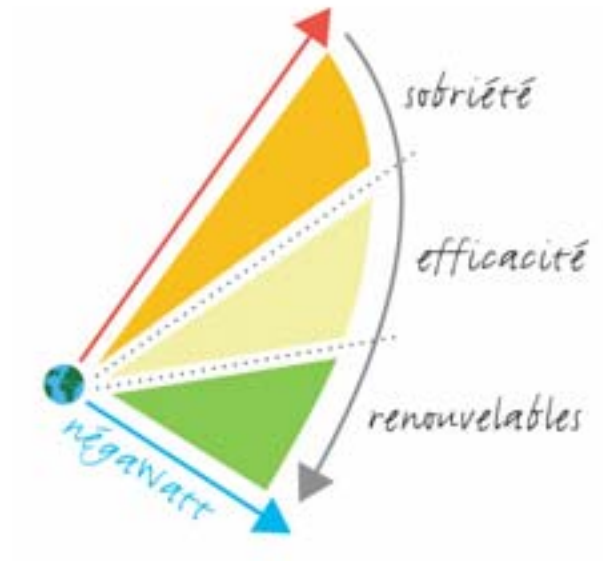
Options and Actions for a Post-Carbon World

- Our industrialized society is dependent on cheap and readily available fossil fuel oil and gas. The post peak oil period of global history is likely to be characterized by social and economic turmoil, disruption of trade, declining standard of living , and warfare... Heinberg outlines **four possible strategies** nations could employ :
- **Denial** : Waiting, and hoping that some unforeseen element will solve the problem
- **Last One Standing**: Global competition for remaining resources
- **Building Lifeboats**: Preparing local areas to be sustainable in the event that the global economic project collapses
- **Powerdown**: Global cooperation in reducing energy usage, conservation, resource management, and reducing population

Economics models and new Indicators

- **No longer GDP the only indicator** Different approaches must be confronted, scientific and technologic, sociologic, politics, governance,
-
- **The concept of well being**
- **New statistics and indicators for social progress.**
- **The Stiglitz Commission** Measuring prosperity and quality of life
- Composite indicators : **aggregation is loss of information.**
- *This aspect is illustrated in the Stiglitz report by the analogy of a car with a single meter aggregating in a single value the speed of the vehicle and the remaining level of petrol. Such a meter would be of no use to drivers as "both pieces of information are critical and need to be displayed in distinct, clearly visible areas of the dashboard".*

The negawatt scheme



Sobriety

Efficiency

Renewables

(In this order, sobriety first)

What would a sustainable economy look like?

- **Principles of Circular Economy, Functional economy, and Sharing economy,**
 - *Conserve scarce resources, especially energy,*
 - *Promote the use of renewable resources*
 - *Enter human activity in the self-sustaining cyclical process (repair, maintenance, recycling short loop)*
 - *Focus on trade with nearby communities*
 - *Create mutually beneficial interdependence (symbiosis)*
 - *Make resilient organizations*
 - *Focus development on information processes*

Is « a Smart growth » possible ?

- Economic growth is generally positive in itself, even though it naturally increases pressure on resources
- We must develop a new model,
- consuming less energy and less resources,
- in conditions really sustainable.

The French National Debate on energy transition

« Imagine together our energy future »

- **Report of Working Group 4** _What are the costs, which benefits and which funding for energy transition?
- Several **Recommendations** :
- Consider the reduction of the needs as an essential key to the economic success of the energy transition

Difficulty of reaching a consensus

Two non-consensual proposals :

- Maintain existing assets to identify sources of funding for the energy transition (nuclear plants)
- Use the exploitation of shale gas as a way to fund the energy transition

A vision for Energy transition

- Tomorrow , living better, we will preserve the resources of the planet for future generations
- The energy transition is a field of economic , social and democratic creativity. The emergence of local production of energy will enable new modes of production and shared and collaborative consumption to grow throughout living areas . Our companies will offer mobility , comfort , information , services, and not strictly material goods , with the real needs of users at the heart of their strategy.

A vision for Energy transition

- Thanks to new information and communication technology and the development of smart grids and storage solutions , we will combine more effectively , including at the local level , the uses and the means of production.
- In transport , households will be no longer dependent on the private car , as alternatives will have been developed, with car sharing and new public transport. Individual car itself , when necessary, will consume less than two liters per one hundred kilometers .