

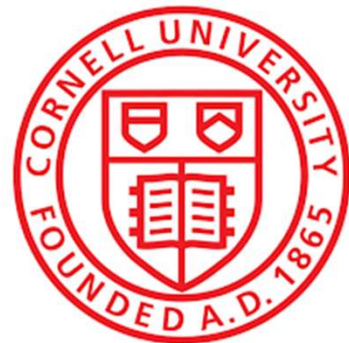
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Social Resilience in Complex Systems

CornellEngineering
Systems Engineering





- ◆ Senior Lecturer, Systems Engineering Program, Cornell University
- ◆ PhD in Systems Engineering and Social Policy
- ◆ Teaching
 - ◆ Sociotechnical Systems and Policy
 - ◆ Systemic Sustainability
 - ◆ Social/Sociotechnical System Modeling and Simulation
- ◆ Research
 - ◆ M&S of Social/Sociotechnical Systems in many different domains
 - ◆ E.g., Circular Economy, Space Policy, Cybersecurity...



- ◆ Founding (now former) chair of the Social Systems Working Group
- ◆ Americas Leader for Empowering Women Leaders in Systems Engineering (EWLSE)
- ◆ Corporate Advisory Board (CAB) rep for Cornell University

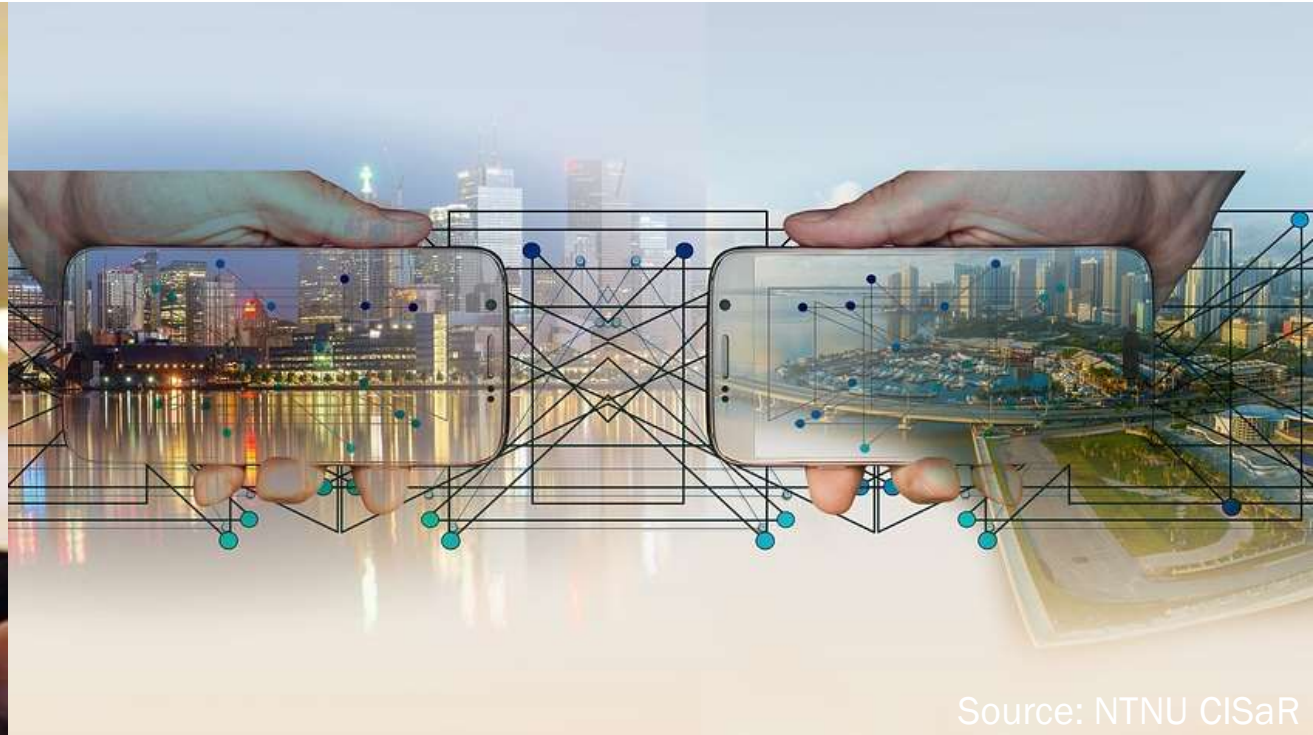
Social Systems

Beyond Users

- ◆ Isn't this just users?
- ◆ Isn't this just human system integration?
- ◆ Isn't this just safety?
- ◆ Isn't this just ergonomics?
- ◆ Isn't this just operations research?

WARNING:

Reflections in this mirror may be distorted by socially constructed ideas of 'beauty'



Source: NTNU CISaR

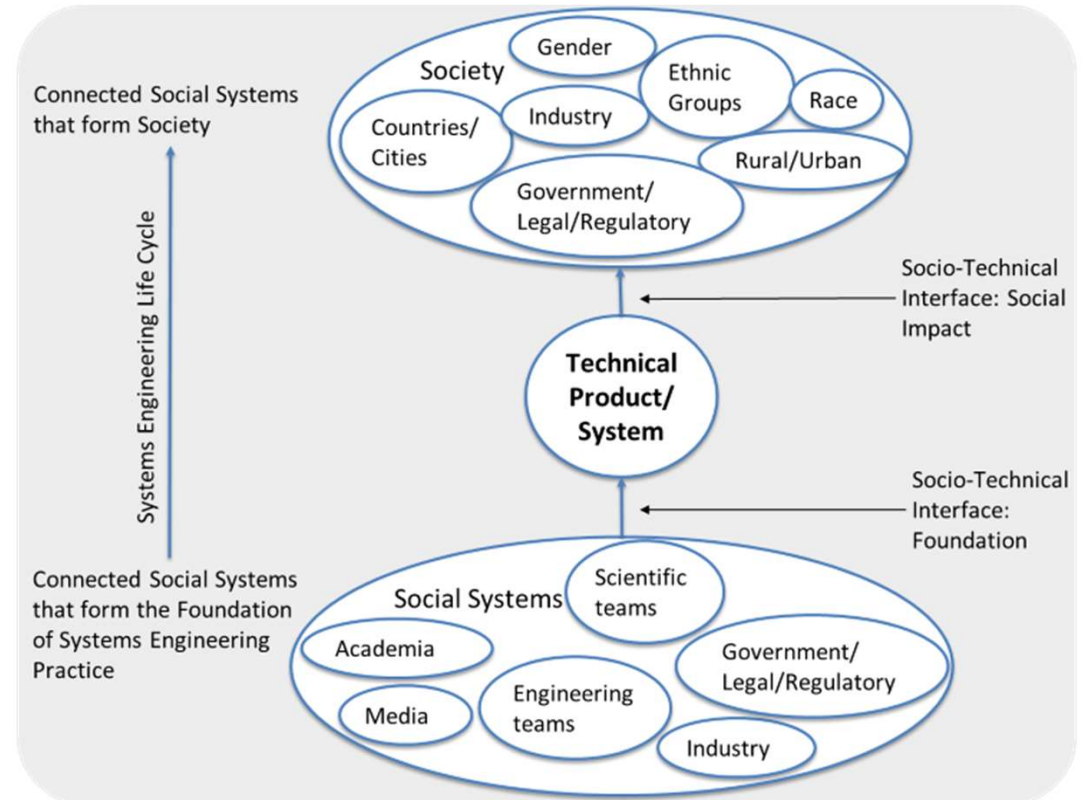
What is a Social System?

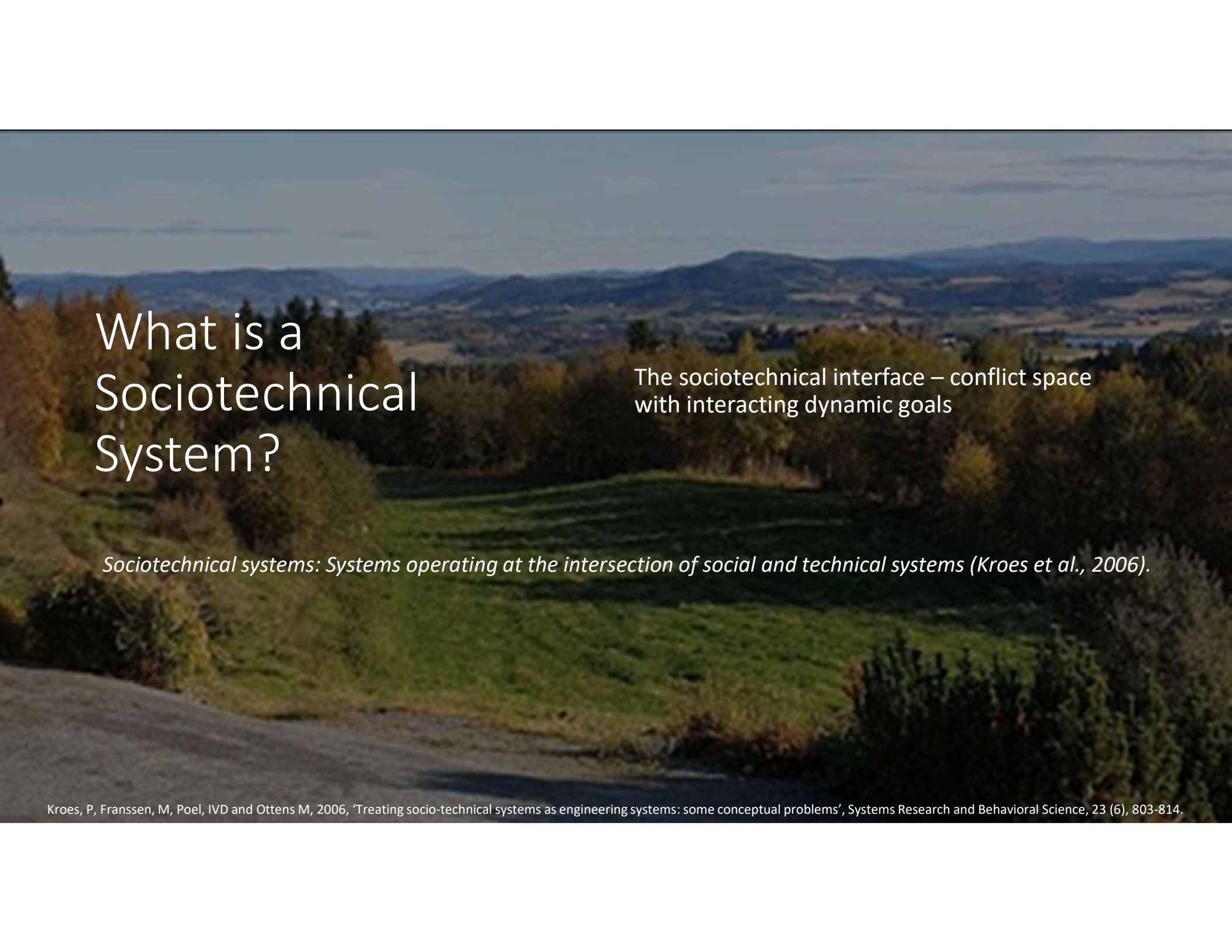
- ◇ Society is made up of many different types of social systems
- ◇ Law and Policy Systems
- ◇ Social Constructs



Sociotechnical Systems

Foundation and Integration/Impact





What is a Sociotechnical System?

The sociotechnical interface – conflict space
with interacting dynamic goals

Sociotechnical systems: Systems operating at the intersection of social and technical systems (Kroes et al., 2006).

A scenic landscape photograph showing a green valley in the foreground, surrounded by forested hills. In the distance, there are rolling mountains under a clear sky. The text "Resilience as resistance and adaptation" is overlaid in white on the left side of the image.

Resilience as resistance
and adaptation

Social Resilience

MacLean (2014) uses theory from both the social and natural sciences and complex adaptive socio-ecological systems

Six attributes of Social Resilience:

1. Knowledge, Skills and Learning
 - E.g., Knowledge Partnerships
2. Community Networks
 - E.g., Social Capital
3. People-Place Connections
 - E.g., Stewardship
4. Community Infrastructure
 - E. g., Recreation Facilities
5. Diverse and innovative economy
 - E.g., Demands and interests
6. Engaged Governance
 - E. g., Living Labs

Norwegian Onshore Wind

Friluftsliv

The Norwegian love of the outdoors



Government drops state windmill plan

October 17, 2019

SHARE

Prime Minister Erna Solberg's conservative coalition is scrapping a new national wind energy plan that identified specific areas as best-suited for windmills. It proved to be highly controversial, prompting Solberg to back down after massive criticism that huge wind turbines can ruin scenic wilderness and that local objections could be overruled.

"This was supposed to be a measure that would ease conflicts," Solberg told state broadcaster NRK, referring to the "national framework" for land-based wind energy proposed by the state energy directorate (NVE) last spring. "It hasn't been, given the response we've



Windmills like these have set off huge protests, especially along the coast of





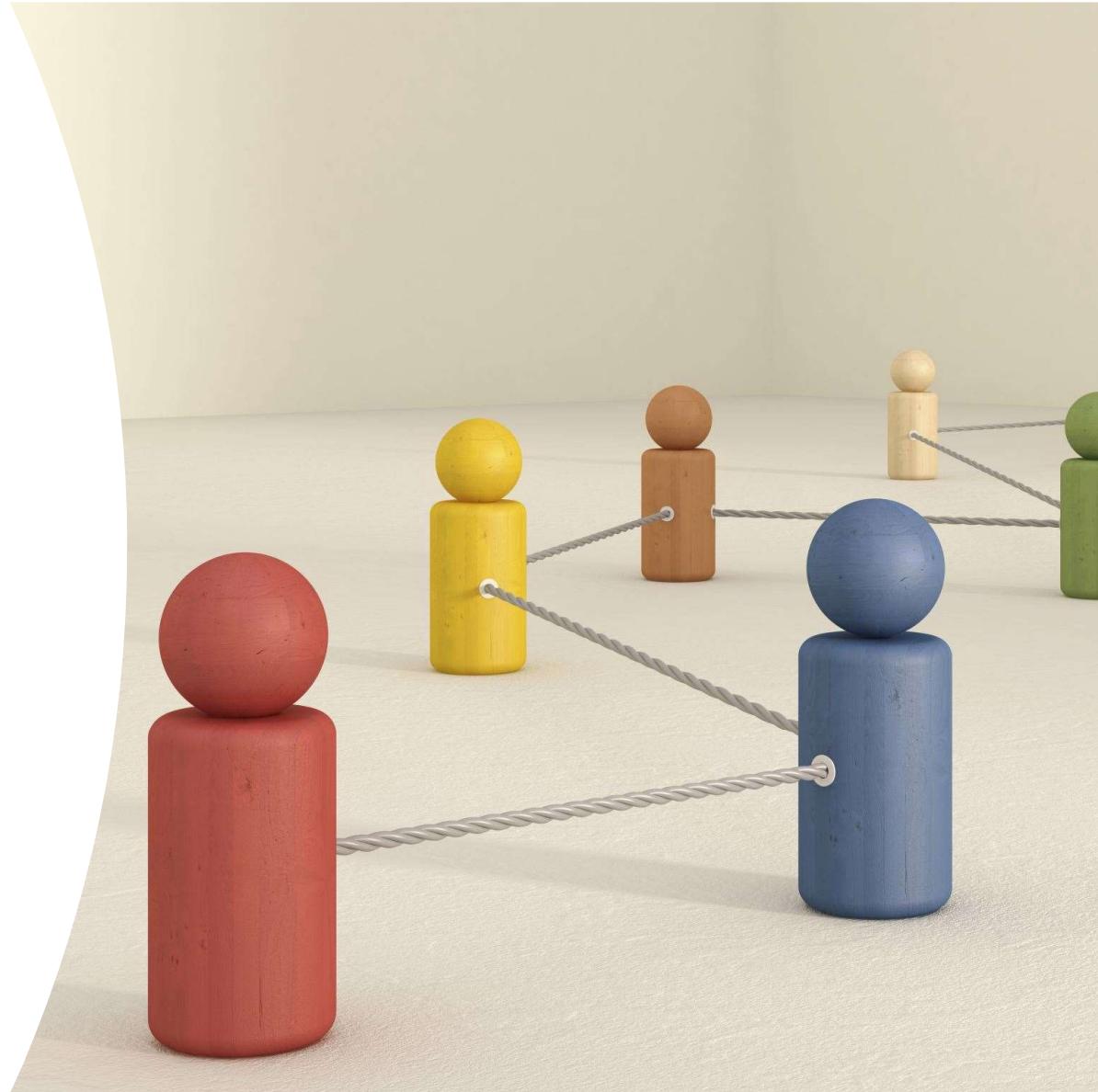
Knowledge Partnerships

Focused stakeholder relationships to absorb system shock

One person's solution is another person's problem

Social Capital

Interconnected Communities





Stewardship



Recreation Facilities



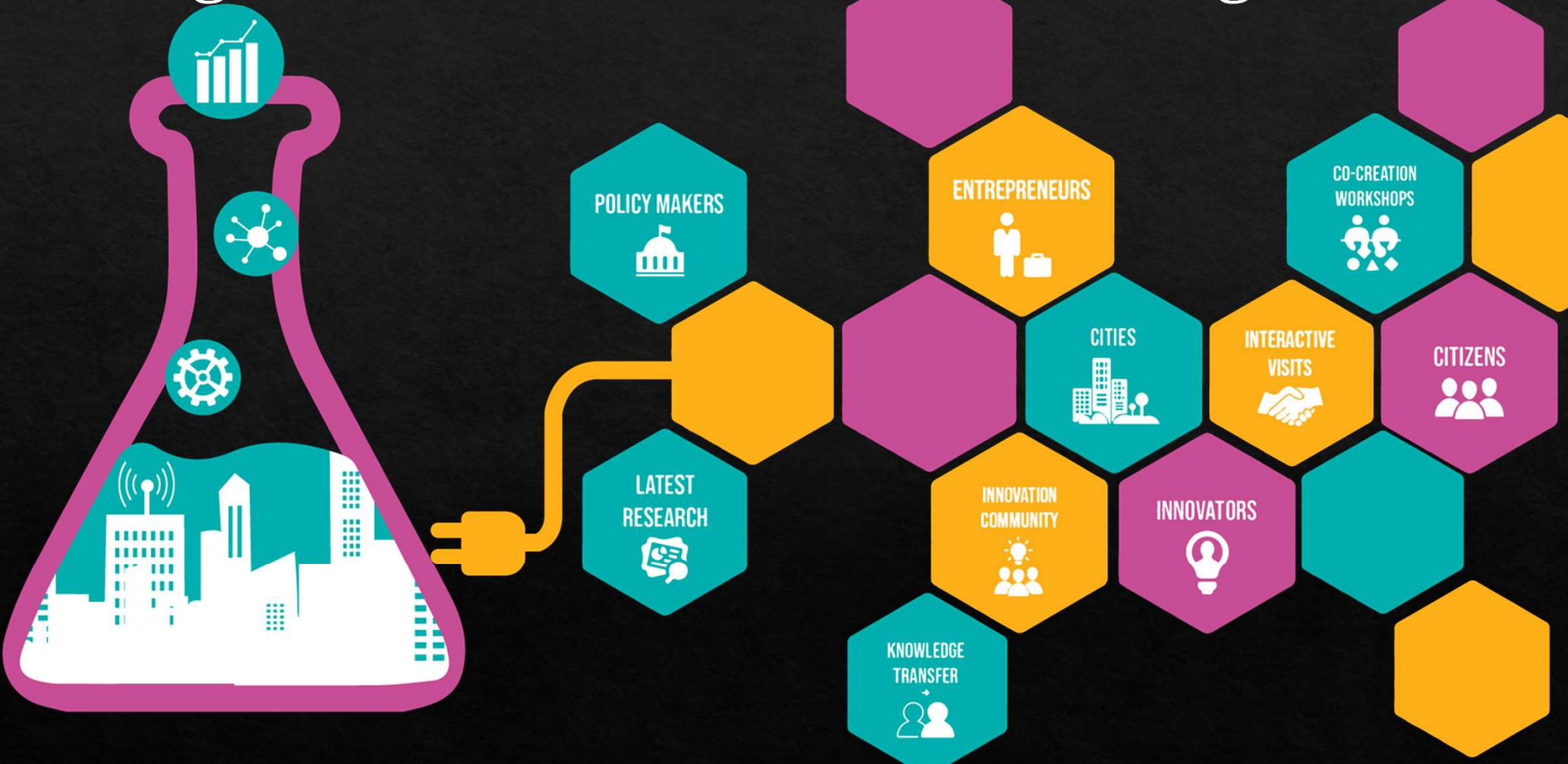


Demands and Interest

The background features a complex network of thin, light-colored lines connecting various nodes, some of which are small squares or circles. Overlaid on this network are numerous 3D rectangular blocks of varying sizes and orientations, some appearing to float or be attached to the network. The overall color palette is dark, with shades of grey, black, and deep blue, accented with some reddish-pink and light blue highlights. The text is centered in a clean, white, sans-serif font.

Social Resilience and Systems Engineering

Living Labs: Co-Production of Knowledge



Source: Living Labs at the Joint Research Centre: the European Commission's Testbed for Smart Energy and Mobility Solutions

Questions?

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