BUSINESS AS UNUSUAL

Gaining Advantage in a Dynamic Project Landscape

Session 3: Sustainability in Project Delivery for the 21st Century: Carbon and Beyond

PROGRAM CO-CHAIR

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KBR

BUSINESS AS UNUSUAL

Gaining Advantage in a Dynamic Project Landscape

Sustainability in Project Delivery for the 21st Century: Carbon and Beyond

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Outline

- This really is business as unusual
- Background: A brief Journey of Sustainability
- Towards a Quantitative Measure of Real Sustainability
- Making Sustainability Work for Business Decision-Making
- Examples from Infrastructure and Hydrocarbons Industries
- A New Measure of Success

What is the goal of business?

Milton Friedman (1970):

"the business of business is business"

Edward Freeman (1984):

"the business of business is stakeholders"

Sustainability Circa 1987

UN Bruntland Commission

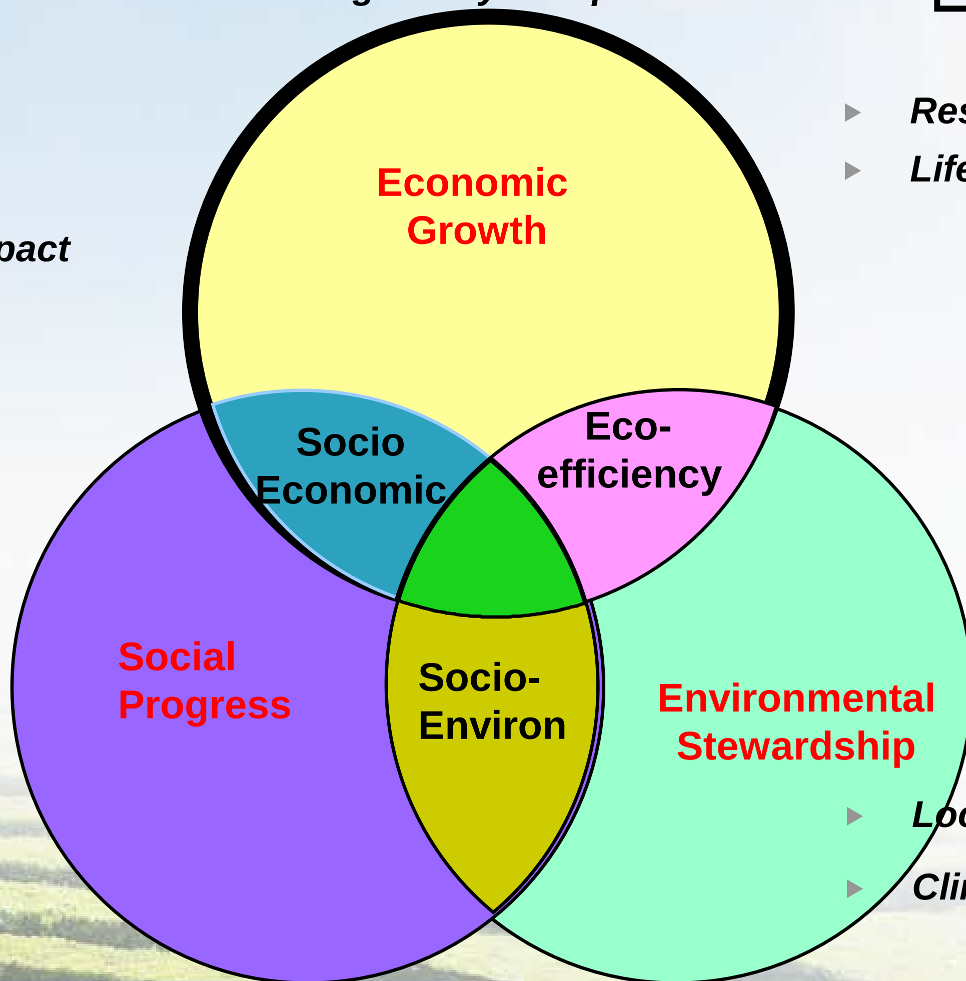
API Sustainability Guidelines

Triple Bottom Line

- *Shareholder Return*
- *Regulatory Compliance*

- *Jobs Creation*
- *Business Ethics*
- *Local Economic Impact*

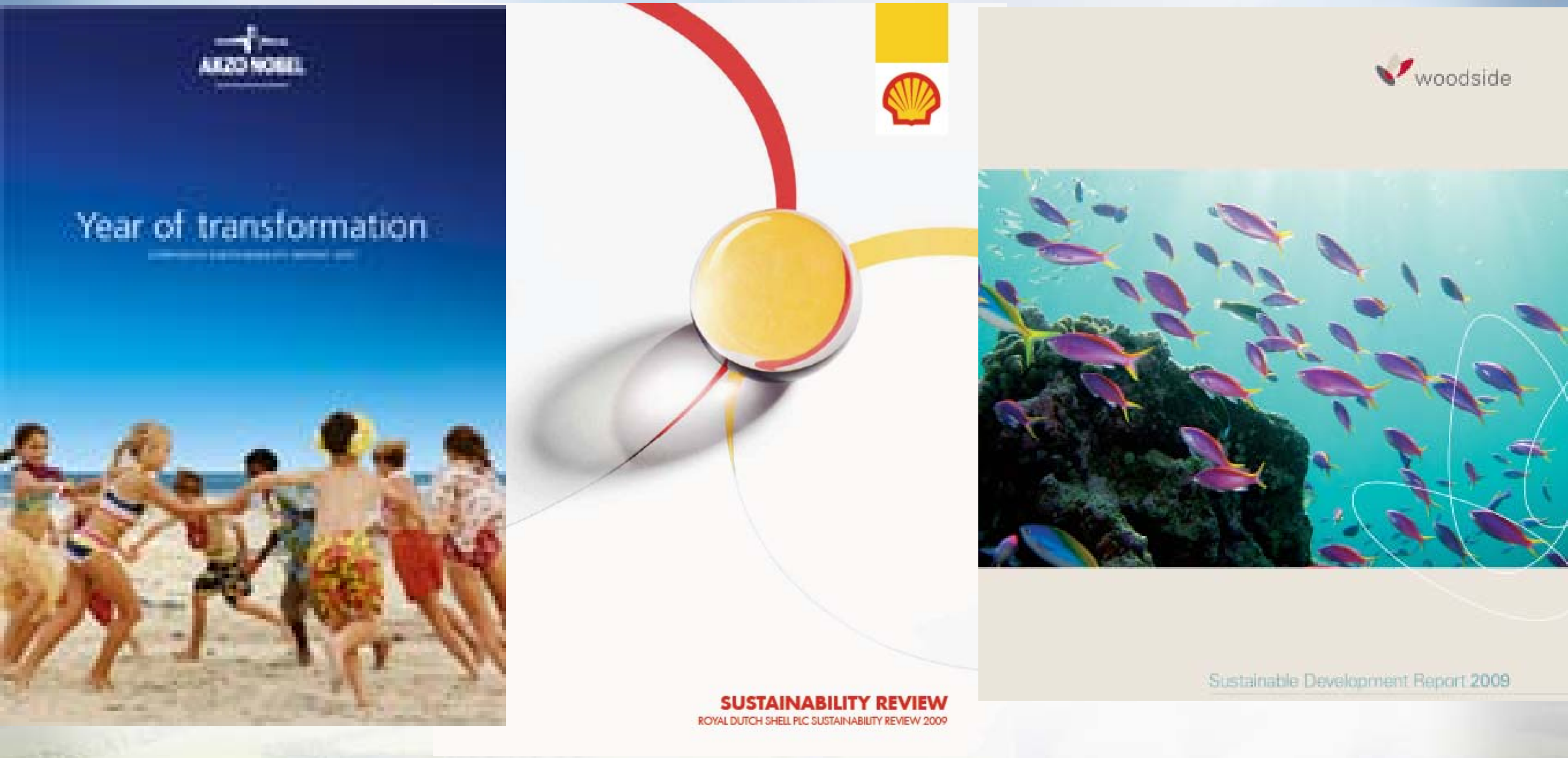
- *Resource efficiency*
- *Life cycle analysis*



- *Human Rights*
- *Labour Standards*
- *Employee Relations*

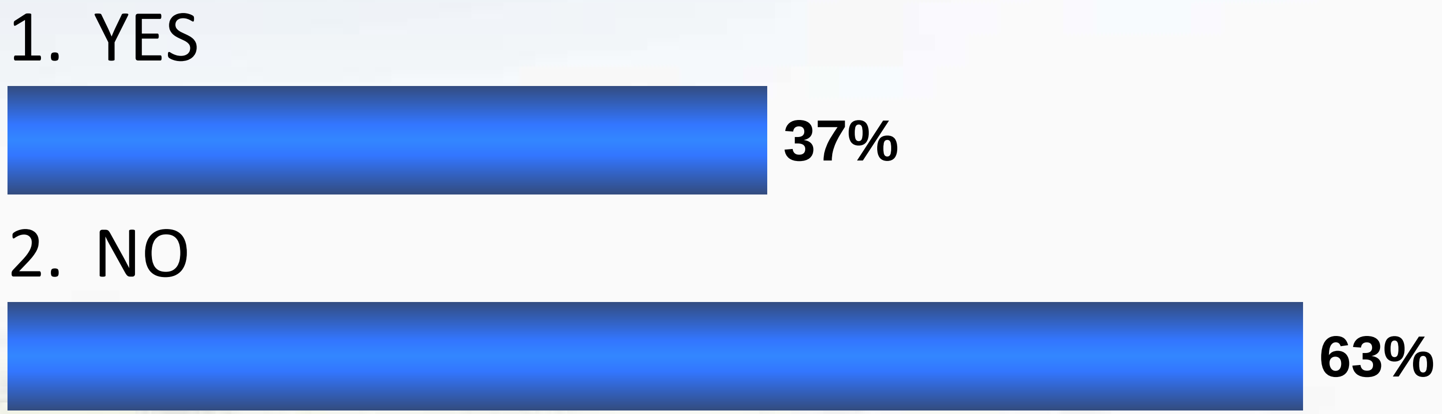
- *Waste minimisation*
- *Emissions reduction*
- *Regulatory compliance*
- *biodiversity*
- *Spill prevention*

- *Local environmental impact*
- *Climate change*

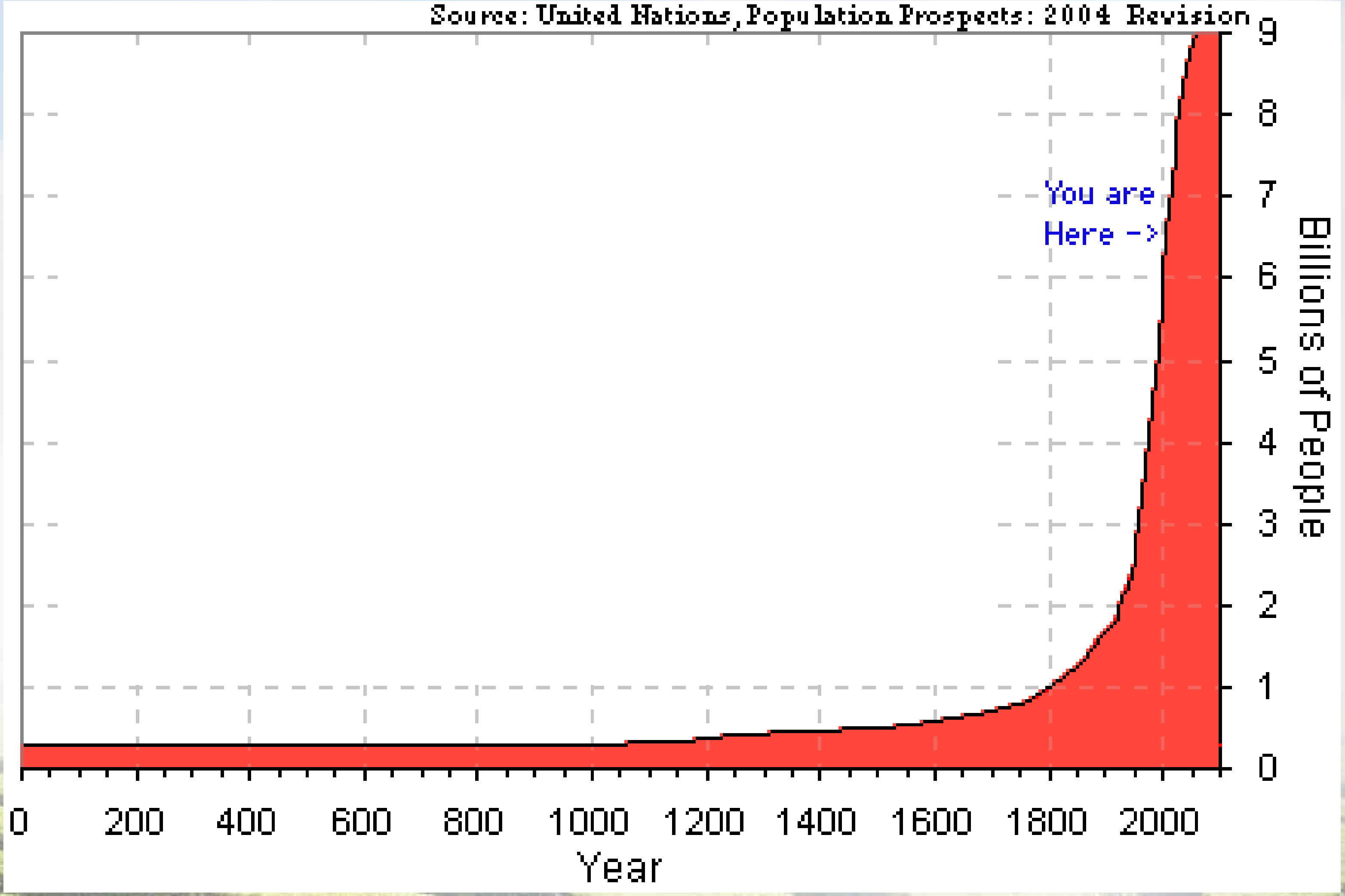

AKZO NOBEL
Year of transformation
SUSTAINABILITY REVIEW
ROYAL DUTCH SHELL PLC SUSTAINABILITY REVIEW 2009
woodside
Sustainable Development Report 2009

ARS Question

1. Do you believe that you understand the concept of sustainability sufficiently well to make it an advantage to your business or project?

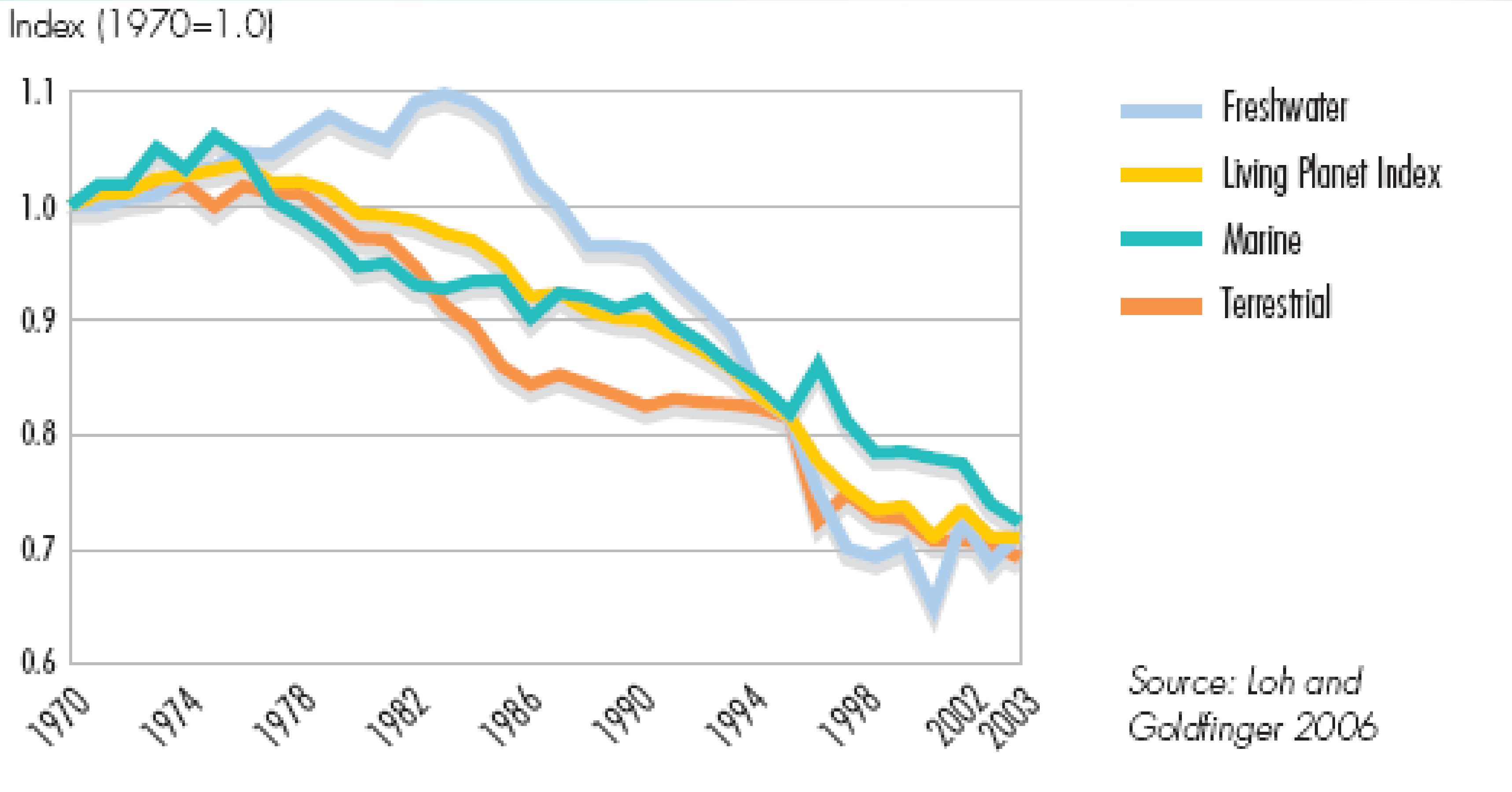


Challenges of 21st Century: Population



Health and Sanitation

Decline in Biodiversity



LIVING PLANET INDEX: UN GEO-4, 2008.

Challenges of the 21st Century

“ The world’s energy system is at a crossroads. Current global trends in energy supply and consumption are patently unsustainable — environmentally, economically, socially. But that can — and must — be altered; *there’s still time to change the road we’re on*.

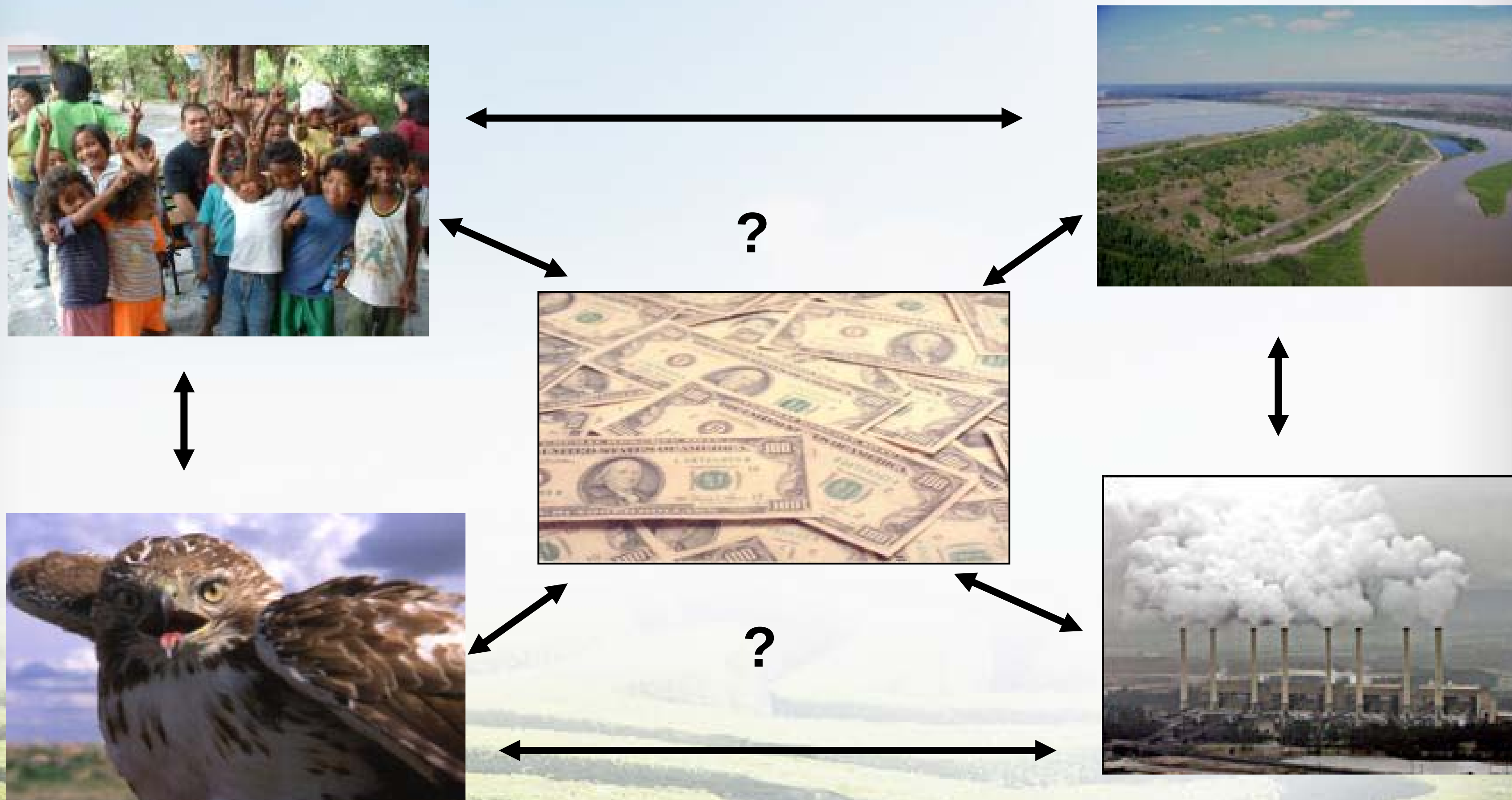
“**It is not an exaggeration to claim that the future of human prosperity depends on how successfully we tackle the two central energy challenges facing us today: securing the supply of reliable and affordable energy; and effecting a rapid transformation to a low-carbon, efficient and environmentally benign system of energy supply. What is needed is nothing short of an energy revolution.**

International Energy Agency / OECD, 2009


WELCOME TO
HOPENHAGEN
POPULATION 6.8 BILLION
SIGN THE CLIMATE CHANGE PETITION AND
BECOME A CITIZEN AT

Decision Making Challenge of Trade-offs:

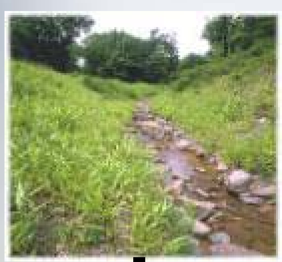
Risk and Value : Cost and Benefit



Monetising Risk and Opportunity

Environment

Society



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Power Production

Conventional Coal-Fired Power

Renewables – wind and solar

ARS Question

2. Which form of power production is more economic?

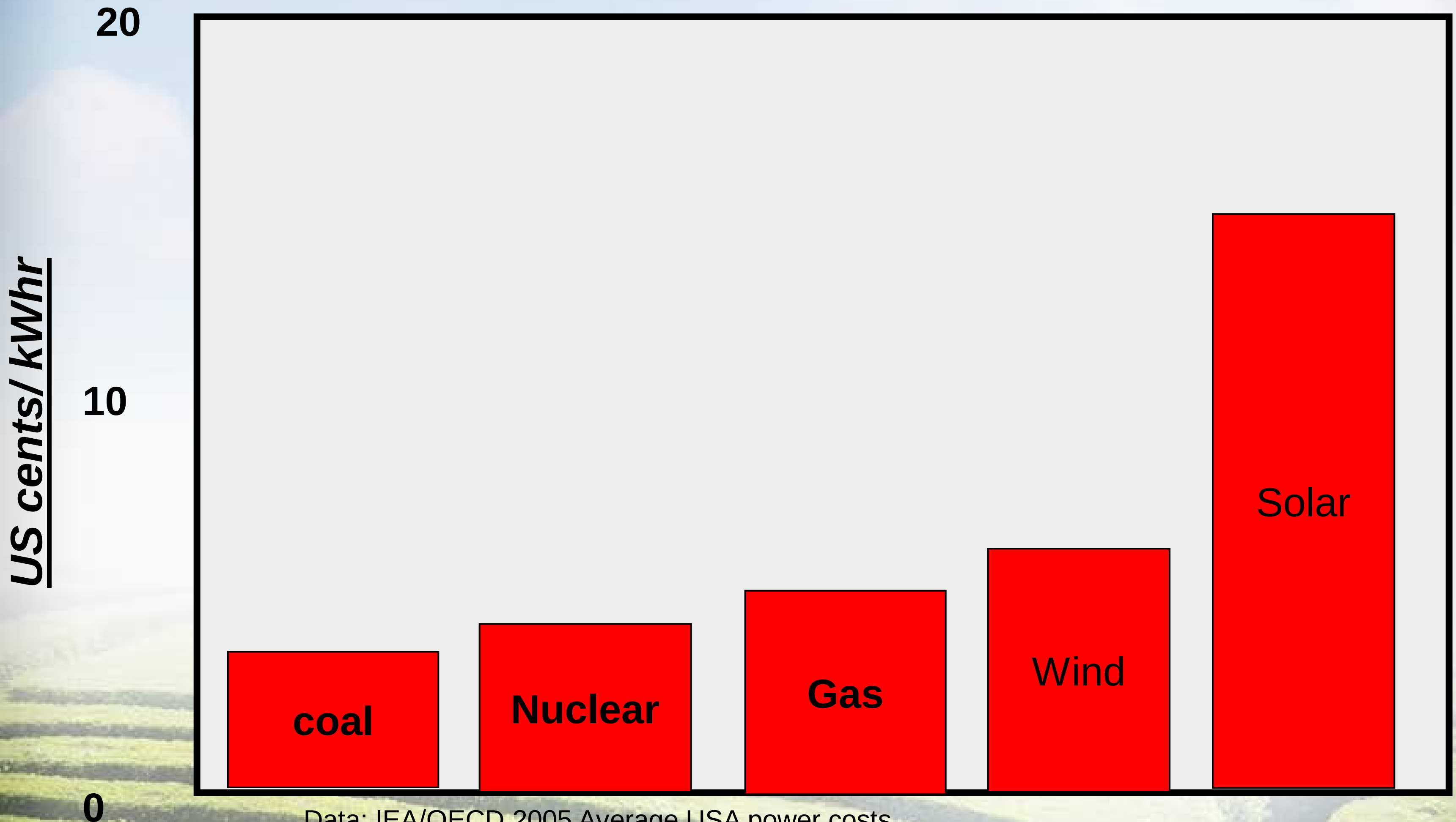
1. Conventional coal fired power or

82%

2. Renewables such as large scale solar thermal and wind

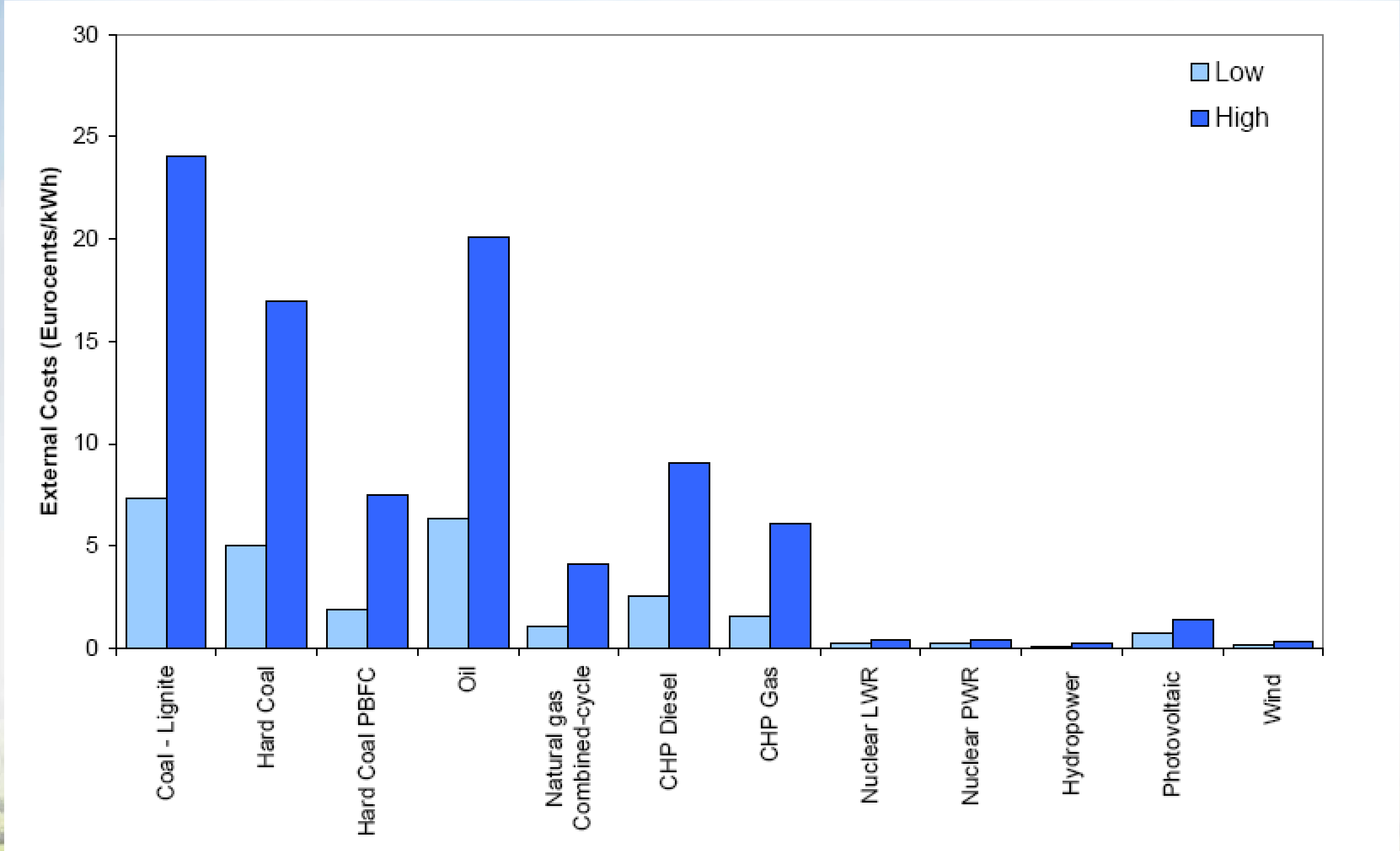
18%

Average US Cost of Power Production



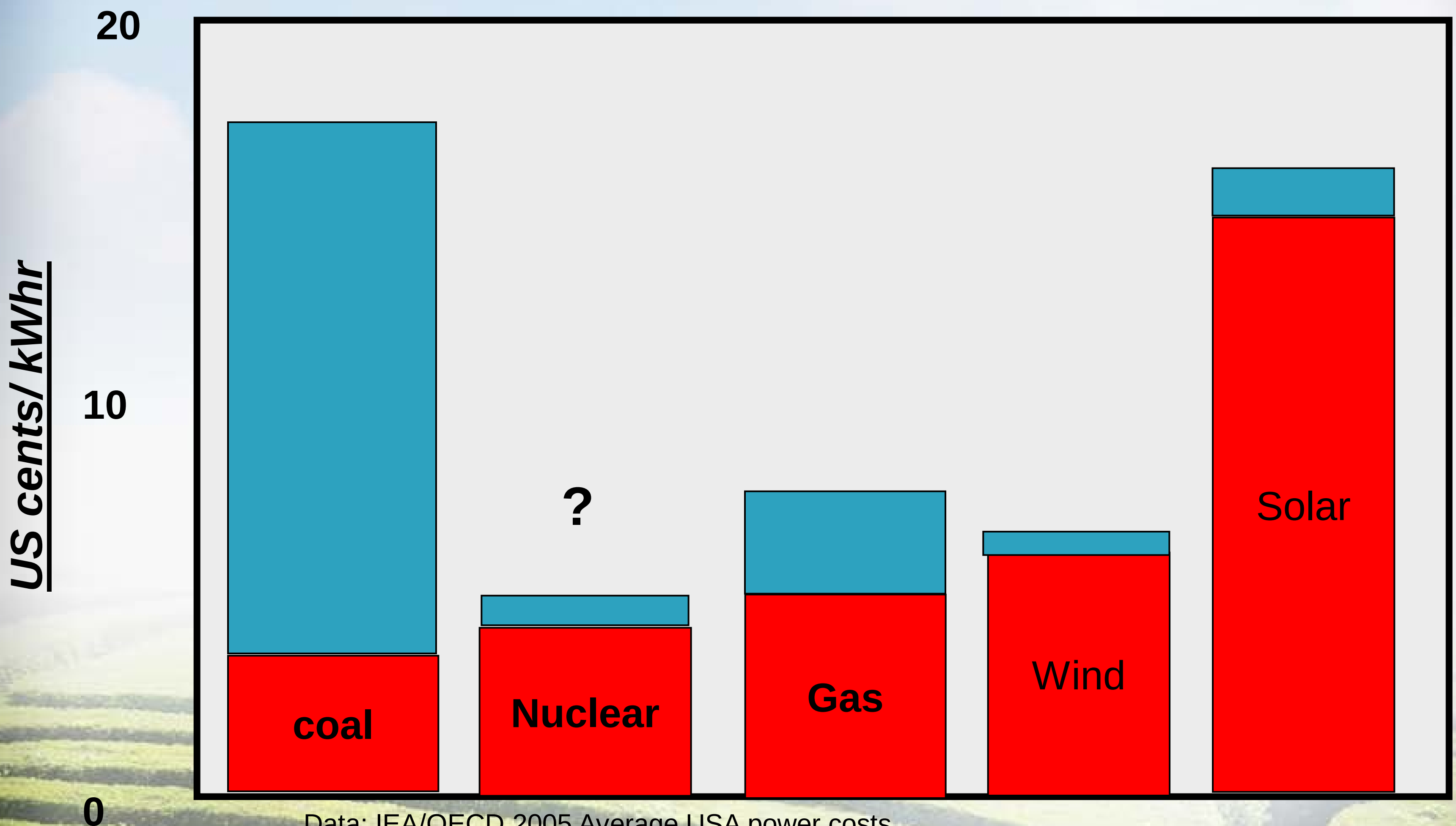
Data: IEA/OECD 2005 Average USA power costs

External Costs of Electricity Production



Source: European Environment Agency, from CAFÉ 2005

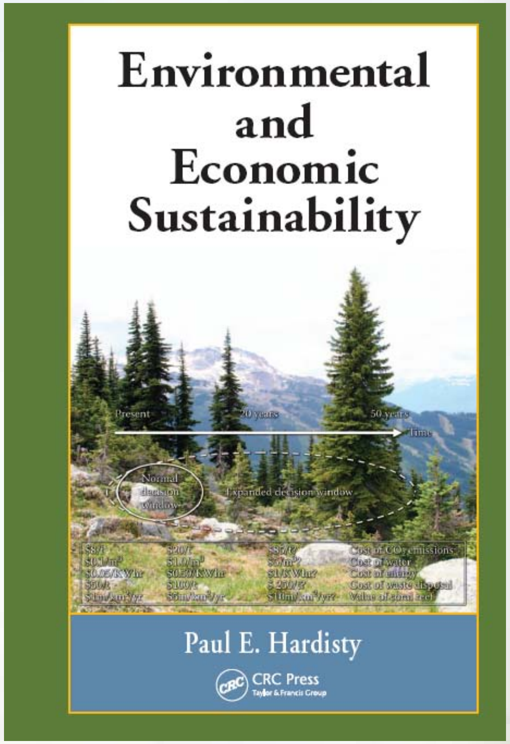
Cost of Power Production + Environmental and Social Cost of Air Emissions



Data: IEA/OECD 2005 Average USA power costs

A New Definition of Sustainability

- *"If over the long term a proposition delivers more benefit than cost over its complete life-cycle, when all environmental, social and economic factors are taken into account, then the proposition is sustainable"*



Environmental and Economic Sustainability Assessment (EESA)

Example:

Waste water treatment and discharge options selection

Introduction

- Major Water Utility
- Current standard of treatment protects human health
- Regulator pushing for higher level of treatment
- Community pushing for "zero discharge to streams"

- "*What is the most economic and sustainable way to treat and dispose of wastewater*?"

- Test Site

Treatment & Disposal Options Considered

	Treatment	Disposal
1	Facultative Pond	Stream Q
2	Facultative Pond	Evap. Pond
3	Facultative Pond	Dam + Onsell
4	Adv. Secondary + Activated Sludge Treatment + Disinfection	Stream Q
5	Tertiary + RO (Drinking Water Quality)	Stream Q
6	Tertiary + RO (Drinking Water Quality)	Dam + Onsell

Increasing CAPEX & OPEX ↓

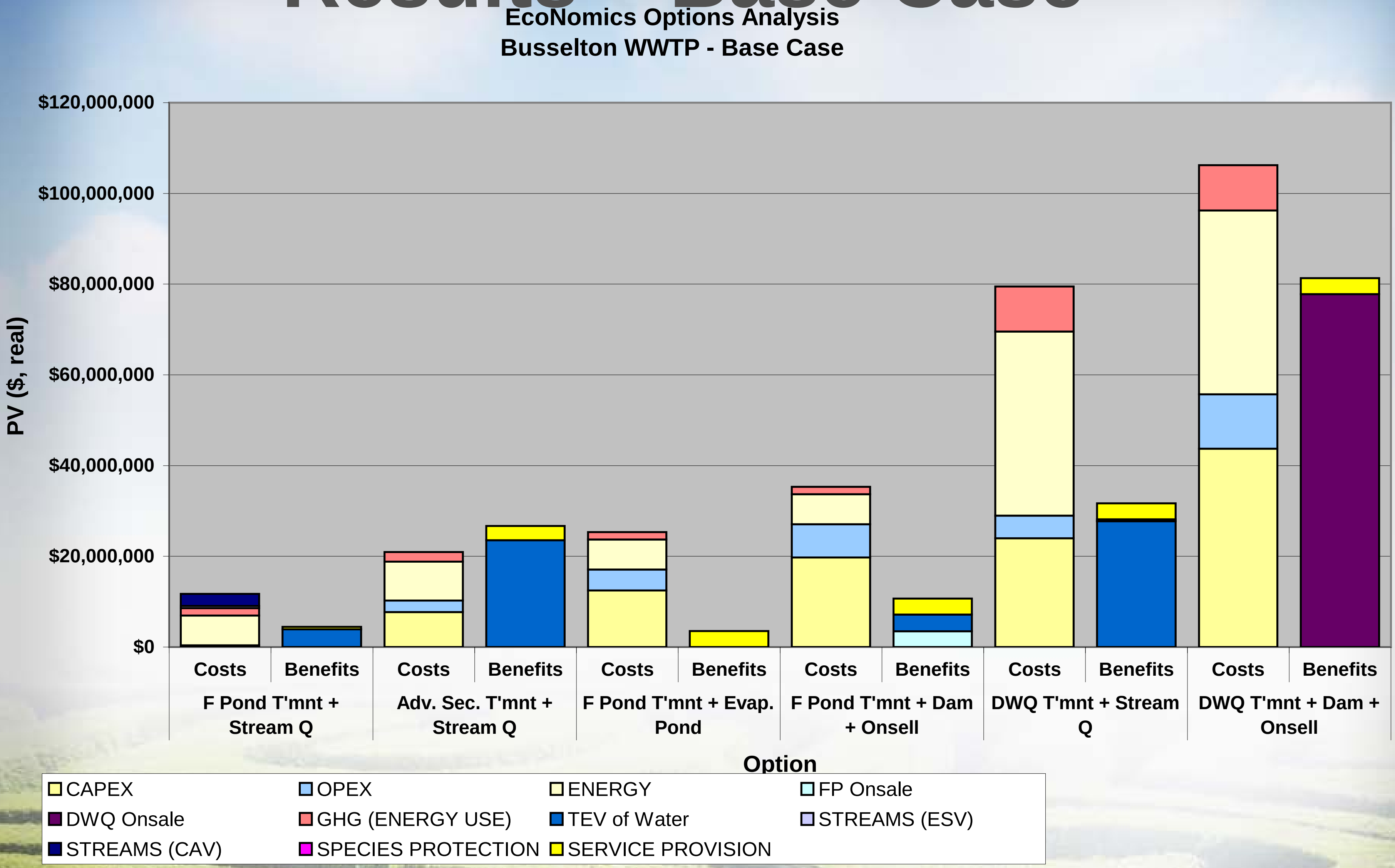
Financial Components

- CAPEX
- OPEX
- Energy Usage
- Revenue from Onsell of F. Pond quality water
- Revenue from Onsell of DWQ water

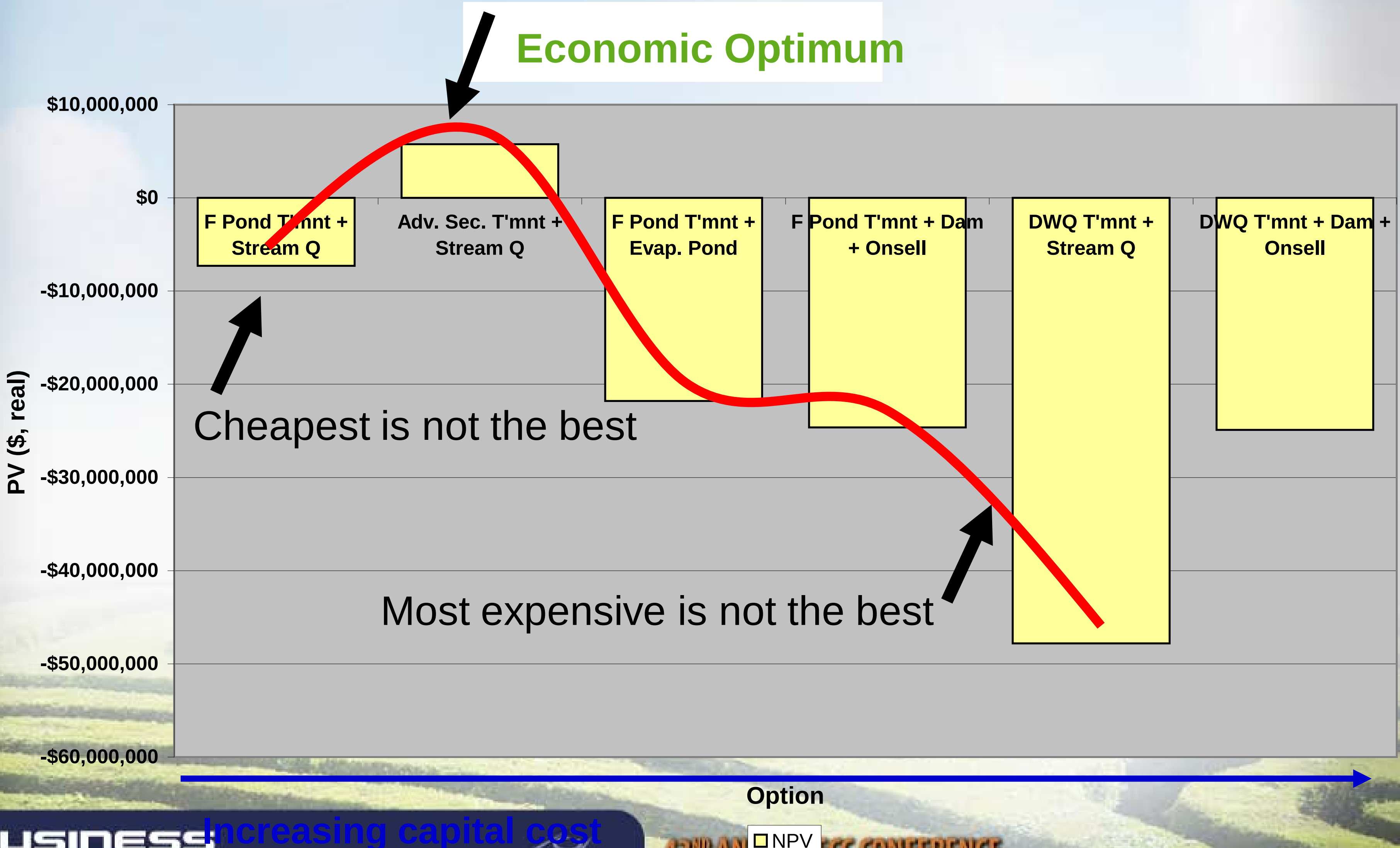
External Components

- $CO_{2\text{-}e}$ from Energy Usage
- Total Economic Value of Water
- Ecosystem Support Value of Streams/Rivers
- Community Asset Value of Streams/Rivers
- Species Protection
- Service Provision

Results – Base Case



Finding the optimal Solution



DELTΔ2

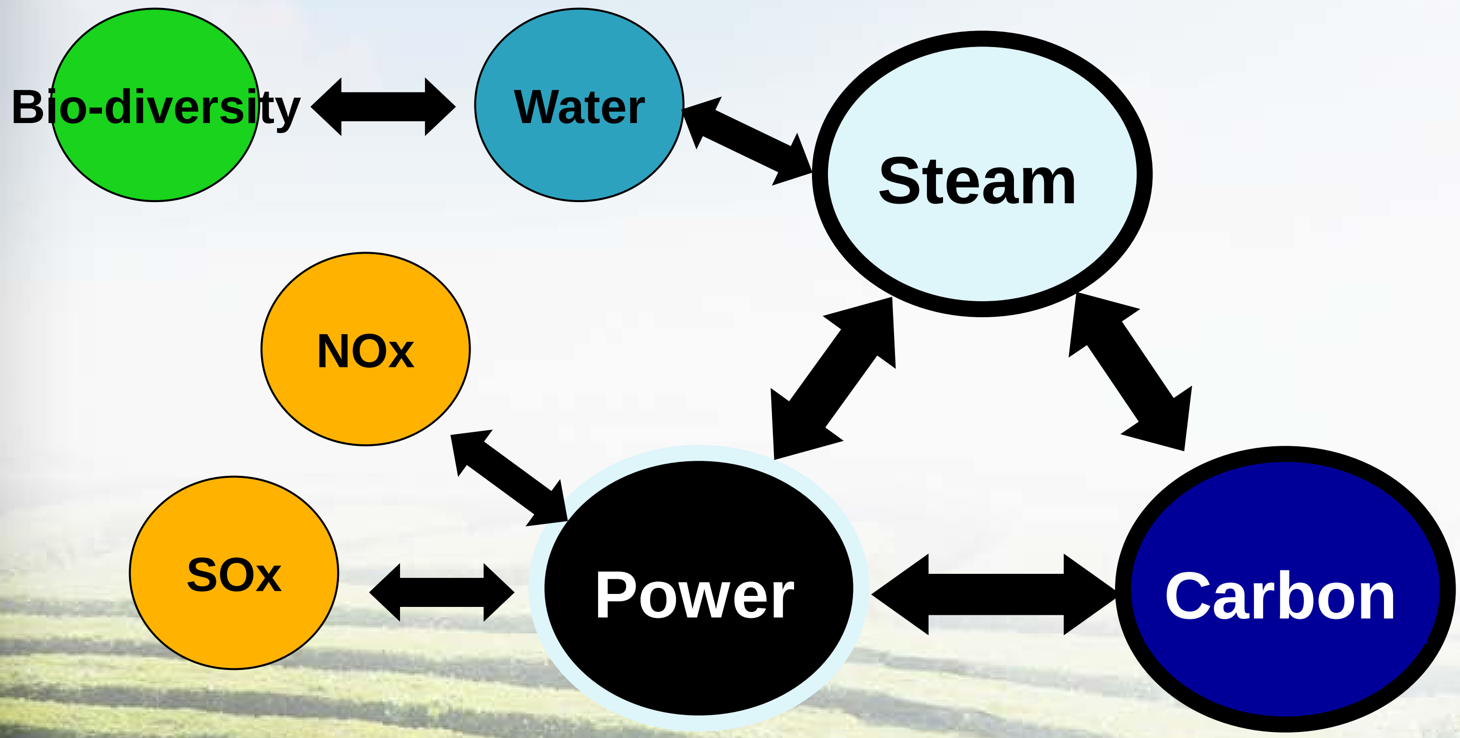
Outcome

- **Agreement between regulator, community and utility on optimal solution**
- **Two year deadlock broken**
- **Utility mainstreaming EESA into their fundamental business decision-making processes for all major capital decisions**

Example: Oil Sands Industry

EESA Objective

determine the most environmentally, socially and economically sustainable combination of power generation, steam generation and carbon capture and storage



Study Options

1A OTSG - Business as Usual – buy power from grid

1B OTSG with CCS

2A On-site gas-fired power-gen

2B Complete with CCS

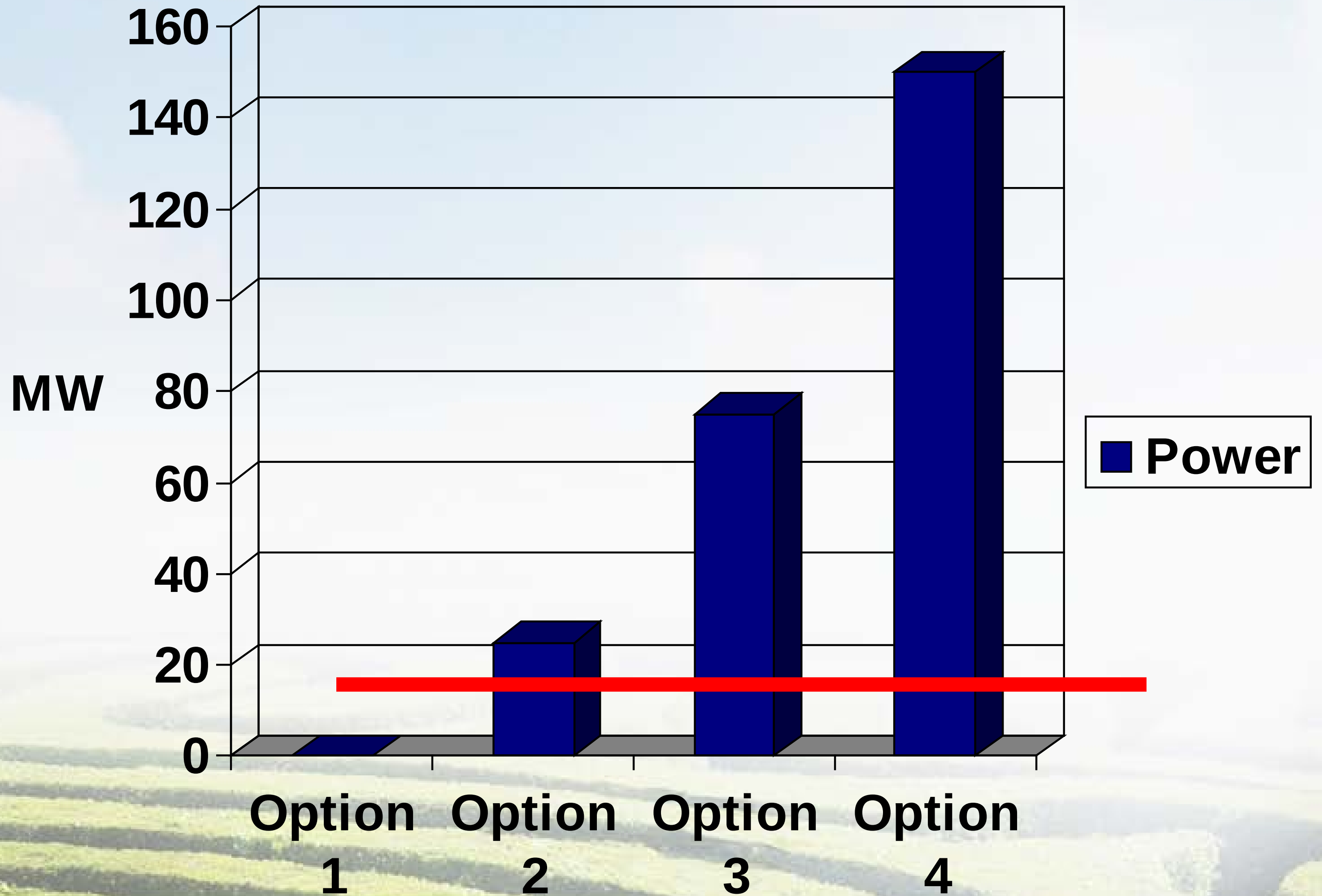
3A On-site gas - compete steam, surplus power

3B Surplus with CCS

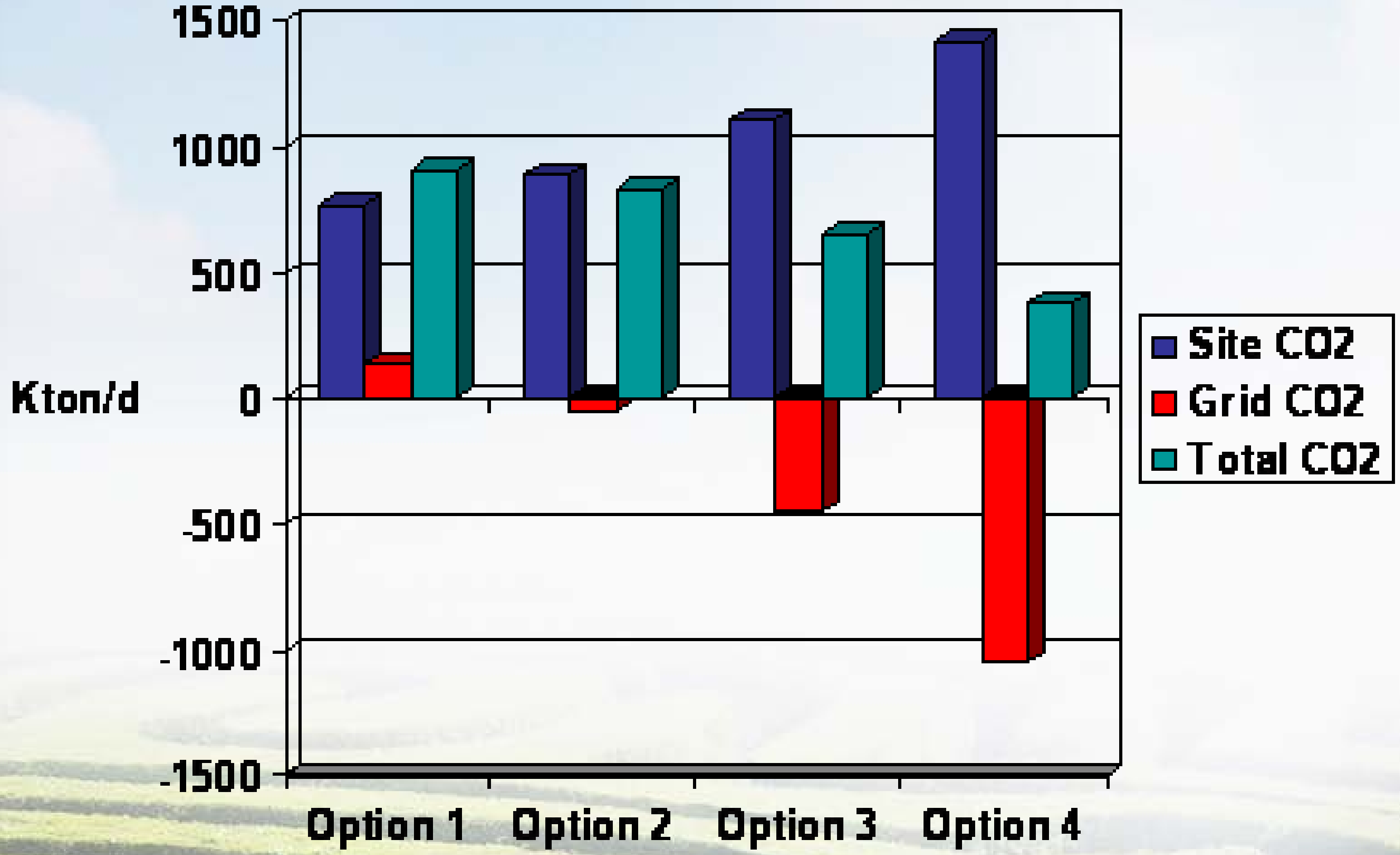
4A On-site gas – full co-gen, large surplus power

4B Excess with CCS

Power Spectrum



CO2 Emissions

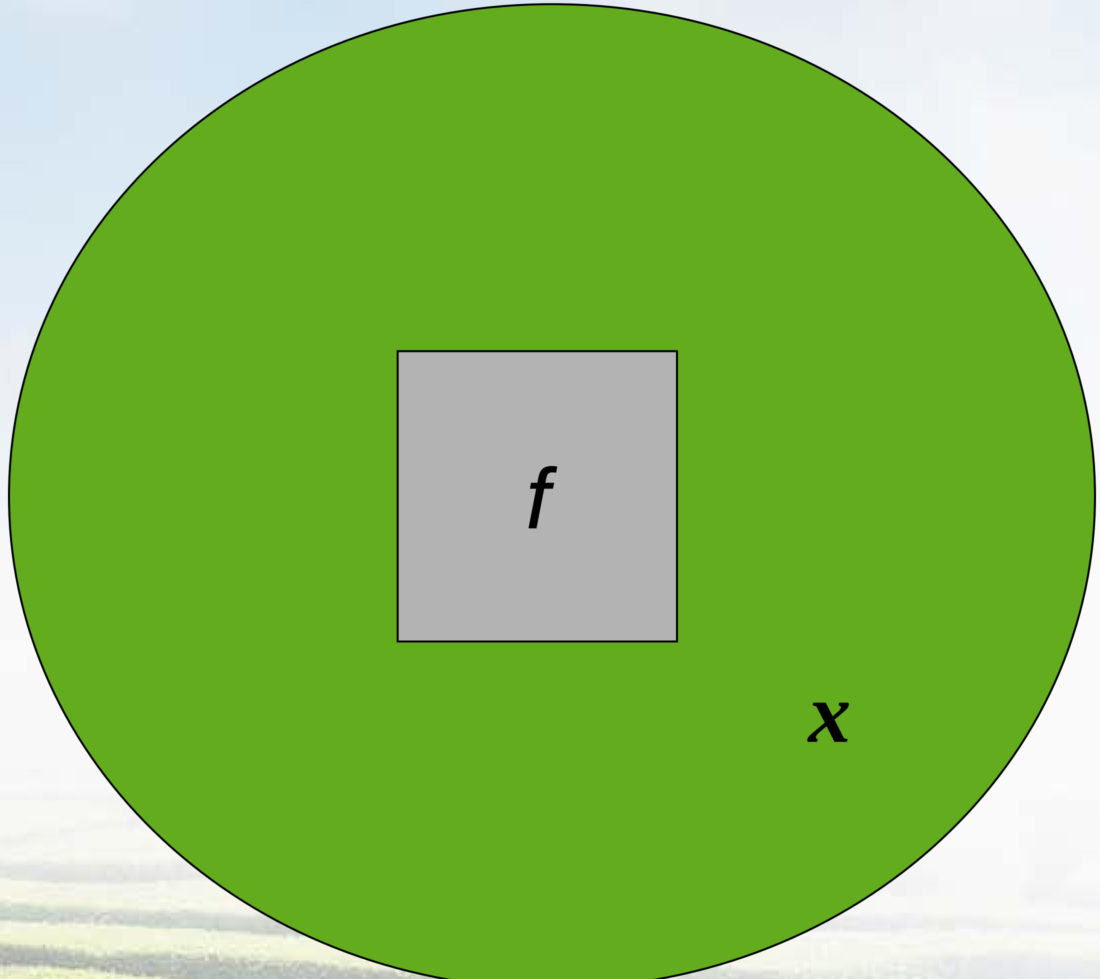


EcoNomics™ DELTA2

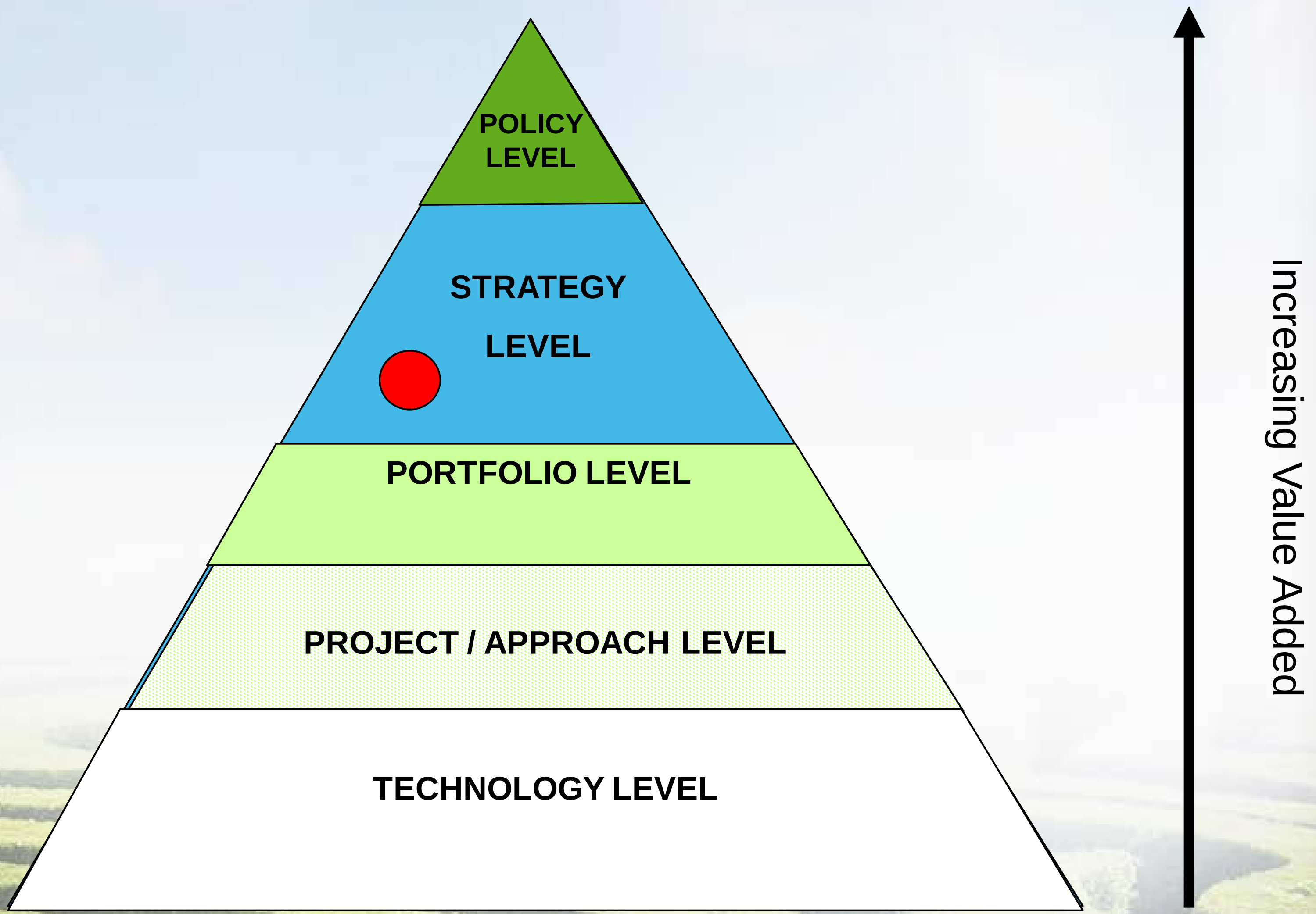
Outcome

- Fundamental shift in project design away from business-as-usual
- Recognition of significant up-side in financial return under high energy cost and rising carbon cost conditions
- Allows company to manage uncertainty in future conditions, carbon costs, social and environmental regulations

Measuring Success



Hierarchy of Assessment



Achieving Real Sustainability

“Never, ever, think outside the box”

Conclusions

- Looking at full life-cycle environmental, social and economic costs and benefits provides a more realistic picture of project success

- By expressing every consideration in a common unit of value that everyone understands (MONEY), decision makers can see the full implications of tradeoffs – The Language of Money

- Business as usual almost never provides the optimum result

- EESA provides a rational business decision making approach to project and policy risk management and optimization that suits the conditions of the 21st Century