

2002 Workshop

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Key Points

Definitions

- *Why engineers don't need them*

Dangers

- *Why its getting worse not better*

Systems

- *Why solutions need systems thinking*

Tools

- *Why we need a toolkit*

Definitions

- *Why engineers don't need them*

Dangers

Systems

Tools



The Definition Problem

Or how to give a lecture on sustainable development.....



The Definition Problem

Start with 'Brundtland Definition'

then say... but I prefer

'Sustainable Development means....

[Doing X with Y]

I will now discuss my research

[Doing X with Y]

Definition Problem

An Engineer's Guide to Brundtland

What actually was the WCED problem?

- Paying 'dividends' out of 'assets' !
 - Environment a poorly managed asset
landscape & landscape
 - Future generations
?at least one student will see 2100

Definition Problem

A Familiar Board Room Row?

- To survive firm has to make a profit
 -so profit indicators critical
 -but if profit is from selling assets
 -then not sustainable
- single focus on 'profit' indicators
 -risks missing the point about assets
- Familiar board room row?
 -Balance Sheet vs. Profit & Loss

Definitions

Dangers

Systems

Tools

- *Why its getting worse not better*

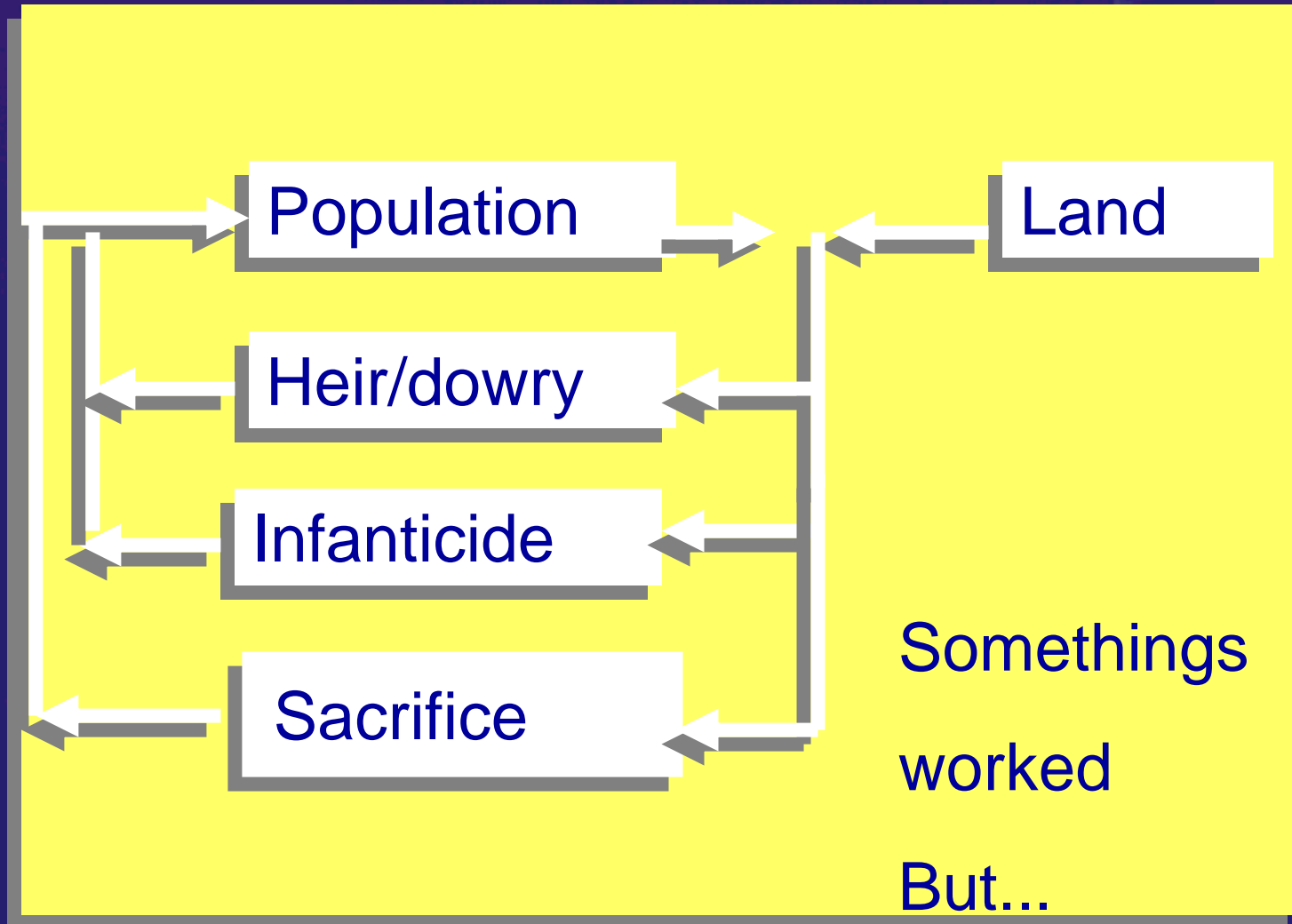
- Not A New problem
- But needs new solution

Not a New Problem

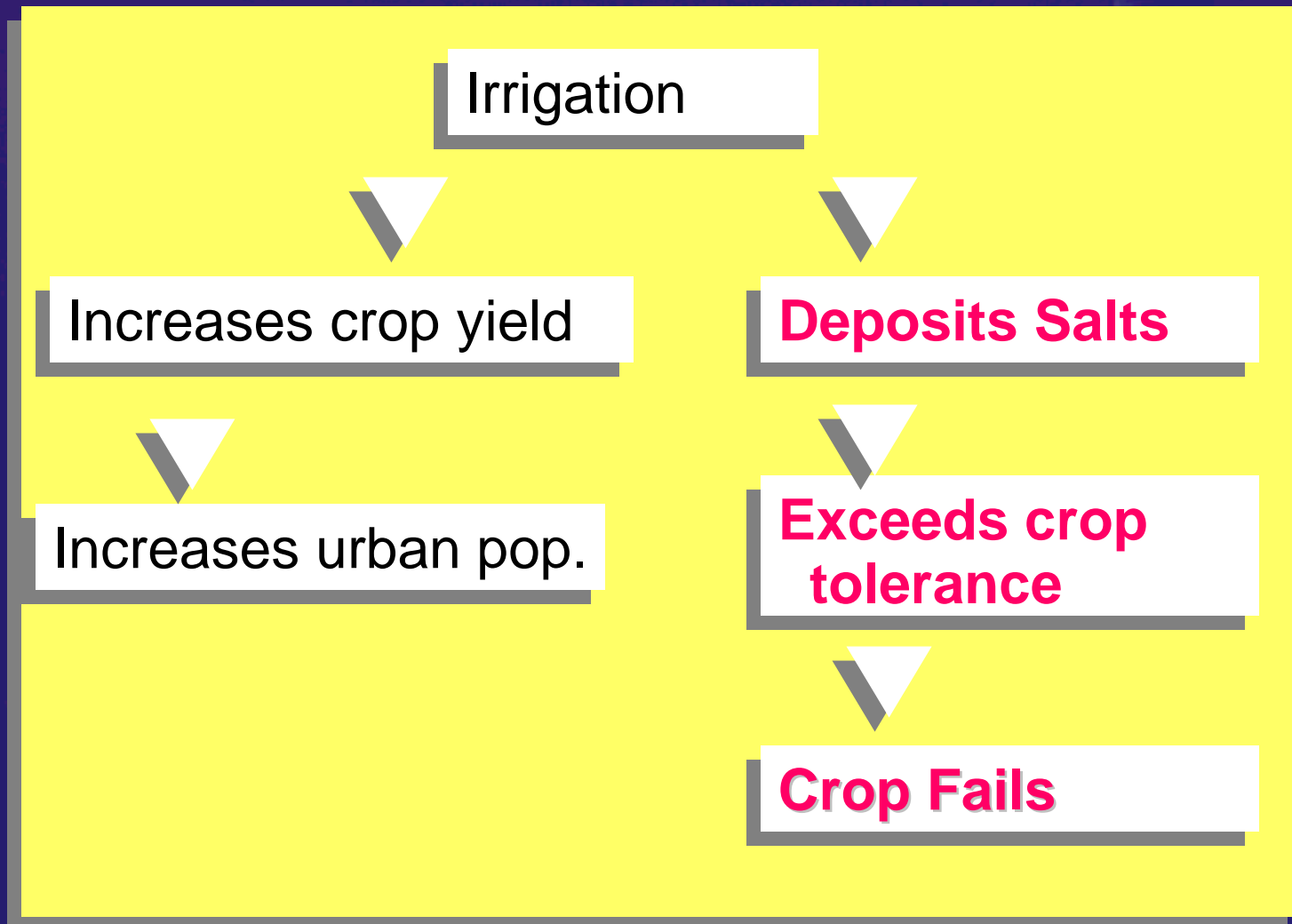
- Notable failures



Not A New Problem



Not A New Problem

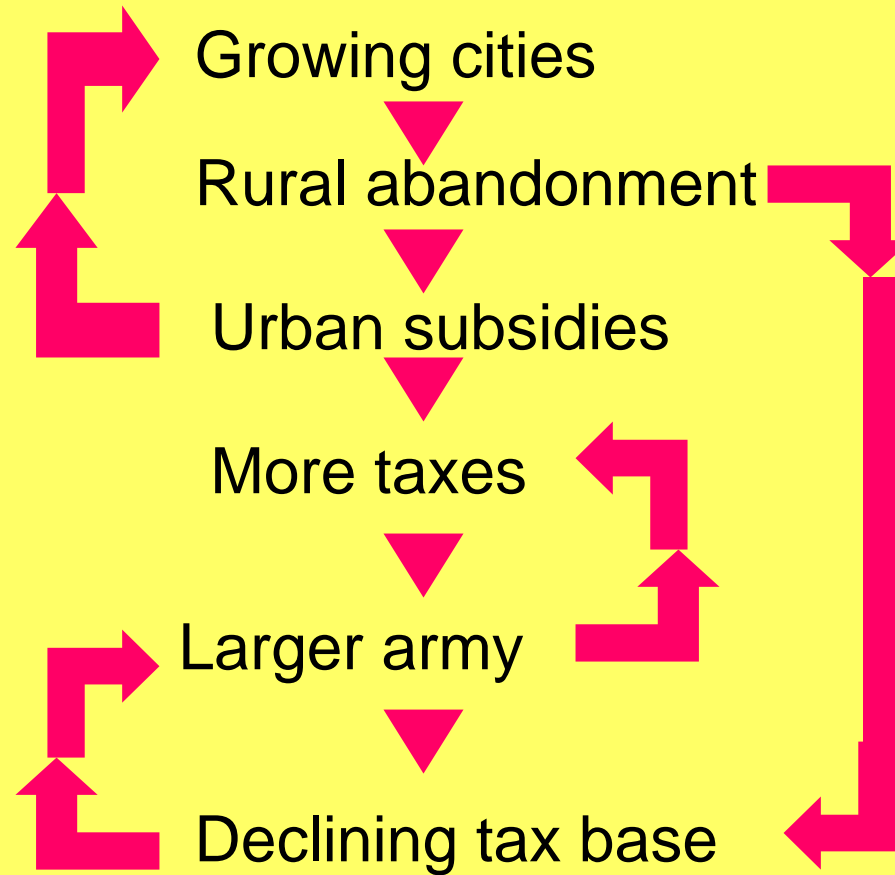


Not a New Problem

- Notable failures



Not A New Problem



Not a New Problem

- Old solution.....
- Won't work



Not as if we didn't have some difficult problems

- Running out of 'sinks' not 'sources'
- Running out of renewables!
- Unstable global money supply
- Social Inequalities widening

And another view.....

- Running out of friends





Definitions

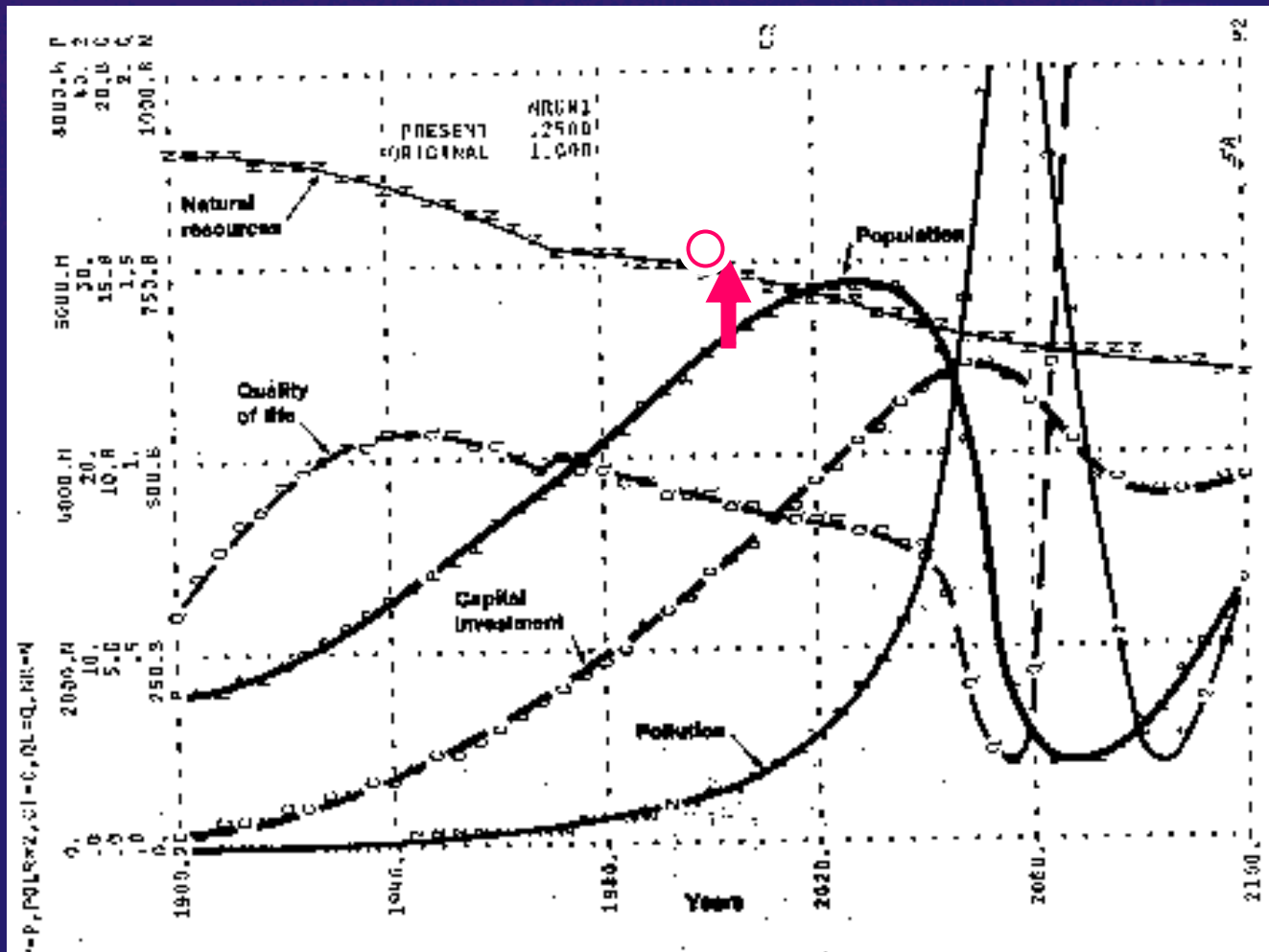
Dangers

Systems

Tools

- *Why solutions need systems thinking*

Systems Thinking (Remember Club of Rome?)



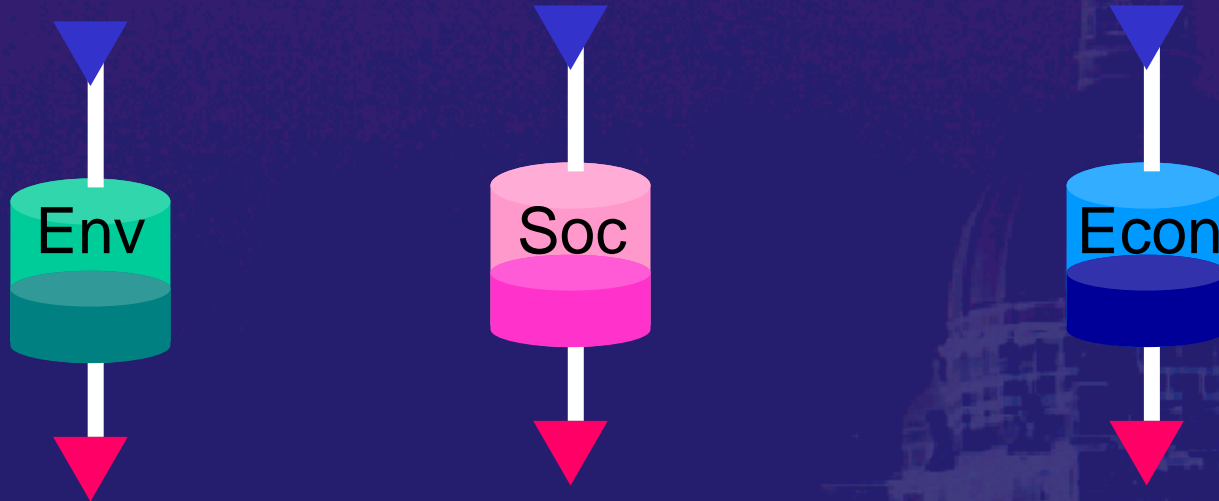
Systems Thinking

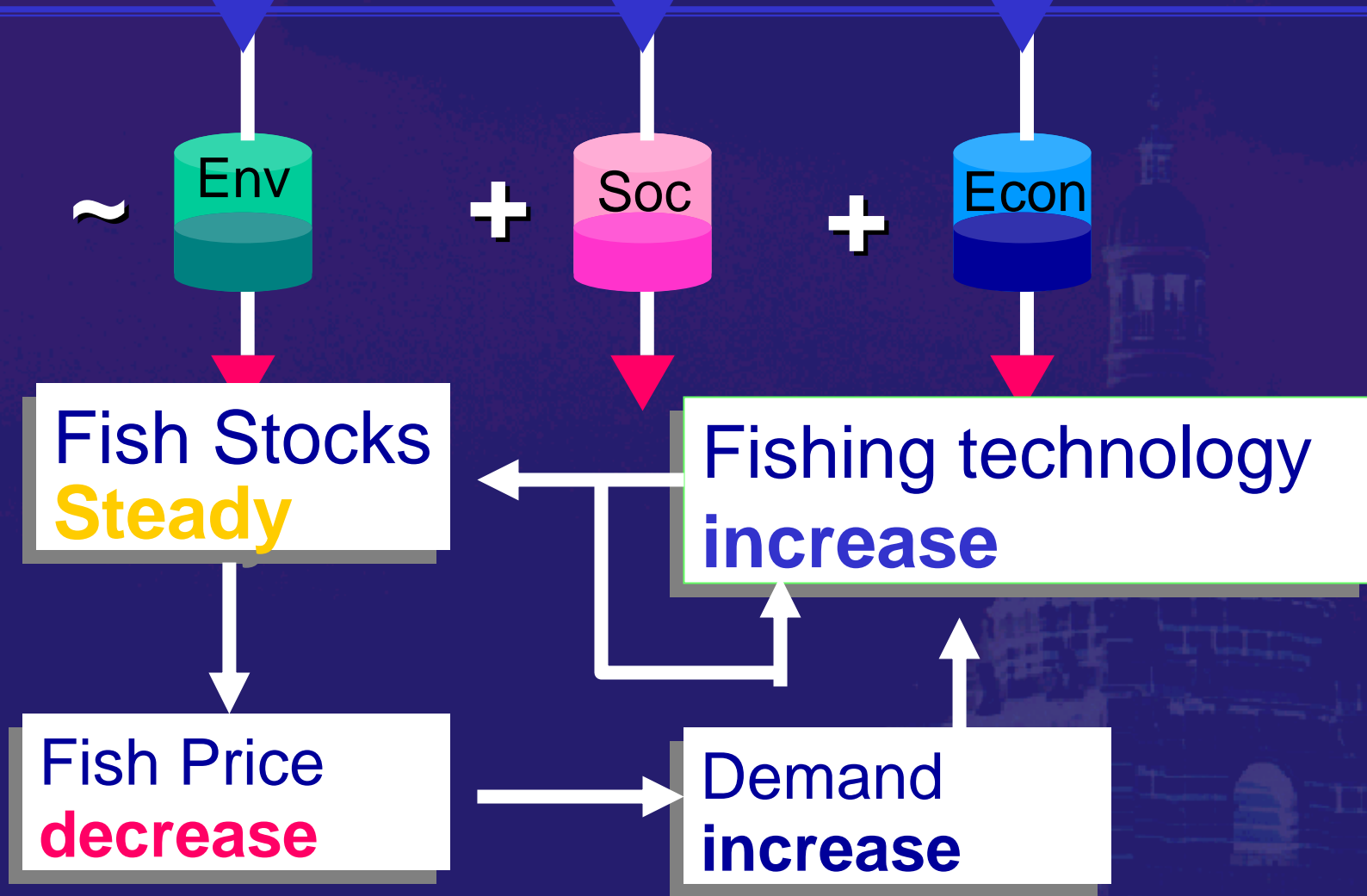
Example: Marine Engineering



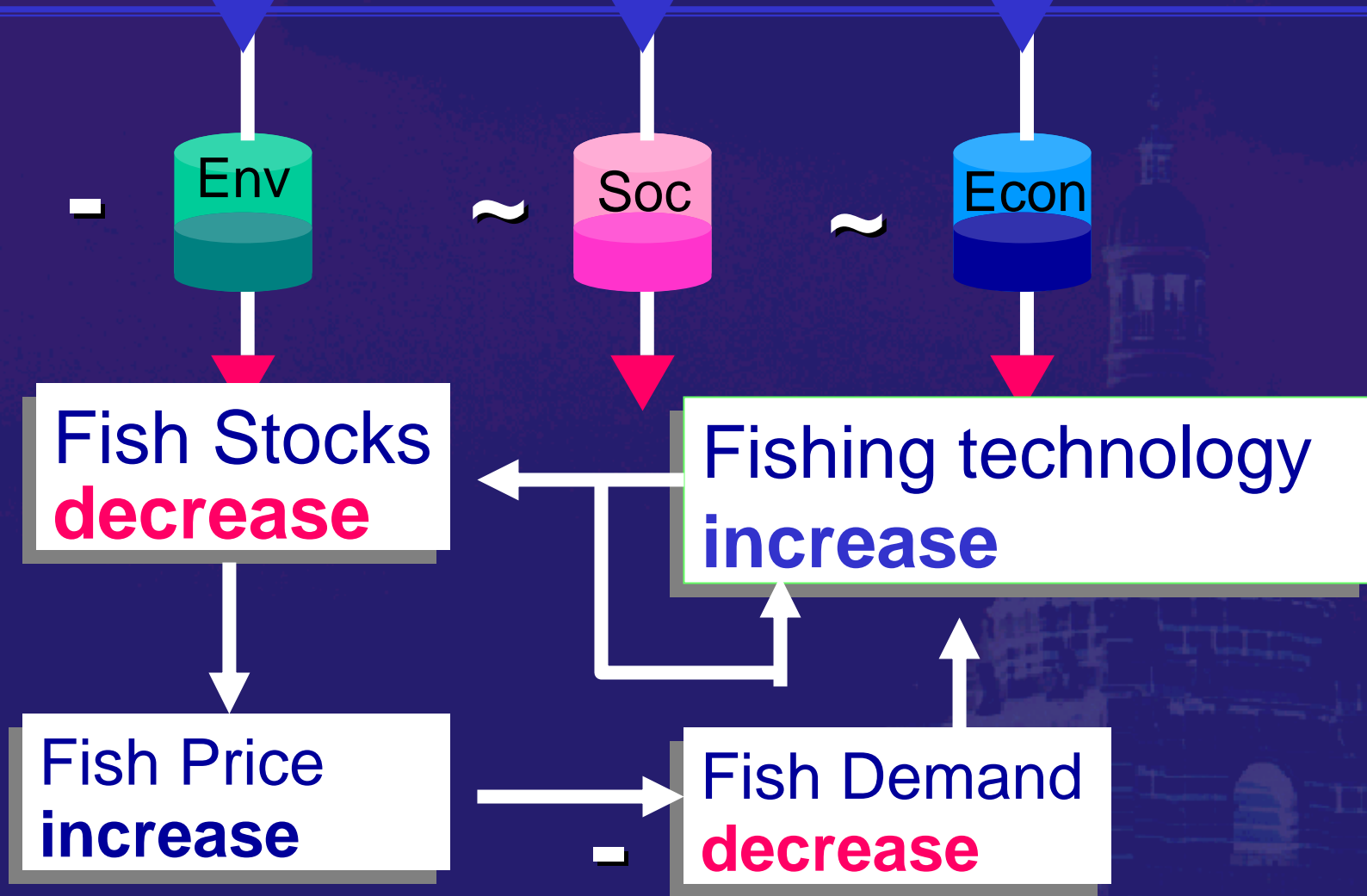
Systems Thinking

Start With the Assets

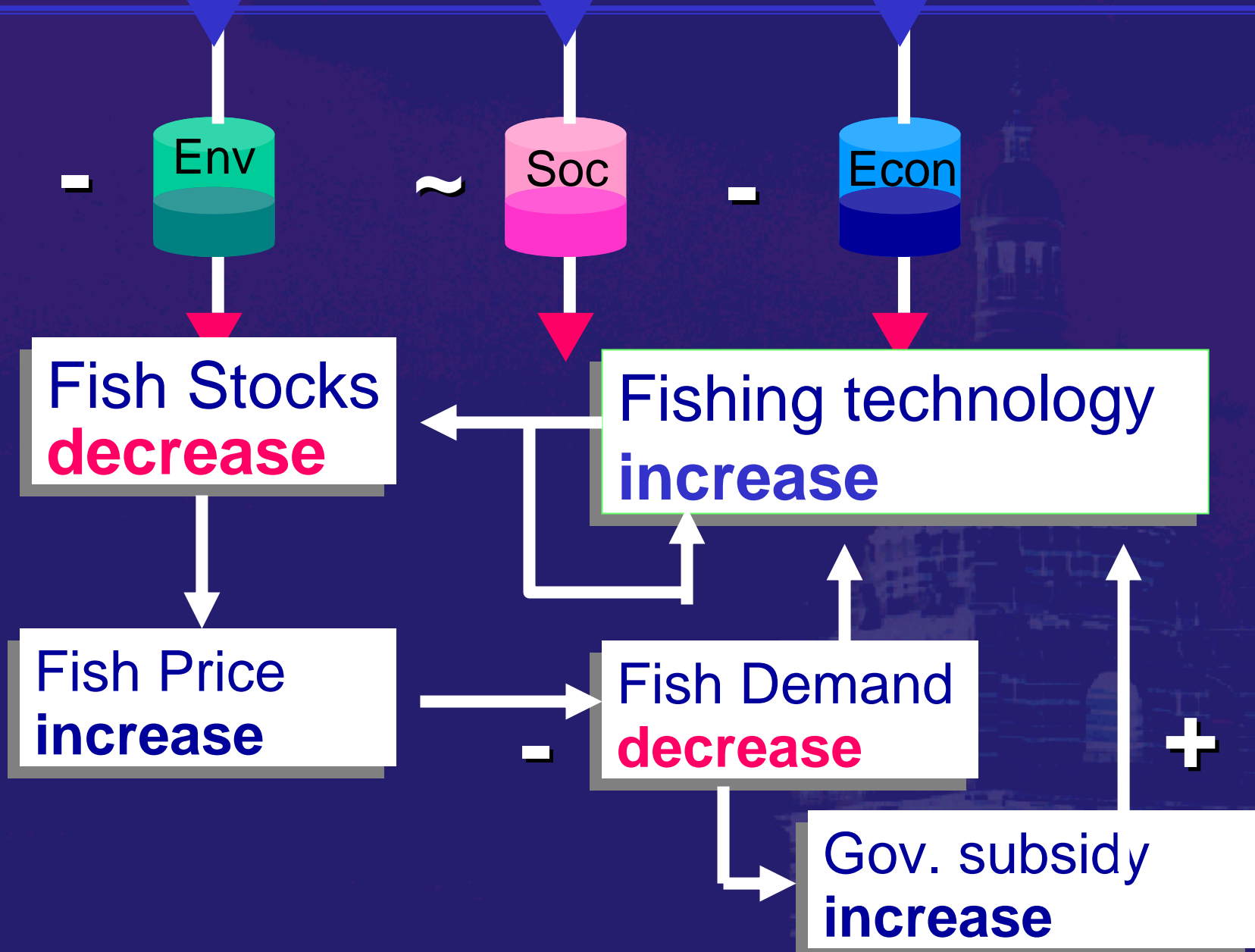




The 'normal' system



The 'normal' system is stable



The 'subsidised' system unstable

Systems Thinking

Here's the Concept Trawler?

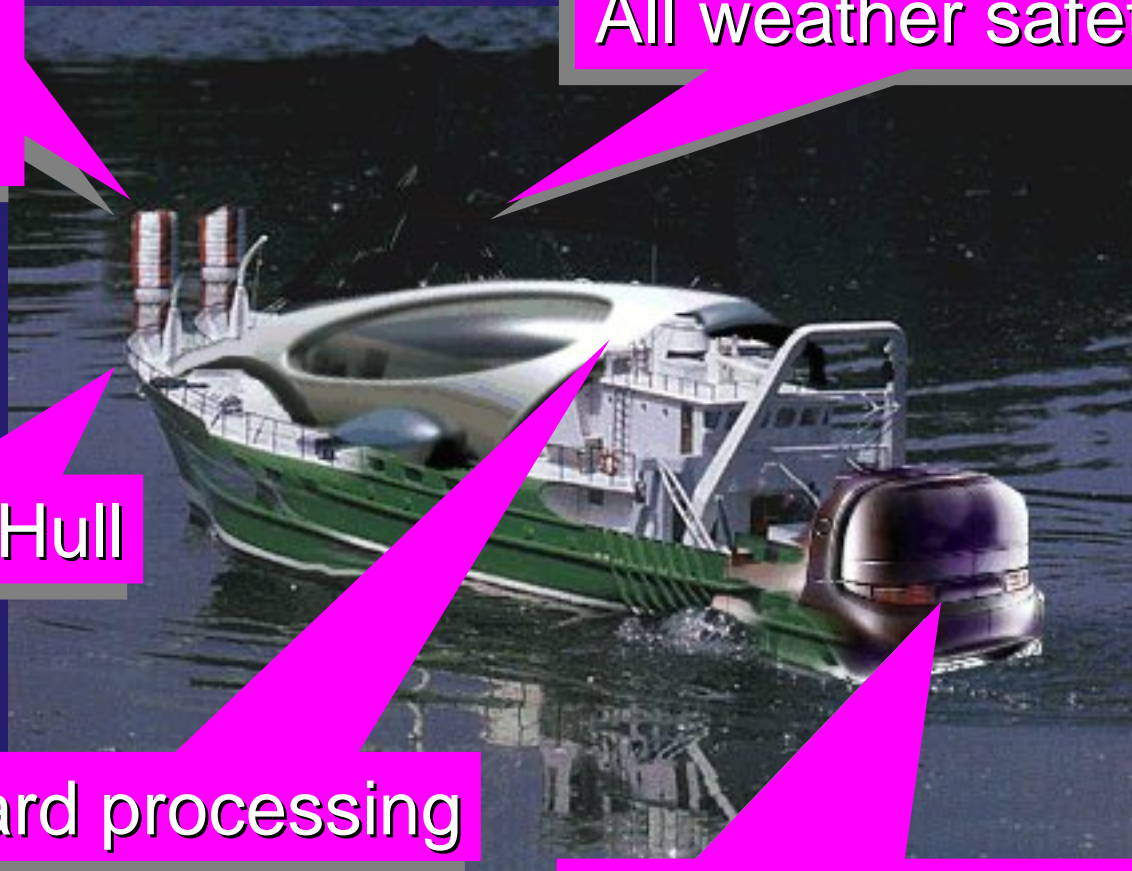
GPS/
satellite
monitor

All weather safety deck

Cat Twin Hull

On board processing

Selective Fish harvester



No SD engineering without
positive people!





Definitions

Dangers

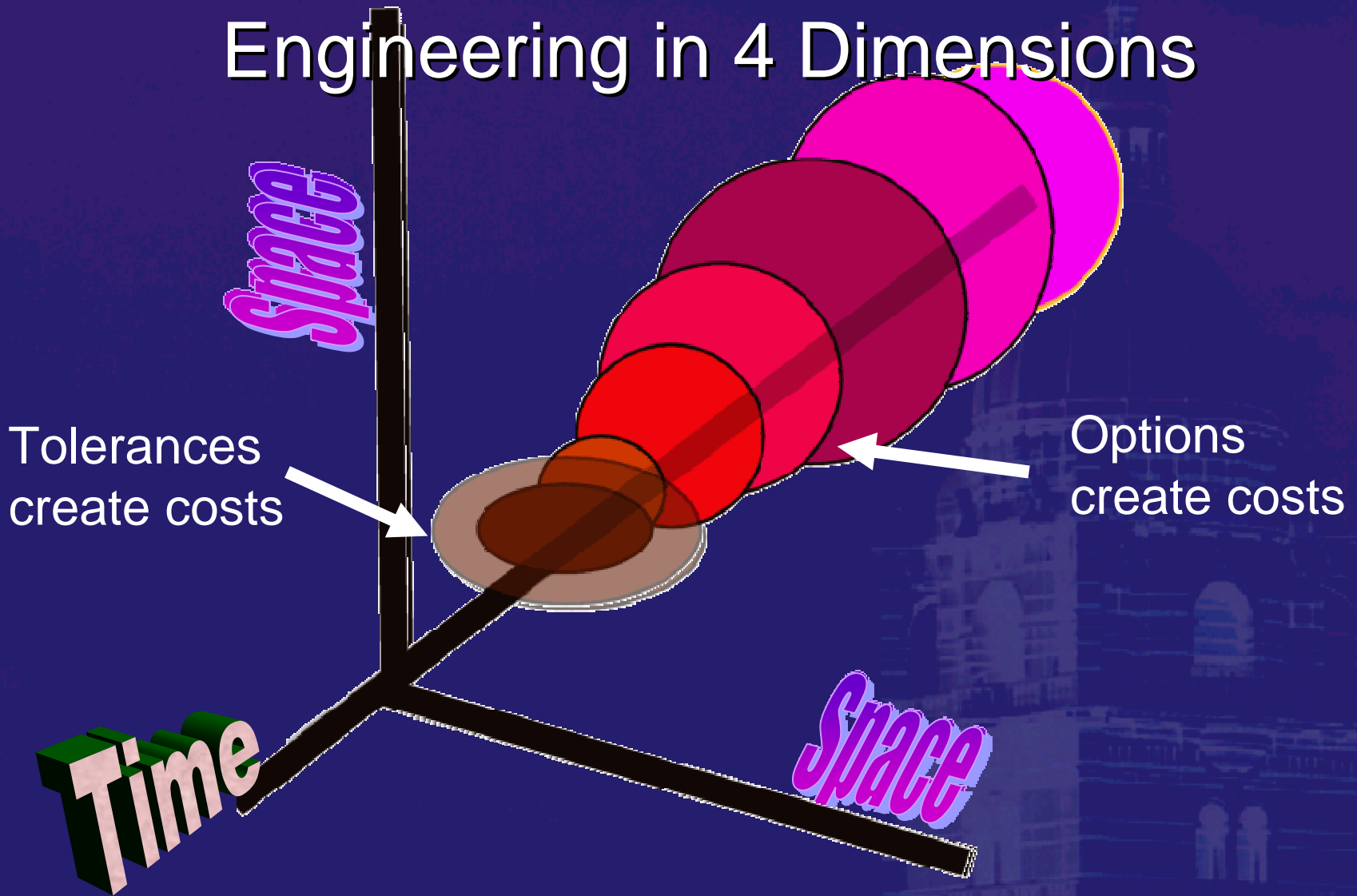
Systems

Tools

- *Why we need a toolkit*

Toolkit

Engineering in 4 Dimensions



Toolkit

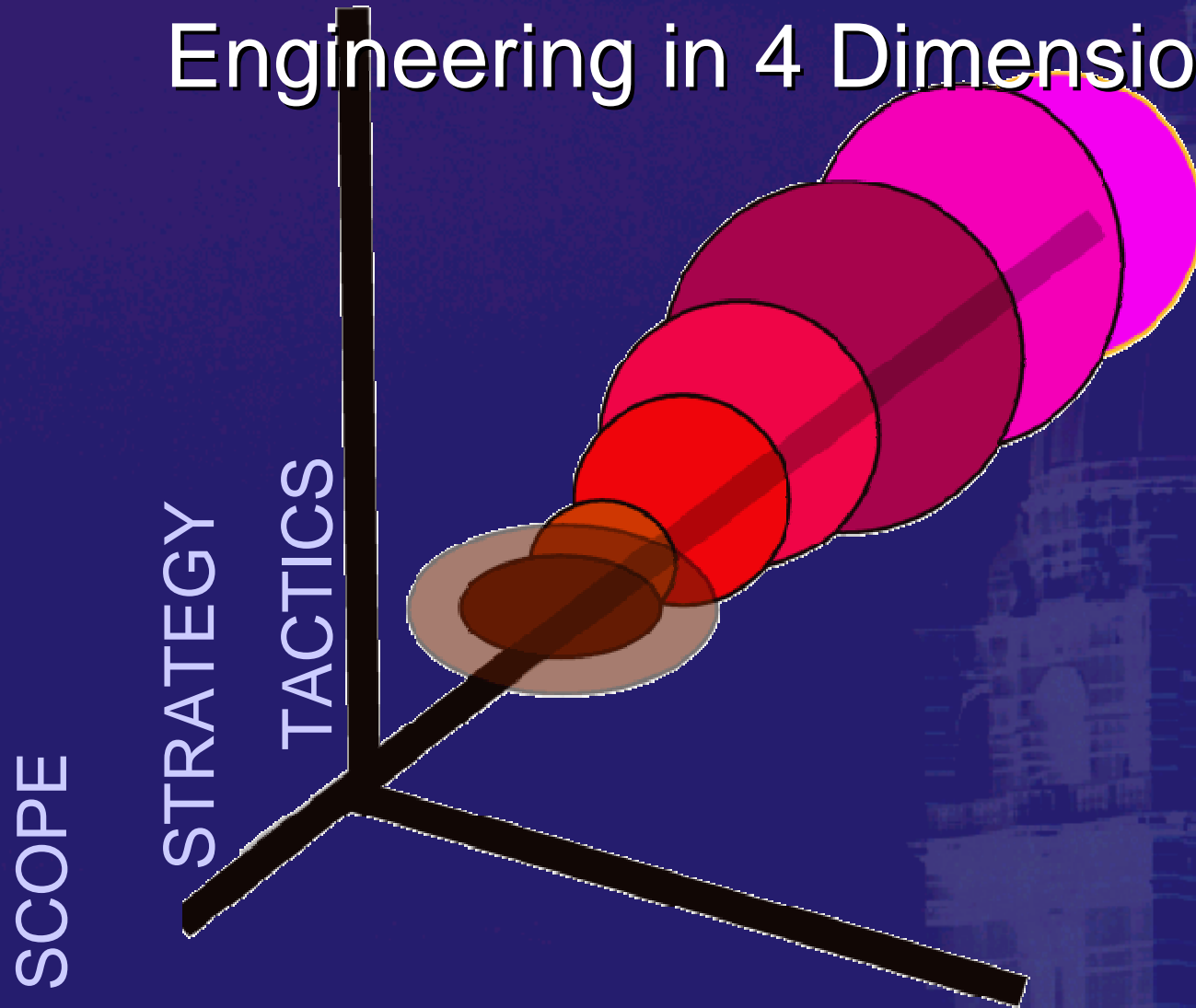


~~Ideal Design Tool:~~

- Takes into account local/global changes
- Covers triple bottom line
- Fits all stages of design/use/re-use/disposal
- Fits all forms of intervention

Toolkit

Engineering in 4 Dimensions



Toolkit

Eng

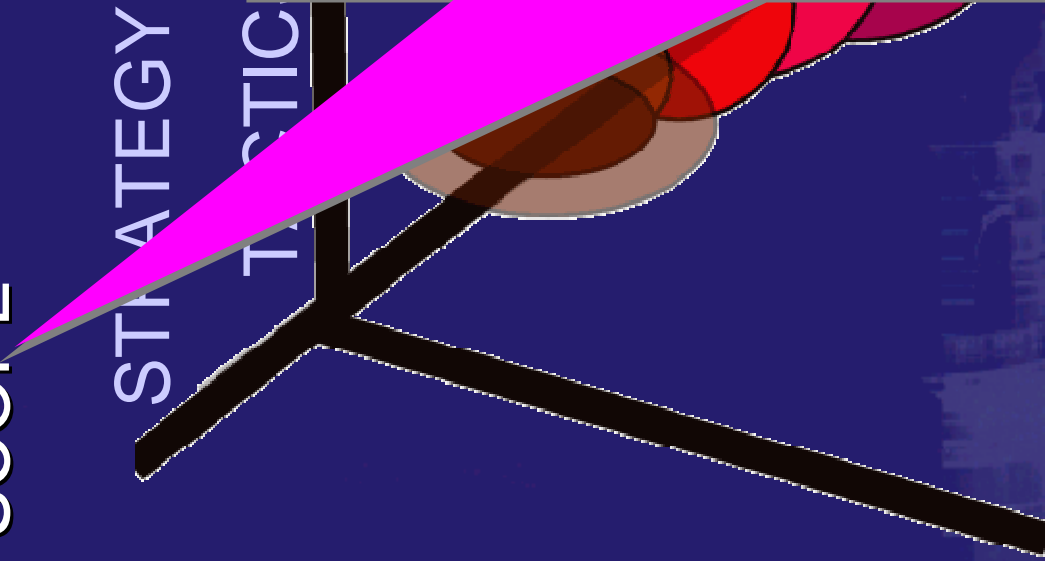
BALANCED SCORECARD

- Identifies E/S/E assets simultaneously
- Can mix Quantitative and Qualitative
- Interfaces to local and national SDI's
- May expose the screamingly obvious

SCOPE

STRATEGY

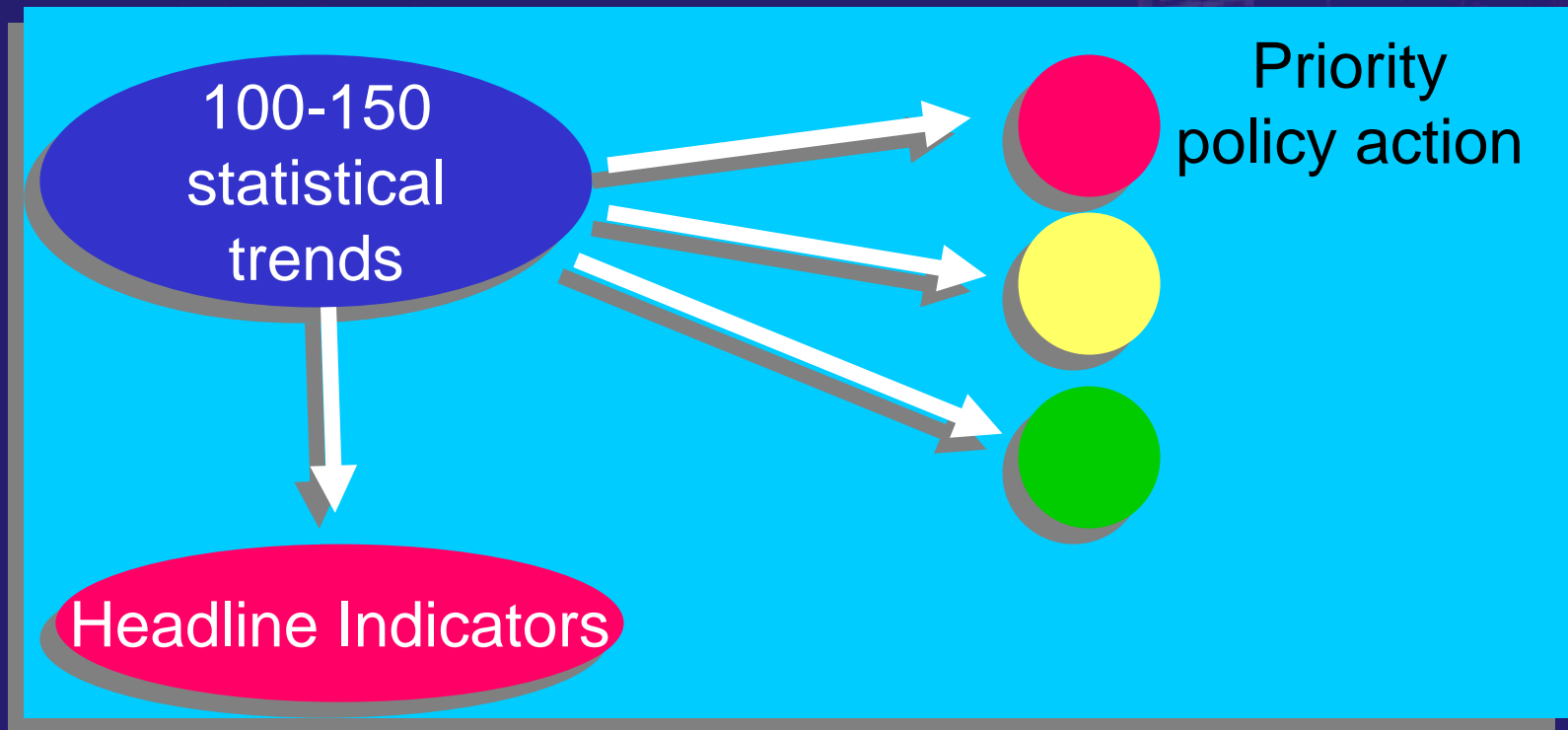
TACTIC



Toolkit

Governments have similar problem

- Sustainable Development Indicators



Toolkit

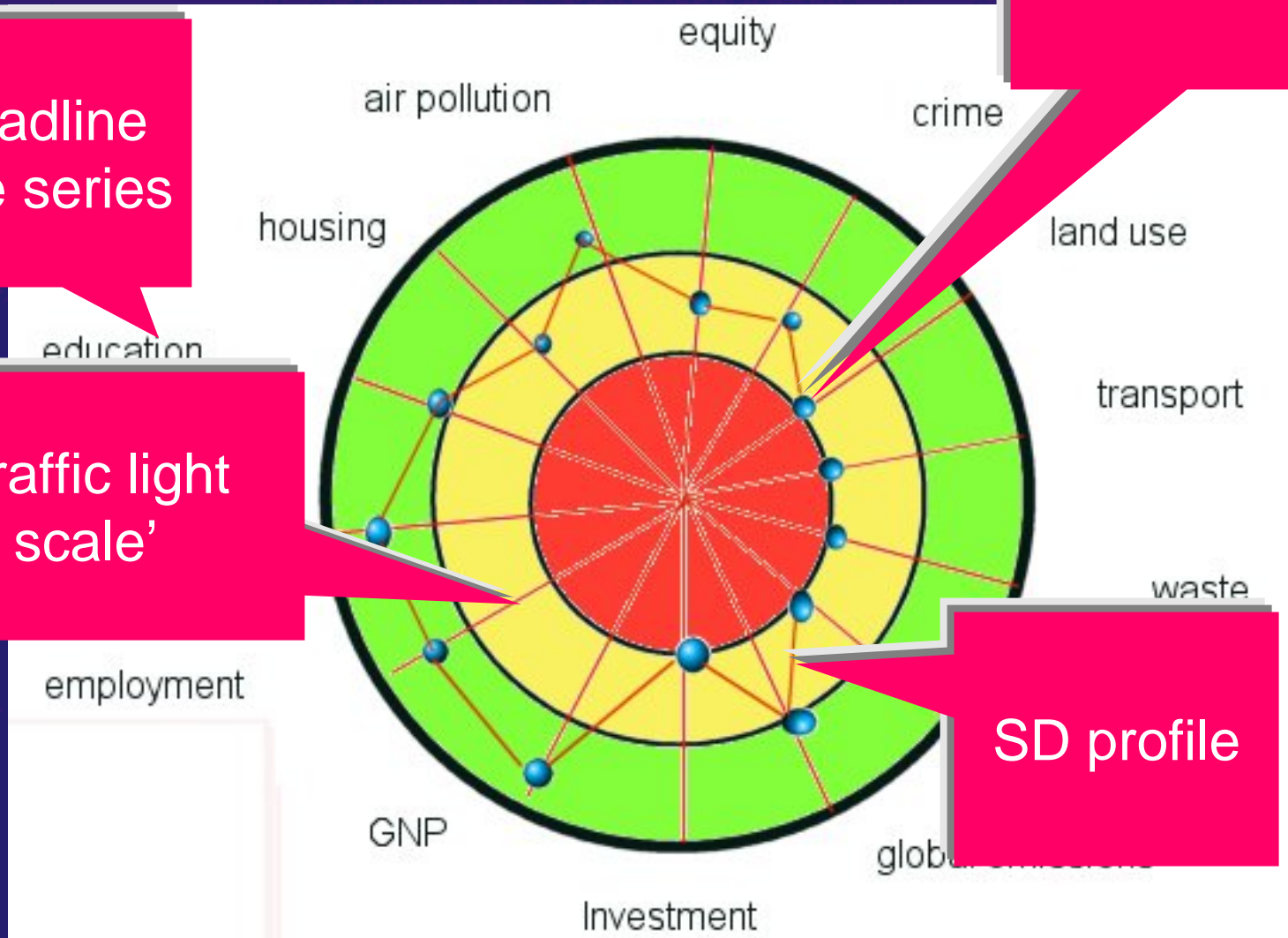
Headline Indicators

Headline
time series

Ranking

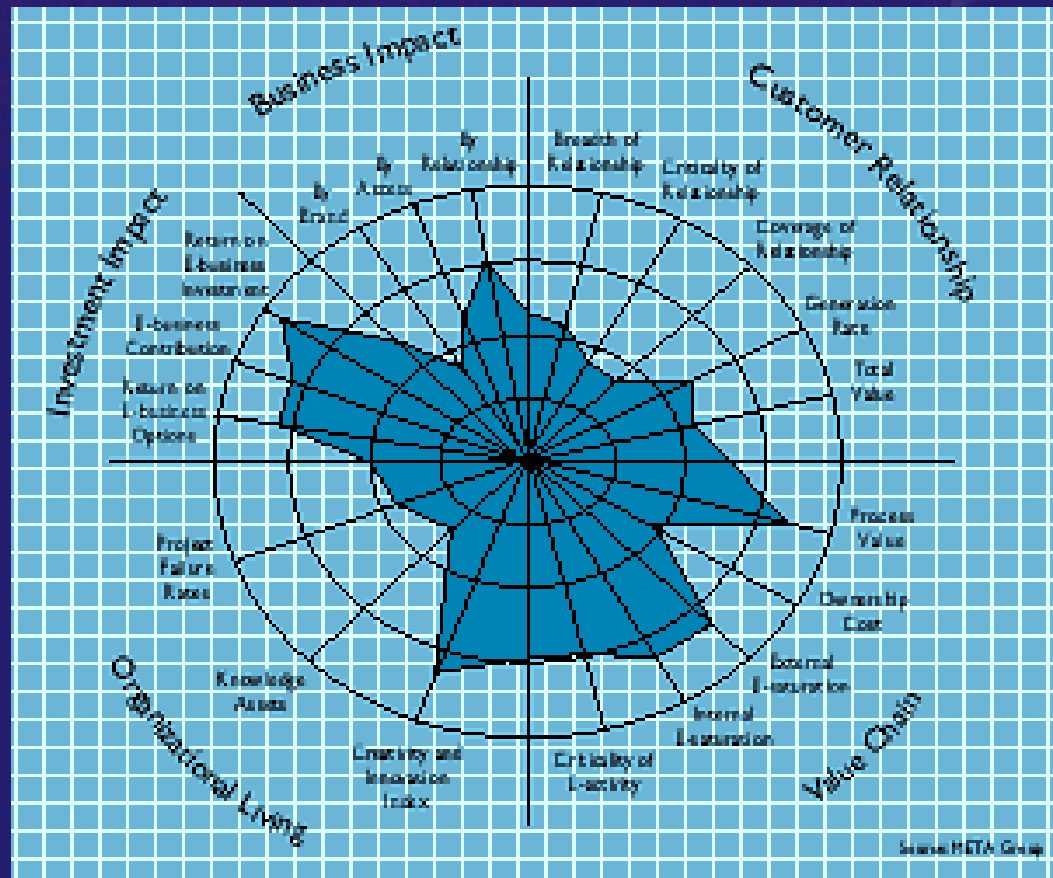
'Traffic light
scale'

SD profile



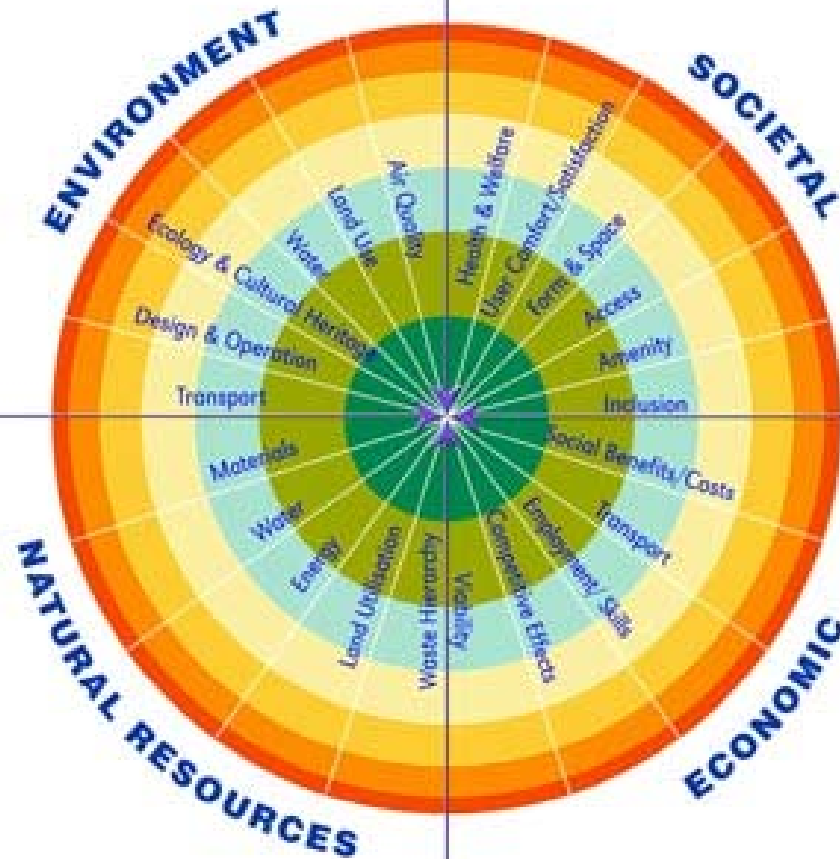
Toolkit

Back In the Boardroom....



Toolkit

Some Examples



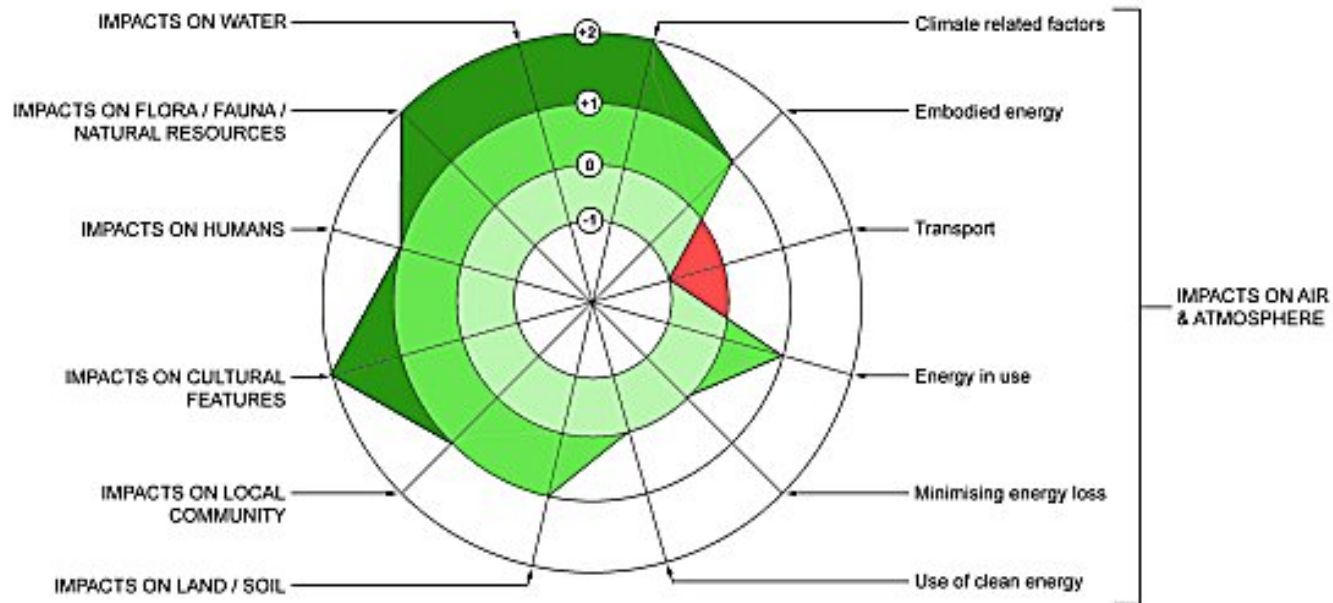
Toolkit

Some Examples

Nicholas Grimshaw
& Partners Limited

Architects, Planners
& Industrial Designers

EMS PERFORMANCE



Toolkit

Eng

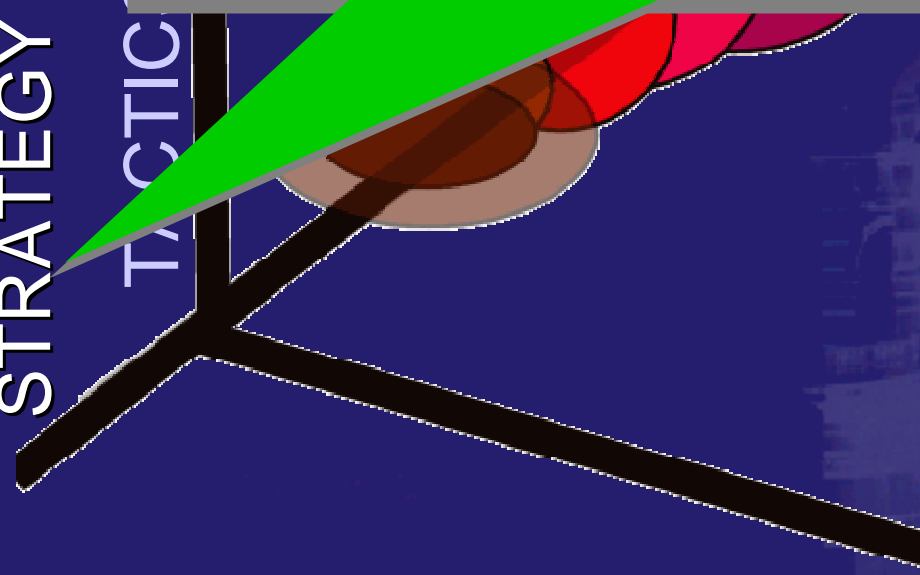
LIFE CYCLE ANALYSIS

- Material flows for each triple bottom line
- Favoured in 'green' regulations
- Data dependent on local processes
- Indirectly relates to national situation

SCOPE

STRATEGY

TACTIC

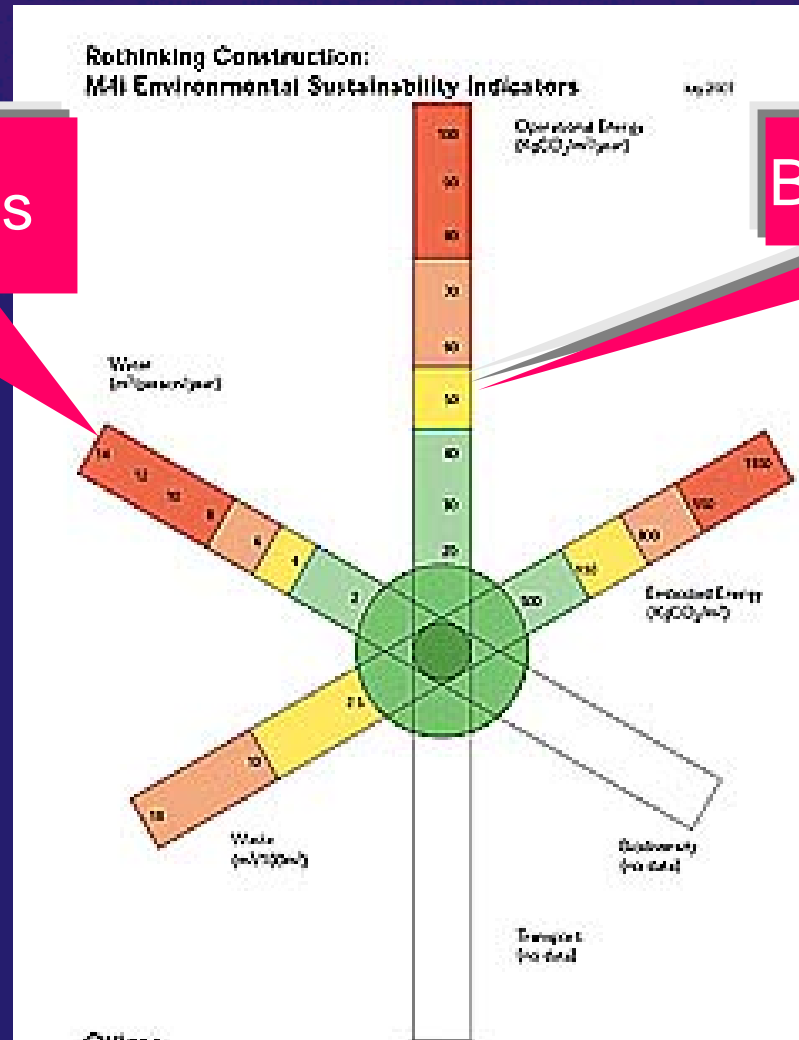


Toolkit

Benchmarking

Key Issue Axes

Benchmark Values



Engineering

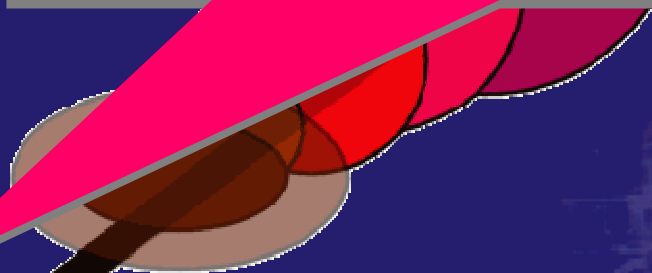
SCOPE

STRATEGY

TACTICS

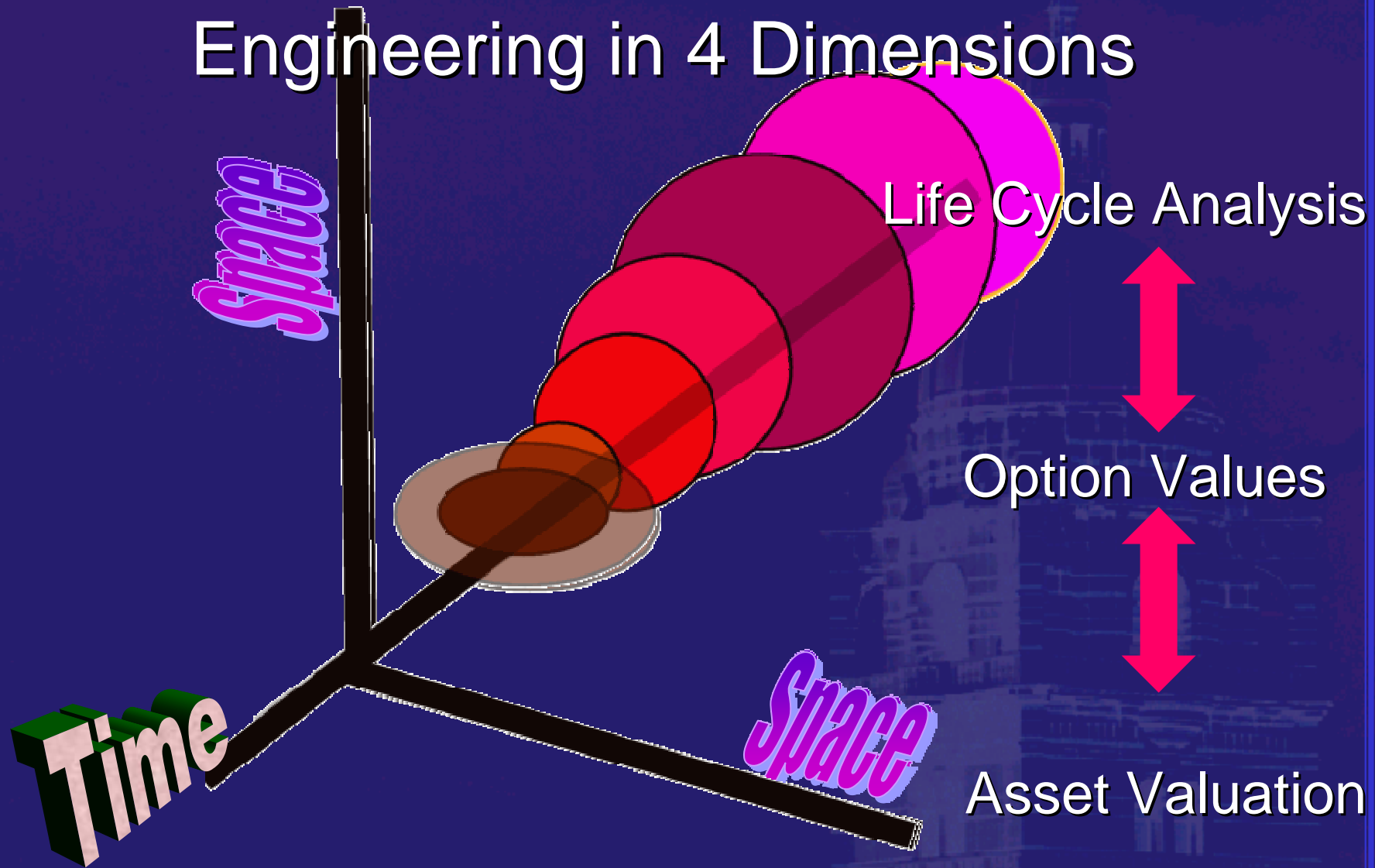
COST BENEFIT ANALYSIS

- Shadow prices triple bottom line to one
- Favoured in green tax calculations
- Some costs expensive to compute
- Indirect connection to national picture
- Opaque so open to controversy



Toolkit

Engineering in 4 Dimensions



Project for the Student *Not*

“...design a Kalashnikov rifle for under \$5 from readily available recyclable materials”

Conclusions

- Avoid the definitions snare by ignoring it
- Bring systems thinking to the party
- Scope with Board Room scorecard technique
- Link life cycle analysis to broader asset concept
- See creating options as creating SD & asset value

