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**DOES THE FOREST-BASED
INDUSTRY HAVE A FUTURE?
HOW WILL IT LOOK?**

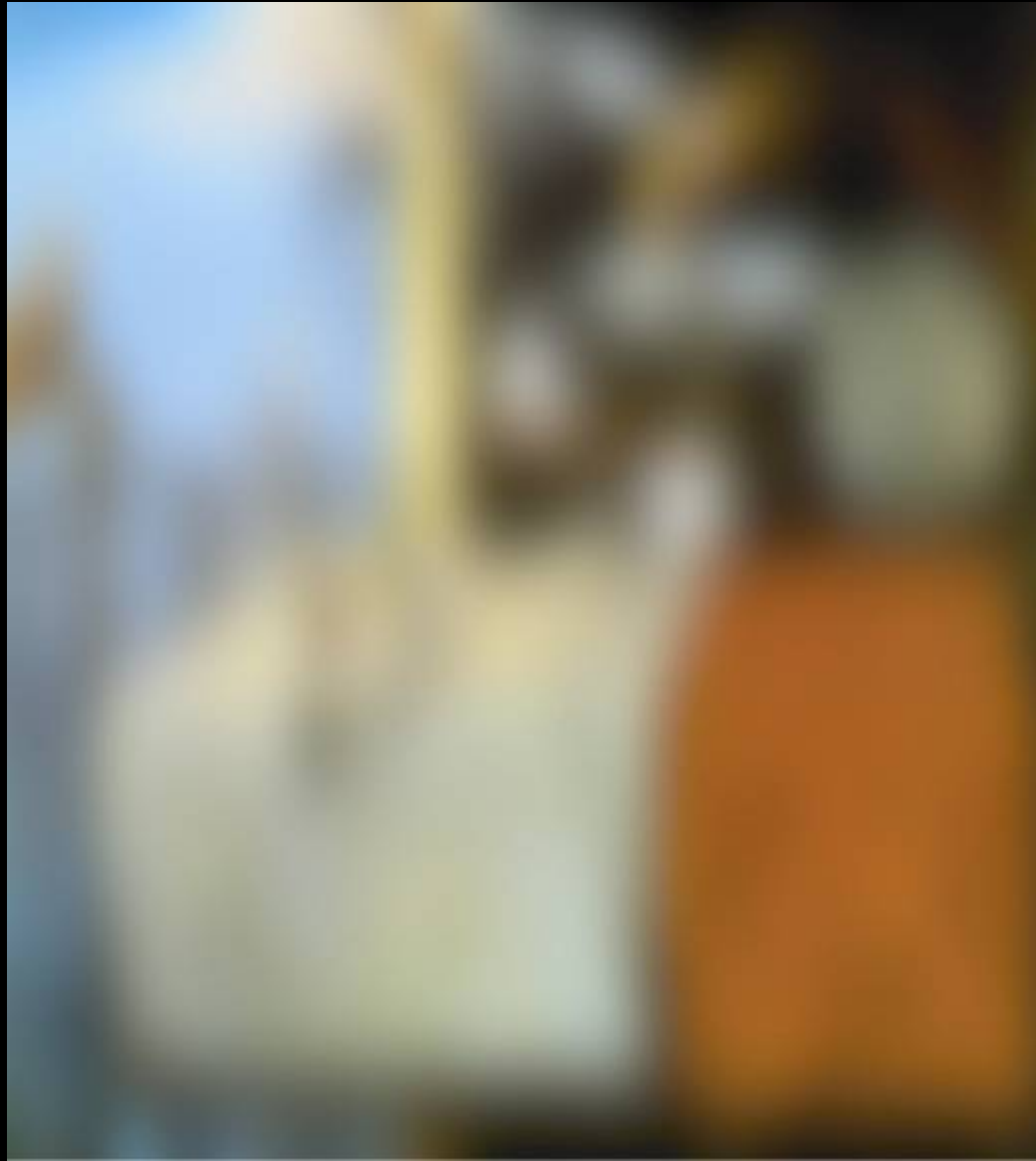
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**International Institute for Applied Systems Analysis (IIASA)
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The Marcus Wallenberg Prize Symposium, Sept. 29, 2009

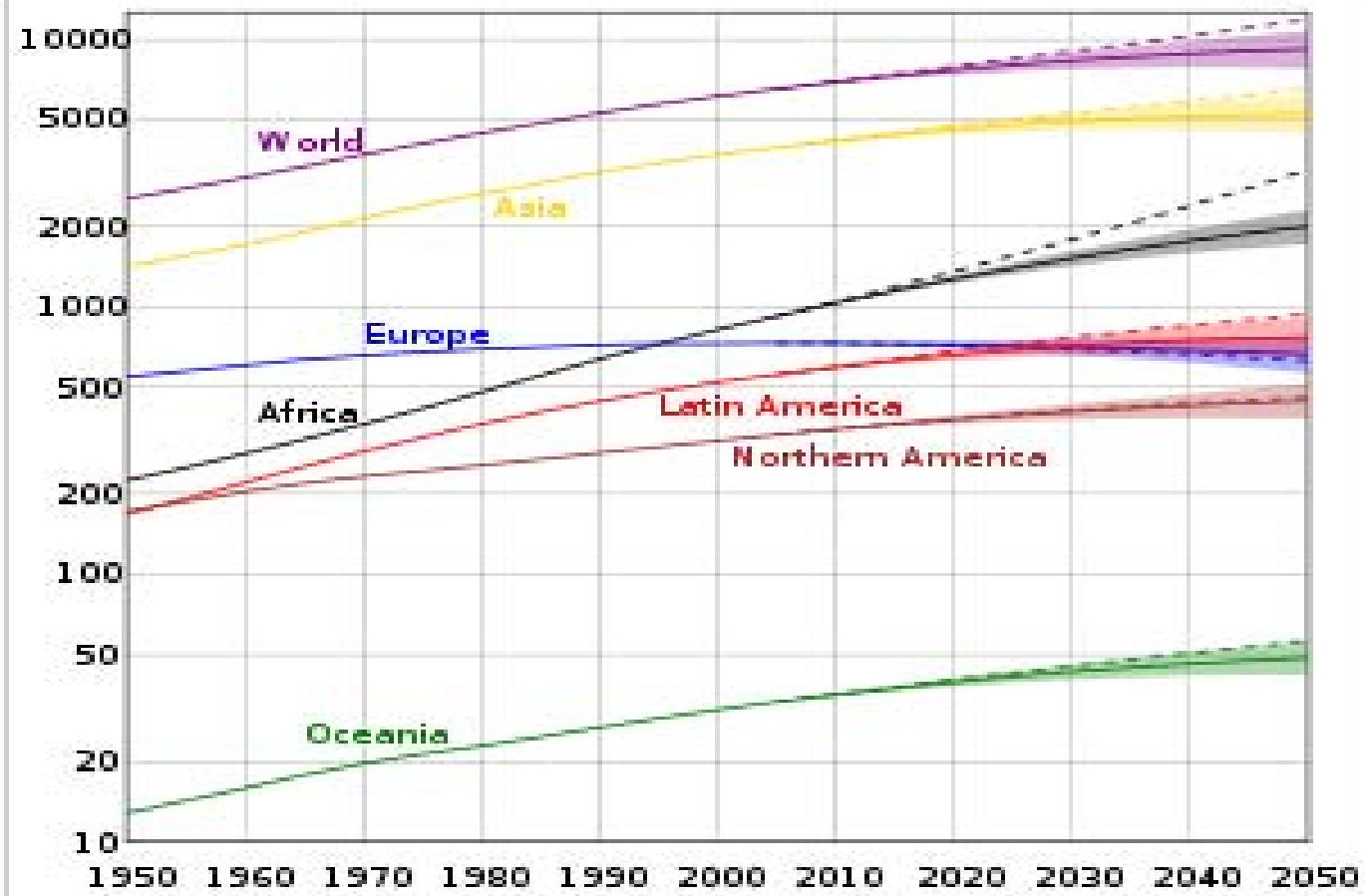


Courtesy: Carl Folke



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Population Development

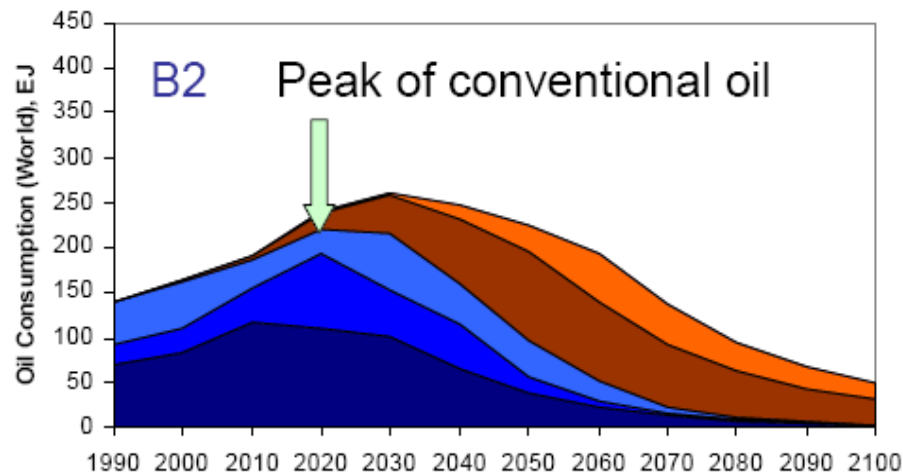
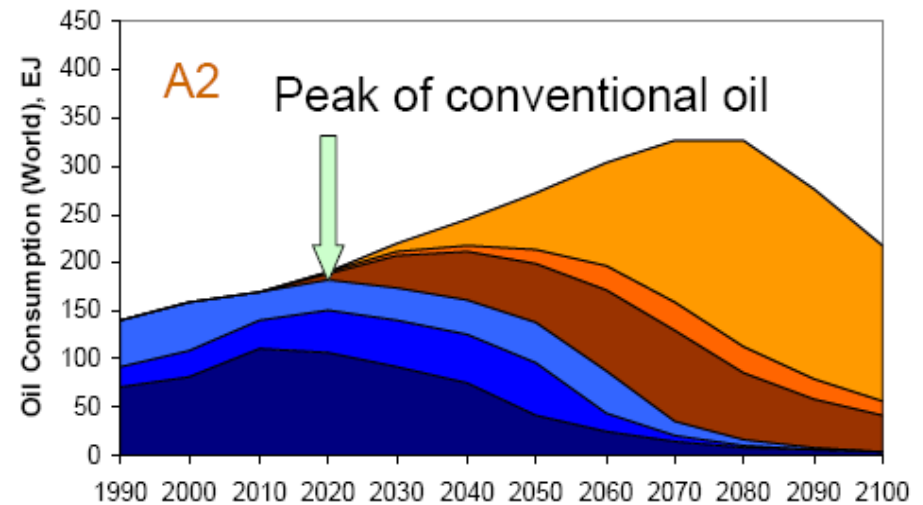
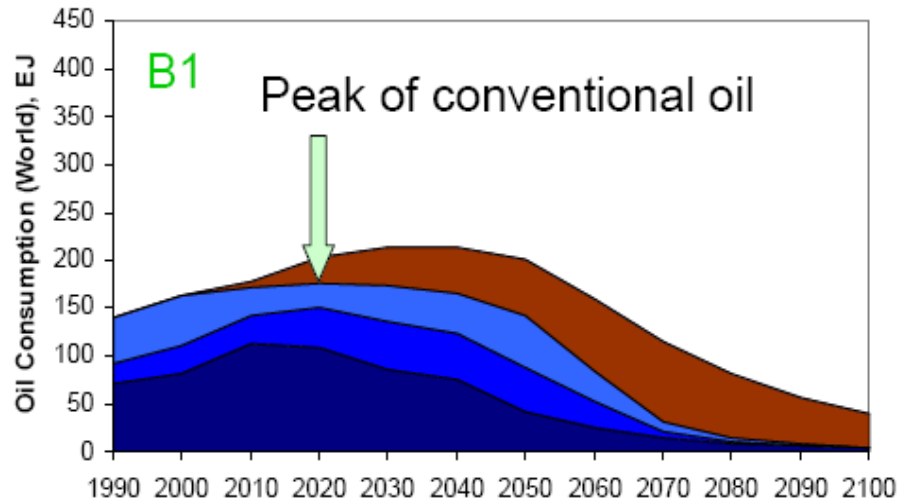


Population evolution in different continents. The vertical axis is logarithmic and is millions of people.

Source: United Nations Population Division; The 2008 Revision

GLOBAL OIL CONSUMPTION

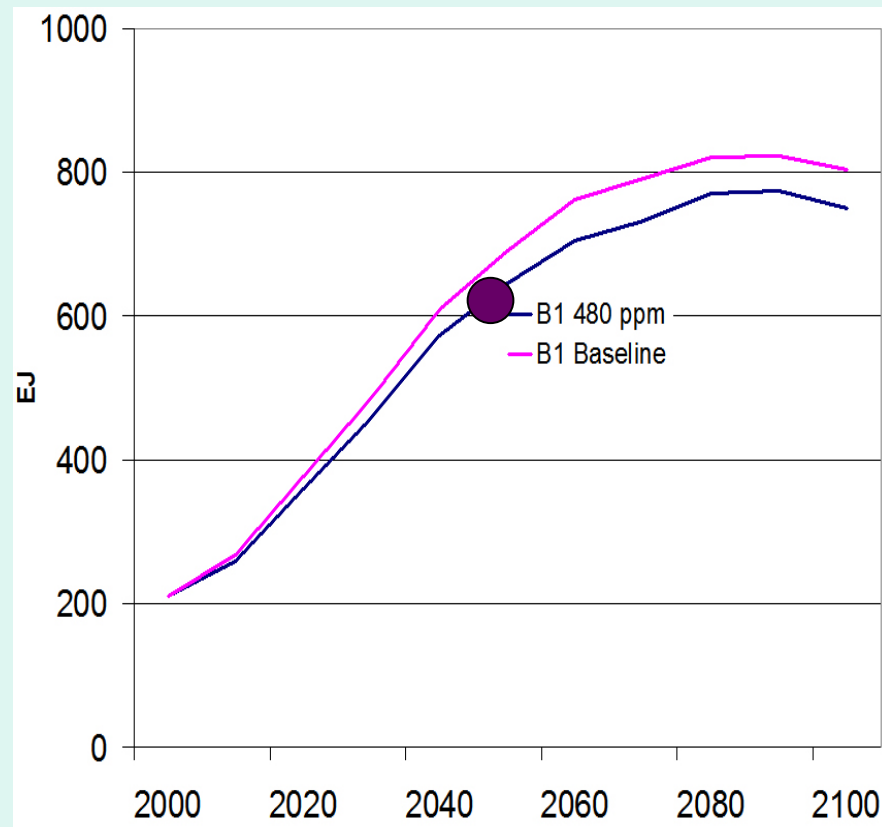
(conventional and unconventional reserves and resources)



■ Unconventional Oil

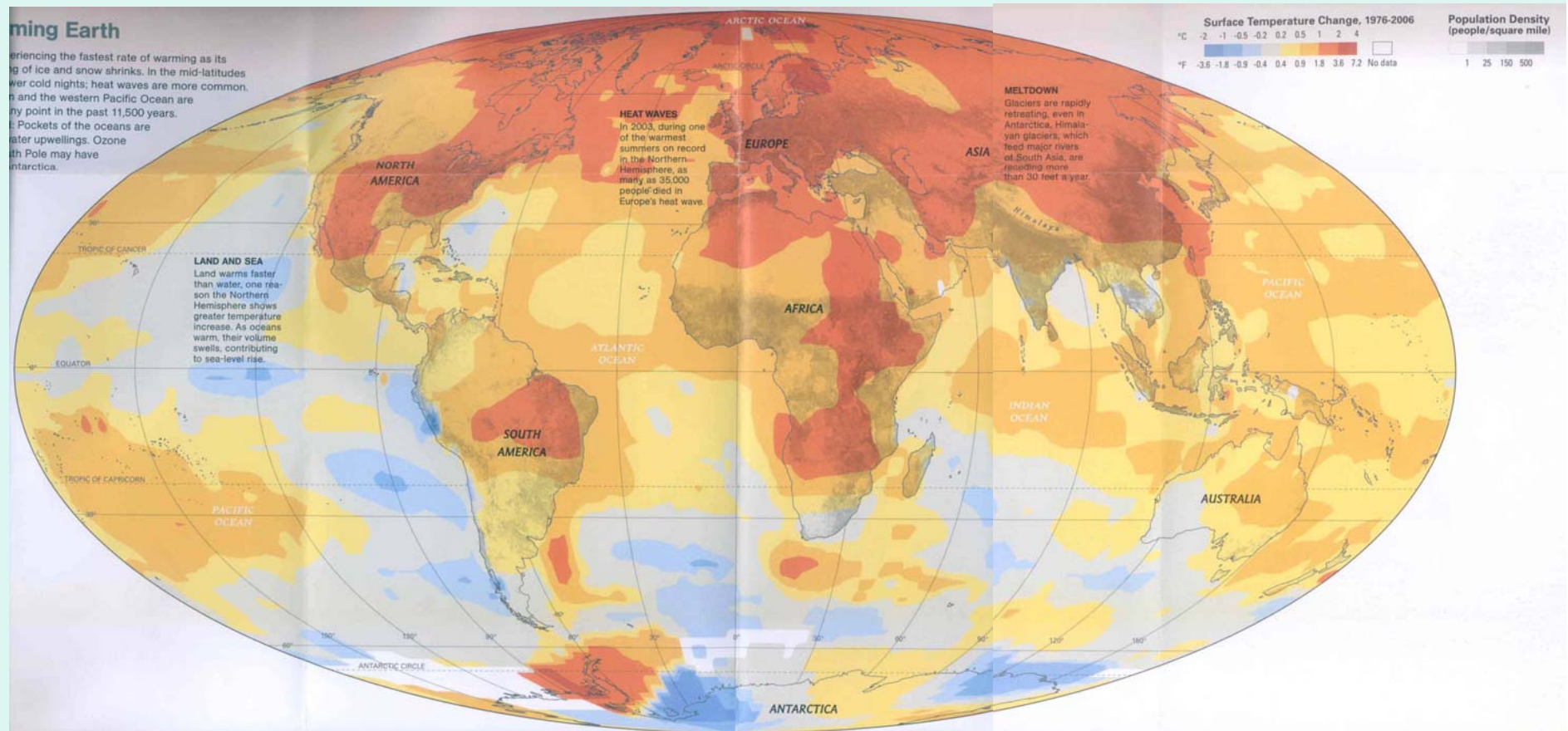
■ Conventional Oil

TOTAL ENERGY DEMAND



**Three fold increase by
2050**

RECENT CLIMATE CHANGE (1976–2006)



Source: National Geographic (2007)

TOWARDS A SUSTAINABLE ENERGY FUTURE

Targets for 2050:

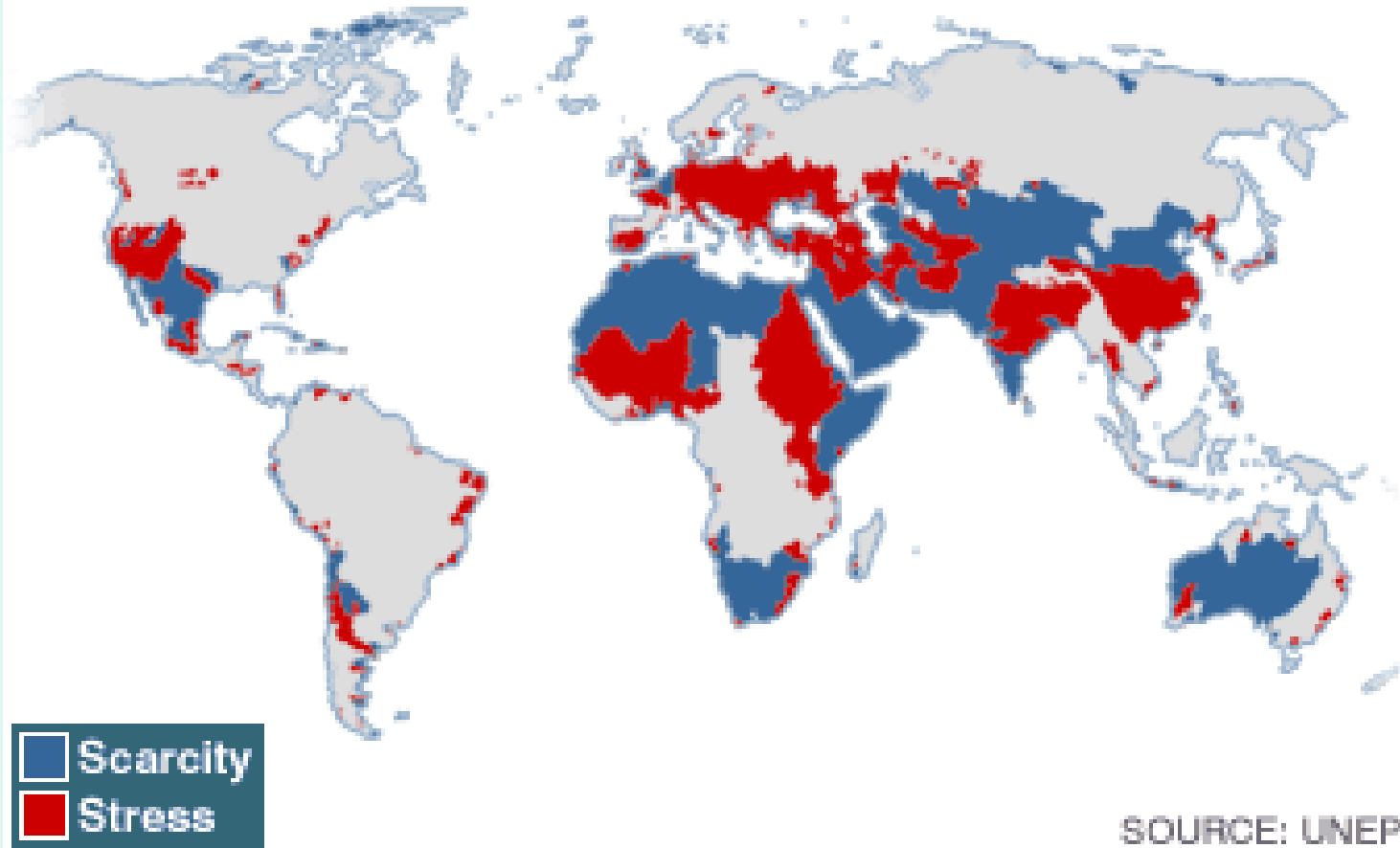
- Reduce GHG emissions by 50-85% of current levels
- Increase the share of carbon-free energy from 20 to 50-80%
- Double the overall energy efficiency from 10 to 20%
- Increase the price of carbon from zero to \$200-300 /ton CO₂
- Increase the annual investments for public and private energy to \$1 trillion

FOOD DEMAND

2000	2030	2050
Total Calorie Intake (FAO, 2006)		
100%	145%	165%
Cereal Demand (IIASA, WFS, 2007)		
100%	142%	167%

WATER CONFLICTS

Predicted water scarcity and stress in 2025



Total world water demands are predicted to increase by over 30% by 2030 (IFRPI)

Where will the land come from in 2030? How can we balance the demand?

Availability
250—300 million ha



TECHNOLOGIES

- 1 billion internet users today
- 4-5 billion internet users tomorrow through mobile phones
- This will lead to completely changed lifestyles
- Our existence is decided by the number of hits on Google

GEO POLITICS

- The US has lost two wars and will not likely become involved in another soon
- Asian countries on world-wide land and commodity grabbing (third wave outsourcing)
- Arab states investing in Western industries
- High risk that Europe will lose vital positions, both economically and politically

BEIJING AND ITS BUBBLE - 1

- China is force-feeding subsidized credits into the system – \$ 1 trillion so far in 2009 – with a under-developed tax system and interest rates below inflation. Many speculative investments.
- The Chinese economy is a mixture of family, social, banking and political ties concerned about cash flows rather than profit.
- The growth has a price in the form of depletion of natural resources and the environment. In 2005 GDP growth rate was € 225 billion, but the depletion costs was € 275 billion. Reality: negative growth.
- The loan expansion was equivalent to 45% of the GDP in the first 6 months in 2009.
- China is heading toward asset bubbles driven by liquidity.
- There is **good** 4% growth and **bad** 8% growth.

GLOBAL ECONOMY - 1

- The world will not be the same after the current economic crisis
- All of the earlier financial crises have changed society with respect to innovations, institutions, and attitudes/values (Grattin, 2008)
- Financial/banking sector will be smaller and less profitable
- Increased taxes; less economic growth
- Destruction of markets
- Less improvement of living standards
- Different economic sectors will find themselves too large and must restructure
- Protectionism will increase
- The state will play a more important role than before
- The US \$ will lose its role as the world's leading currency

INDUSTRIAL RESPONSE

- 70% of major industrial company executives claim global trends have been important, and are becoming even more important
- But, very few have successfully addressed the trends
- Reasons for not acting: other priorities, lack of skills, lack of resources, cannot decide

The
Economist

SEPTEMBER 20TH - 26TH 2008

www.economist.com

Who killed New Labour?

The war in Pakistan's tribal areas

America's unending culture wars

How to save fish

The last typewriter-repair man

What next?



RESILIENCE CHALLENGE

- Turning crises into opportunities for sustainability requires social-ecological resilience
- Lack of resilience may lead to traps and deepened vulnerability

FEATURES OF RESILIENCE

- Persistence: the existence of tipping points will cause shocks and regime shifts which will require persistence to withstand them
- Adaptability: the capacity of social/economic/ecological systems to deal with these changes, uncertainties, transformations and surprises
- Transformability: the capacity of social/economic/ecological systems to create new systems and new opportunities when the conditions make the existing system untenable
- The Forest Sector lacks a resilience concept

TWO CRISES IN ONE IN THE FOREST SECTOR

- The current economic crisis
- The structural crisis

WHEN (USA) BULLS CHASE THEIR TAILS

- Some 70% of US GDP is consumer spending.
- The average household debt is 130% of disposable income.
- The USA has shed jobs during 20 consecutive months; it will take 5-6 years to recover a solid labor market.
- 29% of all home owners want to put their houses on the market (Zillow, August 11, 2009).
- 25-45% of all home owners owe more on their mortgage than the house is worth (Deutsche Bank, 2009).
- The off-balance sheet obligations associated with social security and Medicare cause a \$ 56 trillion financial hole corresponding to \$ 483 thousand per household which is ten times higher than average household income (GAO, September 2009).
- The cumulative debt is \$ 11.7 trillion in a \$ 14 trillion economy.

STRUCTURAL CRISIS

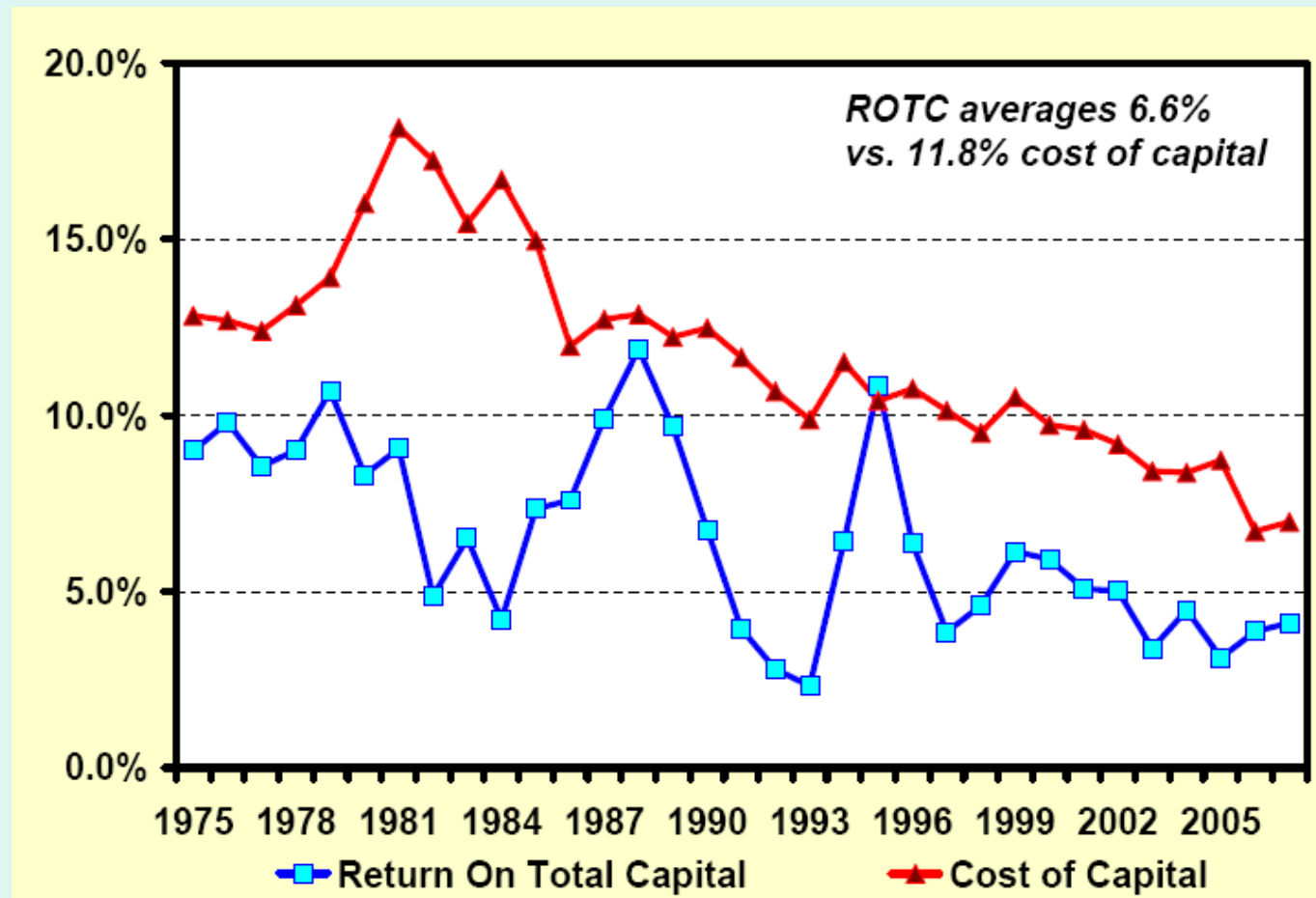
REGIONAL ROCE %

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
USA	4.0	6.8	7.4	4.2	4.5	4.3	6.3	5.7	5.2	5.2	2.9
CANADA	2.4	5.9	7.8	3.1	3.0	4.0	4.6	4.5	2.4	-1.3	-5.9
SWEDEN	6.5	4.7	14.4	8.0	6.8	6.2	5.3	3.0	6.8	8.7	2.7
FINLAND	6.5	9.0	8.8	6.5	4.5	2.5	4.9	2.0	4.2	2.4	0.8
UK	7.0	7.3	7.0	8.6	3.9	7.6	5.2	4.7	6.7	4.6	6.0
EUROPE (REST)	6.5	6.7	9.1	6.7	5.4	3.9	4.7	3.5	4.6	5.0	2.9
JAPAN	1.8	0.5	2.4	3.2	1.6	1.9	3.0	3.6	3.6	2.5	2.1
OCEANIA	3.3	3.4	5.0	4.5	2.9	7.0	5.4	5.5	4.9	5.0	3.0
INDIA	6.6	7.8	8.4	11.5	7.3	8.3	8.7	9.6	10.7	9.7	8.6
OTHER ASIA	5.0	8.2	5.7	4.1	6.9	7.1	7.5	7.0	8.0	8.0	6.6
SOUTH AMERICA	3.4	6.2	12.0	6.6	7.2	8.3	9.7	8.7	9.3	9.0	3.0
SOUTH AFRICA	6.2	4.6	10.5	9.1	7.6	6.3	4.2	1.5	5.5	5.8	4.6

Courtesy: CIBC, Canada

FINANCIAL PERFORMANCE

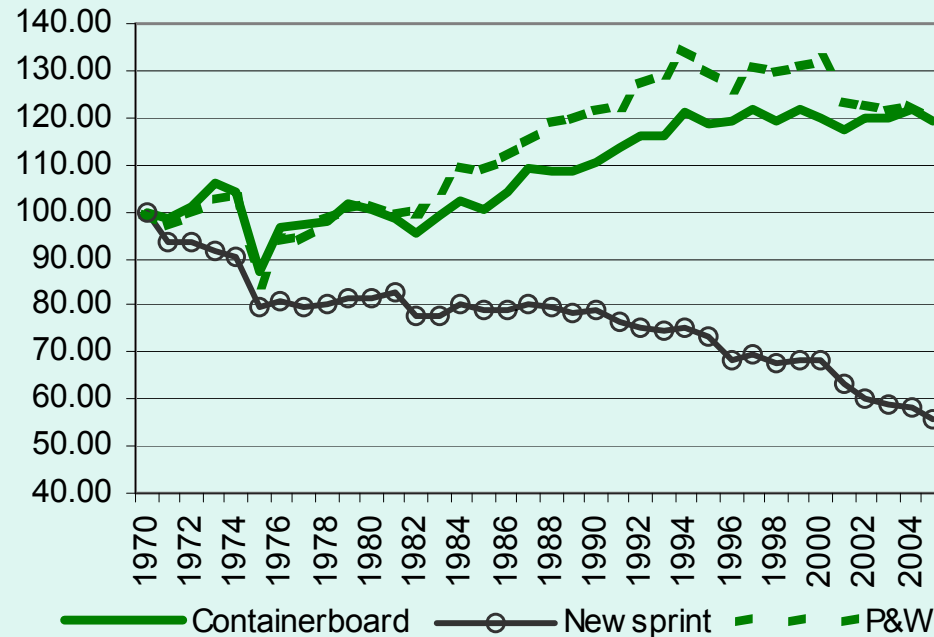
Return on Book Value of Total Capital — *Covers Debt* but Remain Below Cost of Capital



Source: McNutt, CPBIS (2008)

DESTRUCTION OF MARKETS

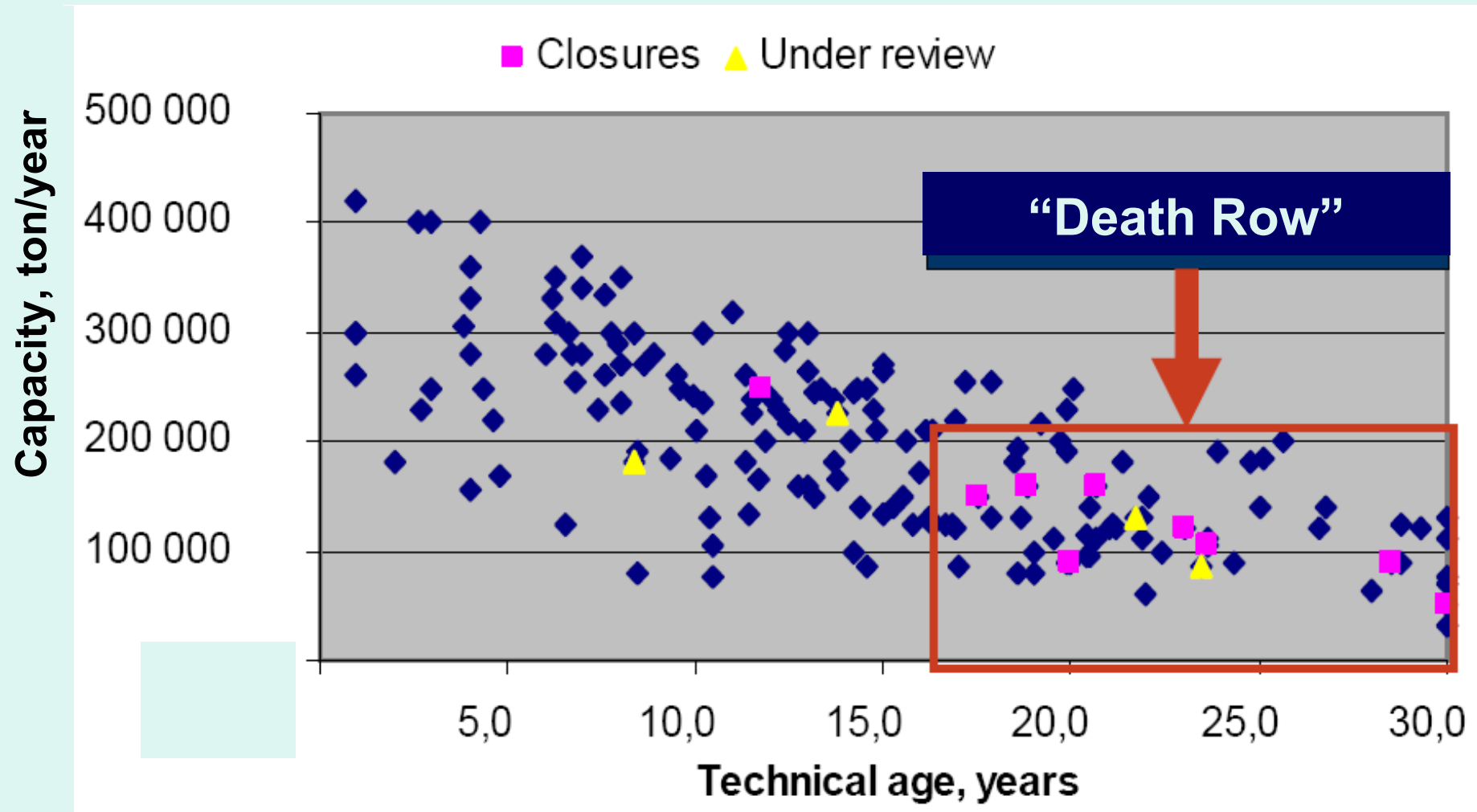
Global Consumption Per Unit of Real GDP



- **Electronic communication is having a significant impact on the consumption of paper**
- **At the global level, the “intensity of consumption” in the economy has been declining for newsprint since 1970, and started to decline for printing and writing papers in 2000**
- **Packaging is more associated with overall economic activity, and is “holding its own”**

DEAD WOOD AND OVERCAPACITY

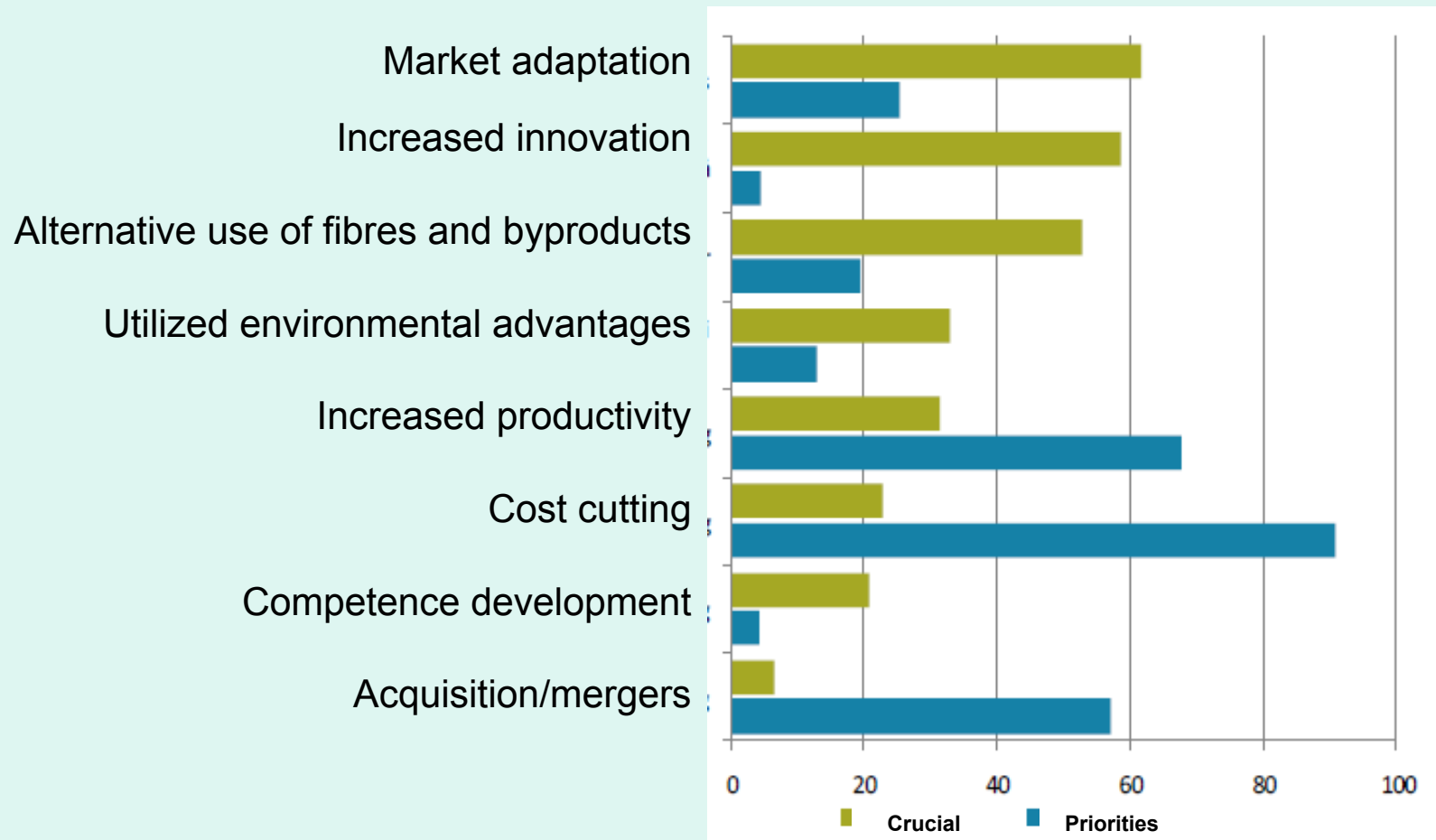
Printing/Writing Machines in Europe



JACK-KNIFING OF COSTS

- Be competitive by cutting costs
- The business concept seems, to a large extent, to have been cost-cutting
- Good for the stock market, but bad for the companies
- Cost cutting alone will not generate any long-term growth

FUTURES STUDY



Lack of Vision in the Forestry Industry

- Rantala (2008): Finnish industry has lacked clear vision for years.
- Nilsson (1996): Corporate Amnesia? *Swedish Paper Magazine*, 9:8.
- Nilsson (1996): The Forest Sector Lacks Vision, *The Forest*, No. 8.
- With lack of vision and strategies in the companies, you end up with jack-knifing.
- Clear vision and strategies dealing with important long-term issues are a must to maneuver through crises. Consider President Obama.

TODAY IS SIMILAR TO YESTERDAY

- Unsatisfactory financial performance
- Over-supply and over-capacity
- Low rate demand growth prospects
- Financing problems
- Fluctuating exchange rates cause risk
- To survive: Be cost-competitive

Source: Jaakko Pöyry, 1986

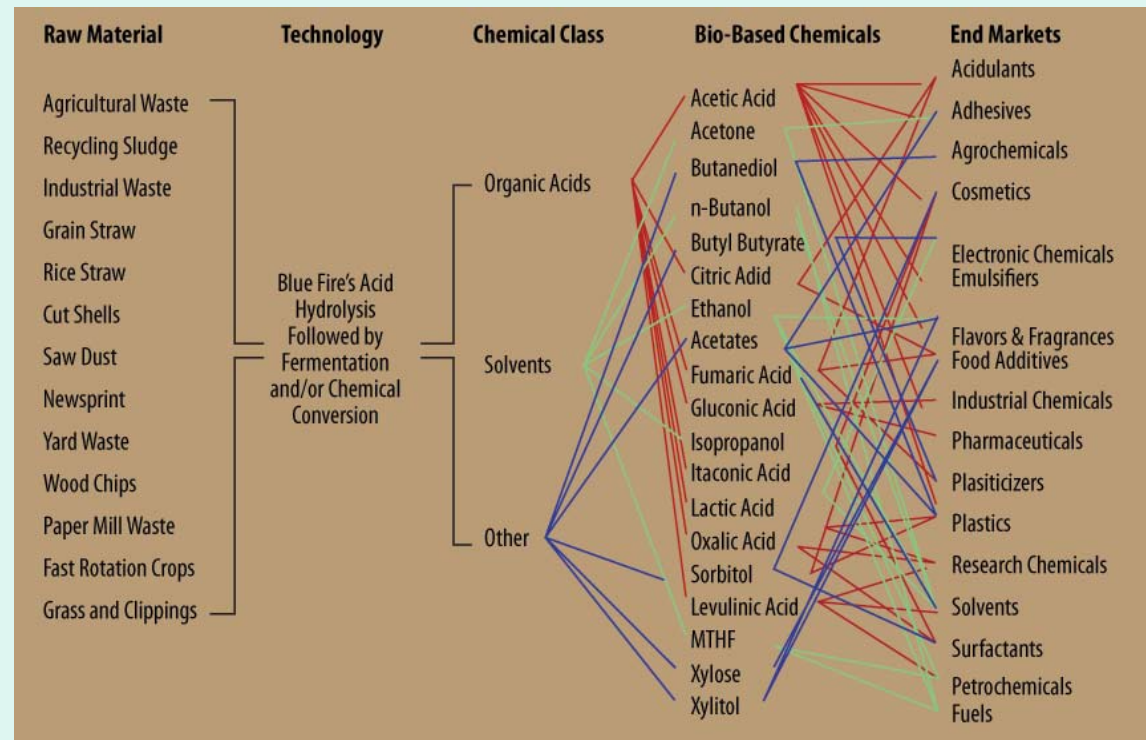
- What would have happened if Dr. Pöyry had stated that to survive you have to come up with a new business concept?

BUT MORE IS NEEDED

- Ecosystem Services
- Ecotourism
- Bioenergy
- Biofuels
- Biorefineries

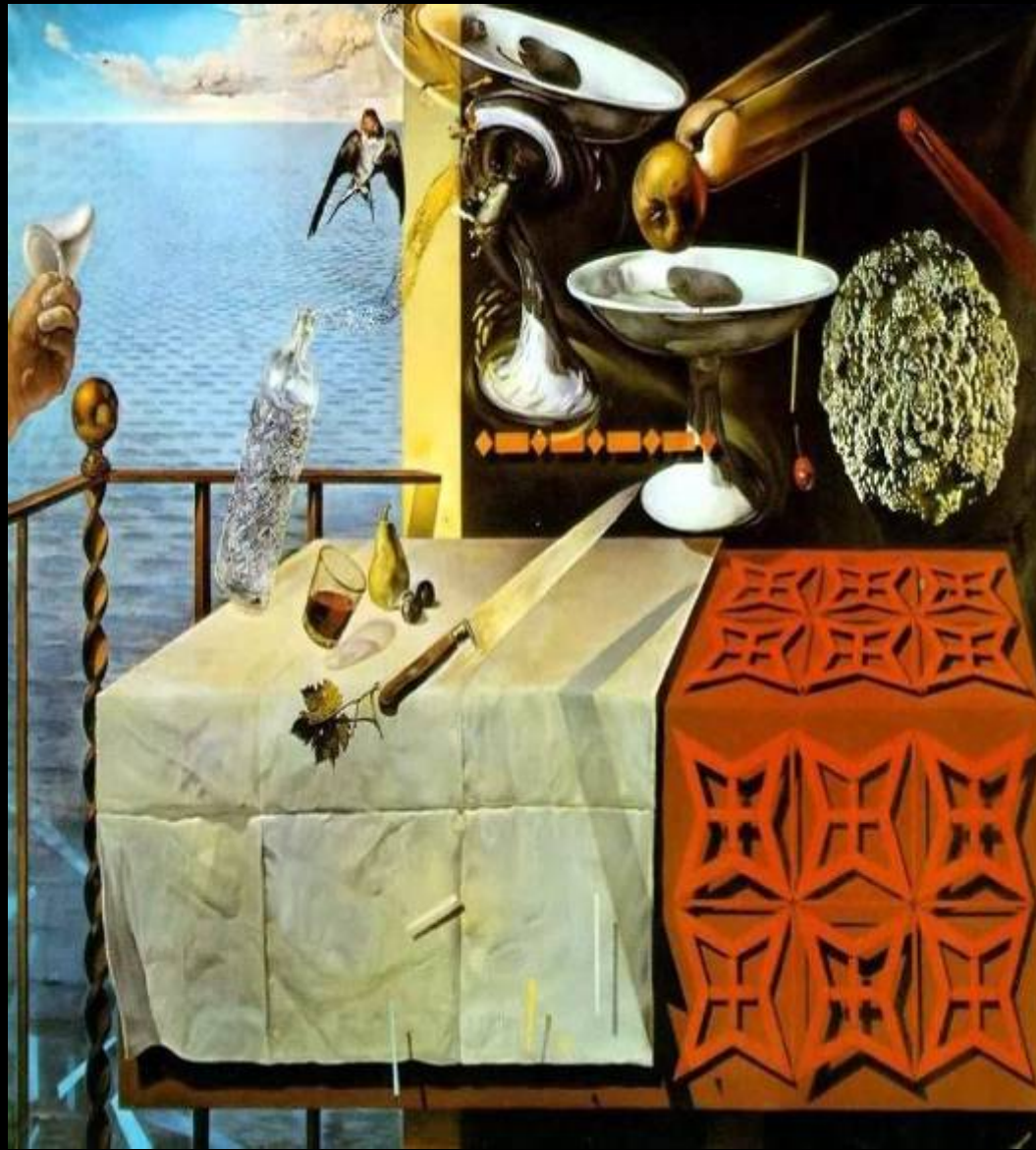
BIOTECH AND BIOCHEMICALS - 1

- Glesinger (1949) outlined in “Coming Age of Wood” that the biochemicals and bio-refineries are the big challenges for the future of the forest sector
- Goldstein (1978) demonstrated at the World Forestry Congress, 1978, in “Chemicals from Wood” that wood has the potential to meet all our chemical needs in place of petrochemicals



THE CONVENTIONAL FOREST INDUSTRY WILL NOT BE SO IN THE FUTURE

- Without a pro-active understanding of the global transformations and their resilience there will not be much left of a conventional forest-based industry
- Under all conditions, the conventional sector will be slimmed down
- Much more is needed to have a viable Forest Sector:
 - possibly one portion carbon trading
 - one portion bioenergy
 - one portion biotech and biochemical production
 - one portion performance fibres for high-value, advanced technical applications
 - one portion light materials with high technical features
 - one portion of today's conventional forest industry
- Large population numbers will not drive the market but a huge number of micro-markets
- Thus, there is a need for different price models in the future



Courtesy: Carl Folke

Thank you !



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