

A black and white photograph of the lunar surface, showing a horizon line with various craters and craters. In the background, the Earth is visible as a large, dark sphere with some lighter patches, set against a starry black sky.

Learnings on the EU Missions so far

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7 March 2024**

Who am I?

Academic

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Exercise on EU
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Key Learnings

Innovation is changing
(it is emergent not best practice)

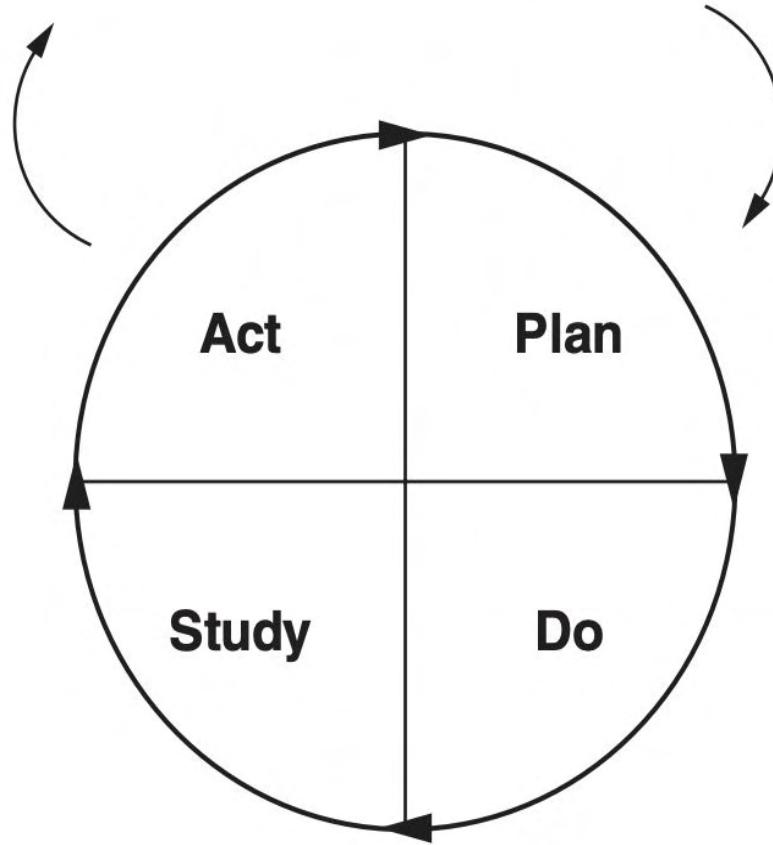
Missions are a new language
(Phrasebooks and practice help)

Implementers are pioneers
(Building new ecosystems)

There are Capability Gaps
(Engagement and community)

Action Learning and Experimentation

An Action Learning Pedagogy

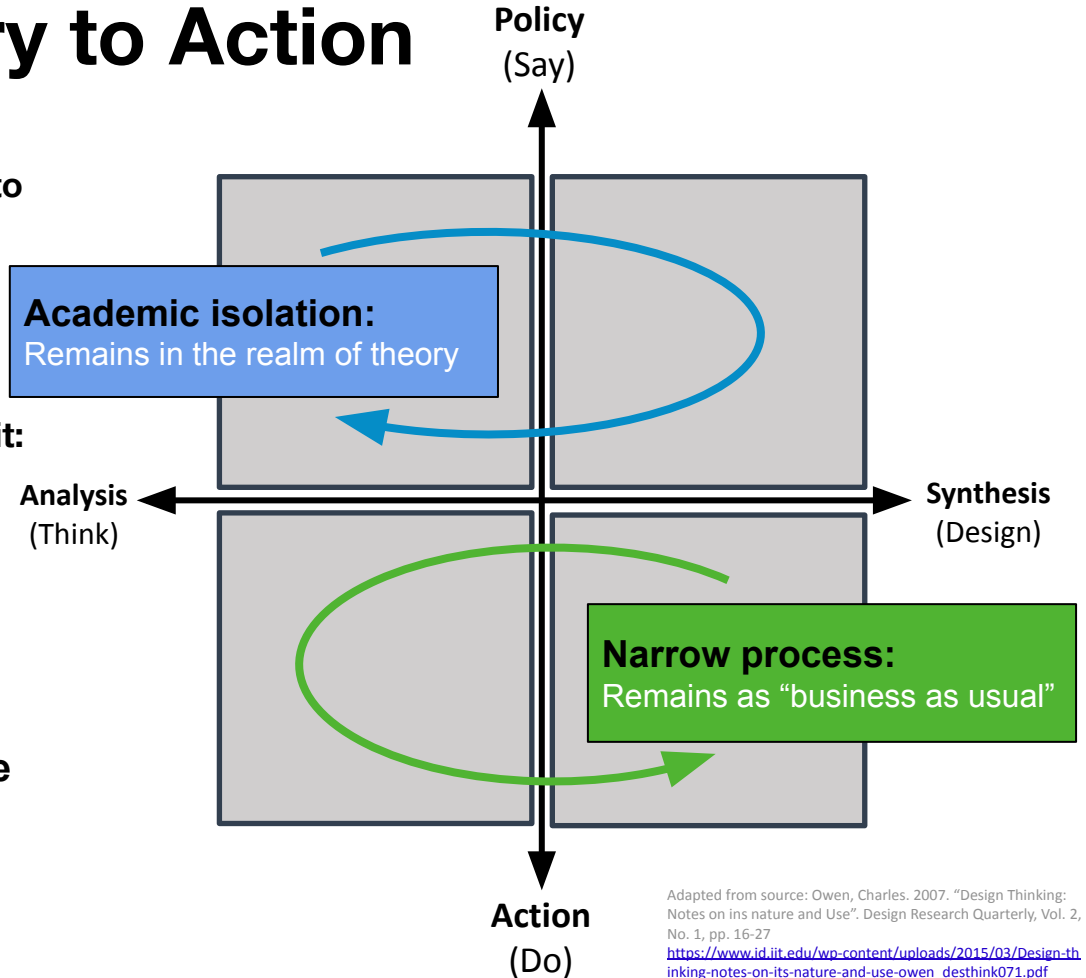


Moving from Theory to Action

Policymakers and practitioners are largely unready for the shift in practice that needs to take place to support long term transformative innovation.

The MLE offered a pedagogy to cross the “say-do gap” with wise experimentation sharing 3 types of learning in each topic visit:

- **KNOWLEDGE**
the expert topic report
- **PRACTICE**
the immersive “innovation safari”
- **PEER LEARNING** the collaborative design exercises and experiment action planning



Adapted from source: Owen, Charles. 2007. "Design Thinking: Notes on its nature and Use". Design Research Quarterly, Vol. 2, No. 1, pp. 16-27
https://www.id.iit.edu/wp-content/uploads/2015/03/Design-thinking-notes-on-its-nature-and-use-owen_desthink071.pdf

Key Learning 1

Innovation is changing
(it is emergent not best practice)

Over the last decade there has been “paradigm reorientation of research and innovation policy” (Lindner et al. 2021)

So let's remind ourselves why we are doing missions...

Vienna insight

The collage features several panels with the following labels and content:

- European Union**: Logo of the European Union.
- interreg Austria-Hungary 2014-2020**: Logo for the interregional cooperation program.
- interreg Slovakia-Austria**: Logo for the interregional cooperation program.
- interreg Austria-Czech Republic**: Logo for the interregional cooperation program.
- EFRE**: Logo for the European Regional Development Fund.
- IWA**: Logo for the International Water Association.
- Why a new Lab?**: The central title of the collage.
- Floods**: A panel showing a person in a red jacket standing on a pile of debris next to a flooded area.
- Renewable Energy**: A panel showing a large-scale construction site, possibly for a dam or hydroelectric project.
- Droughts**: A panel showing a large stone block with the words "AVOID HUNGER" and "AVOID DROUGHT" carved into it.
- Rivers out of order**: A panel showing a river with a large dam or barrier across it.
- Transport - Navigation**: A panel showing a large cargo ship on a river.
- Biodiversity - Ecology**: A panel showing a collection of small, colorful objects, possibly representing biodiversity.
- Logo of the University of Applied Sciences (FH) in Vienna**: Located in the bottom right corner.

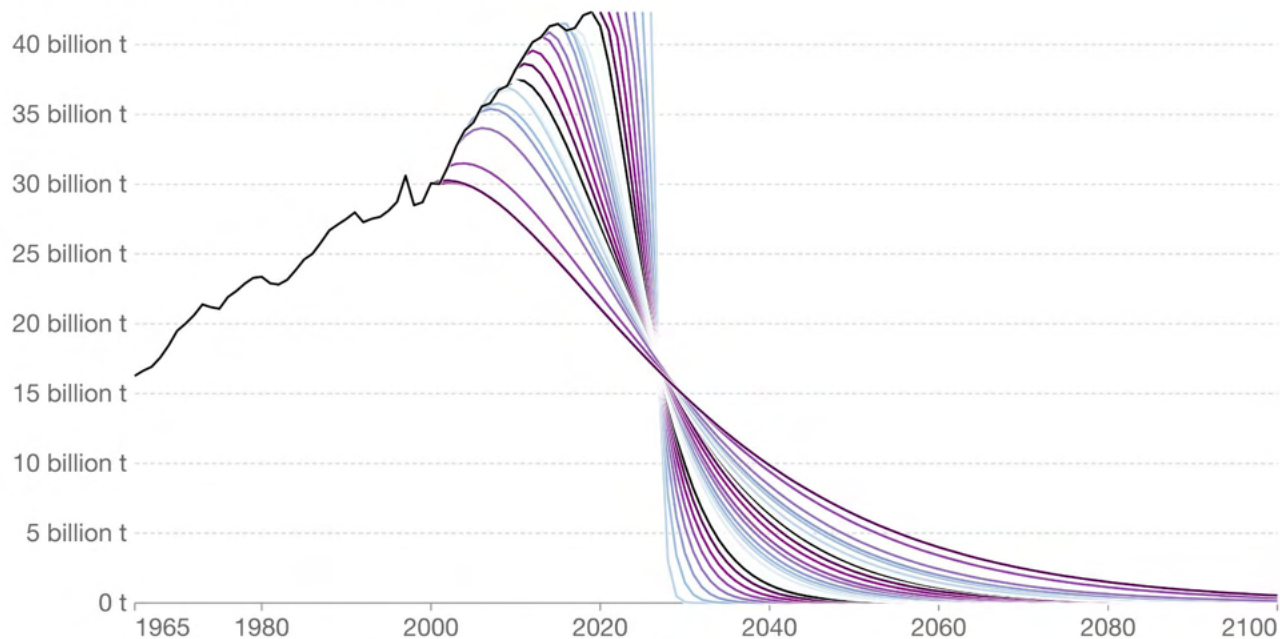
In the bottom left corner of the collage, there is a photo of a man in a suit and tie, looking towards the right. Below the photo, the text reads: "anckenberg Naturhistorische in Dresden, RND, DPA".

**Net Zero
is a very
steep
curve**

CO₂ reductions needed to keep global temperature rise below 1.5°C

Our World
in Data

Annual emissions of carbon dioxide under various mitigation scenarios to keep global average temperature rise below 1.5°C. Scenarios are based on the CO₂ reductions necessary if mitigation had started – with global emissions peaking and quickly reducing – in the given year.



Source: Robbie Andrews (2019); based on Global Carbon Project & IPCC SR15

Note: Carbon budgets are based on a >66% chance of staying below 1.5°C from the IPCC's SR15 Report.

OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY

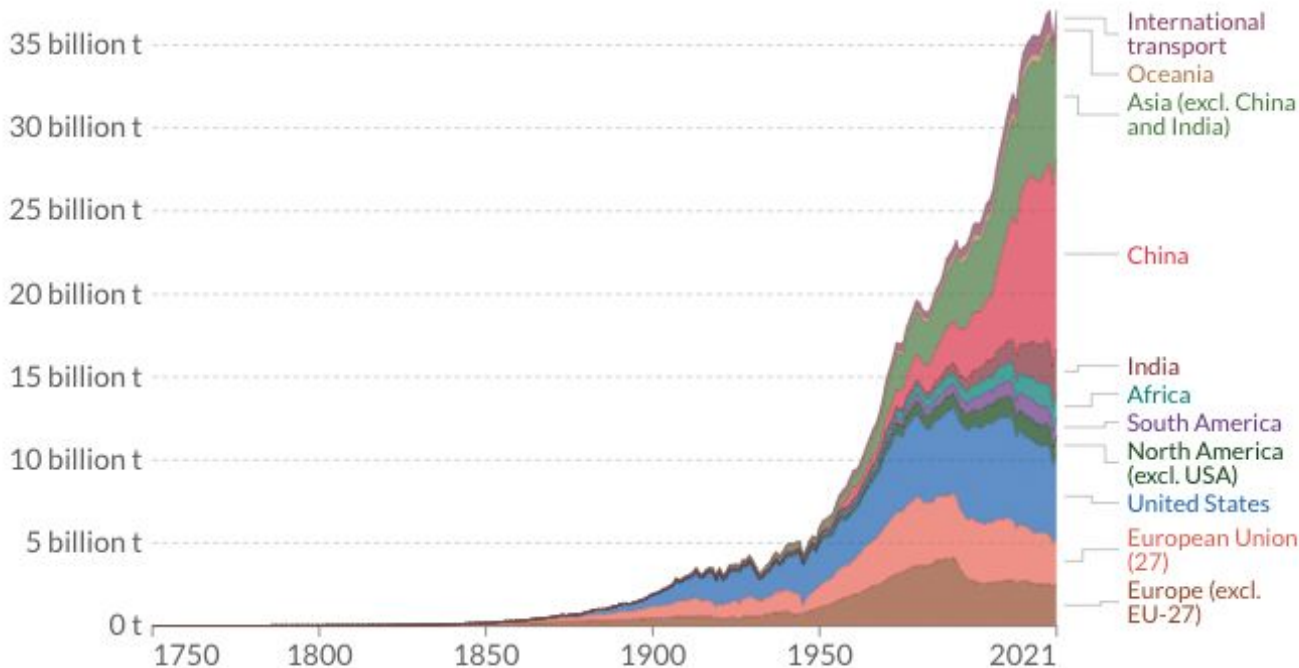
At a time when global emissions need to be falling, they are still rising and the world has not yet peaked.

Annual CO₂ emissions by world region

Our World
in Data

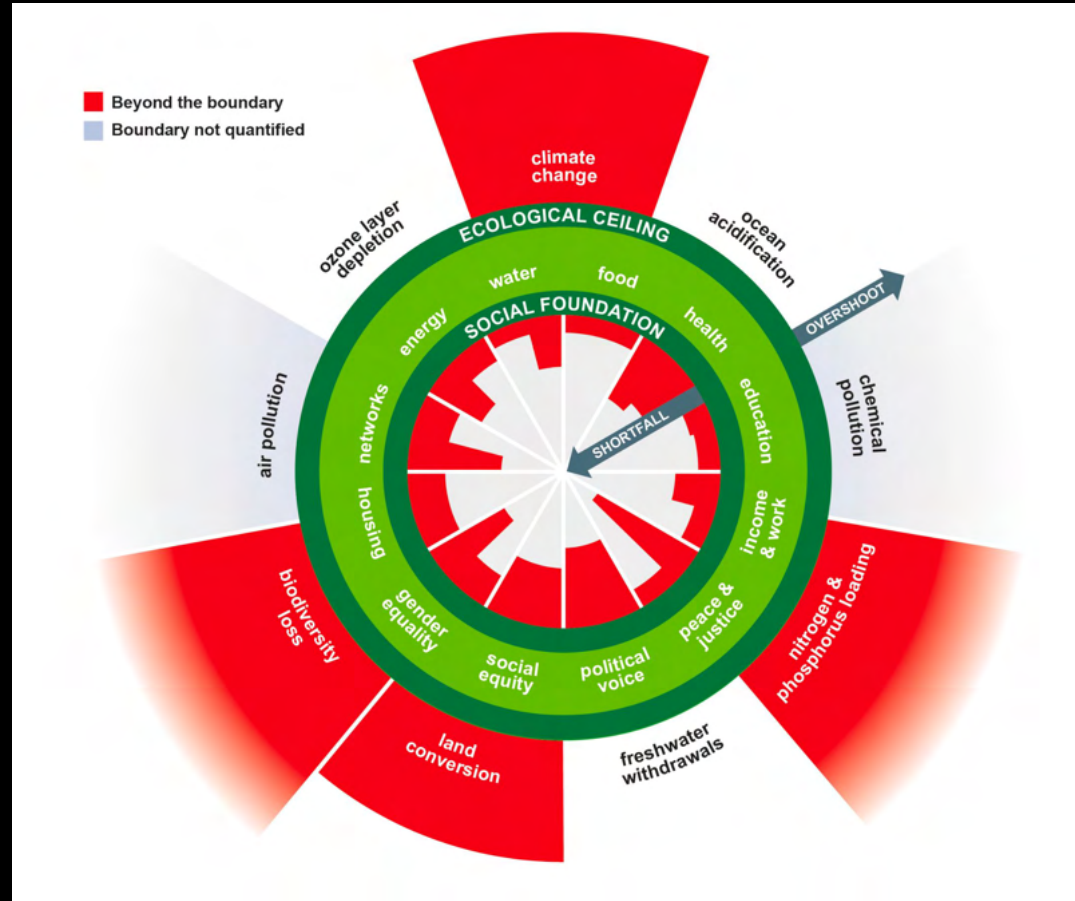
This measures fossil fuel and industry emissions. Land use change is not included.

□ Relative



Source: Our World in Data based on the Global Carbon Project (2022)
OurWorldInData.org/co2-and-other-greenhouse-gas-emissions • CC BY

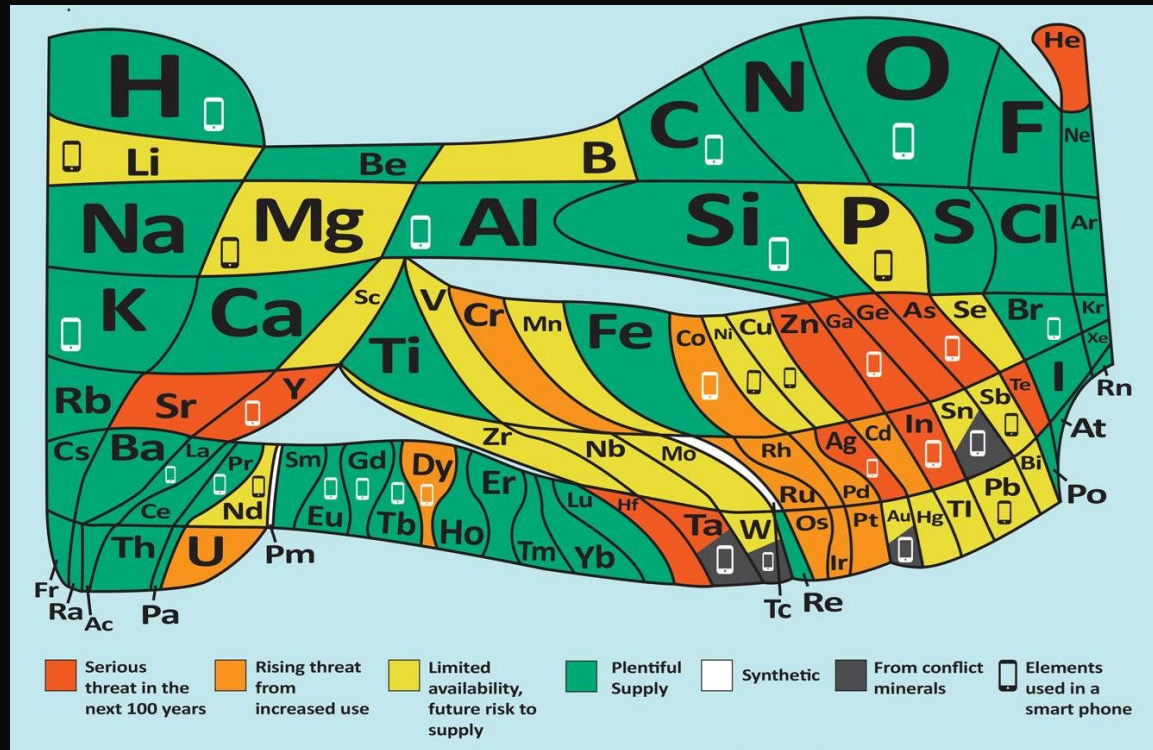
A “business as usual” scenario will lead us to continue to overshoot planetary boundaries which in turn will transgress the social foundations of life: safe housing, clean water, waste processing, health, education, food and clean air.



And we are also creating resource challenges like never before...


We are on a finite planet. There are 90 natural elements that make up everything. 50 of those are at risk or in conflict zones

Some of the elements have less than 100 years if we use them at the rate that we currently do (without factoring in compound growth of consumption).



Soil health matters

**Everything you make
returns to the Earth as
either food or poison.**

 **Slow Factory
Foundation**



Climate matters



Sydney, 2020

An underwater photograph showing a white plastic bottle floating in clear blue water. The bottle is partially filled with a yellowish liquid and has a brown leaf inside. Surrounding the bottle is various marine debris, including brown leaves, green seaweed, and small pieces of plastic. The scene is brightly lit, highlighting the textures of the bottle and the surrounding environment.

Oceans matter

The Ocean, 2023

Source: [Hakai Magazine](#)
Image Copyright: Credit: Cavan / Alamy Stock



Water pollution matters
Cleantech demands dirty mining

Chilean desert mining, 2022

Source: The Washington Post

Resilient cities matter

An aerial photograph showing a vast area of a city in Pakistan that has been completely inundated with floodwater. The water is a murky, brownish-green color. Numerous rectangular, single-story buildings, typical of the region's architecture, are partially submerged, with only their roofs and upper walls visible above the water level. Some buildings are completely isolated, surrounded by water on all sides. The background shows a dense urban area that is also affected by the flooding, with water filling the streets and courtyards between the buildings. The overall scene depicts a significant humanitarian and infrastructure crisis.

Pakistan, 2022

Source: [Hakai Magazine](#)
Image Copyright: Credit: Cavan / Alamy Stock

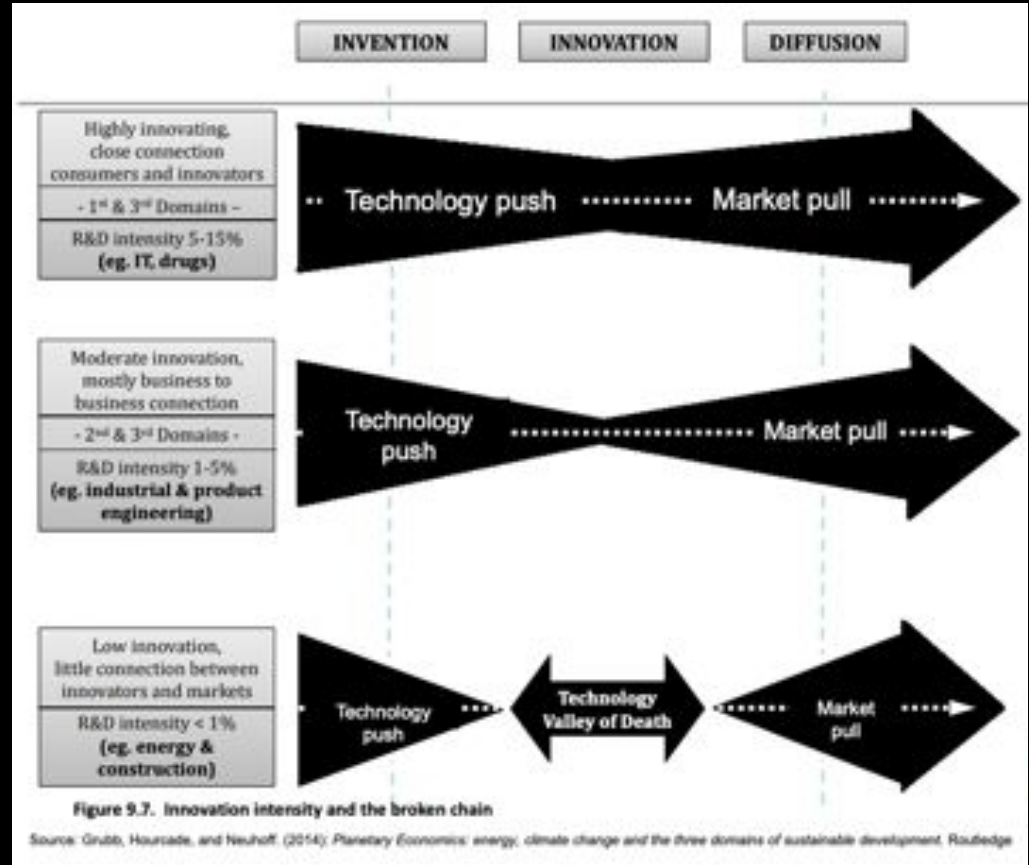
Resilient cities matter



Turkey - Syria, 2023

**Planet-centred
Innovation
can't just
disrupt old
worlds.**

**It must also
construct new
ones.**



Planetary Economics, Michael Grubb

Key lesson:

You are “STI bootstrapping”

This change in orientation will only grow - your work at this moment is paving the way for future transitions and transformative innovation

Key Learning 2

Missions are a new language
(Phrasebooks and practice help)

The EU Missions

Mission CANCER

Save the lives of more than
3 million people, improve
expectancy and quality of life

Mission CLIMATE

Prepare Europe for adapting
to climate change; create 150
climate-resilient regions and
communities



Mission CITIES

100+ model cities (living labs);
turn all cities in Europe
climate-neutral by 2050

Mission SOIL

Contribute to the objective of 75%
healthy soils in Europe; support
100 demonstration cases

Mission WATERS

Clean oceans, seas and waters
from pollution; restore
ecosystems; foster a CO₂-neutral
blue economy

Why Mission Oriented Innovation is different

COMPETITION AND MISSION-ORIENTED APPROACHES

Characterization of competition-oriented vs. mission-oriented innovation policy
(based on Boon and Edler 2018)

	COMPETITION-ORIENTED (TRADITIONAL) INNOVATION POLICY	MISSION-ORIENTED INNOVATION POLICY
Justification for state policy	<ul style="list-style-type: none">• Intervention aimed at modernizing the system without substantive direction.• Market and system failures.• Focus on technology and actors.• Innovation policy as economic policy.	<ul style="list-style-type: none">• Intervention that targets transformative change.• Focus of research and innovation activities (solution supply) and markets (demand) on specific problems.• Innovation policy as problem-solving policy.
Results-based public acceptance	<ul style="list-style-type: none">• Innovation performance (better performance through more innovation).• Growth, competitiveness, increase in exports as a basis for prosperity.	<ul style="list-style-type: none">• Solution to societal problems.• Societal progress through fulfillment of the mission.

Missions seek Transformation

Mission-oriented innovation aims to tackle grand challenges and address the root of any given problem. The process seeks to set out innovation pathways in areas of high uncertainty, nurturing new industrial and technological landscapes.

Source: Christian Naczinsky

Entrepreneurial univ. model	Transformative univ. model
Function – Objective	
Tech transfer, science communication – Contribution to economic development	Co-creation for transformation – Contribution to societal transformation
Approach	
<ul style="list-style-type: none"> Technical or scientific problem • Closed-model innovation • Device orientated • Response to problems in isolation • Knowledge interaction between univ. & firms • University as the primary source of knowledge 	<ul style="list-style-type: none"> Societal problem • Open-model innovation • Place- and stakeholder-oriented • Comprehensive response to interwoven problems • Multi-directional flows & multi-faceted sources of knowledge
Collaboration type	
Actors from academia, industry and government	Large-scale coalition: academia, industry, gov., civil society
Channels	
<ul style="list-style-type: none"> Patents/licenses • Spin-off firms, technology parks • Conferences, publications • Consultation ... 	<ul style="list-style-type: none"> Knowledge man. & curation • Socio-technical experiments • Involvem. in policy processes ...

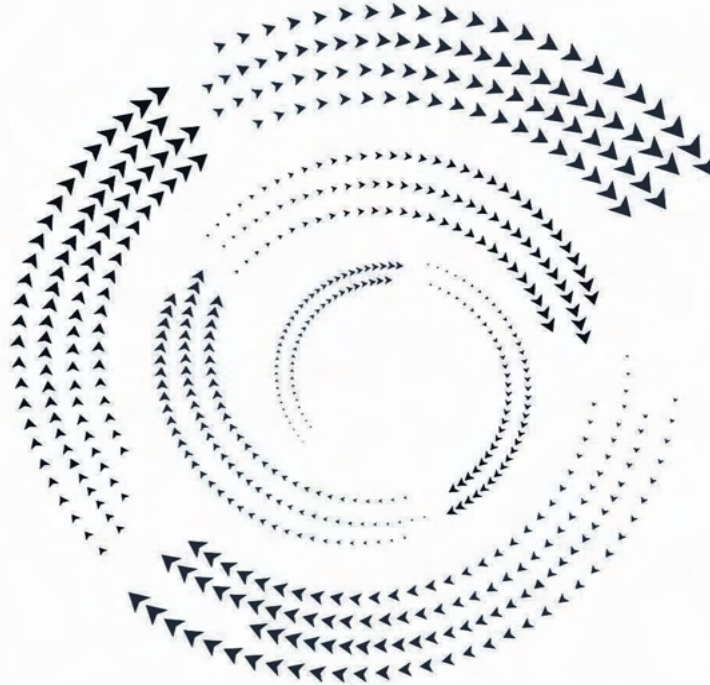
Source: Developed from Trencher et al. (2014); Loorbach & Wittmayer (2023)

At Best: Missions create an “Ambition Loop”



Government Climate Policy

- ▲ Clear, ambitious targets and policy
- ▲ Predictable regulatory environment
- ▲ Incentives and infrastructure
- ▲ Long-term market signals
- ▲ Support for research, development, and deployment
- ▲ Clear plans and timelines for full transition to a zero-carbon economy



Business Climate Action

- ▲ Ambitious, science-based targets
- ▲ Public updates on progress
- ▲ Investments and growth strategies aligned with a zero-carbon future
- ▲ Commercial demand for zero-carbon energy, zero-carbon transportation and zero-carbon land use
- ▲ Responsible policy engagement (individually and through trade associations)

Source: From **UN Global Compact, We Mean Business and World Resources Institute** [here](#)

At worst:

“Mission Mimicry”

Missions require new tools, capabilities and a long term view

To focus on the problems first and foremost will require commitment to new capabilities which will not emerge automatically. Here are some examples of emerging practice.

“Isomorphic mimicry is a key “technique of successful failure” that perpetuates capability... [it] is the tendency of governments to mimic other governments’ successes, replicating processes, systems, and even products of the “best practice” examples. This mimicry often conflates form and function: leading to a situation where “looks like” substitutes for “does”; i.e., governments look capable after the mimicry but are not actually more capable.”

The authors state that this tendency to mimic is amplified when the public sector seeks “agenda conformity” as this makes it very hard for states to build the new capabilities needed, for their contexts, given their realities.

“Building State Capability: Evidence, Analysis, Action”
Matt Andrews, Lant Pritchett, and Michael Woolcock
Oxford University Press: 2017

Key lesson:

Avoid “mission washing”

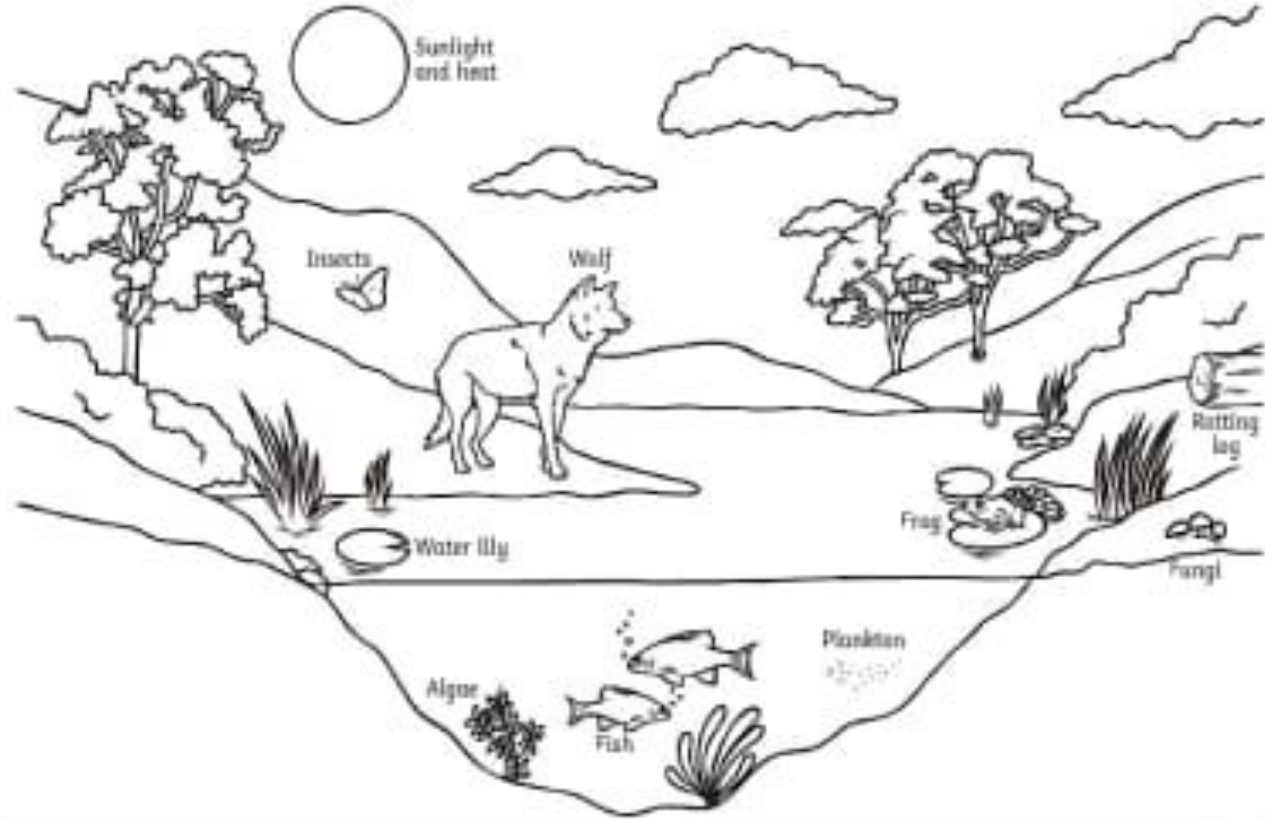
Make space for silly questions to avoid agenda conformity

Key Learning 3

Implementers are pioneers
(Building new ecosystems)

You are cultivating Mission Oriented Ecosystems

British botanist Arthur Tansley coined the term “ecosystem” in the 1930s, to describe a community of organisms in the natural world that **collaborate and compete** with one another, evolve together, adapt to new challenges, and exploit new opportunities.



“A mission-oriented innovation ecosystem is characterized by its distinct target focus. As opposed to ‘standard’ innovation ecosystems [that] predominantly aim to bring innovative technologies, products and services to the market, mission-oriented innovation ecosystems pit themselves against the grand challenges...”

Mission Managers are boundary spanners

They are world builders

They need mental dexterity, charismatic authority, bundles of energy and the ability to pivot between policy world and the world of ordinary people

And they need a community

“Healthy ecosystems are symbiotic not parasitic”

**FOCUS ON SYSTEM
TRANSFORMATION**

**GREEN TRANSITION
ECOSYSTEMS**

(described in 8 papers)

Often centered around science-industry collaborations, which might involve partners “beyond the value chain”, these ecosystems aim to transform a sector’s pattern of production and resource use.

**SUSTAINABLE
TRANSFORMATION
ECOSYSTEMS**

(described in 10 papers)

Led by public sector actors, these ecosystems are characterized by a heterogeneous stakeholder mix, active involvement of civil society and the integration of technological and social innovations.

**FOCUS ON SINGLE
SOLUTIONS**

**GREEN INNOVATION
ECOSYSTEMS**

(described in 7 papers)

Triggered by political regulations and new market demands, firms build said ecosystems to develop environmental innovations, sometimes incorporating NGOs as “environmental thought leaders”.

**SUSTAINABLE
INNOVATION
ECOSYSTEMS**

(described in 6 papers)

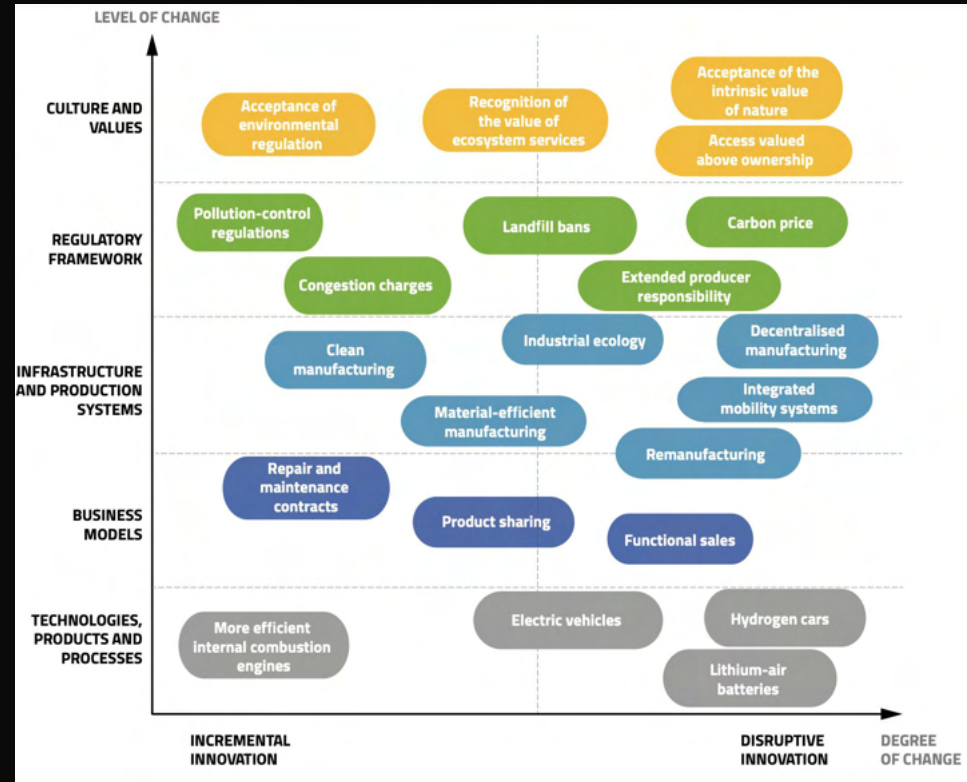
Consulting various stakeholders, firms use external sources of knowledge within their ecosystems in order to create new technologies, products or services, hereby meeting triple-bottom line criteria.

**A healthy ecosystem is the
“soft infrastructure”
needed to support mission portfolios**

Silly questions are allowed:

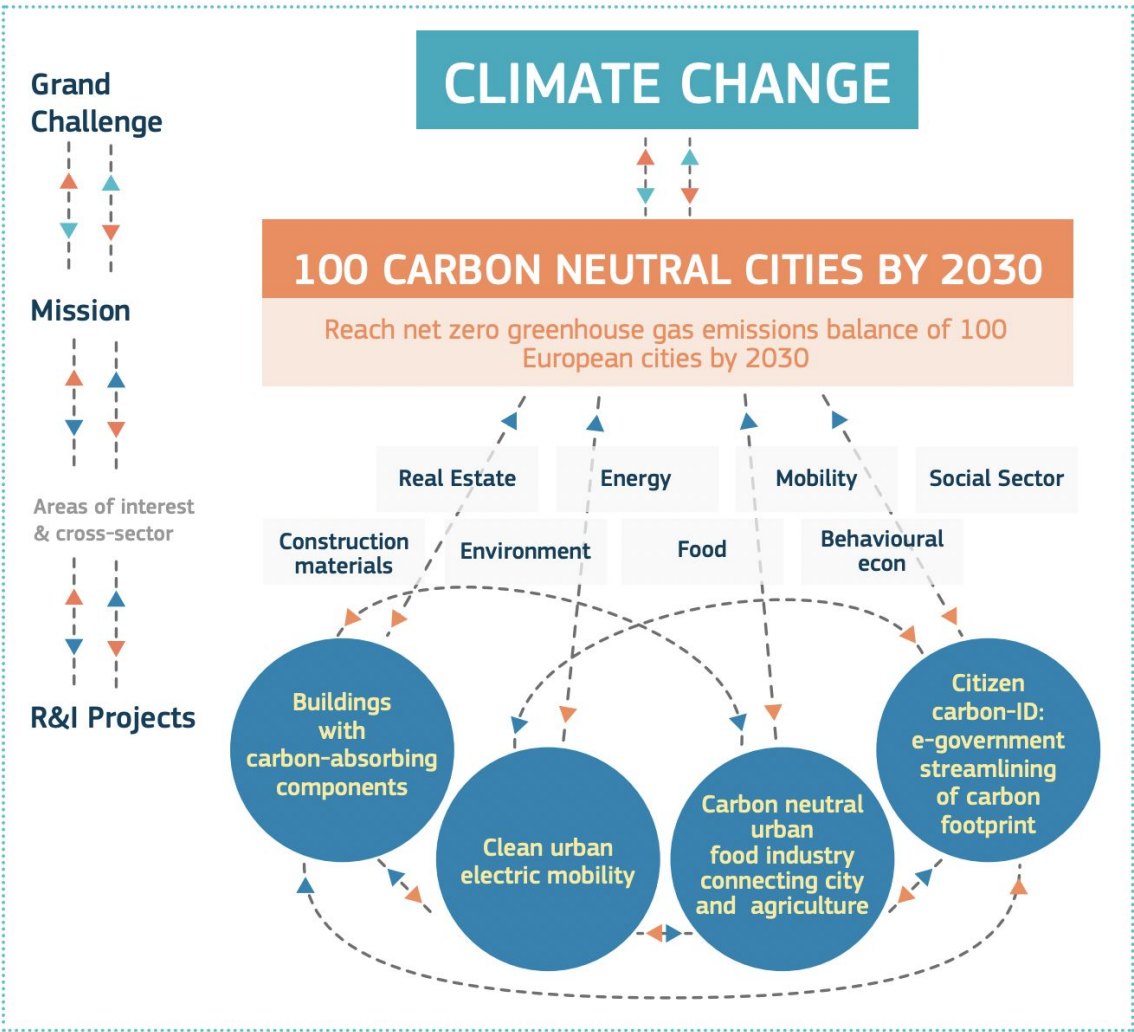
“What are Portfolios?”

“Many innovations with a transformative impact are system innovations. System innovation is a portfolio of interdependent and mutually reinforcing innovations which together have a potential to transform systems. The impact of system innovations depends on the strength of synergies between its elements rather than only on the disruptiveness of individual technologies.”

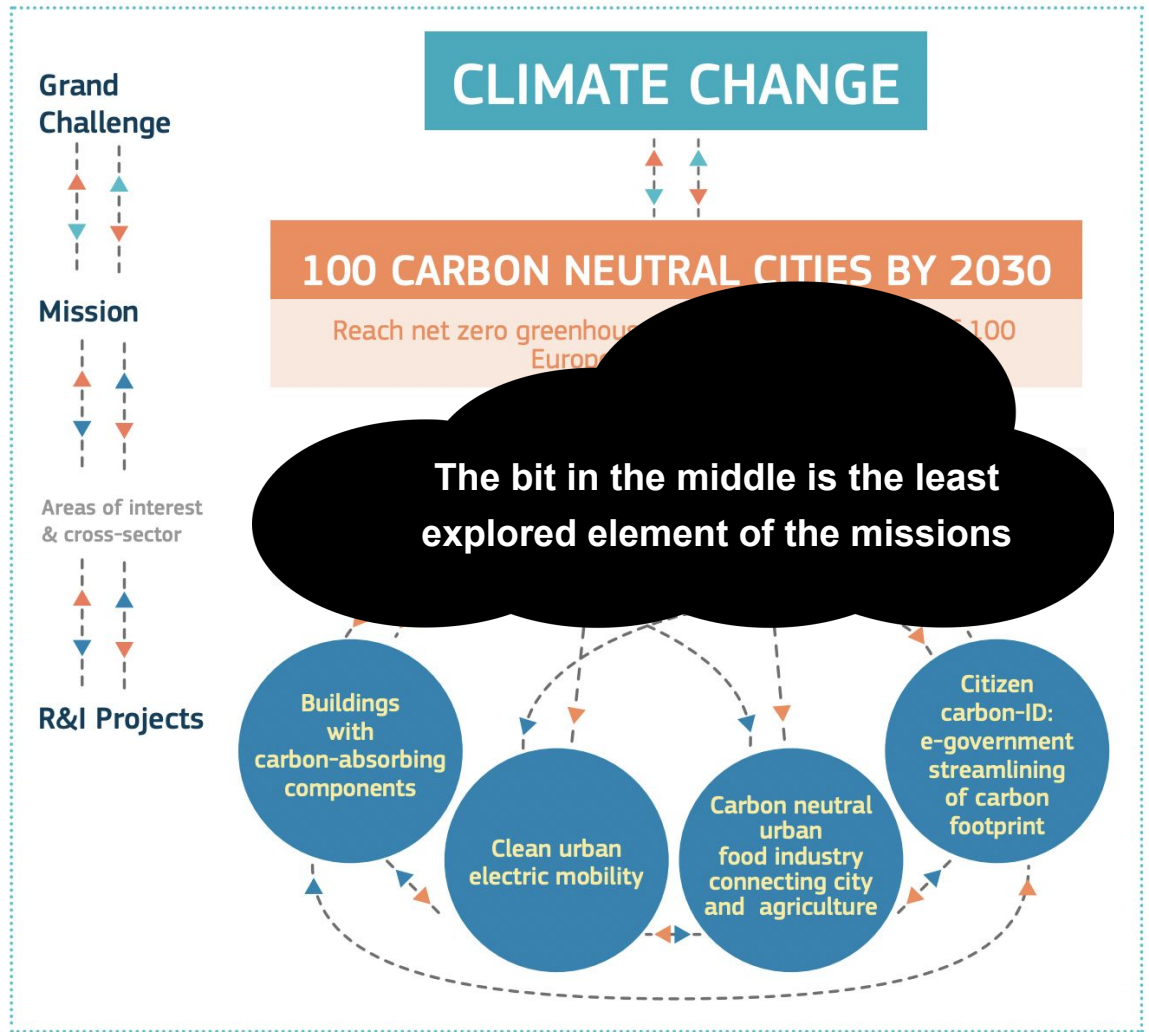


Portfolio insight...

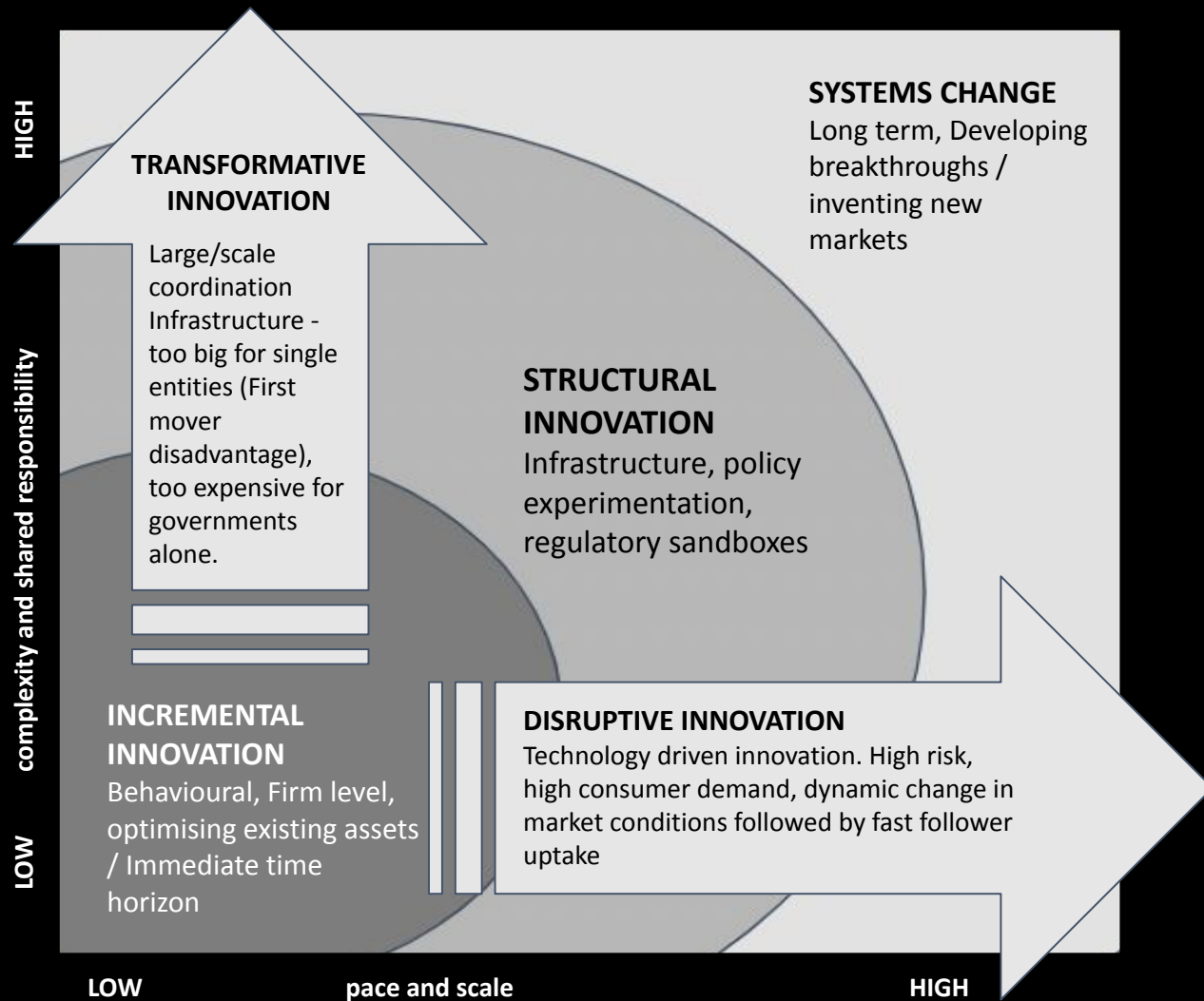
This looks great, but it needs to be grounded in the national and local industrial context



When we debate tensions between top down and bottom up we risk getting lost in the theory and not actually doing anything



Portfolios need to manage a wide range of different types of innovation



Source: Conway 2022, Designed with reference to various source material: System Climate Innovation for a Transformative Impact, by Michal Miedzinski, Institute for Sustainable Resources, University College London, 2018
https://www.climate-kic.org/wp-content/uploads/2017/03/Insight03_Proof4.pdf How to Manage an innovation portfolio
<https://www.viima.com/blog/innovation-portfolio>

Leverage point

Cultural Values
and Citizen
engagement

Infrastructure
and production
systems

Policy mix and
Regulatory
environment

Consumer
Market and
Business model

Science and
Technology

Finance

Governance

“MISSION READINESS LEVELS” prototyping portfolios

Basic principles

Fundamental research

Applied Experiments

Prototypes

Demonstrator

Market-ready / Scalable

Rate and pace
of change

Early Concept

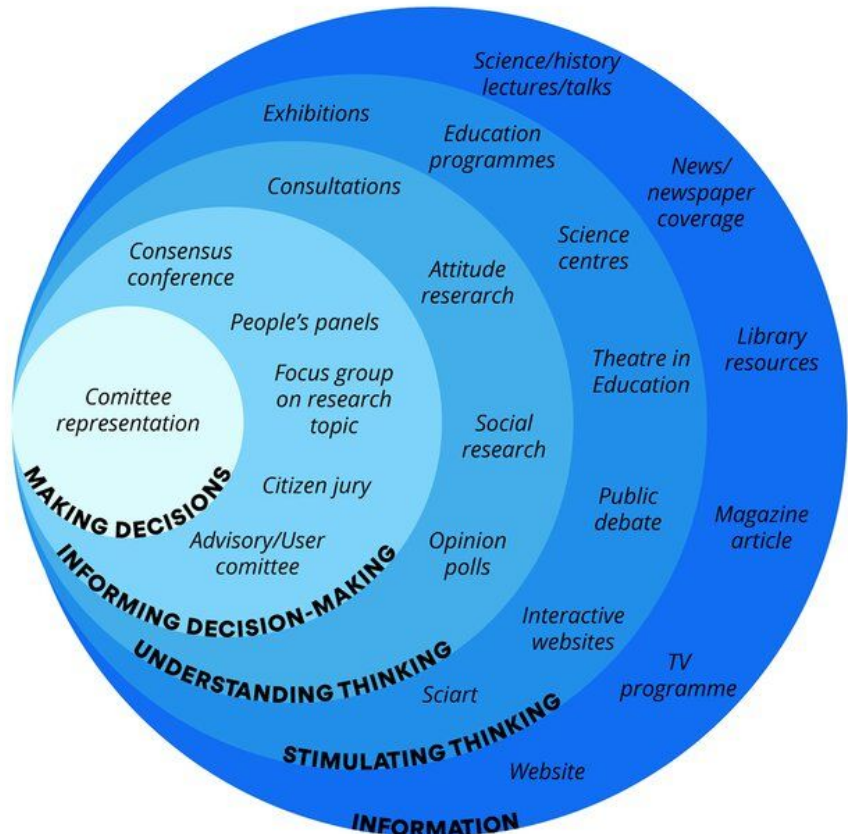
Practical application



Exploring real world portfolios

Key Learning 4

There are Capability Gaps
(Engagement and community)



Capability gaps: Why engage citizens?

There are many reasons why we seek to engage the public – from gathering insights to informing decision-making. But citizen engagement is a broad term, with many mechanisms for delivery.

We need to become conversant in the different types of activities under public engagement, with deep and collaborative co-production at one end and the mass communicative ways to engage and influence public discourse at the other.

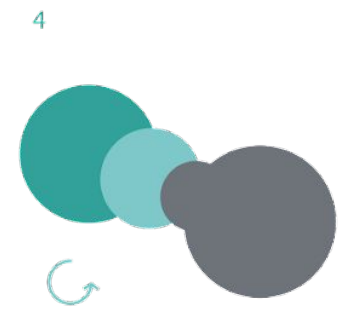
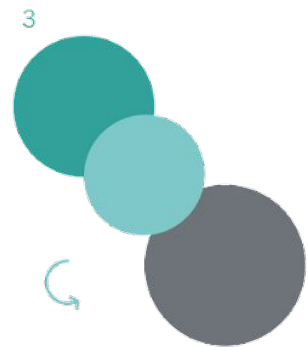
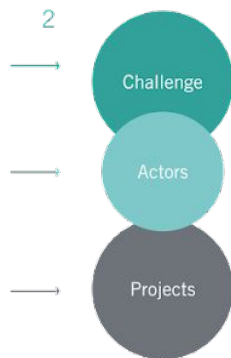
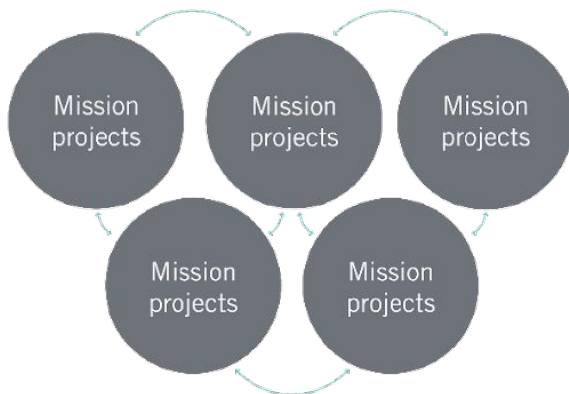
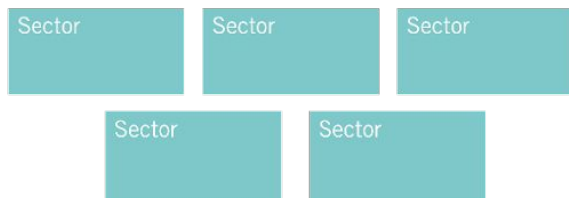


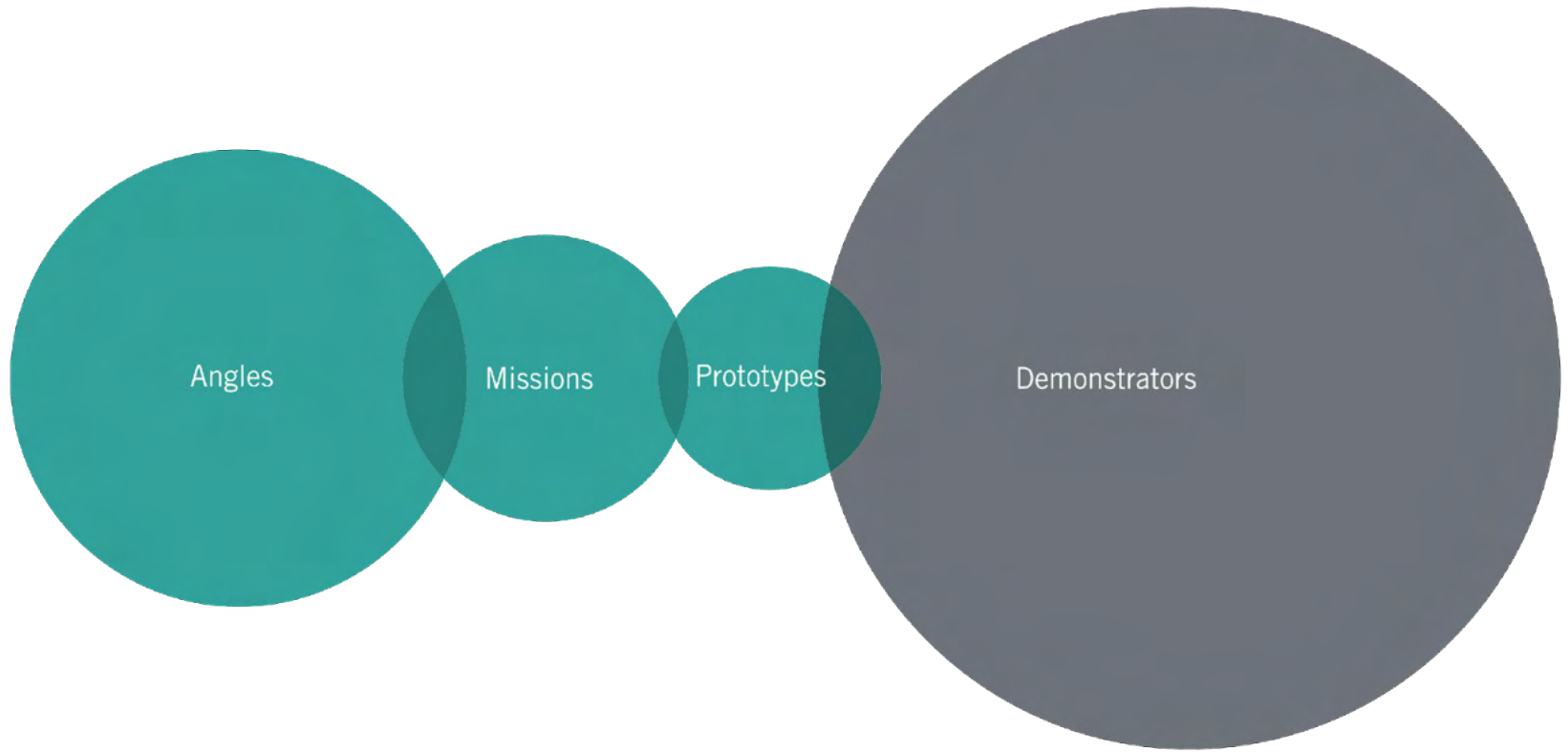
Learning about prototypes from Vinnova's Design-led Missions in Sweden



Grand challenge

Mission







School food

Ensure that every student in Sweden eats sustainable and tasty school food by 2025.



Connection between the school meal and learning

Today, there is little or no connection between the meal and pedagogy and learning. By using the school meal, the kitchen and the meal environment as educational tools where both kitchen and educators work together, children and young people can learn about sustainable food while creating more commitment and knowledge about the meal and the food system.

Hofors prototype

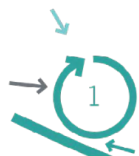


Snowball

Prototypes in one place

Rich small data, local learning and value

Local political

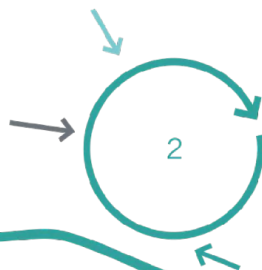


- Applied force
- System friction
- Mission gravity

Prototypes in multiple places

Shared learning and value, early evidence

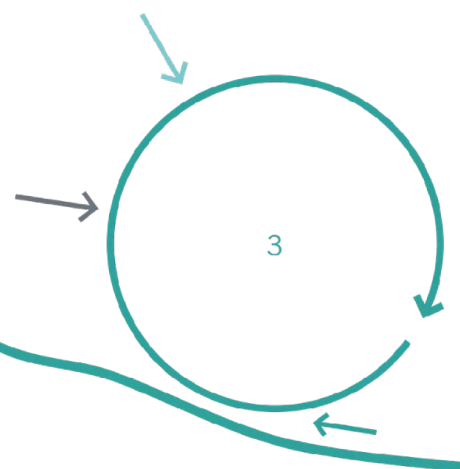
Regional political



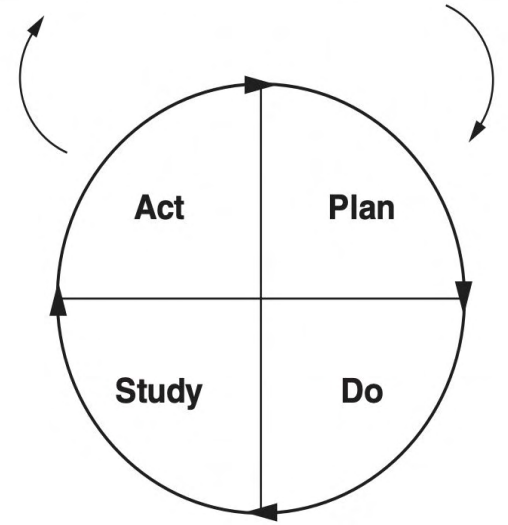
Prototypes in many places

Convincing evidence

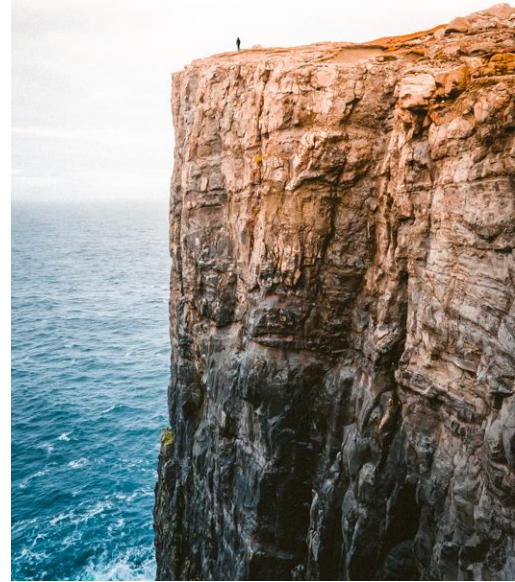
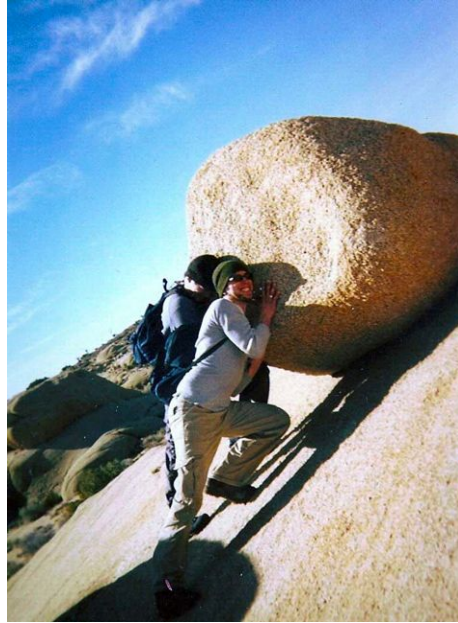
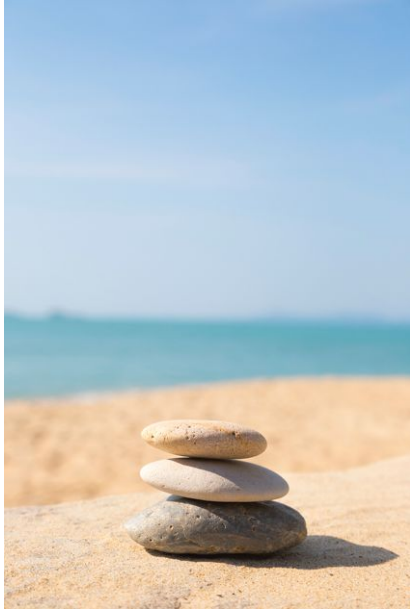
National political



**Practicing by building our own
micro experiments**



Push what moves



How do you test at the suitable scale for your exploration?

Start with a “gut check” - What is your degree of belief in the proposed change?

Current Situation		Readiness to Make the Change		
		Resistant	Indifferent	Ready
Low Confidence that current change idea will lead to Improvement	Cost of failure is large	Very Small Scale Test	Very Small Scale Test	Very Small Scale Test
	Cost of failure is small	Very Small Scale Test	Very Small Scale Test	Small Scale Test
High Confidence that current change idea will lead to Improvement	Cost of failure is large	Very Small Scale Test	Small Scale Test	Wide Scale Test
	Cost of failure is small	Small Scale Test	Wide Scale Test	Implement

Source: *The Improvement Guide*, Langley et al. 2009

Key lesson from Sweden:

Generous hosting matters...

Make sure you provide a good buffet

That's all folks!

Thank you!