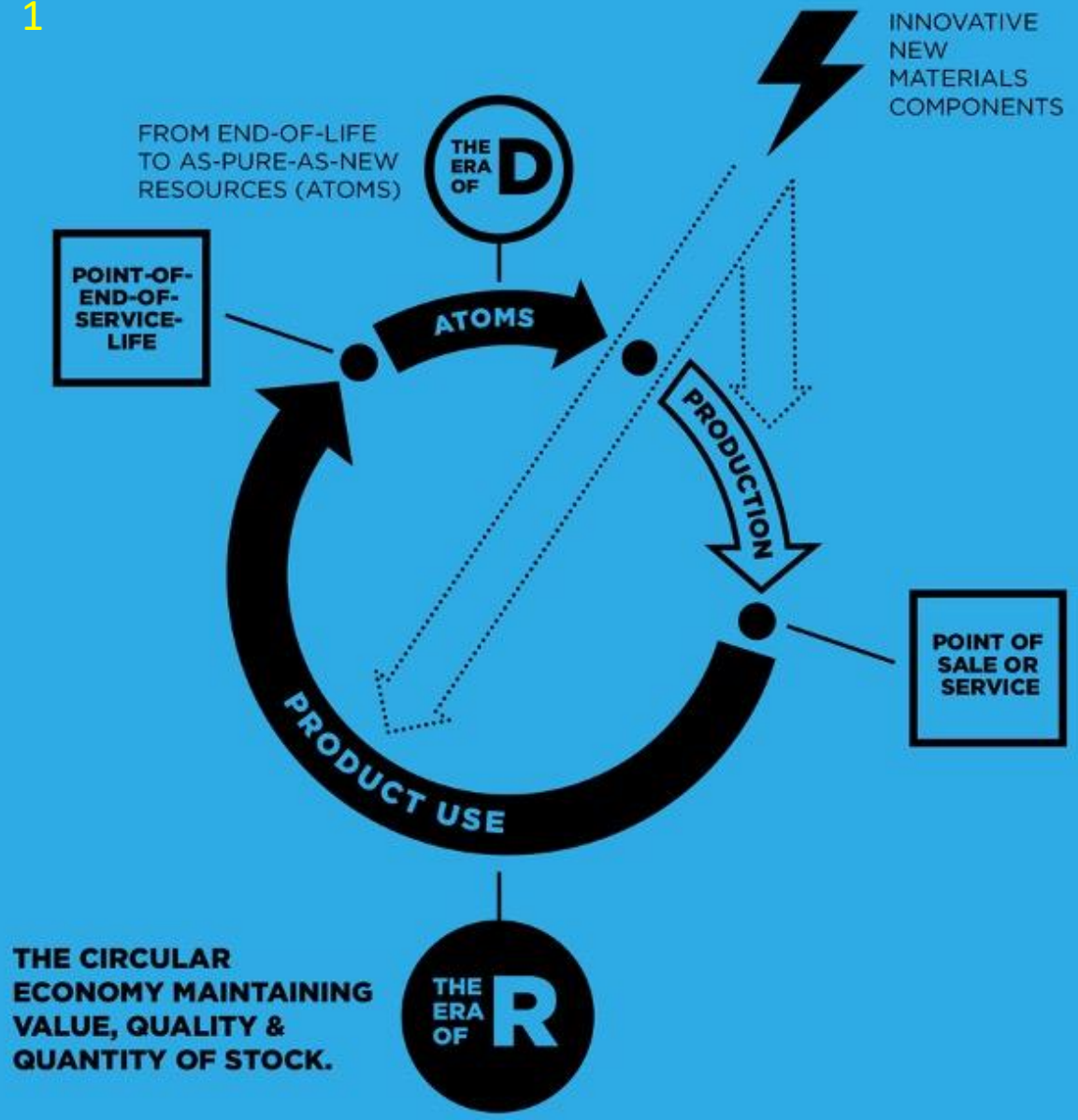
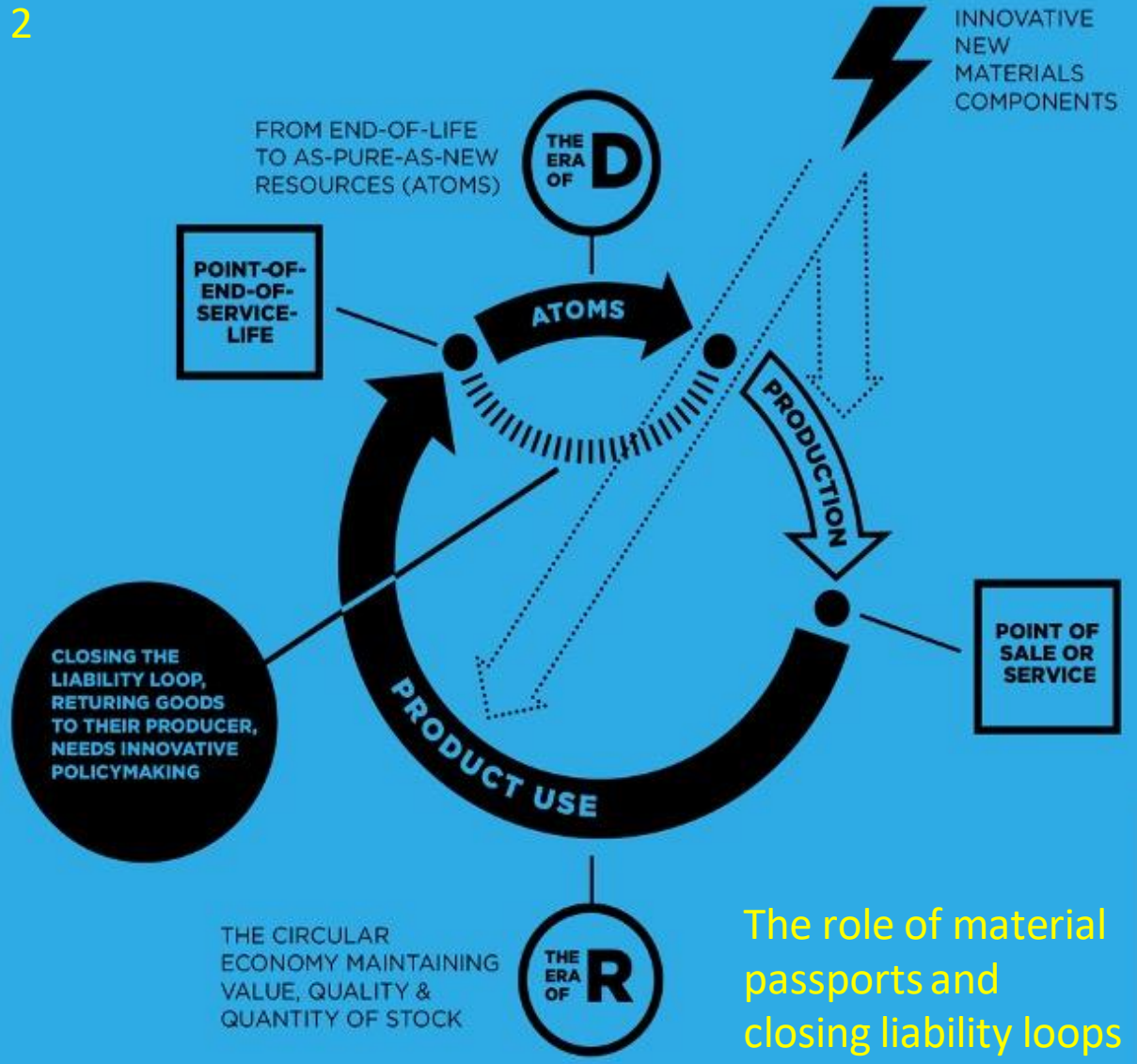
1



Prices need to reveal full costs

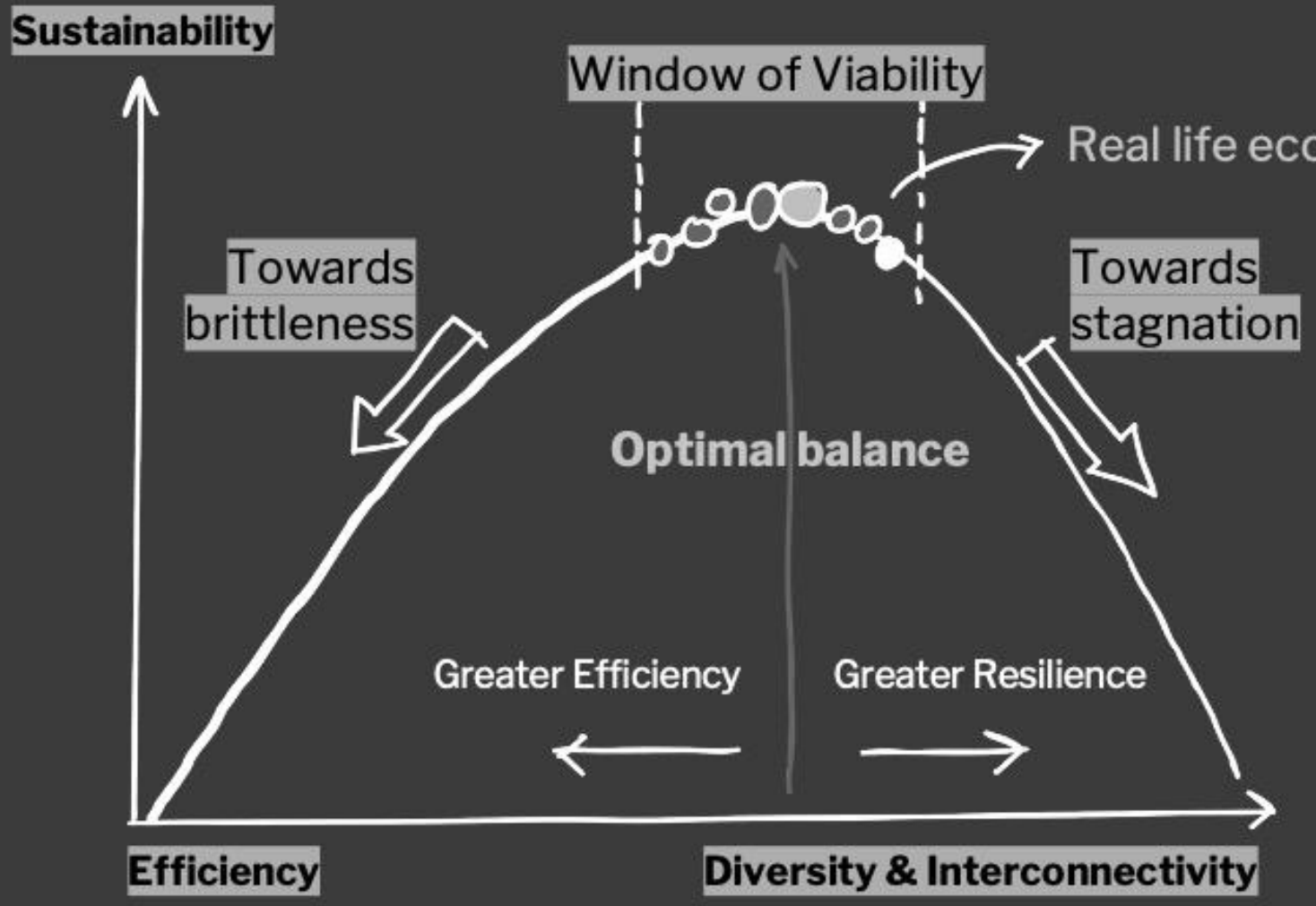
2



The role of material passports and closing liability loops in a CE?

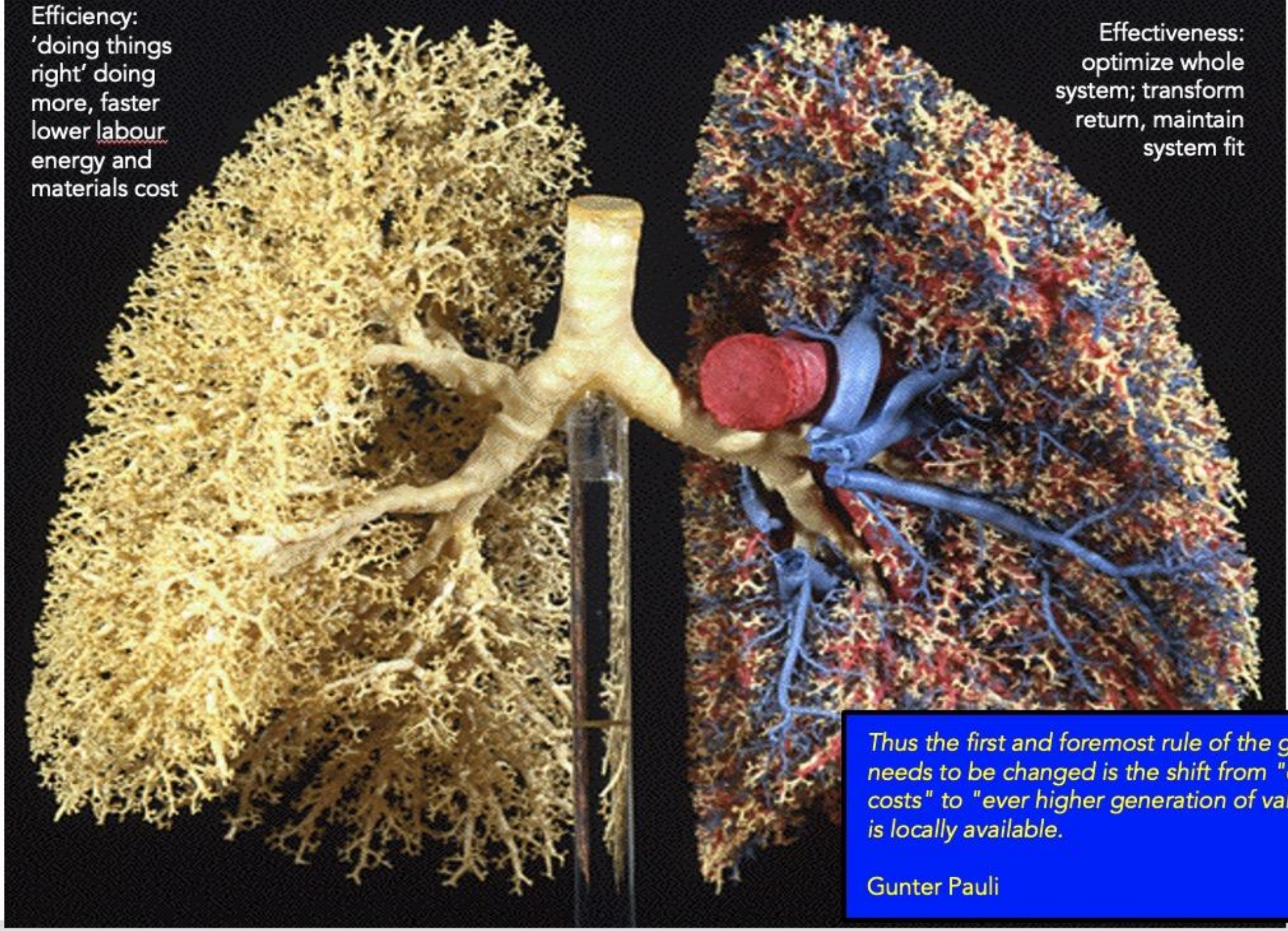
After WR Stahel

Effective Systems as a Dynamic between Efficiency and Resilience



Authors claim this structure applies to all flow networks - data, energy, money, molecules, in these kind of systems.

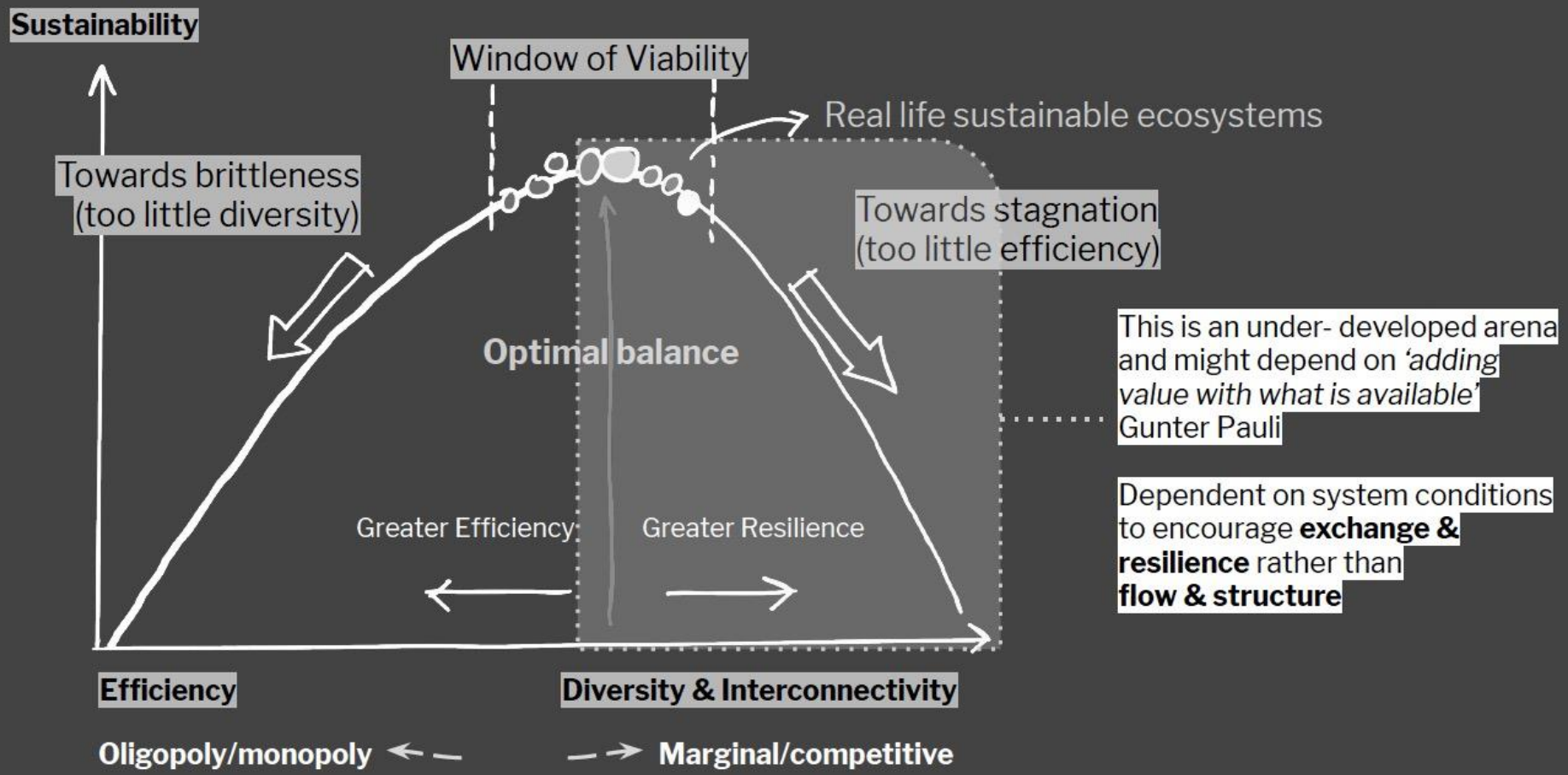
Source: Goerner, Lietaer and Ulanowicz, 2009



Thus the first and foremost rule of the game that needs to be changed is the shift from "ever lower costs" to "ever higher generation of value" with what is locally available.

Gunter Pauli

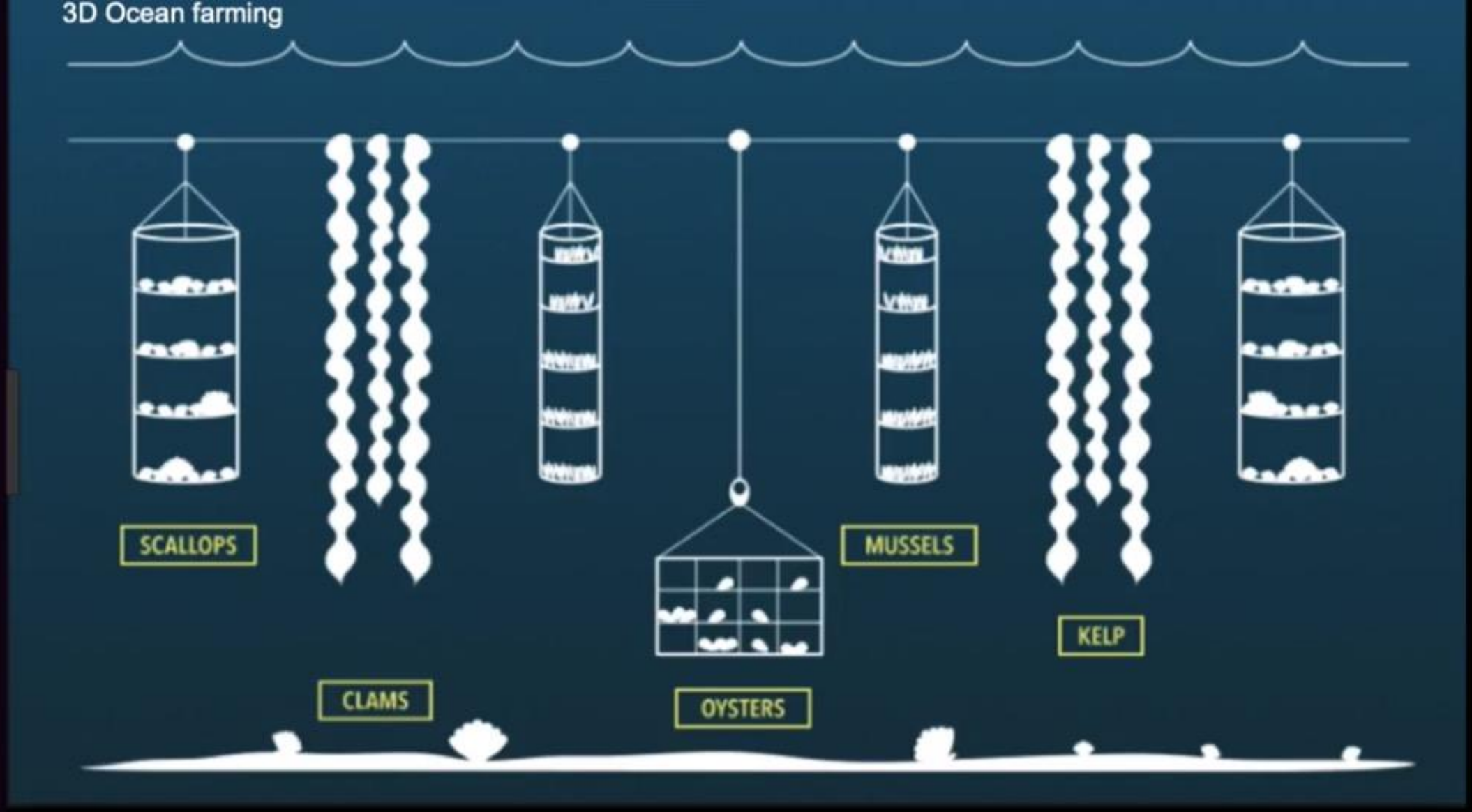
Building Effectiveness



This is an under- developed arena and might depend on *'adding value with what is available'* Gunter Pauli

Dependent on system conditions to encourage **exchange & resilience** rather than **flow & structure**

Source: Goerner, Lietaer and Ulanowicz, 2009



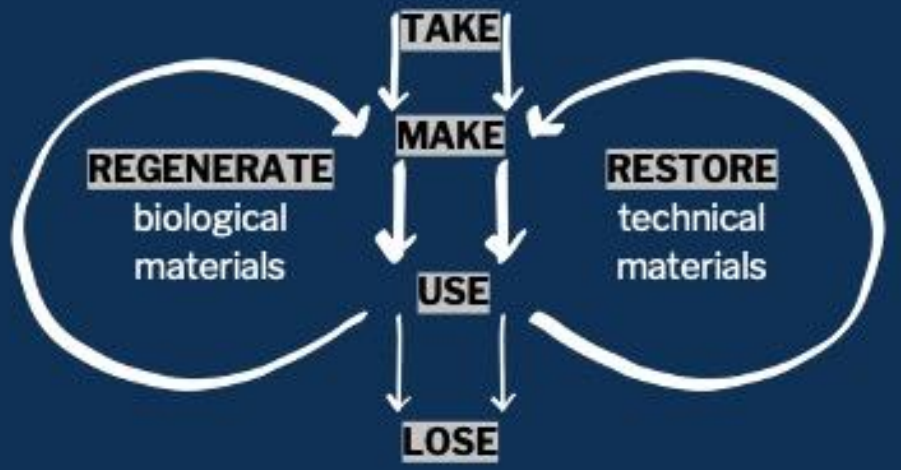
Economies of *scope* rather than *scale* 'Add value with what we already have'
Multiple cash flows, multiple benefits
Effective not just *efficient* systems

What kind of circular economy is emerging?

Centralised Circularity

Zero - waste manufacturing
Product-to-service
Recover own-brand goods

Top-down
In-house R&D
Material control
Proprietary technology



Notions of effective rather than efficient systems answer 'both' - through iteration of nested systems within enabling conditions
But which dominates?

Distributive Circularity

Open standards
Open source
Open data

Network-based
Distributed R&D
Material ecosystem
Knowledge commons

Source: Adapted from Kate Raworth / Exeter Centre for Circular Economy / Inaugural Lecture 2018