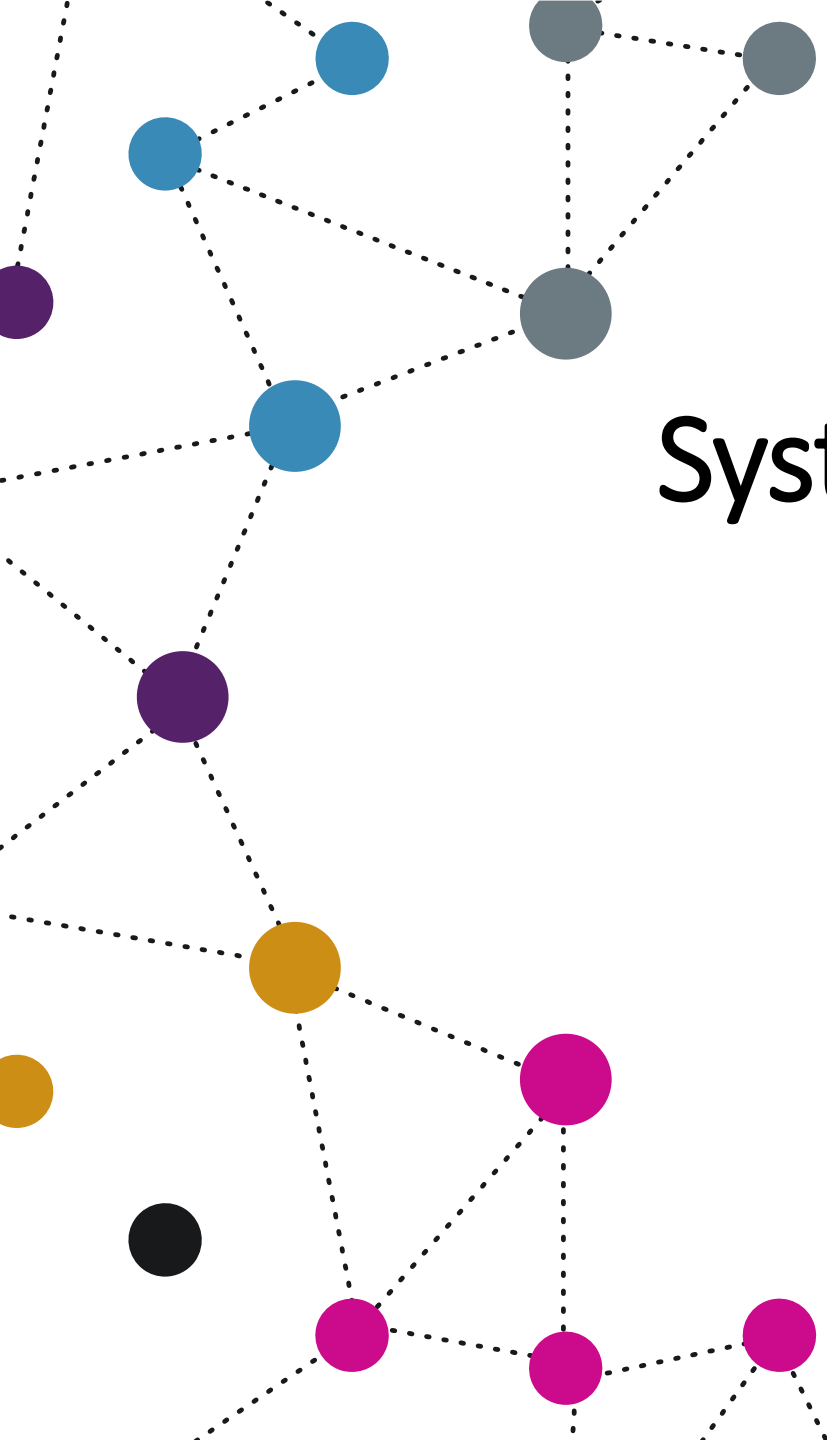

Systems approaches to accelerating the circular economy – Some food for thought

Inaugural seminar CE Hub, October 1st 2021

Frank Boons

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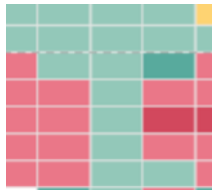
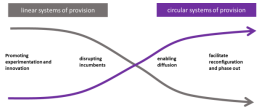
Professor of Innovation and Sustainability

Academic Fellow, Defra Systems Research Programme

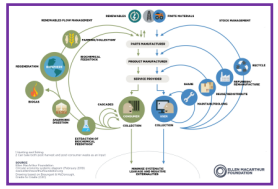
Outline



Interacting societal challenges require a systems approach



A perspective for action: system transitions



Circular economy and industrial symbiosis: a regime challenge?

Principles for systems-based action towards CEs

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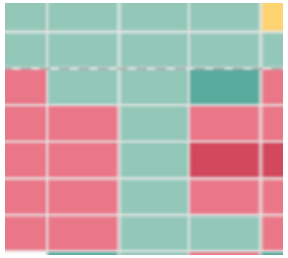


Interacting societal challenges require a systems approach

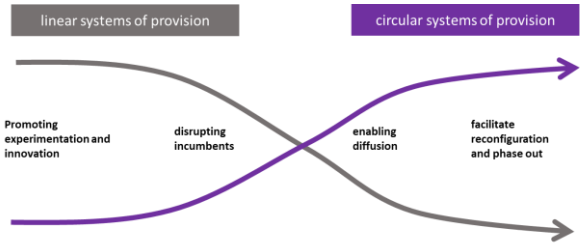
-no poverty

-affordable clean energy
-work & economic growth
-infrastructure and industry
-reduced inequality
-cities and communities
-sustainable natural resource mgt
-sustainable mgt. chemicals/waste

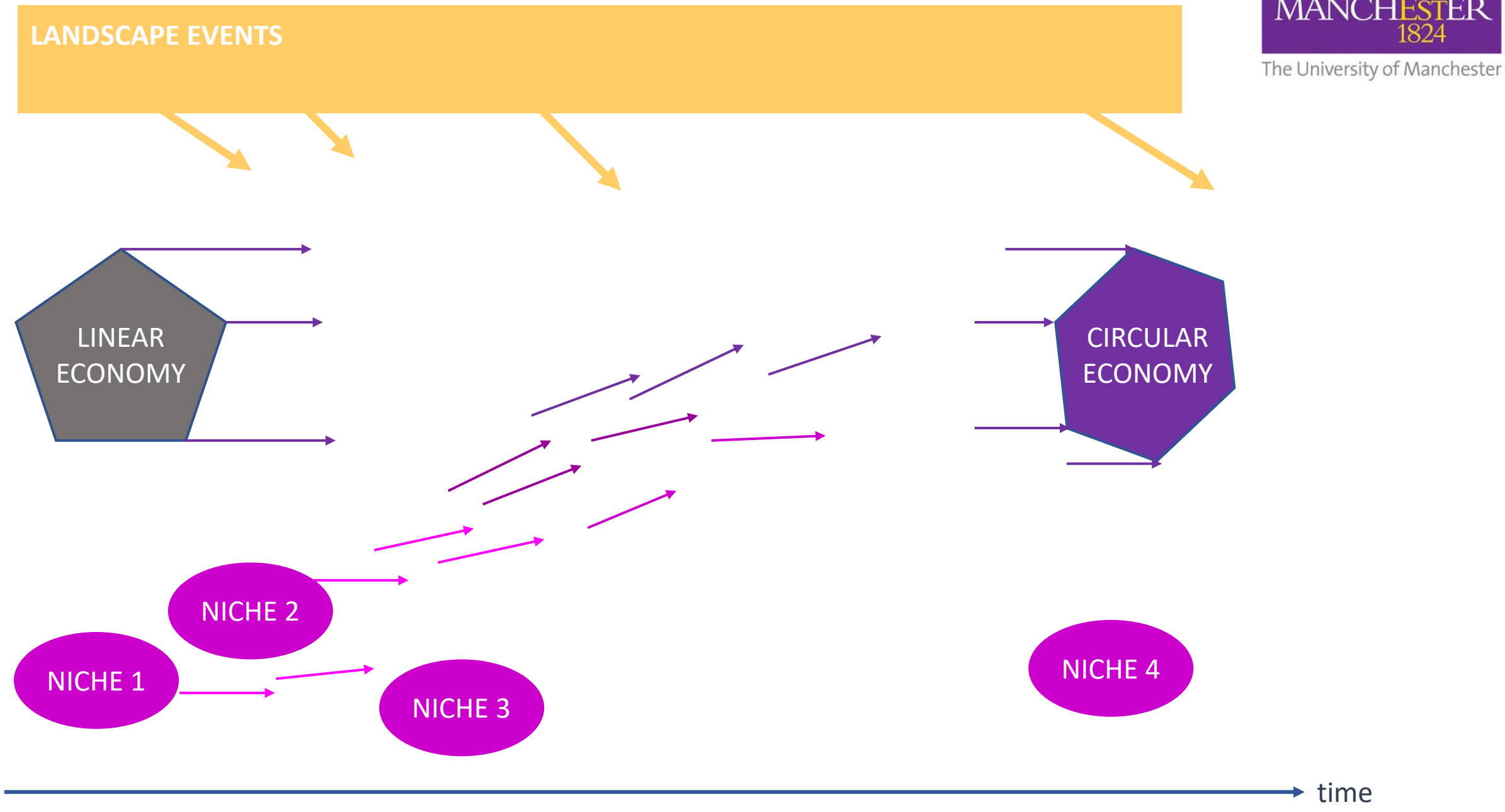
[adapted from Weitz ea 2019]

defining our systems approach:

- Systems approaches enable a perspective on the ***interrelations*** between a ***set of entities*** which fulfils a ***function***
- A ***whole systems*** approach combines ***reflection*** with ***action***
- (re-)defining the ***system boundary*** is key to ***impactful*** systems work
- three systems ***we are part of*** in developing the CE:
  - *socio-ecological earth system*
  - *socio-technical innovation system*
  - *The political economy of provision (i.e., food system, housing system, mobility system, clothing system, leisure system)*

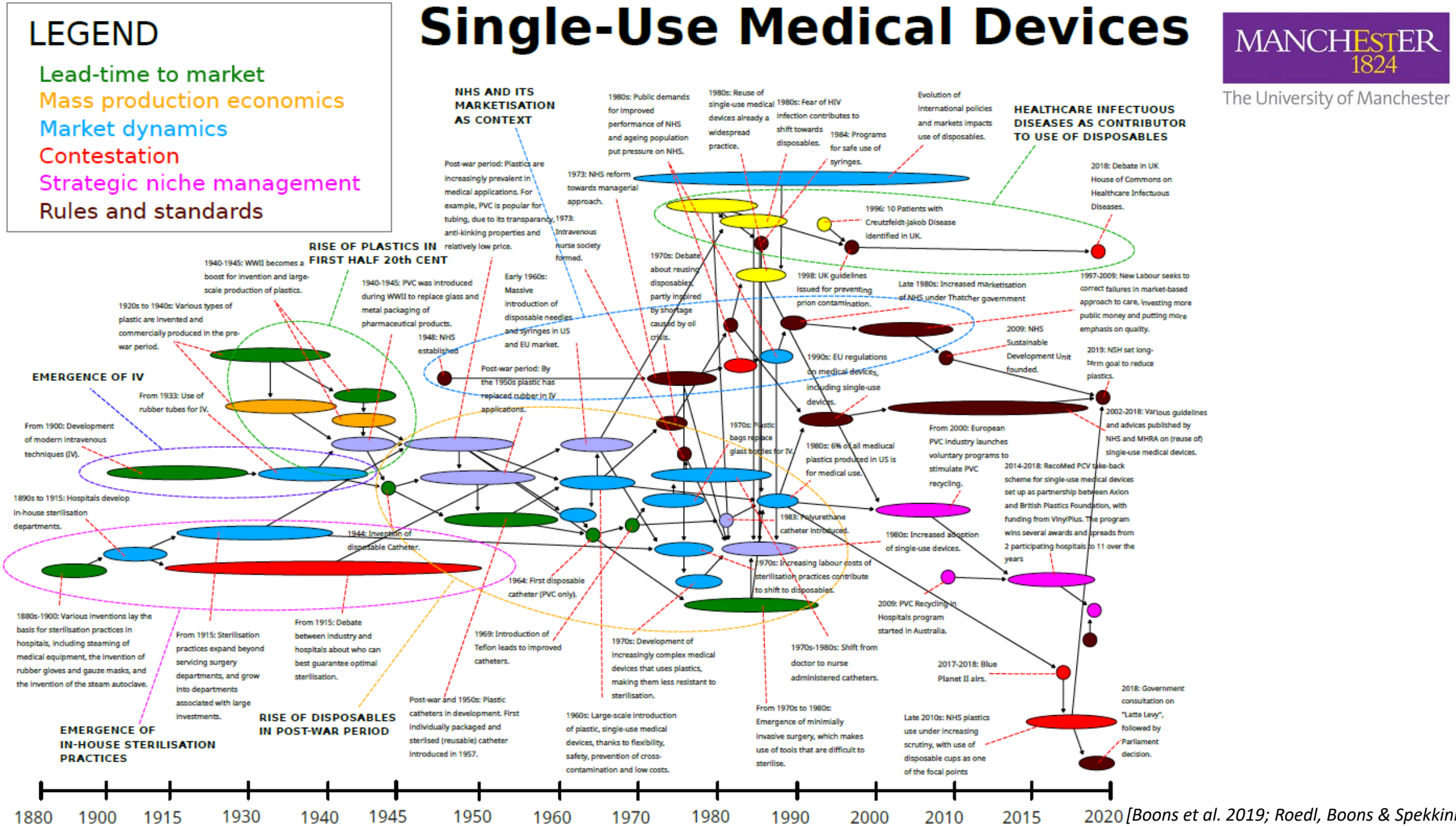


A perspective for action: system transitions



[after: Geels 2004]

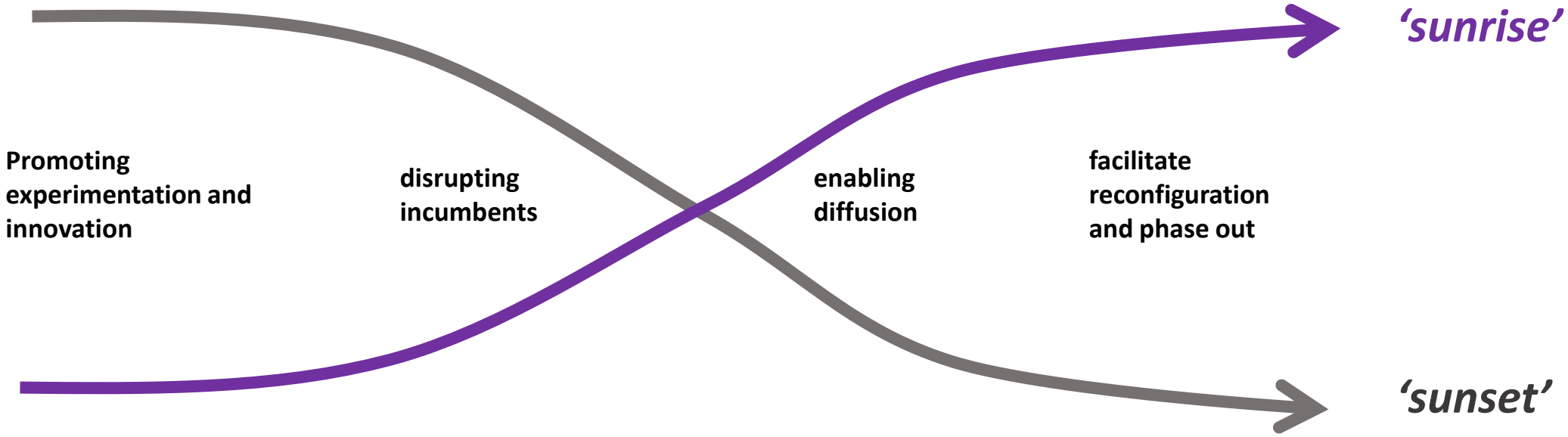
Single-Use Medical Devices



[Boons et al. 2019; Roedl, Boons & Spekkink 2021]

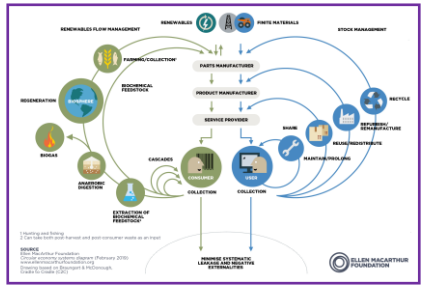
linear systems of provision

circular systems of provision



increasing scope of policies	- strict environmental regulation - R&D policy - promoting experiments - network building	- remove harmful subsidies - market creation - adoption subsidies - backing winners	- phase-out measures - compensating losers - retraining - offset inequities - regional assistance

[based on: Loorbach 2015; EEA 2021]



Circular economy and industrial symbiosis: a regime challenge?

What about industrial symbiosis and circular economy?

Industrial symbiosis (IS): the networks (long or short term) exchange of waste flows and by-products between co-located production facilities

Circular economy (CE): the provision in human needs through closed loop processes that cover production, transport, and consumption

→ Building IS increases dependencies, which ***lock-in*** existing forms of production (i.e. enhancing existing regime)

→ Closing loops in systems of provision ***CAN be*** part of a systems transition towards sustainability

multiple boundaries of systems of provision: do they make one CE?

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NATIONAL INDUSTRIAL SYMBIOSIS PROGRAM

SCAP 2020
Sustainable Clothing Action Plan

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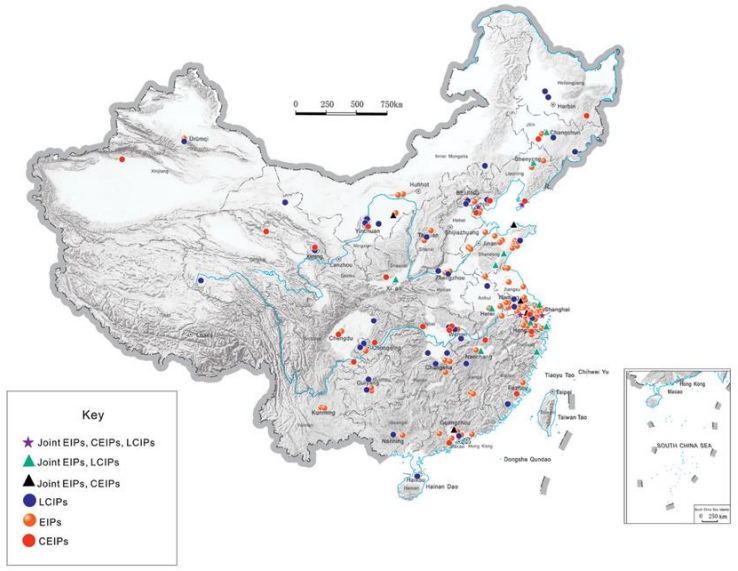

Principles for systems-based action towards CEs

Principles for a sustainable CE transition

1. The system boundary needs to allow consideration of ***whole systems of provision*** in their ecological, technological, cultural and political complexity
2. ***Reduction of absolute levels of resource use*** within this whole system needs to be the objective
3. The system boundary defines who is to be ***actively included*** in shaping the transition
4. The process of transition requires ***attention to 'sunrise' and 'sunset'*** activities

What is needed is the well-integrated combination of:

1. Up-to-date ***data*** on material stocks and flows in systems of provision

2. Experimentation/disruption/diffusion/phase out based on ***responsible innovation*** with active & coordinated roles for government, business, users and civil society

3. Societal debate on sustainable provision that engages with the need for ***reduced consumption***

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Thank you!
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