



Institute
and Faculty
of Actuaries

We need to talk about sustainability

Nico Aspinall and Louise Pryor



Agenda

- Relevance
- Actuarial weaknesses
- Actuarial strengths
- The future
- Getting involved



What's it got to do with me?



"5197 - Near Eigergletscher Station" by Andrew Bossi - Own work. Licensed under CC BY-SA 2.5 via Commons



Institute
and Faculty
of Actuaries



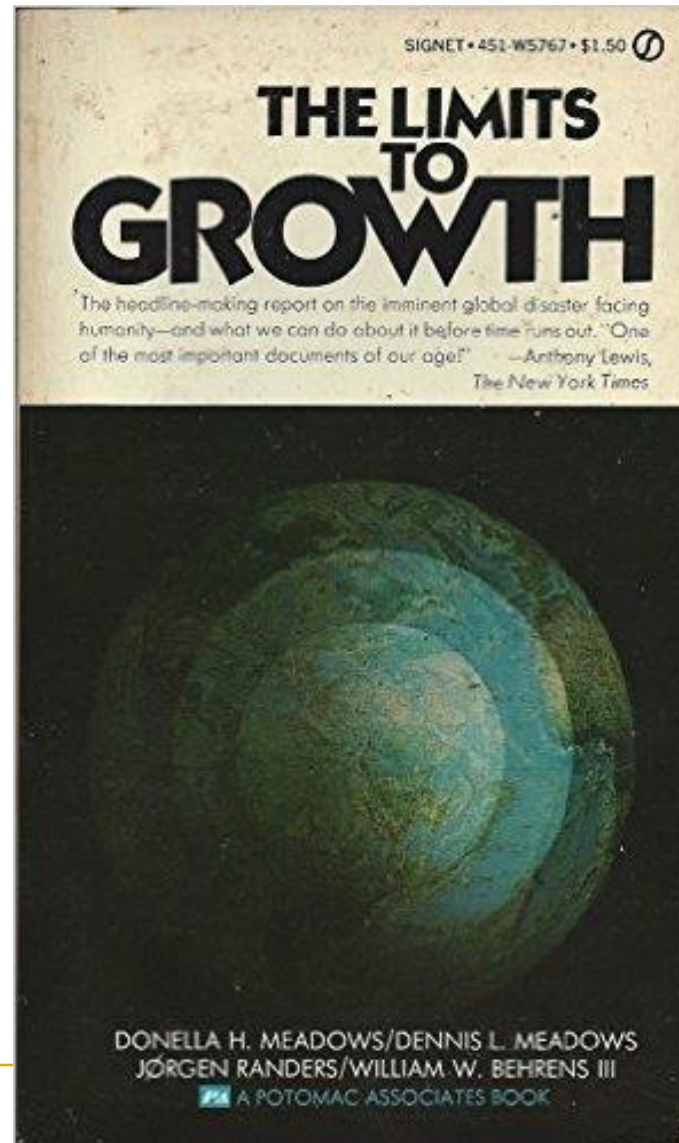
Institute
and Faculty
of Actuaries

Weaknesses

25 November 2015

ertise
ponsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Support

Limits to Growth



Institute
and Faculty
of Actuaries

Limits to Growth

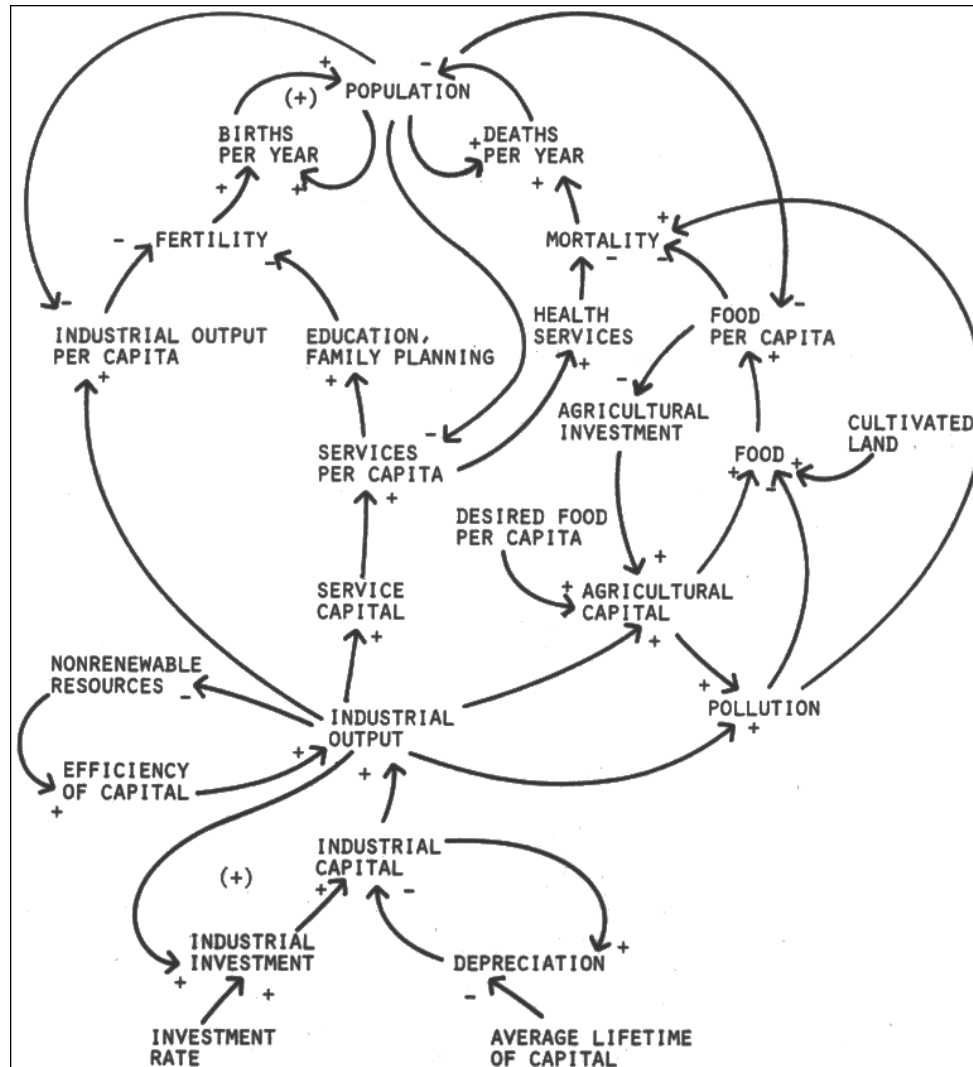
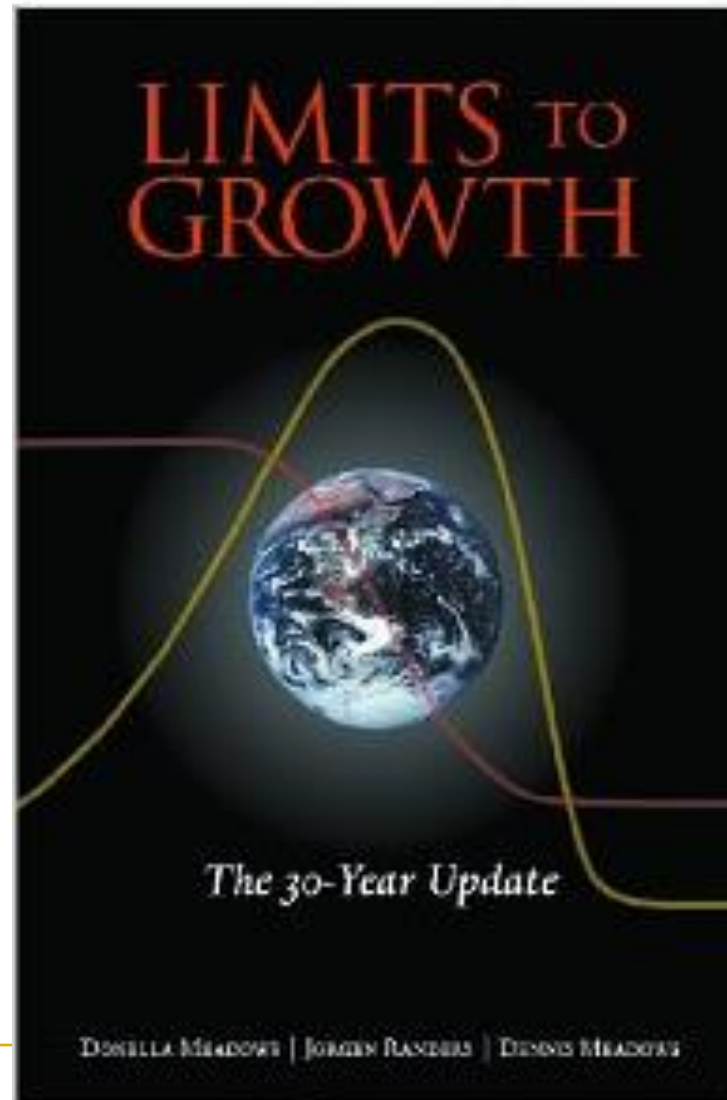


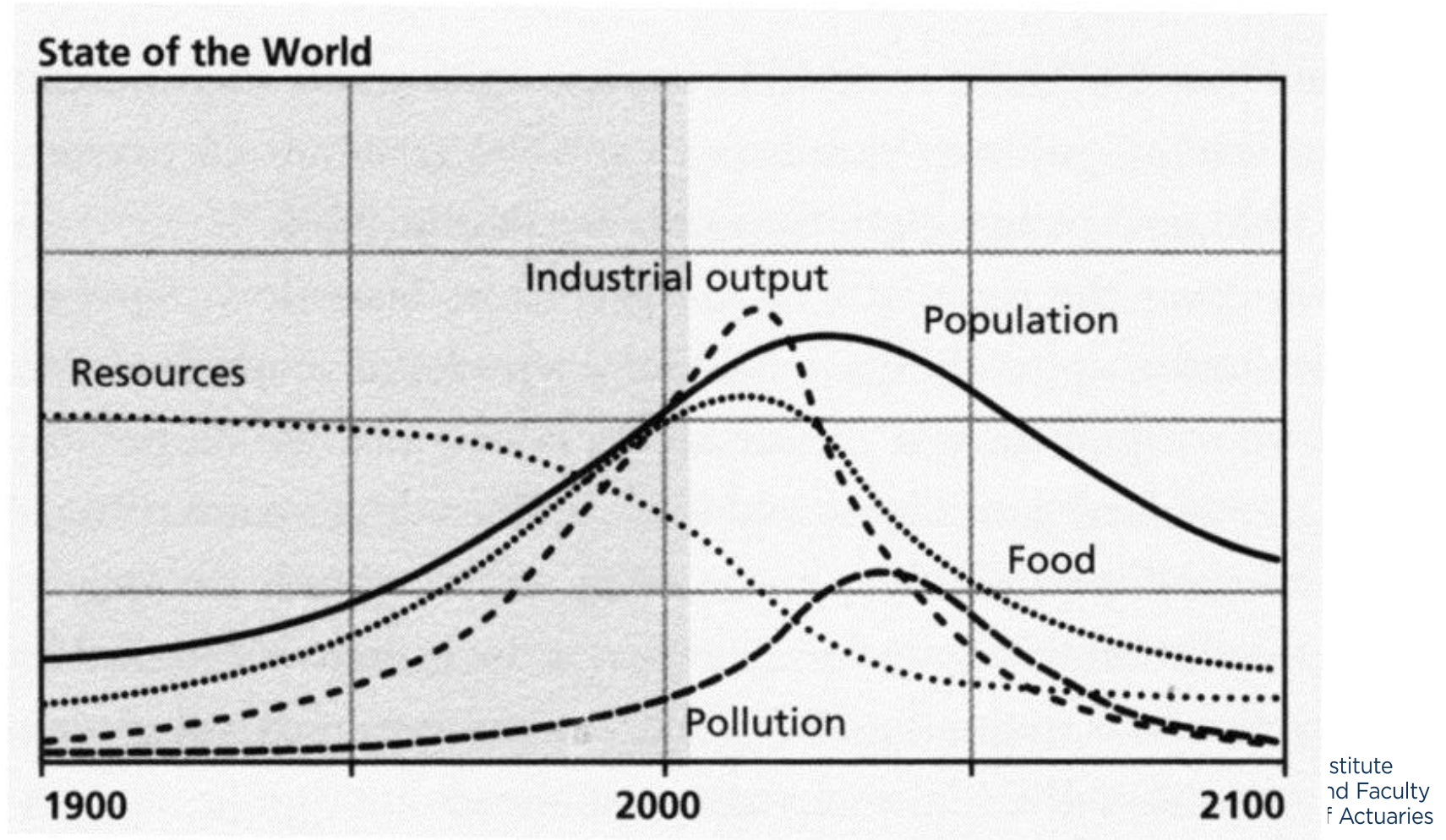
Figure 1-3 Causal-loop diagram of several important feedback loops in World3

Limits to Growth

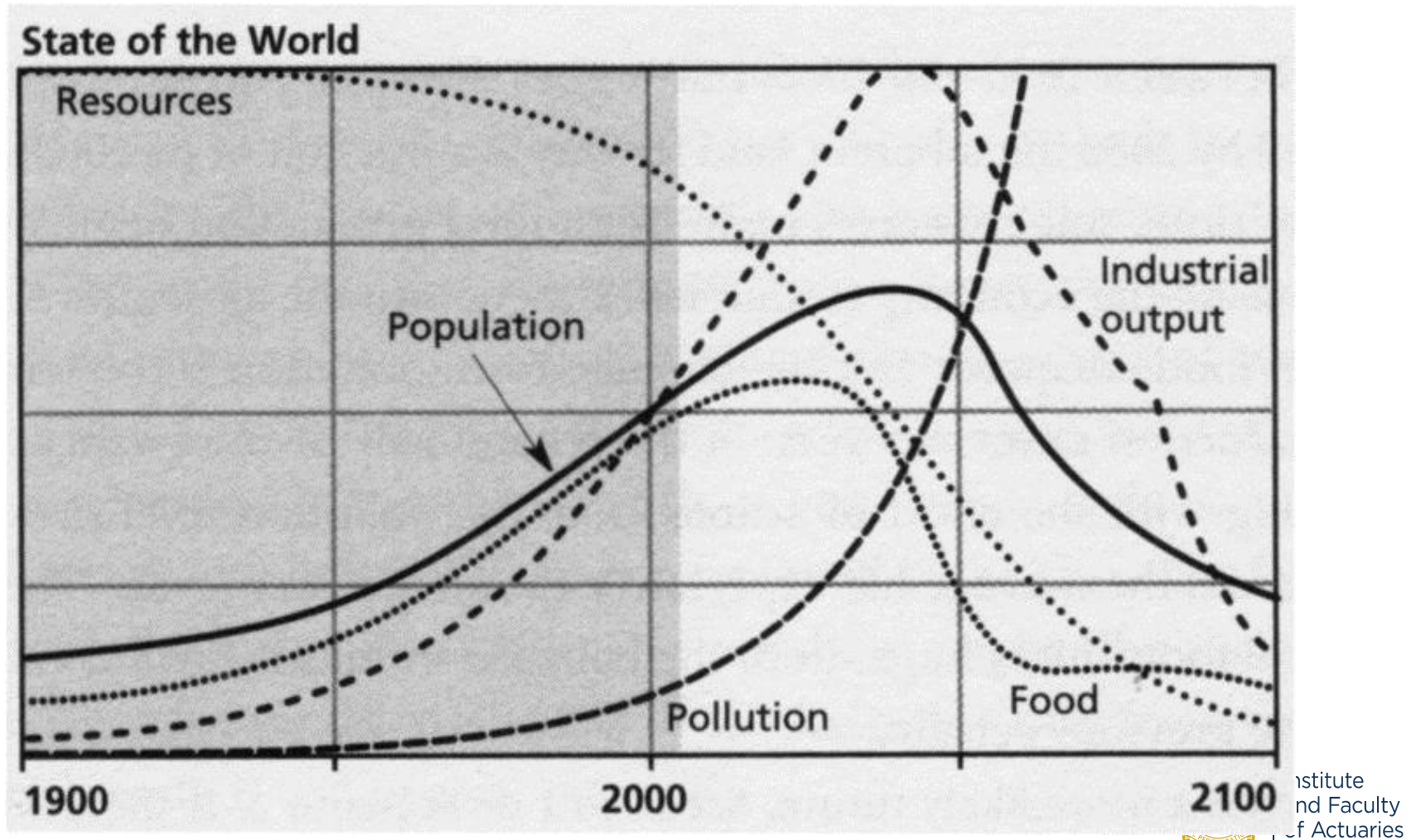


Institute
and Faculty
of Actuaries

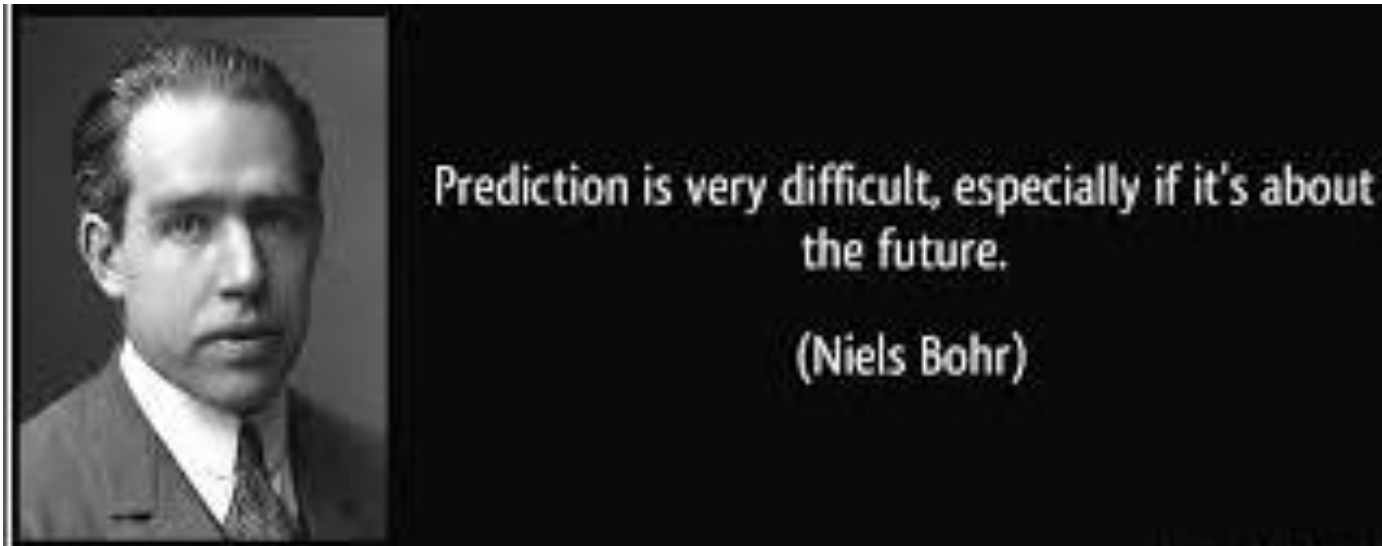
Limits to Growth



Limits to Growth



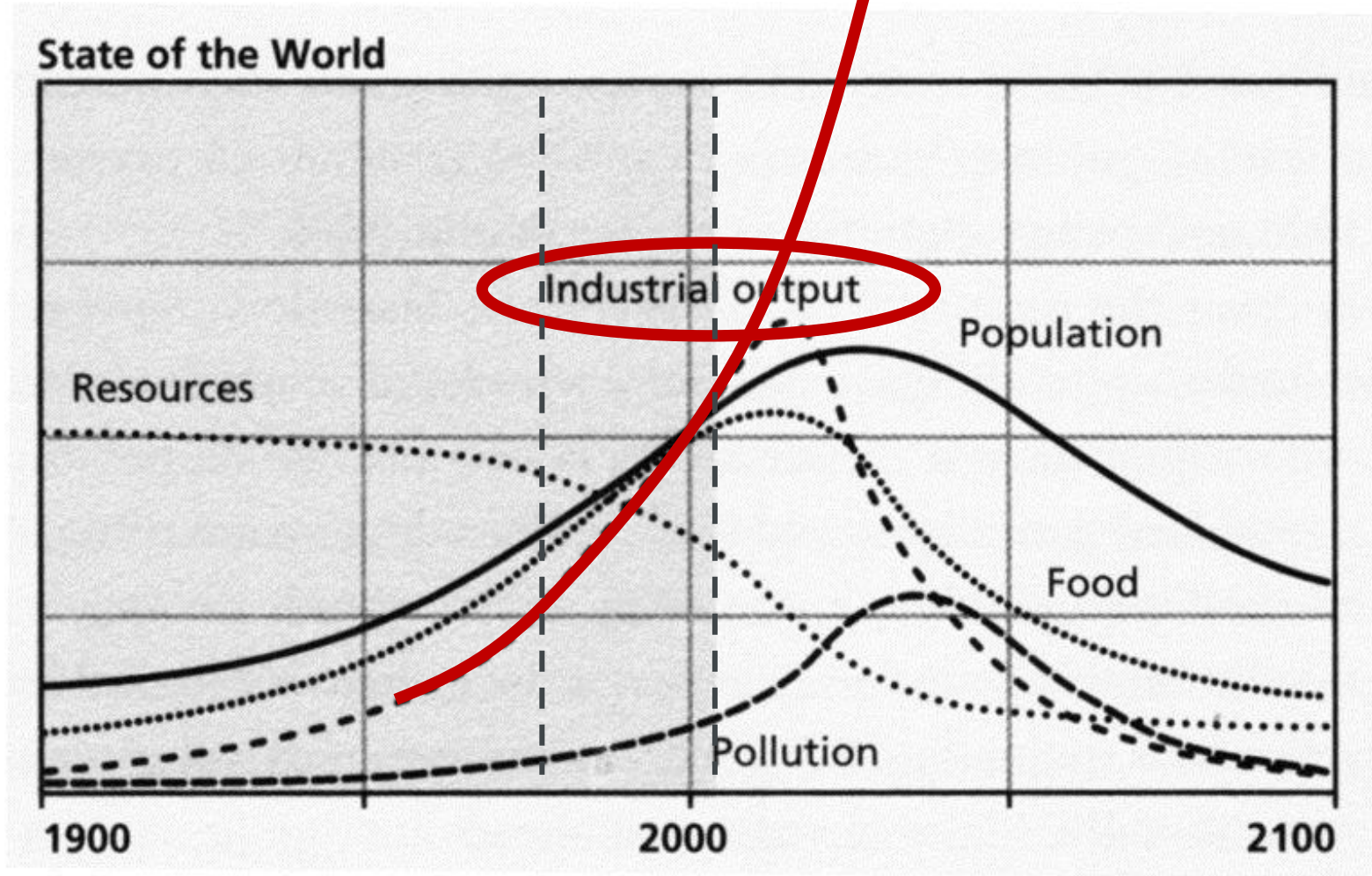
Extrapolation



Extrapolation

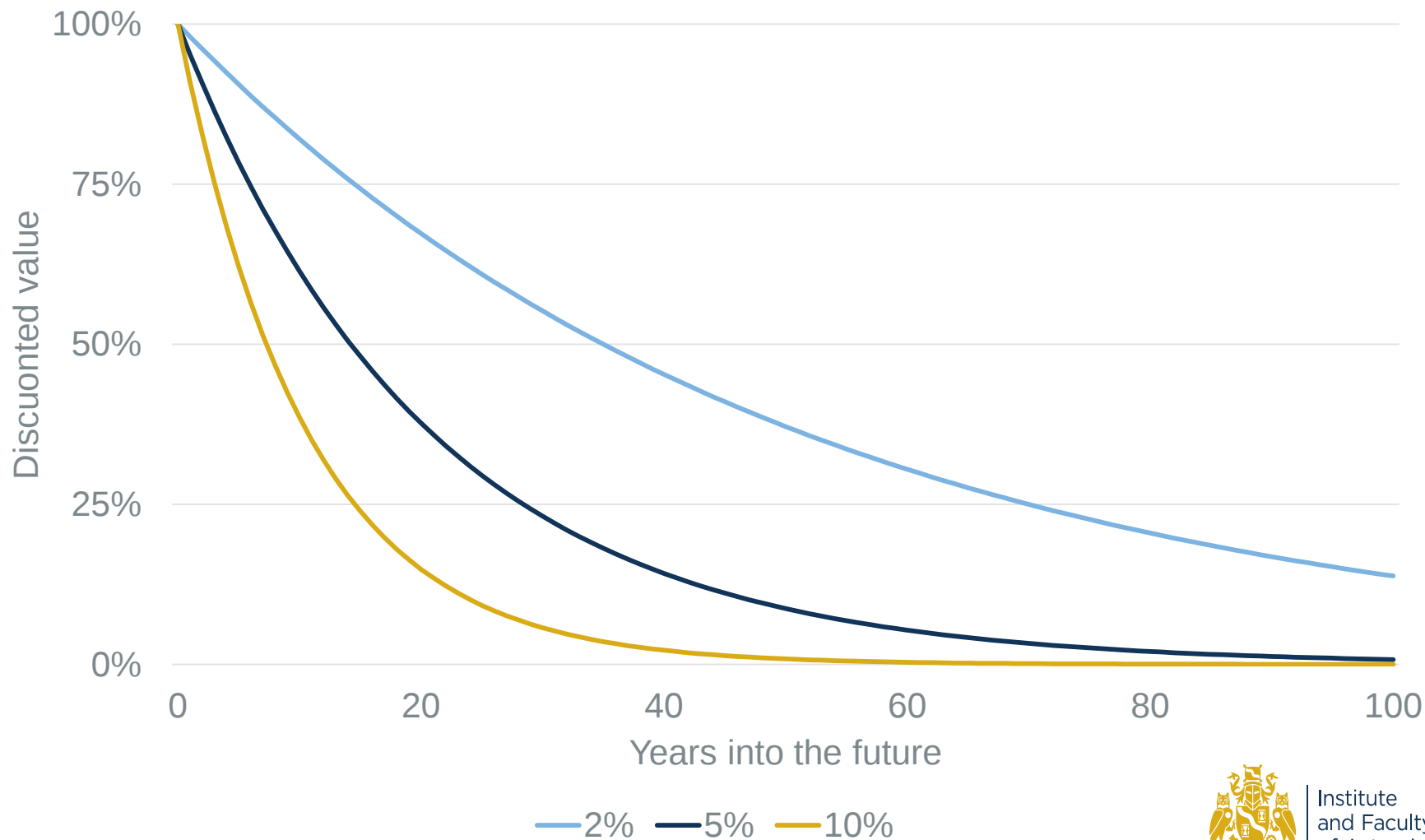


Extrapolation



Institute
and Faculty
of Actuaries

Discount rates and monetisation



Institute
and Faculty
of Actuaries

Discount rates and monetisation



=?

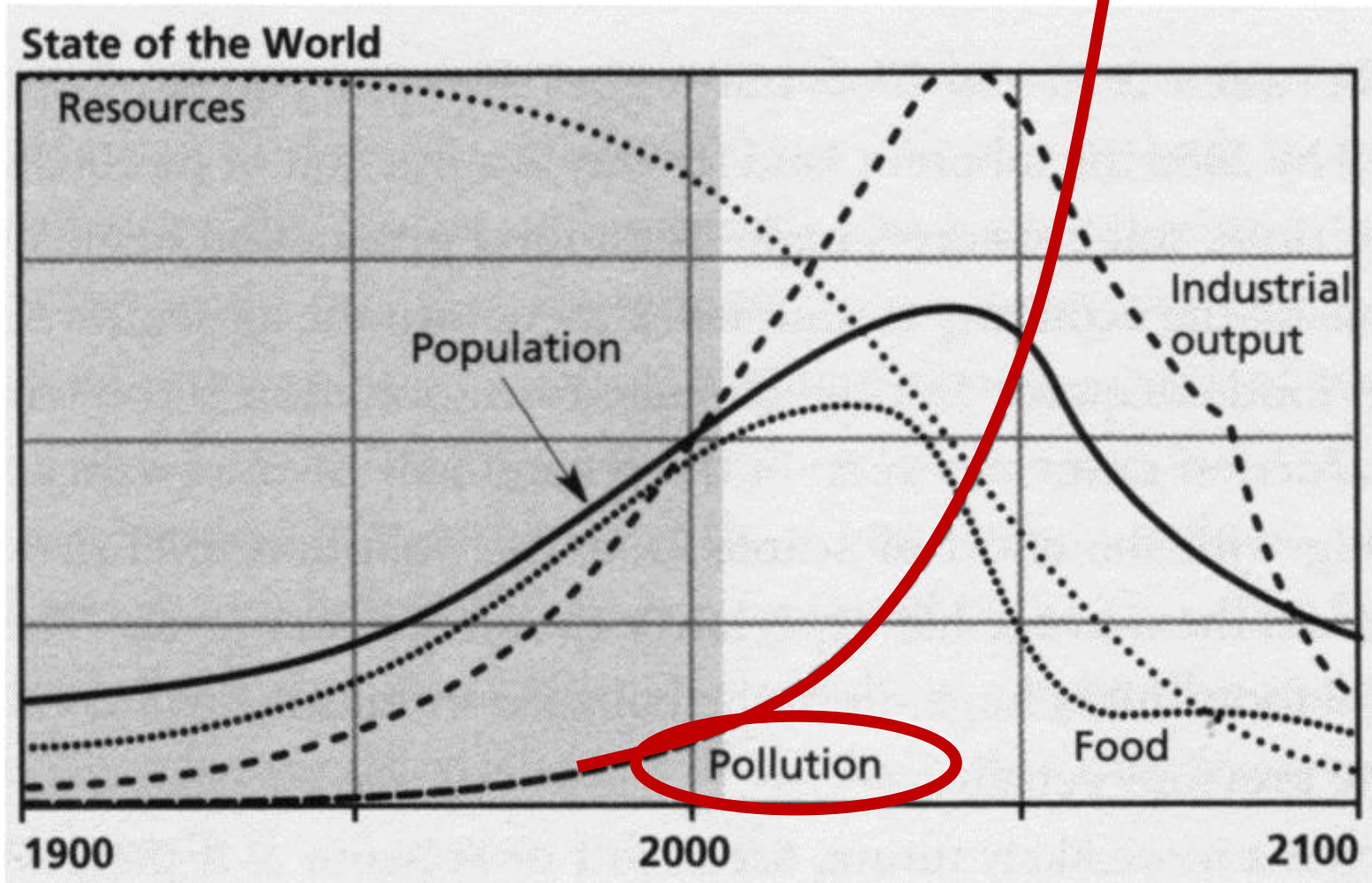


=?



Institute
and Faculty
of Actuaries

2nd law of thermodynamics

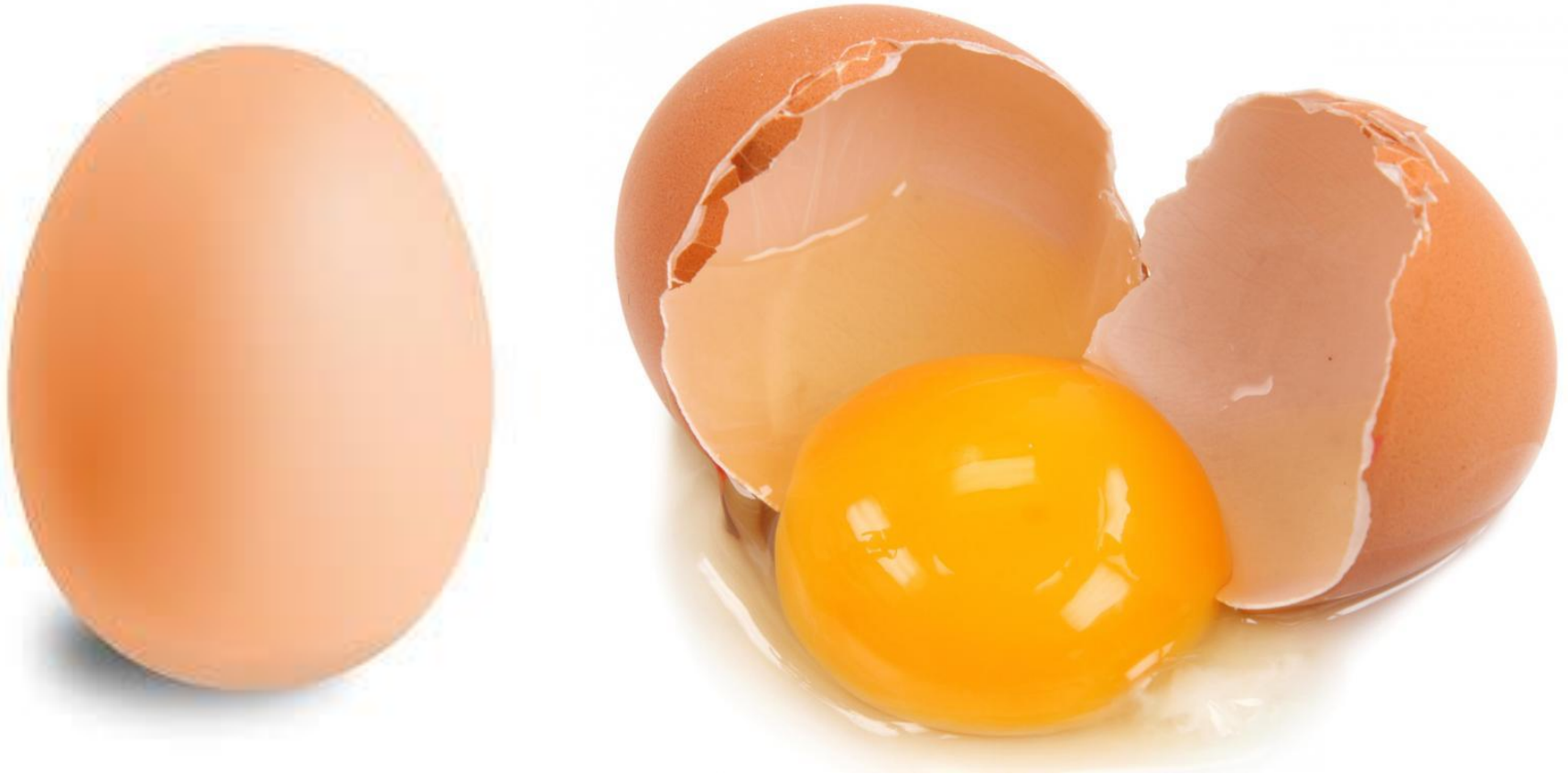


2nd law of thermodynamics

$$dS \geq 0$$



2nd law of thermodynamics

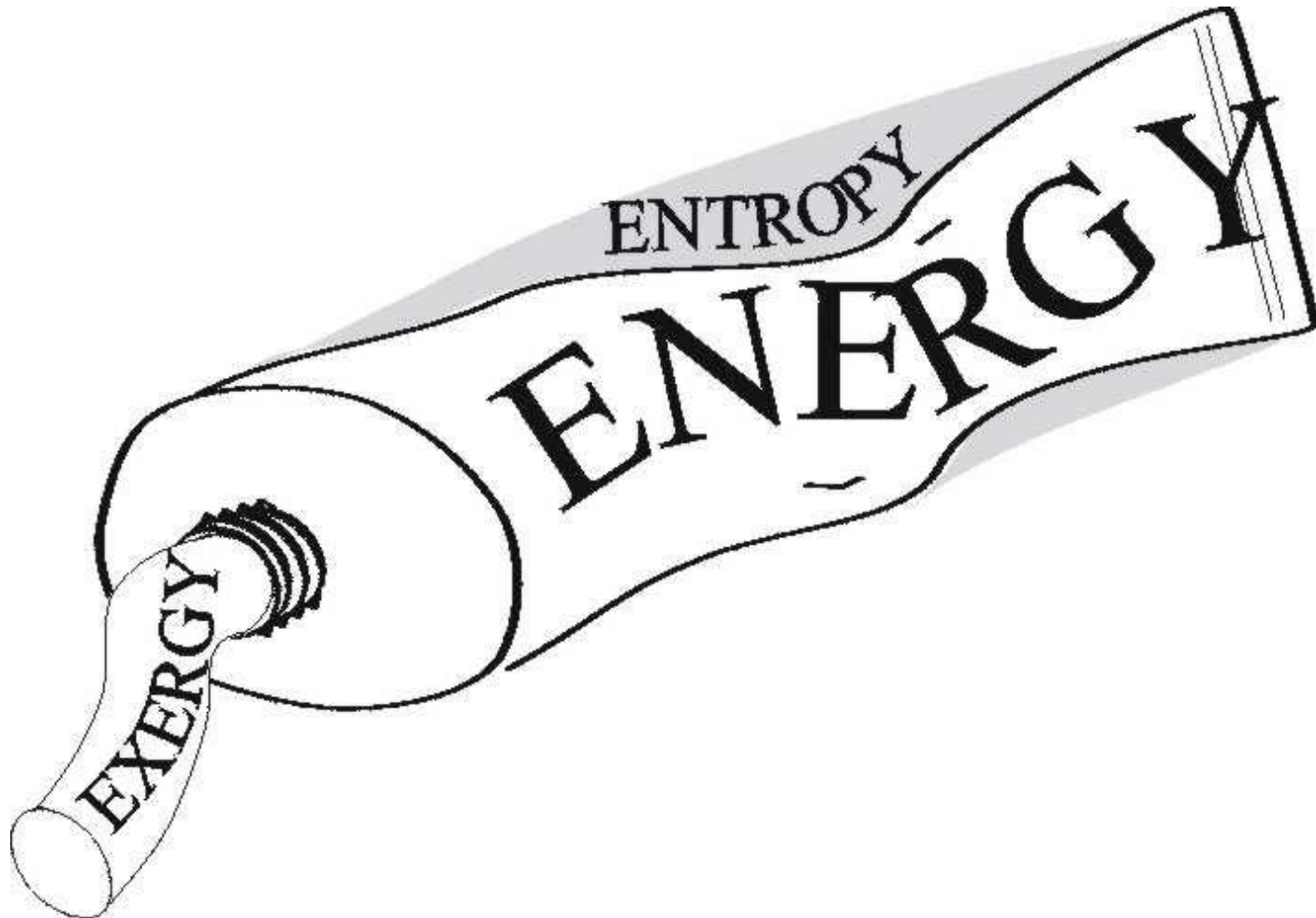


2nd law of thermodynamics



Institute
of Actuaries
Faculty
of Actuaries

2nd law of thermodynamics



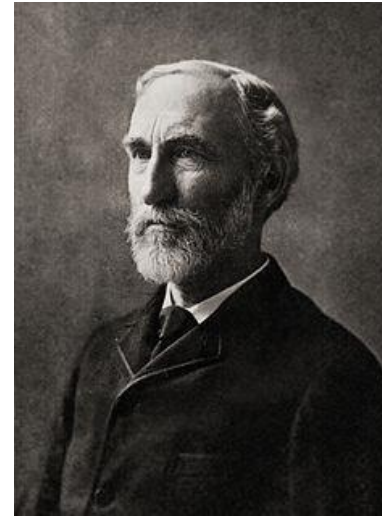
2nd law of thermodynamics



Adam Smith
1723 – 1790



David Ricardo
1772 – 1823



Josiah Gibbs
1839 – 1903



Ludwig Boltzmann
1844 – 1906



The Entropy Law and the Economic Process

Nicholas Georgescu-Roegen



Harvard University Press



Institute
and Faculty
of Actuaries



Institute
and Faculty
of Actuaries

Strengths

25 November 2015

ertise
ponsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Support

Risk management

Figure 5: **Example of a non-modelled risk**; alternative estimates of temperature sensitivity to CO₂ (plotted areas include uncertainty of 1 standard deviation, the full range of possible outcomes is wider).⁶

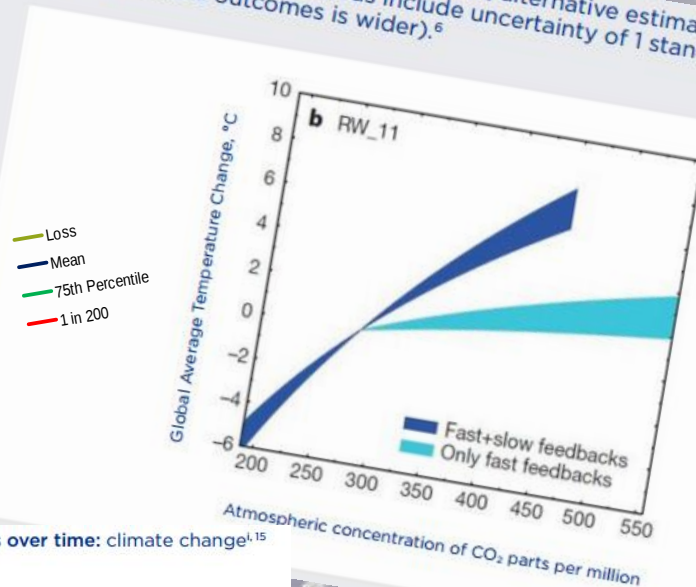
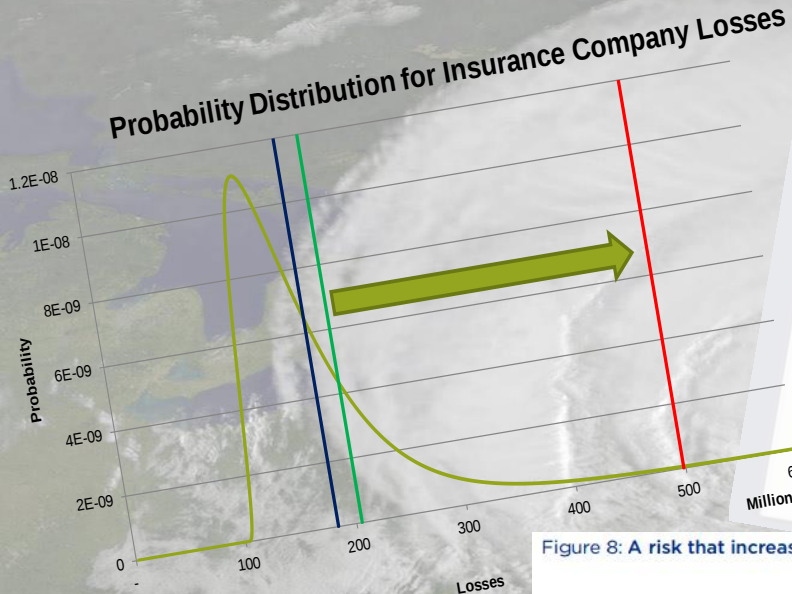
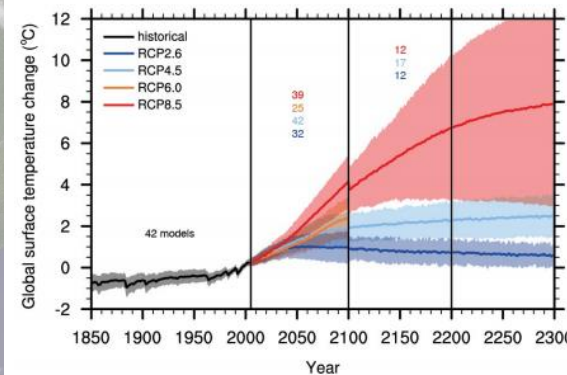


Figure 8: **A risk that increases over time: climate change**.¹⁵



"Hurricane irene 082711 0150 est"
by NASA/NOAA GOES Project -
NASA Licensed under Public
Domain via Commons -
https://commons.wikimedia.org/wiki/File:Hurricane_irene_082711_0150_est.jpg#/media/File:Hurricane_irene_082711_0150_est.jpg



Institute
and Faculty
of Actuaries

In the IFoA

Find out about



Finance and Investment Board

Find out about



General Insurance Board

Find out about



Health and Care Board

Find out about



Life Board

Find out about



Pensions Board

Find out about



**Resource and Environment
Board**

Find out about

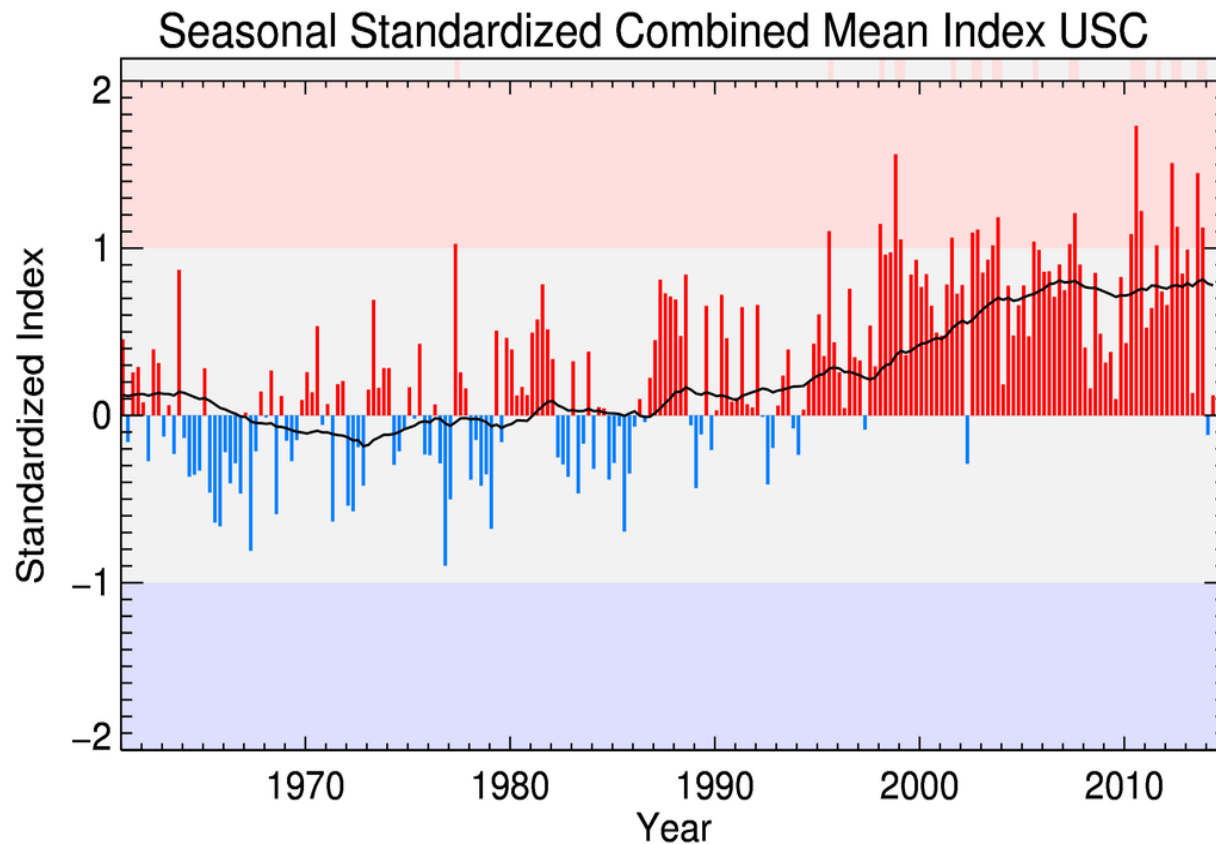


Risk Management Board



Institute
and Faculty
of Actuaries

Actuaries Climate Index





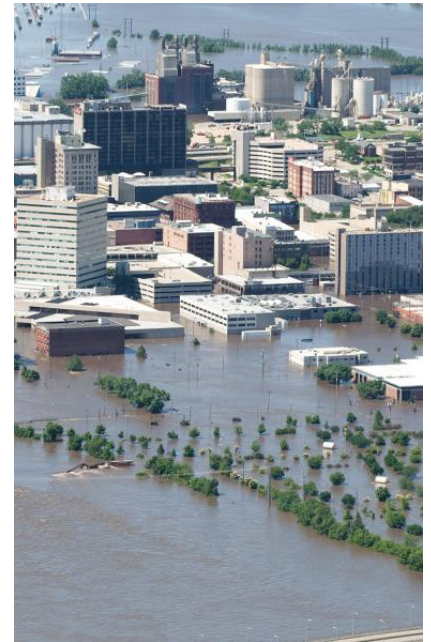
Institute
and Faculty
of Actuaries

The future

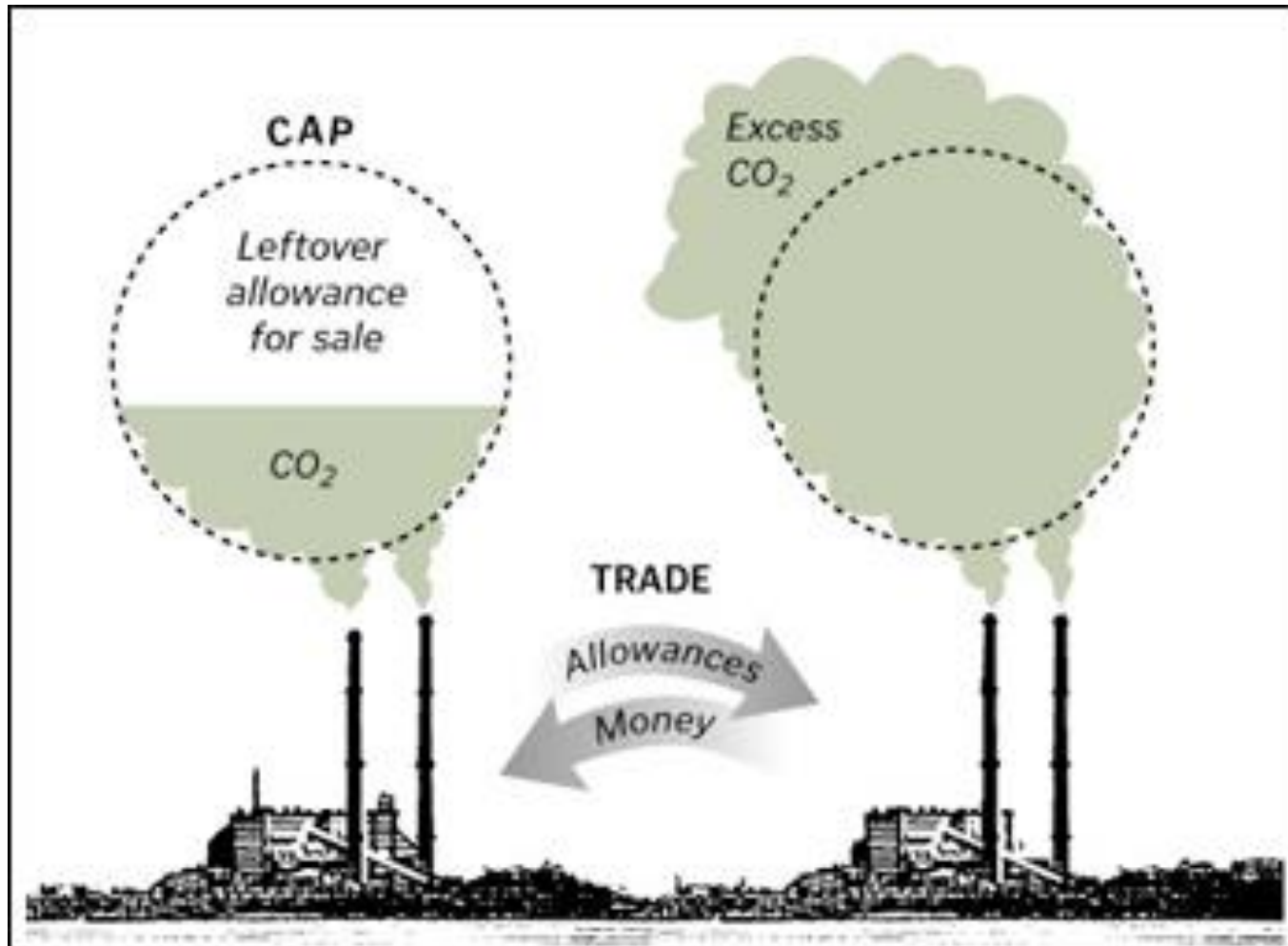
25 November 2015

ertise
ponsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Support

Shallow approaches



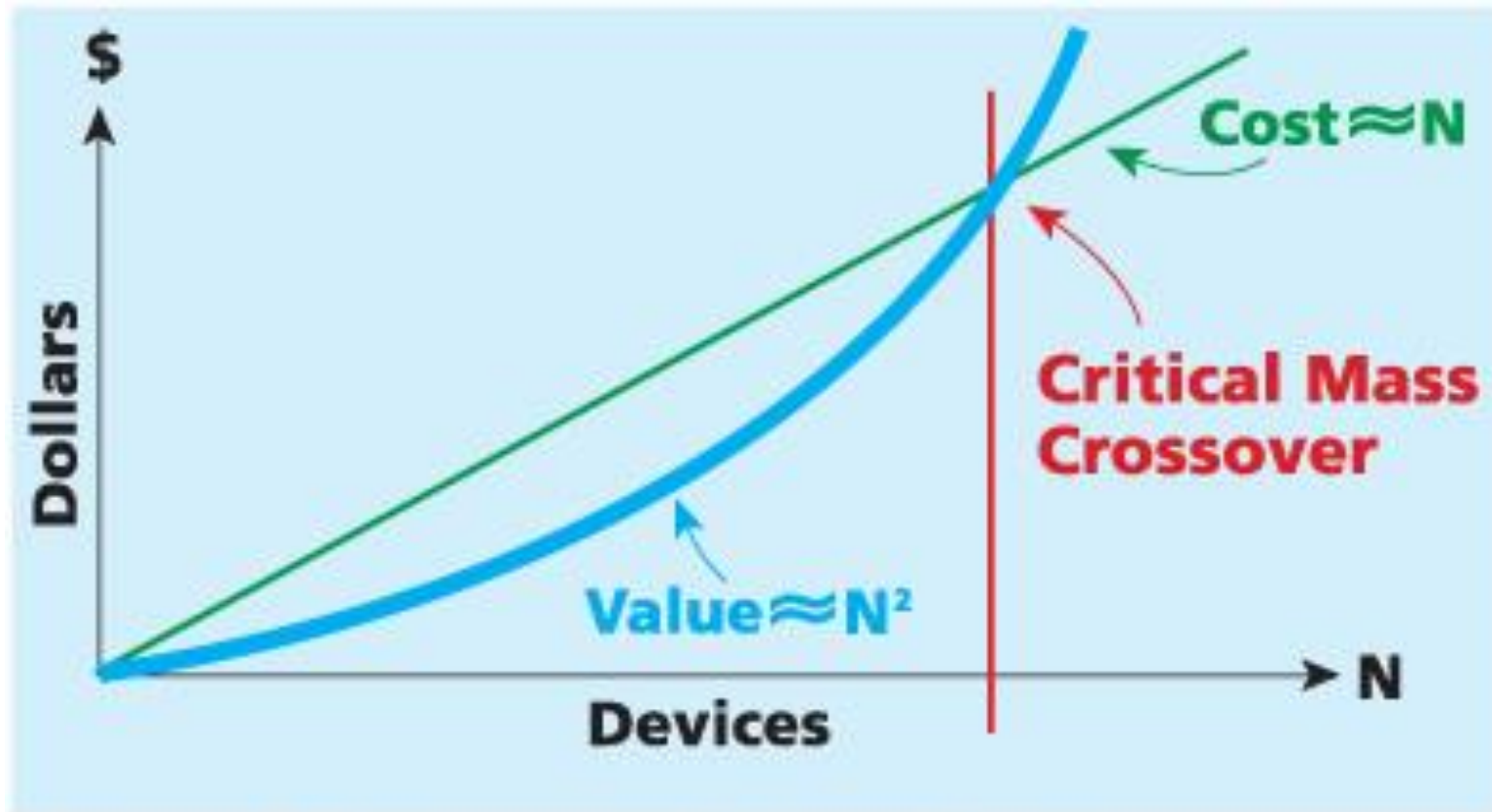
Shallow approaches



Shallow approaches

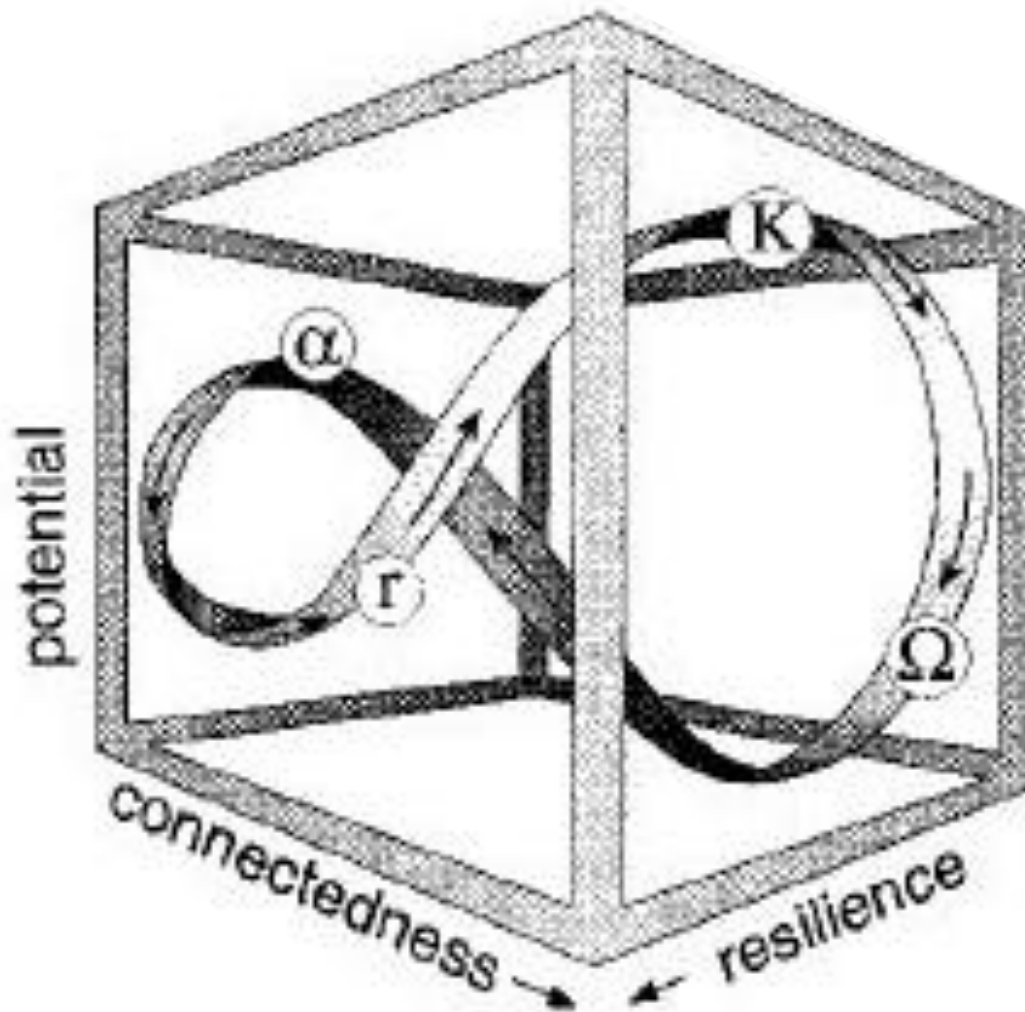


Deep approaches

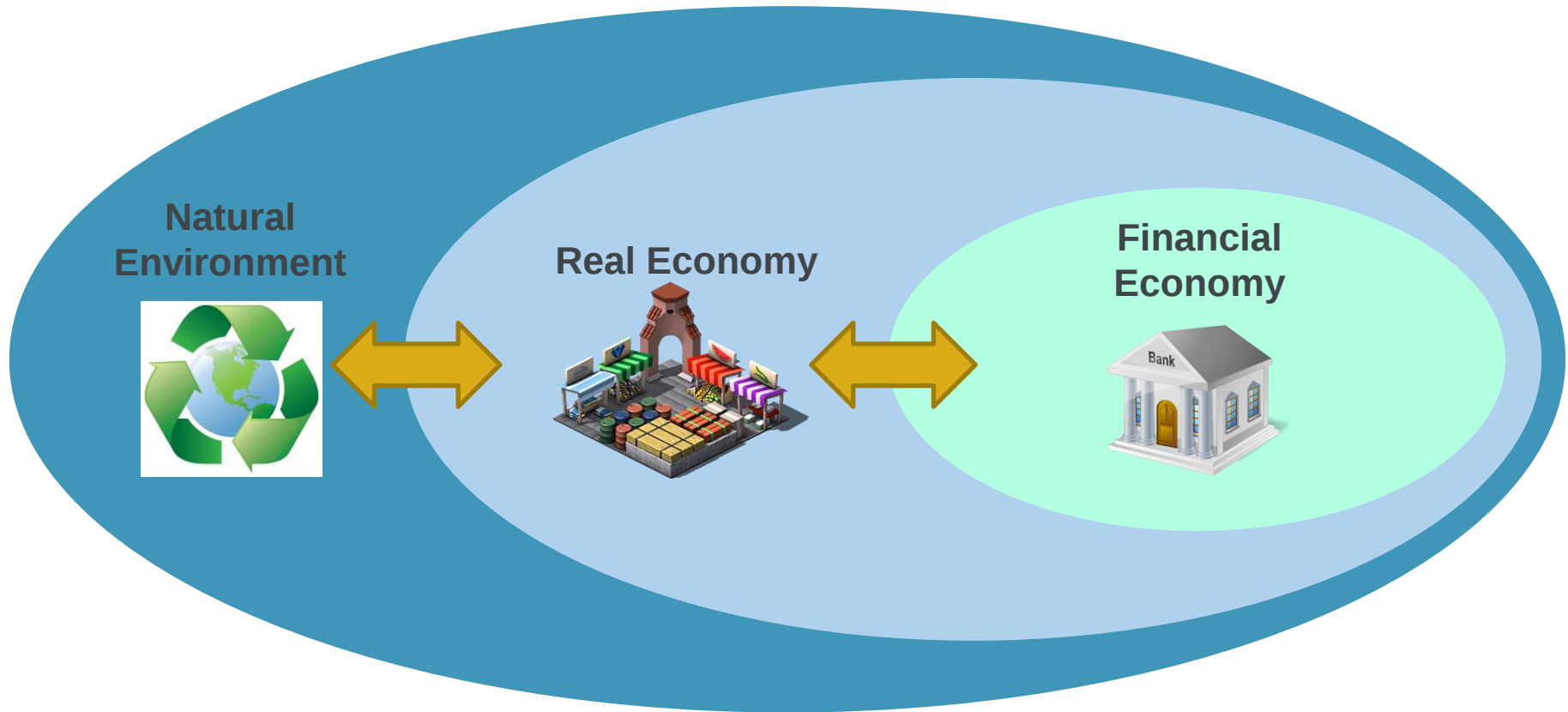


The Network Effect

Deep approaches



Deep approaches





Institute
and Faculty
of Actuaries

Getting involved

25 November 2015

ertise
ponsorship
Thought leadership
Progress
Community
Sessional Meetings
Education
Working parties
Volunteering
Research
Shaping the future
Networking
Professional support
Enterprise and risk
Learned society
Opportunity
International profile
Journals
Support

What you can do

- Think about these things in your daily life
- Sign up to the R&E newsletter
- Suggest!
- Volunteer!

Hello Louise

[Near you](#) [Practice areas](#) [My Account](#) [Log out](#)



Contact preferences

Select the information you would like to receive and your preferred method of contact.

My practice area newsletters

- ☒ Enterprise Risk Management practice
- ☐ Finance & Investment practice
- ☒ General Insurance practice
- ☐ Health & Care practice
- ☒ Life practice
- ☐ Pensions Practice
- ☒ Resource and Environment



Institute and Faculty of Actuaries