

## THE EMERGENCE OF LIMITS TO GROWTH SCENARIO 2: THE POLLUTION CRISIS

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July 30, 2007

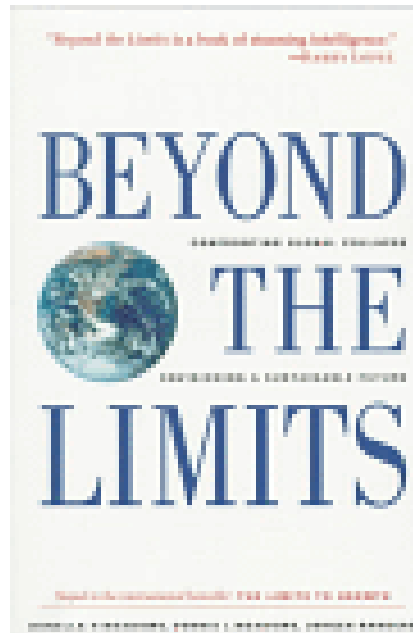
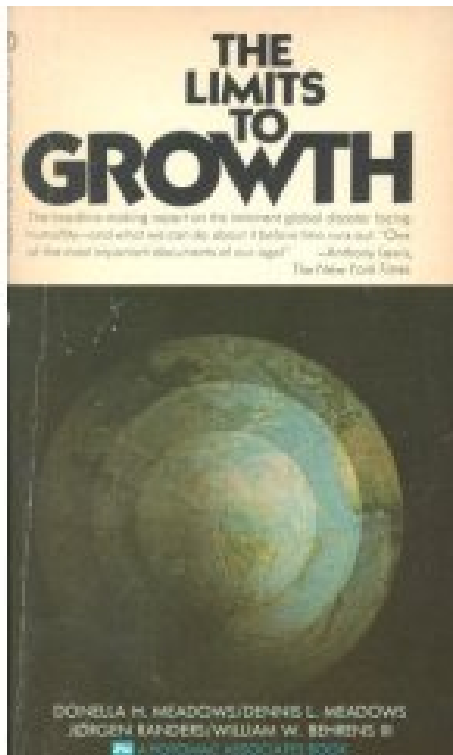
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# OVERVIEW

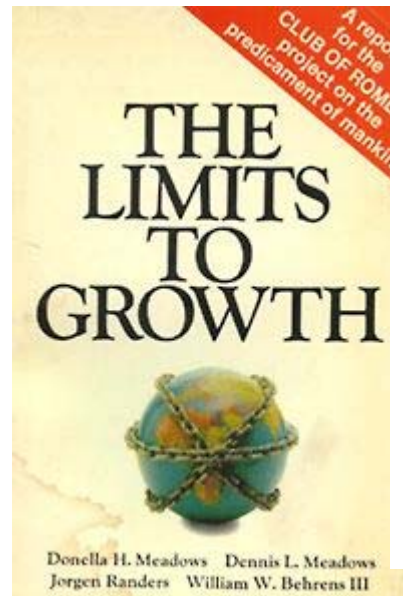
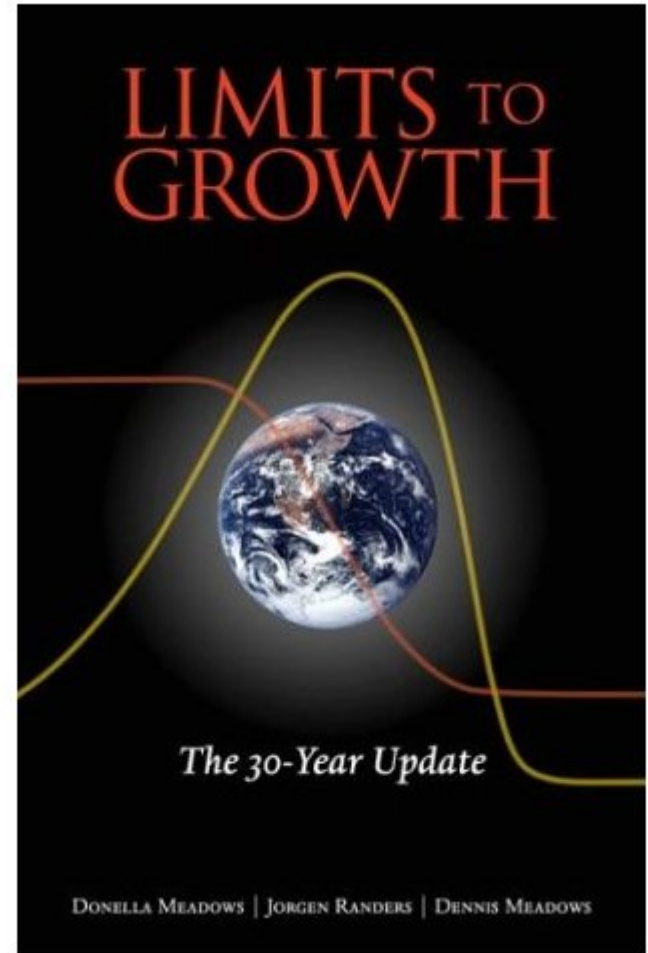
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**1. A TRIBUTE TO  
THE POWER OF SYSTEM DYNAMICS  
CONCEPTUALIZATION  
AND  
JAY W FORRESTER'S ELEGANCE IN USING  
THE TOOLS OF THE SYSTEM DYNAMICS  
TRADE**

**2. HOW THE HEROIC STRUCTURAL  
ASSUMPTIONS MADE A GENERATION AGO  
IN WORLD3 ARE PROVING INCREASINGLY  
RELEVANT IN TODAY'S CLIMATE DEBATE**



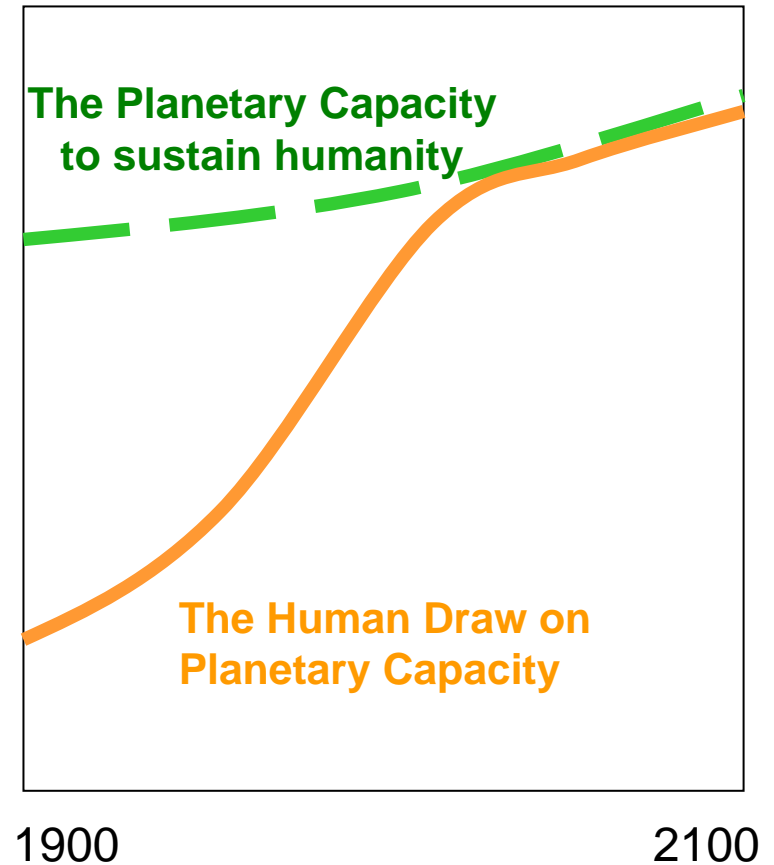
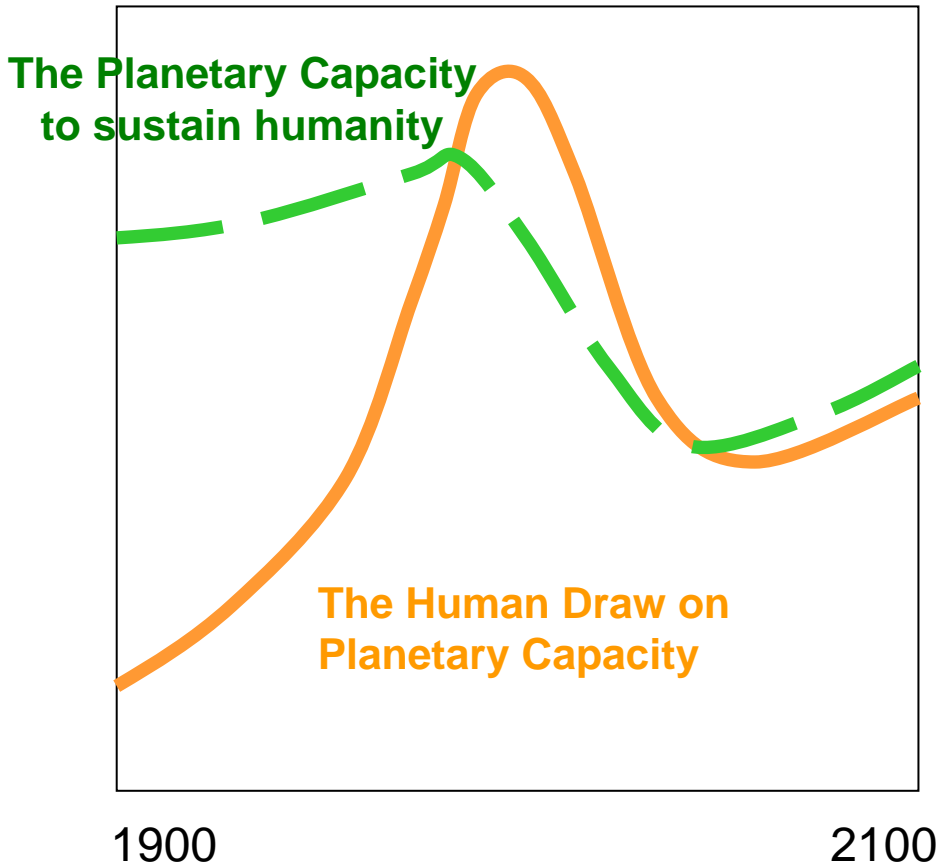
# OVERSHOOT AND COLLAPSE ?



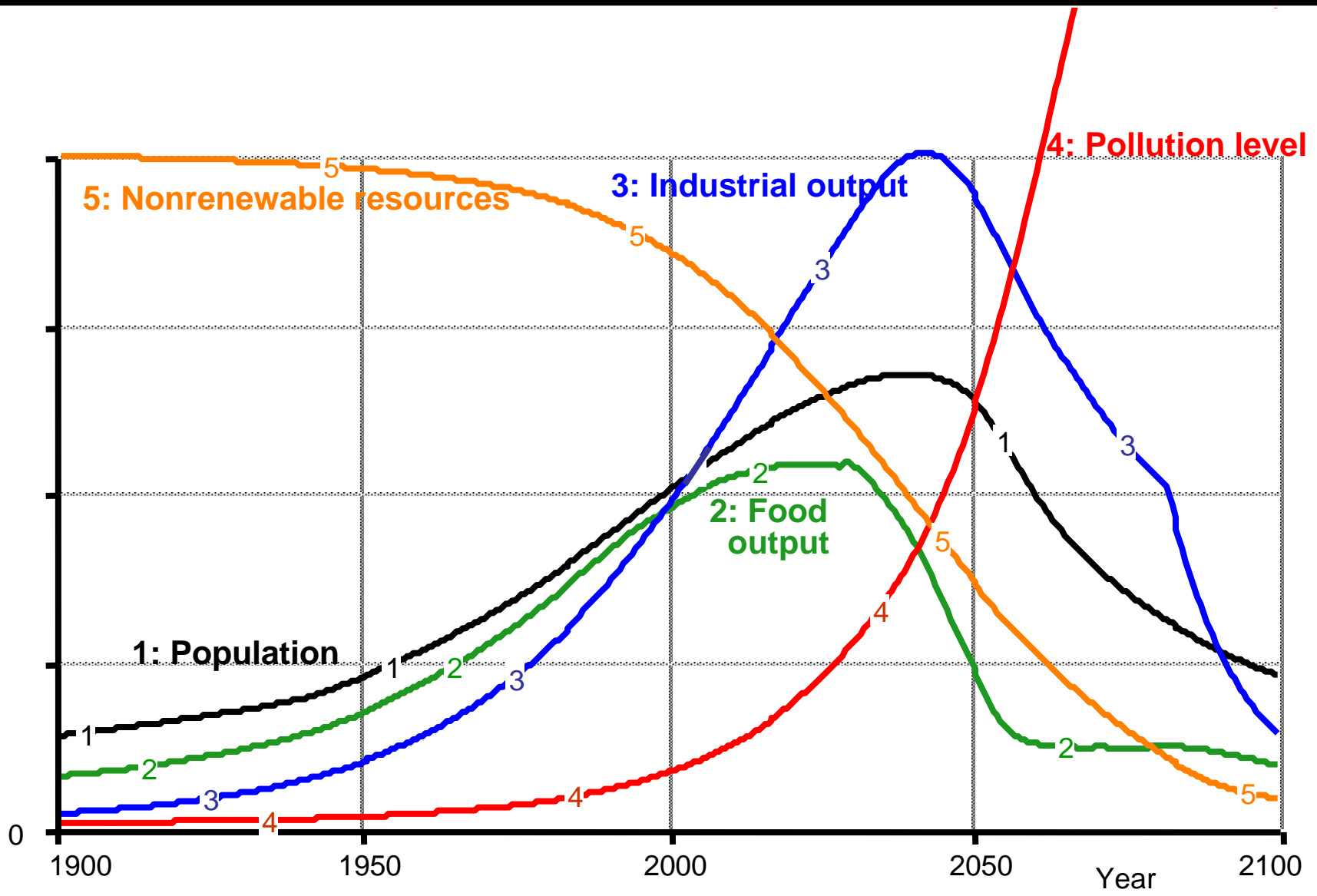
# OVERSHOOT AND COLLAPSE

“Overshoot and collapse”

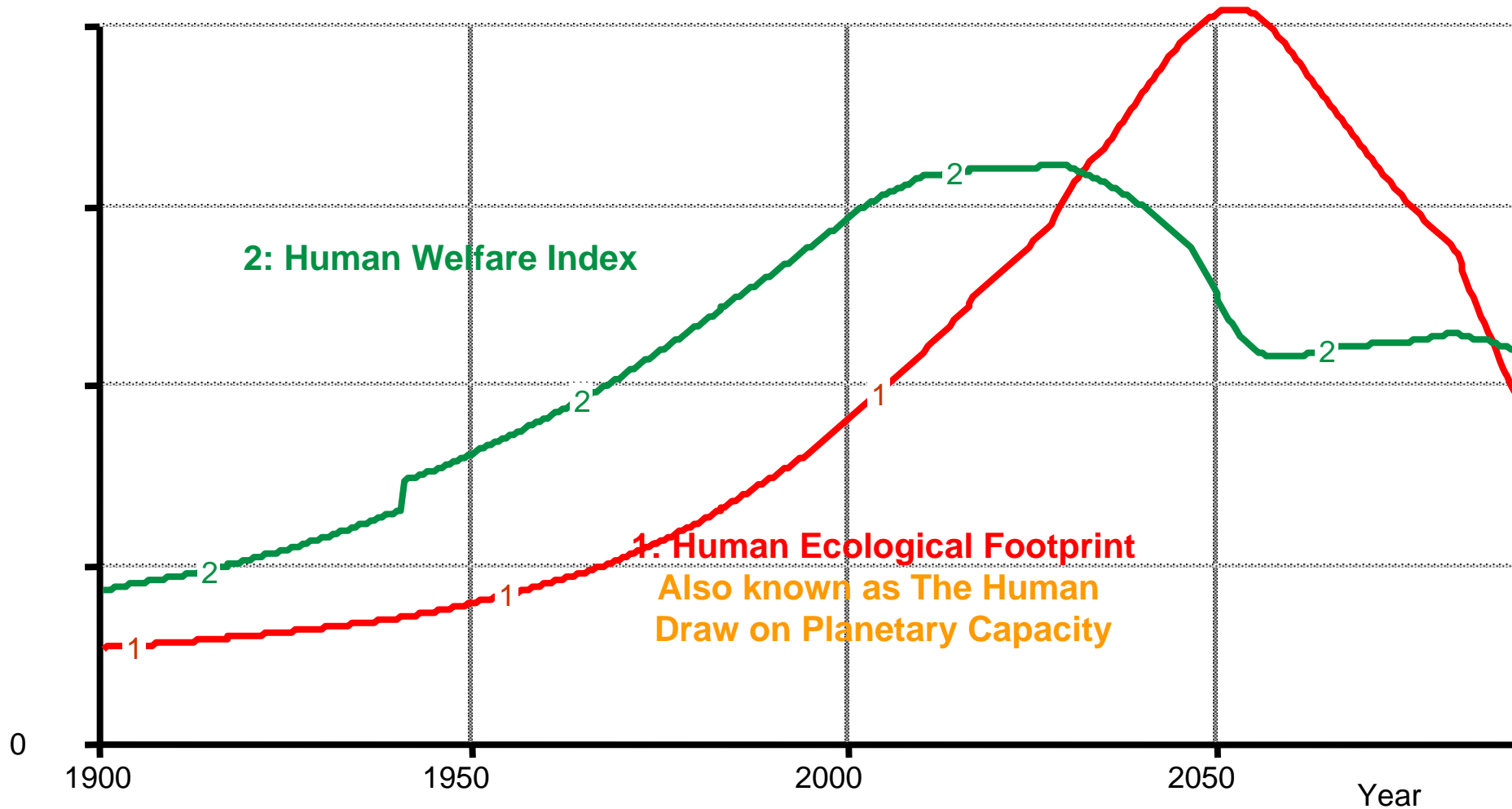
Not : “Smooth landing”



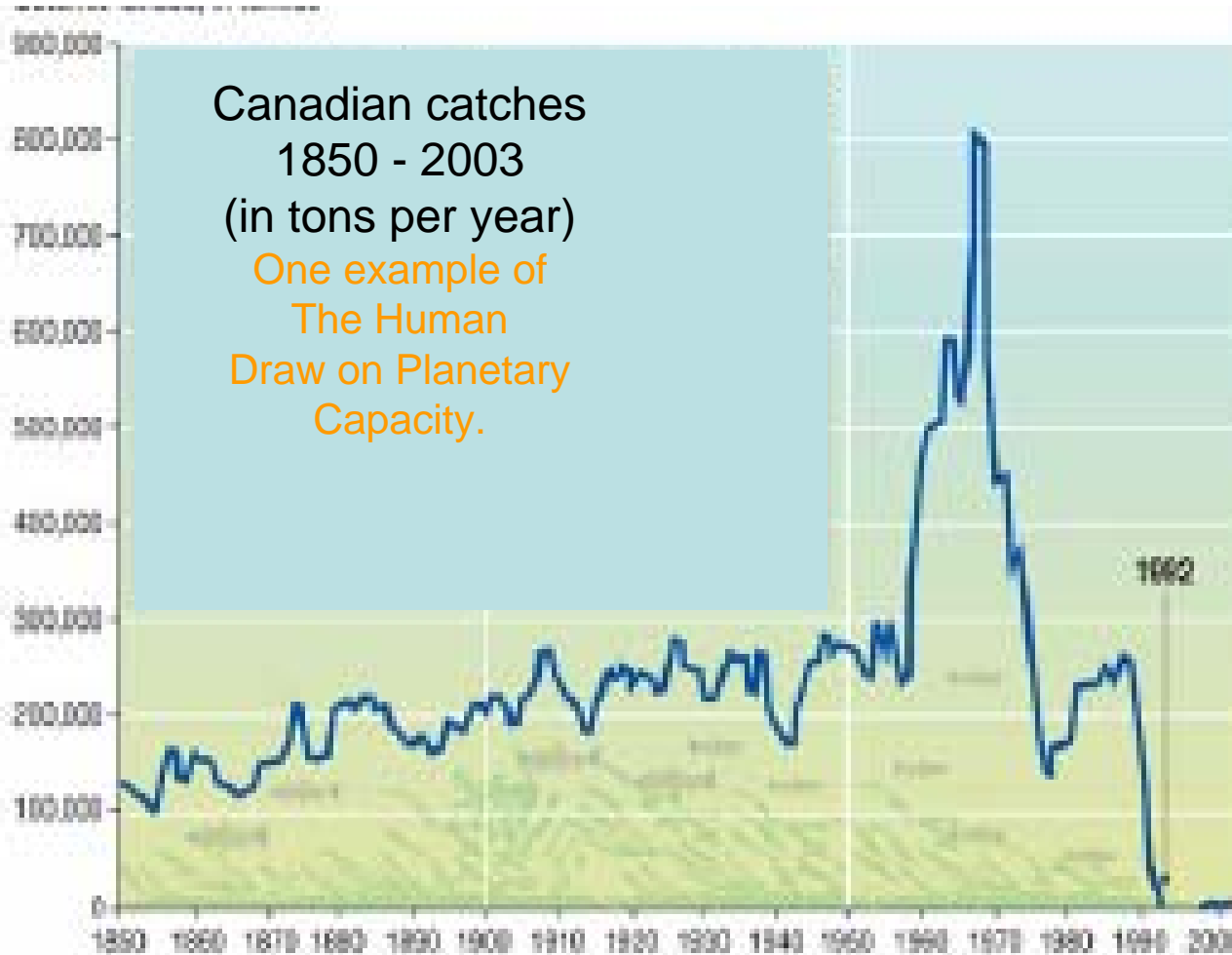
# LTG SCENARIO 2: POLLUTION CRISIS



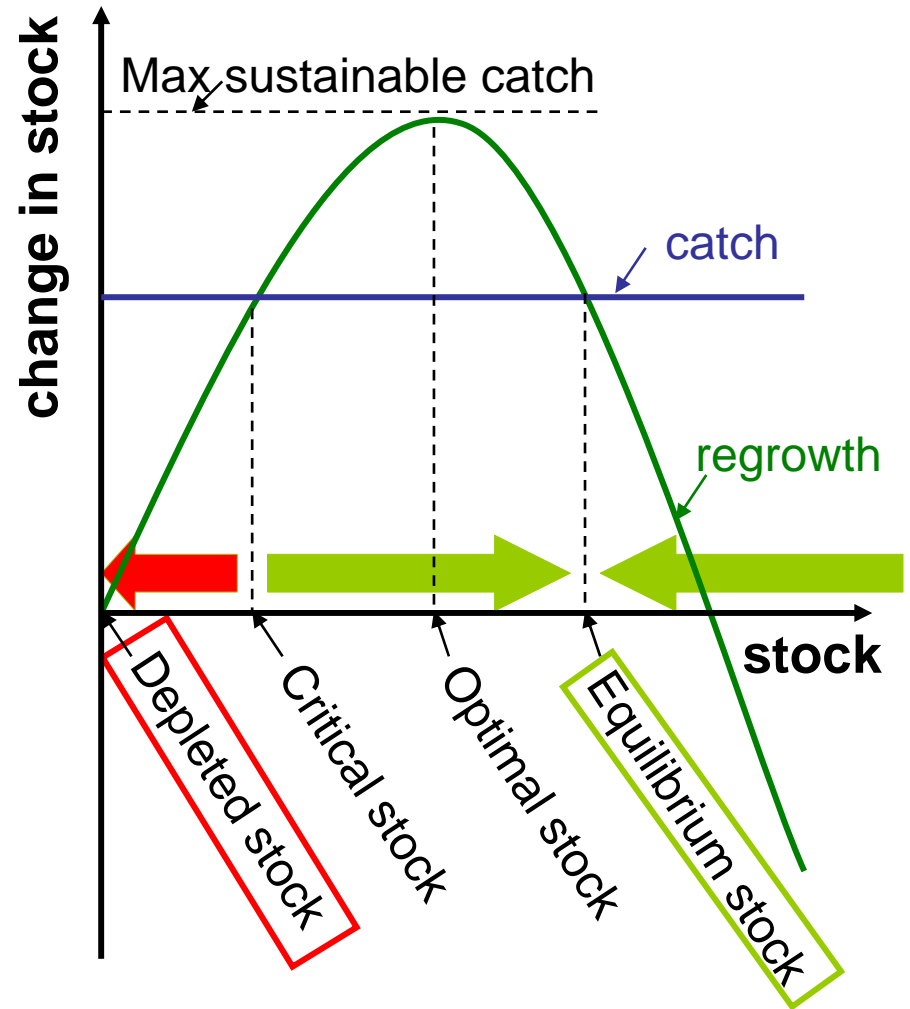
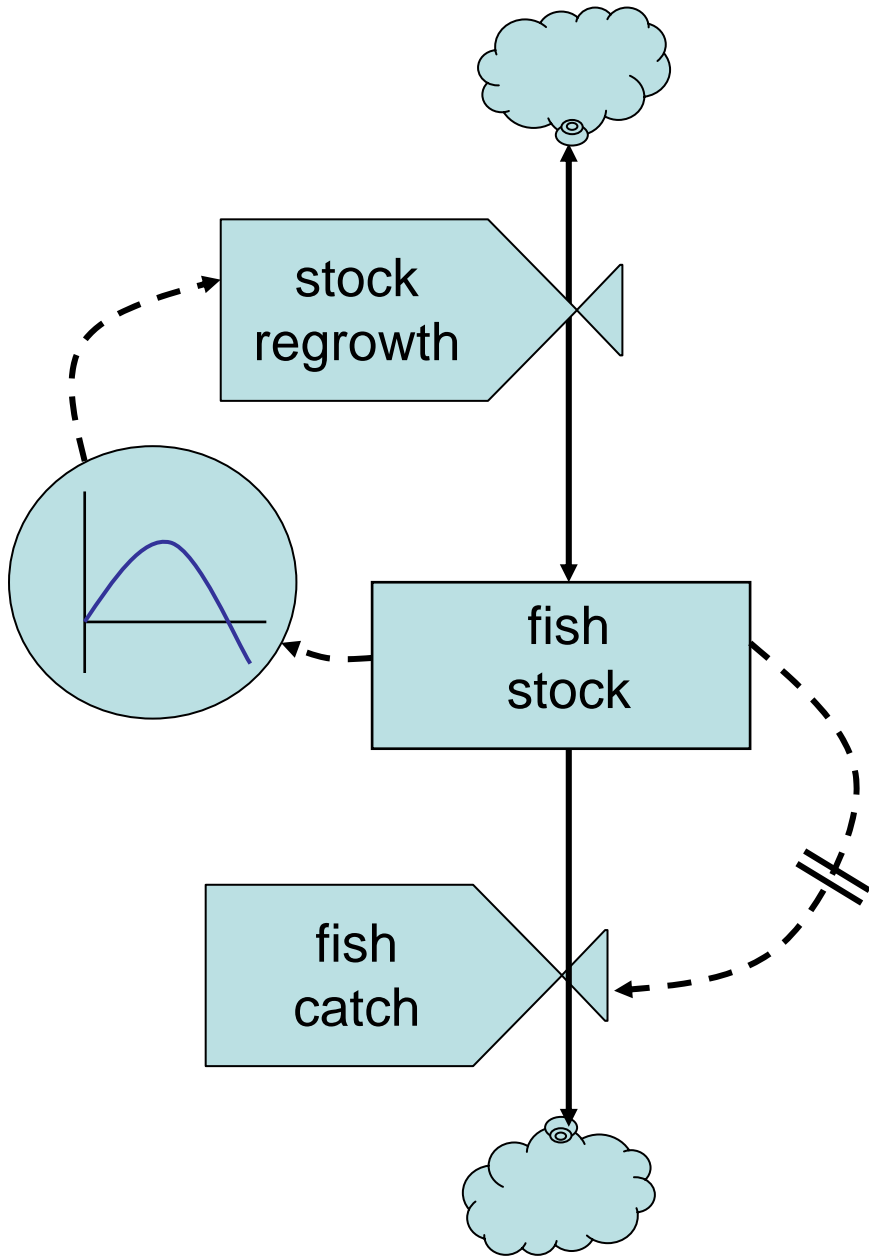
# LTG SCENARIO 2: POLLUTION CRISIS



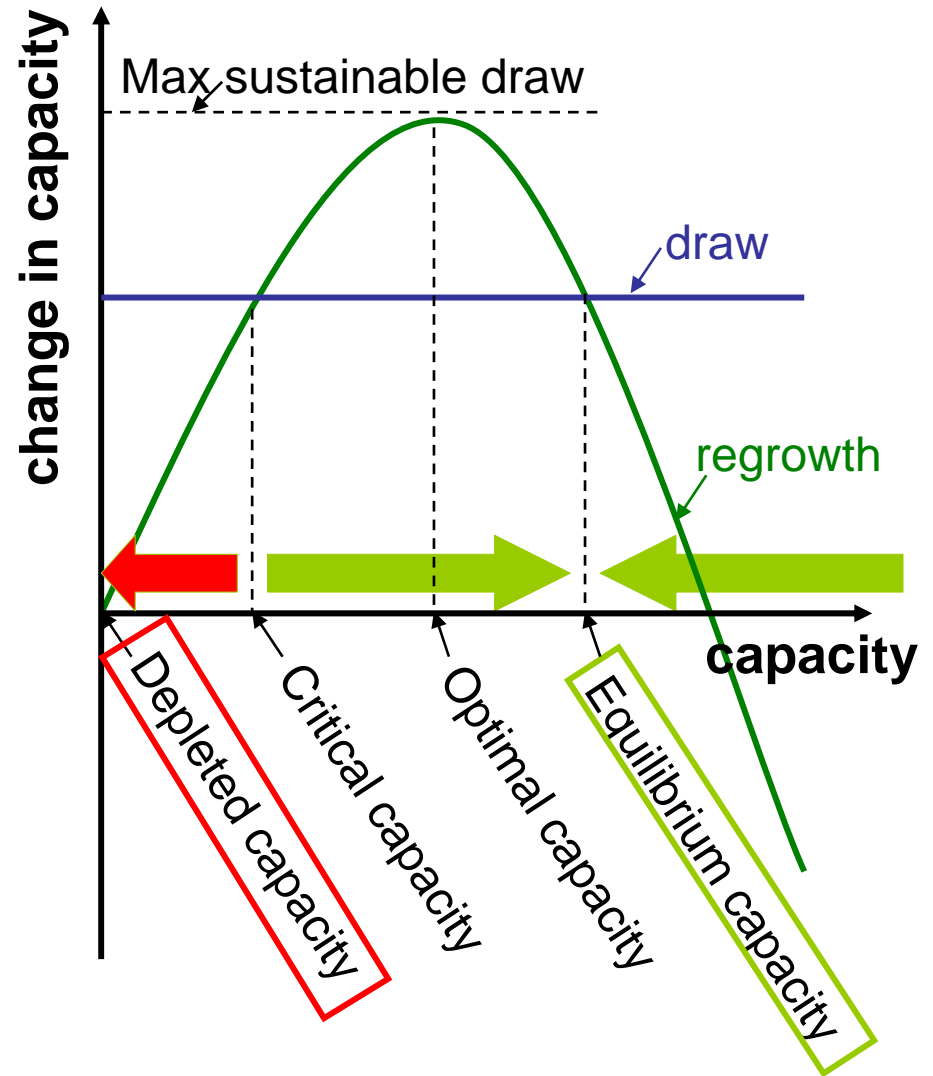
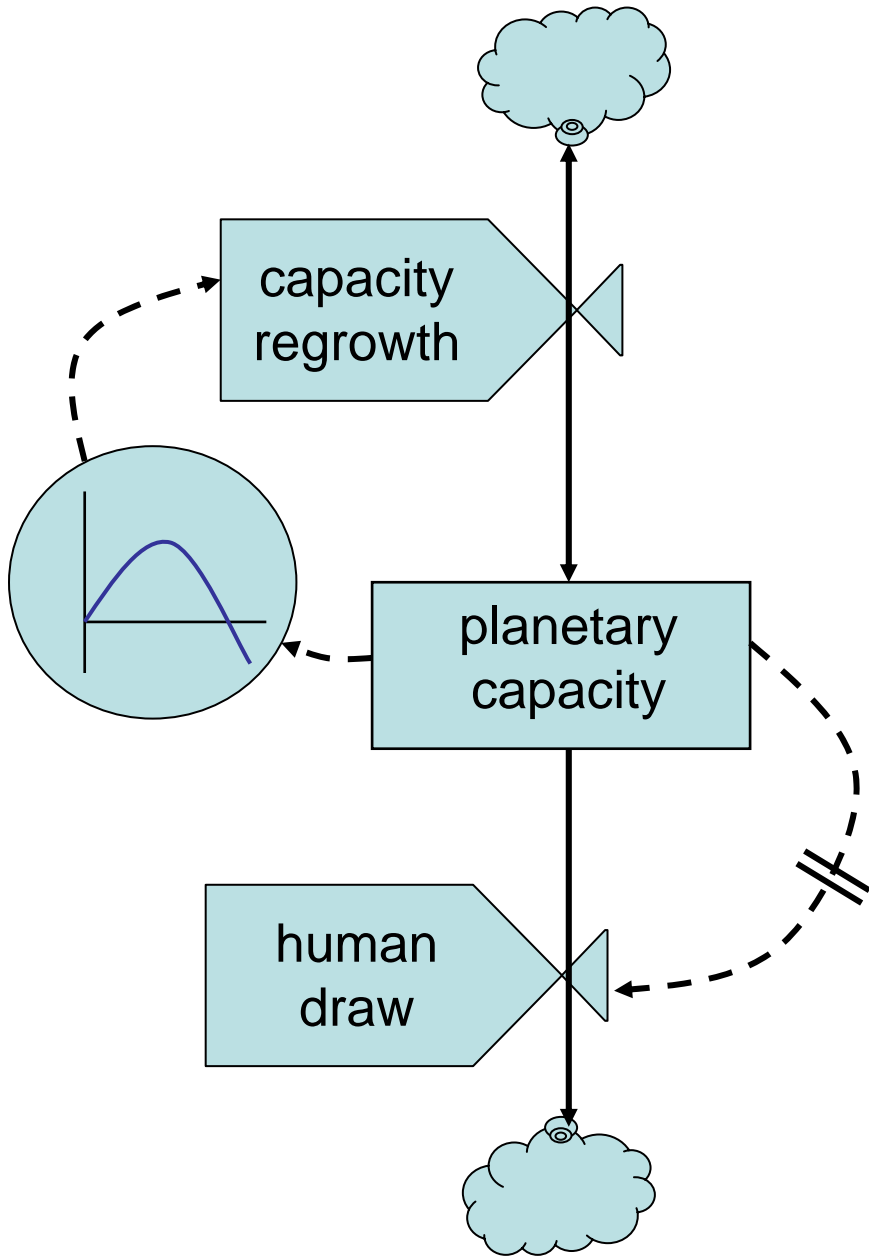
# COLLAPSE IN COD FISHERIES 1850 - 2003

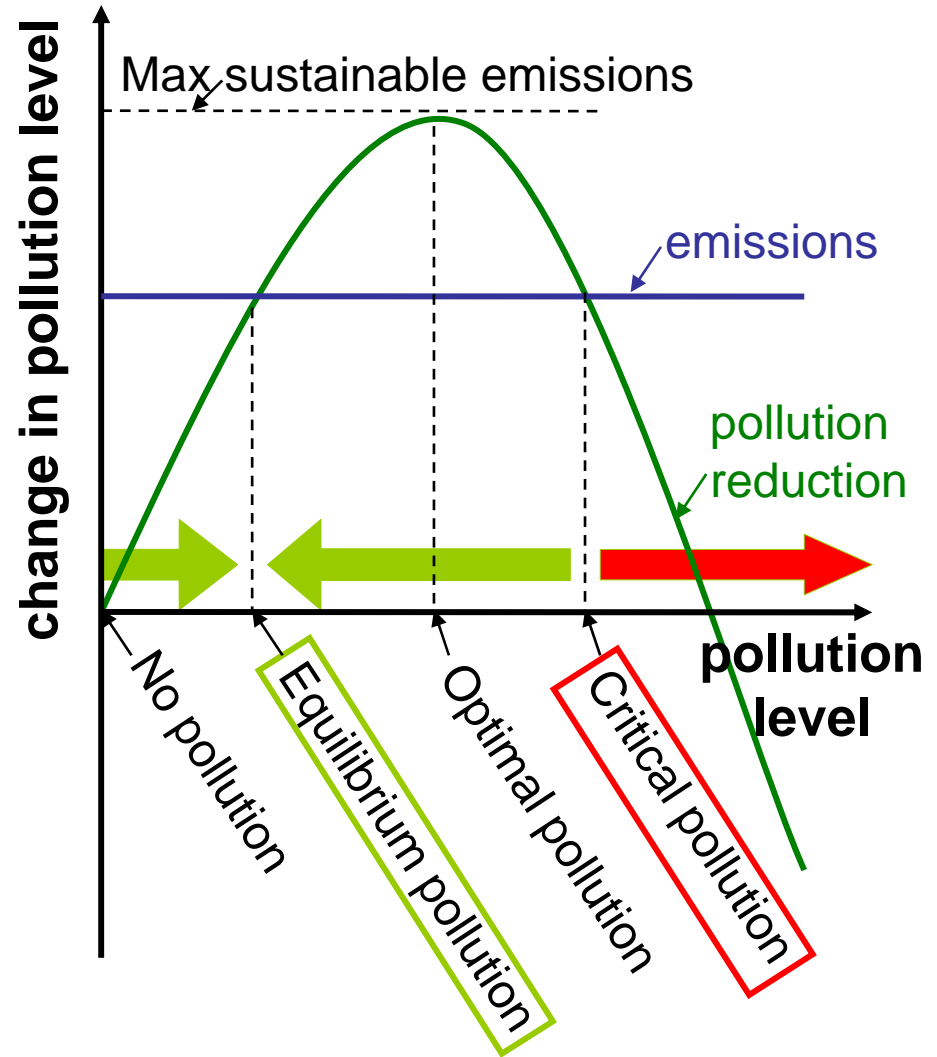
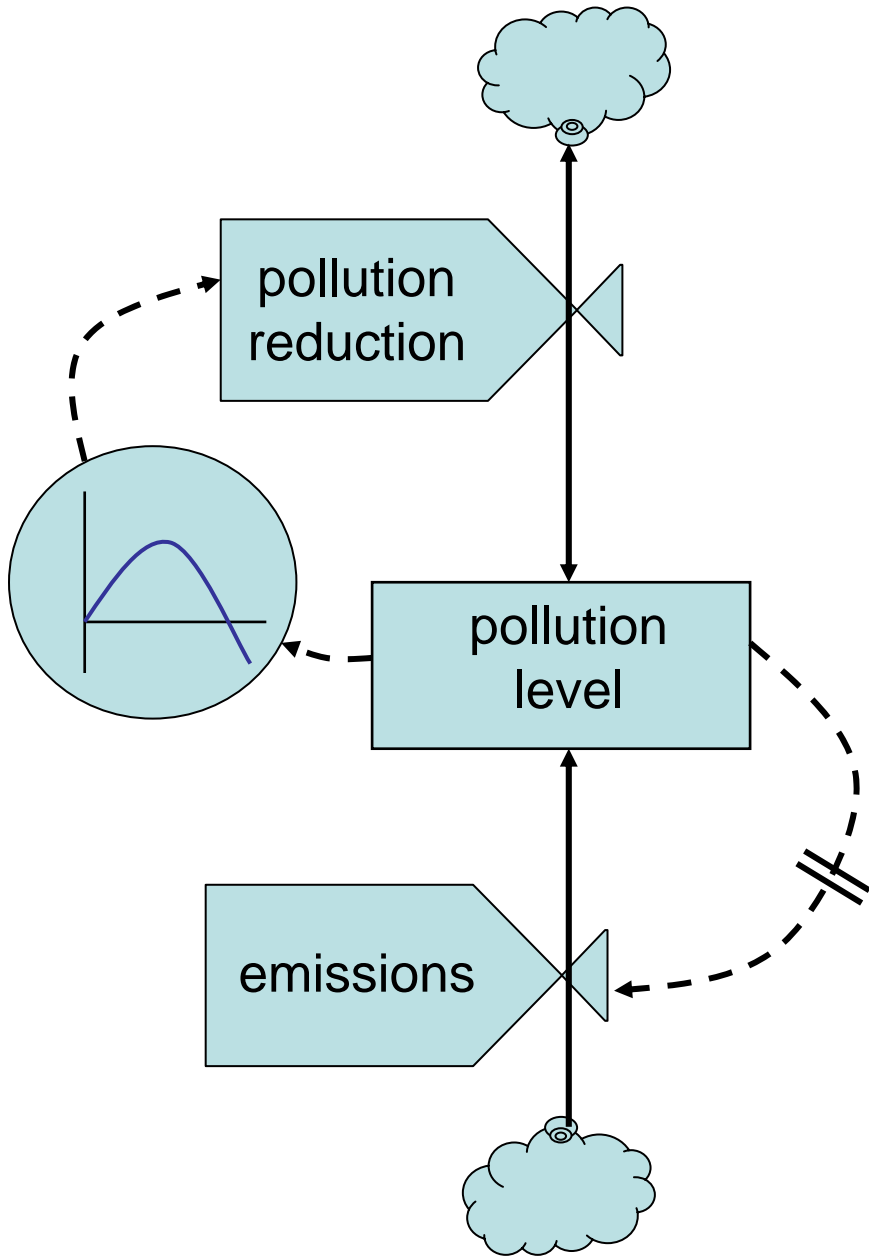


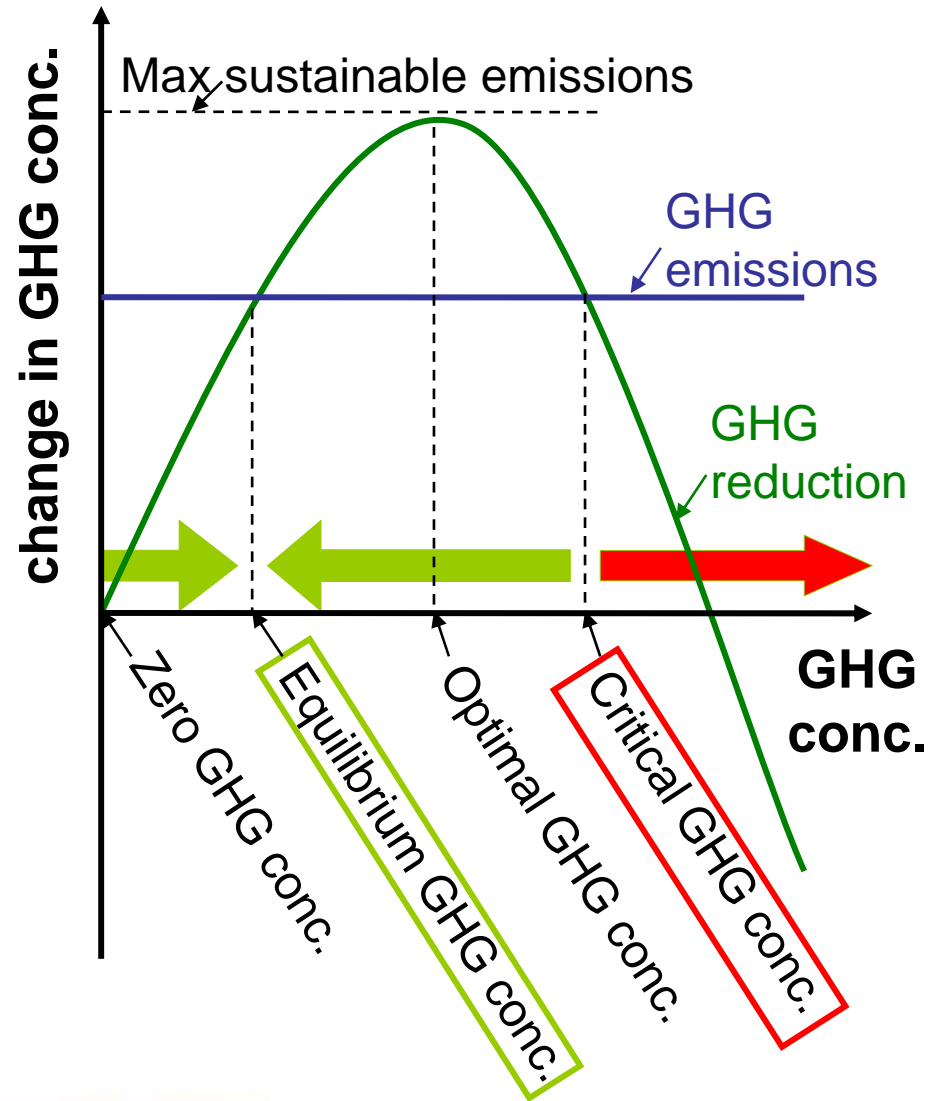
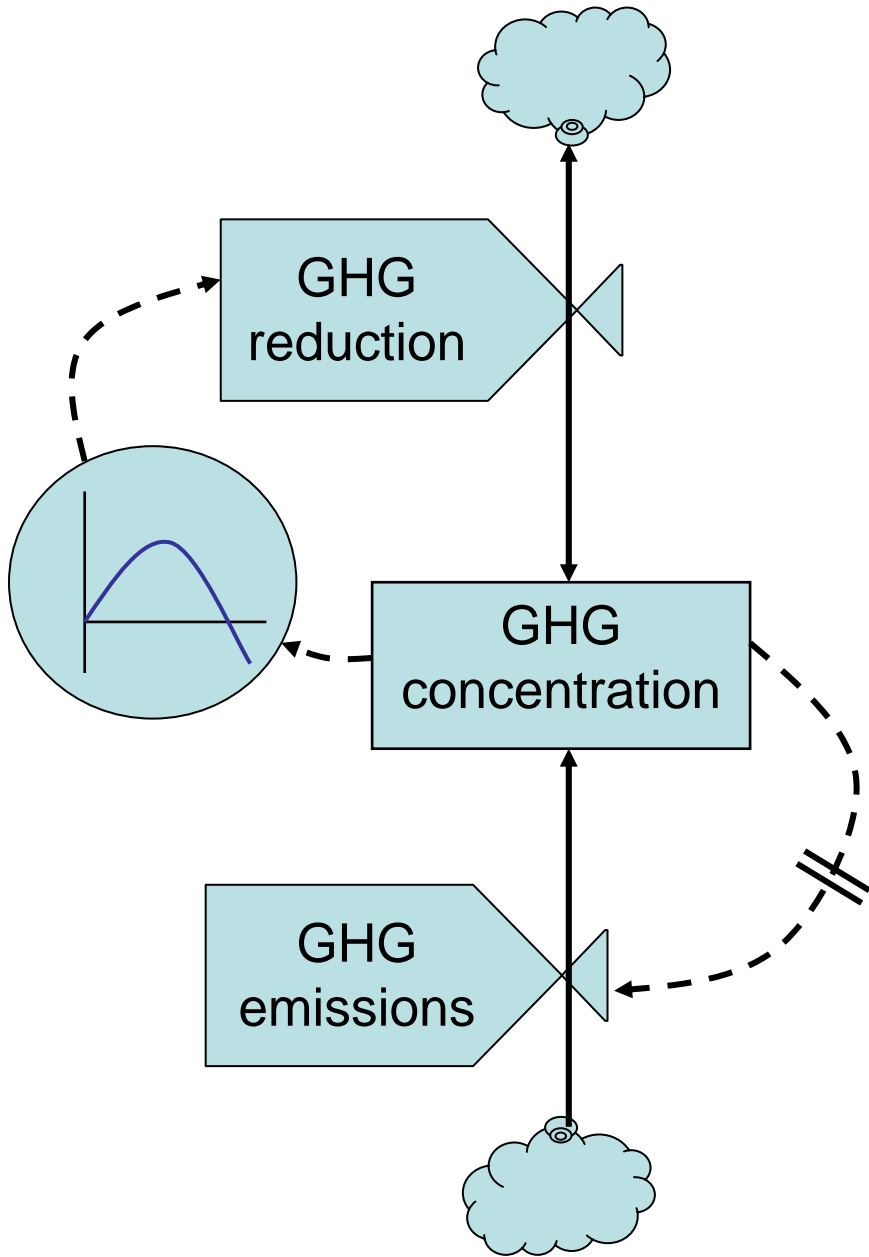
Source: GRID Arendal, Planet in Peril, 2004











# BENDING THE GHG RATE/LEVEL GRAPH

**Some phenomena lower the right-hand end of the rate/level diagram for GHG concentration:**

- 1. Deforestation – less GHG bound at a given GHG conc**
- 2. Acidification of the ocean – less GHG absorption at given GHG conc, possibly down to zero and below**
- 3. Release of methane gas from the tundra – adding new GHG to the atmosphere at a given GHG conc**

**Humanity is bending the rate/level diagram for the GHG concentration. Jay was right!**

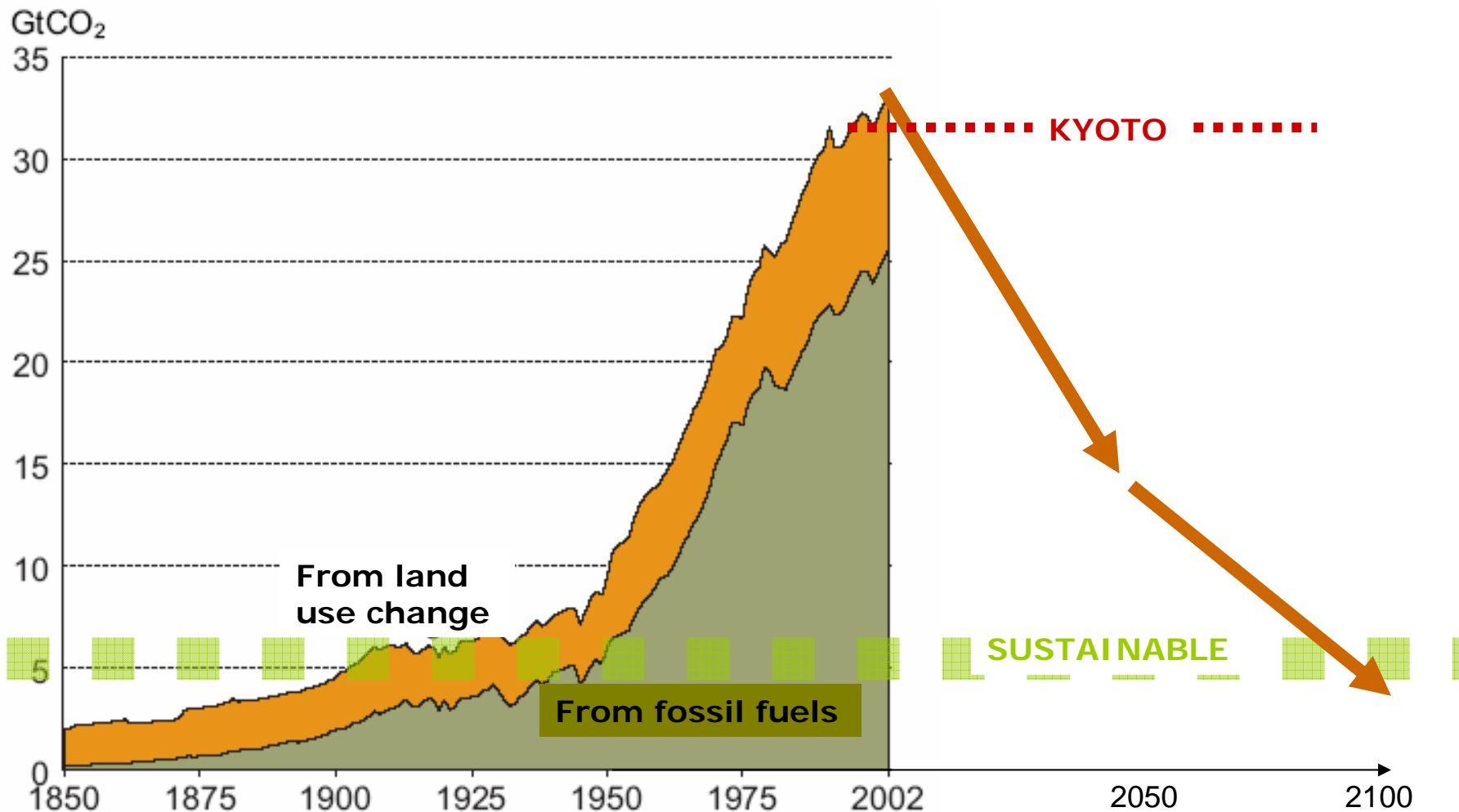
# INCREASING GLOBAL DECISION DELAYS

## GLOBAL SOCIETY TENDS TO POSTPONE STRONG CLIMATE ACTION BECAUSE OF:

1. The perceived high cost of action
2. Long time from cost to benefit
3. Immediate effects on distribution: loss of jobs
4. The tragedy of the climate commons
5. The initial damage strikes those who can't afford to act
6. Legitimate unwillingness among the poor to commit
7. The tyranny of cost- effective solutions

**This lengthens the reaction delay. Jay was right!**

# ENOUGH? 50 % CUT IN CO<sub>2</sub> BY 2050



# GLOBAL COLLAPSE?

