

# A Conceptual Model of Integral Sustainable Design Framework



## Leigh & Orange

*DELIVERING EXCELLENCE FOR 140 YEARS*



Organisers:



International Co-owners:



# Context



## 1. Introduction - Challenges of Our Architectural Practice

## 2. Limitation On Traditional Design Process

1. Disparity between “Good” and “Green” Design
2. Complex Rules and Self-perpetuating Process of Externalization
3. Top-down Command Control

## 3. Integral Design Conceptual Framework

1. Theory of Integral, Ecological and Regenerative Design
2. Fundamental Shift of Values from Bottom-up
3. Integral Design Palette for Qualitative Reflection Process



Organisers:



International Co-owners:



# Introduction

## Challenges of Our Architectural Practice



Organisers:



International Co-owners:



# Introduction

## Challenges of Our Architectural Practice

40%

of the world's energy use  
is due to buildings

90%

of the total energy of buildings  
is consumed during building lifetime

10%

of consumption is linked to the materials  
and construction of buildings



Organisers:



International Co-owners:



Sustainable Buildings  
and Climate Initiative  
Promoting Policies and Practices for Sustainability



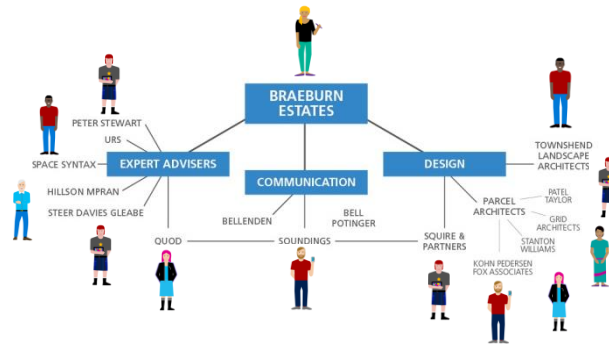
Global Alliance  
for Buildings and  
Construction

# Introduction

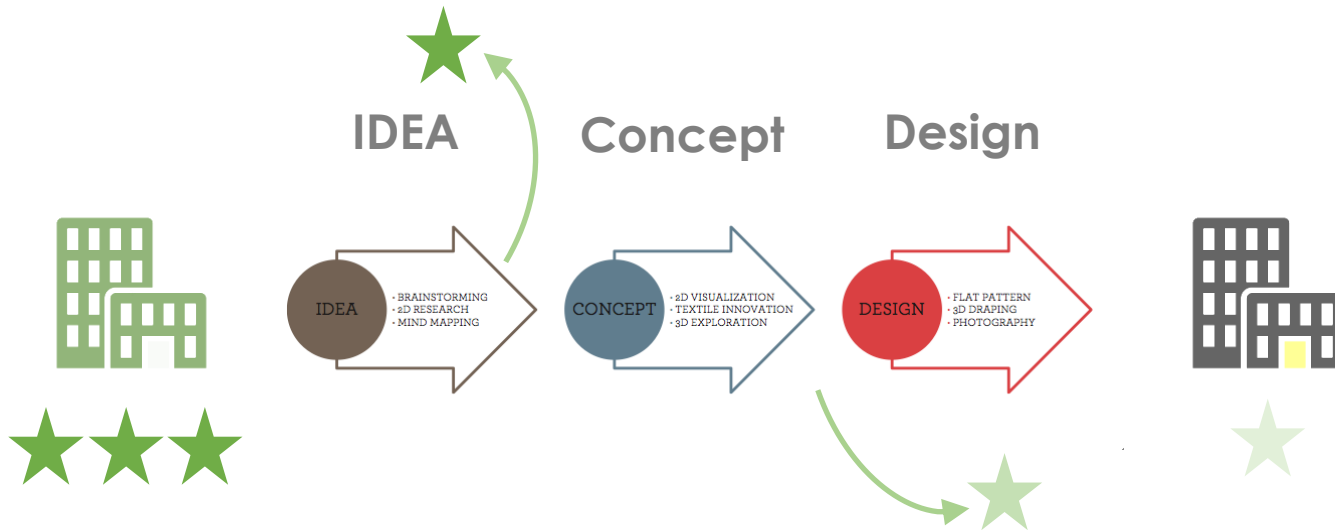
## Challenges of Our Architectural Practice



### Architectural Studio



Ecological ideas Get lost in the system



# Limitation On Traditional Design Process

## Disparity between “Good” and “Green” Design



Organisers:



International Co-owners:



Sustainable Buildings and Climate Initiative  
Promoting Policies and Practices for Sustainability



# Limitation On Traditional Design Process

Disparity between “Good” and “Green” Design

# Good = Green?



# Green = Good?



Organisers:



International Co-owners:



# Limitation On Traditional Design Process

## Complex Rules and Self-perpetuating Process of Externalization



Organisers:



International Co-owners:



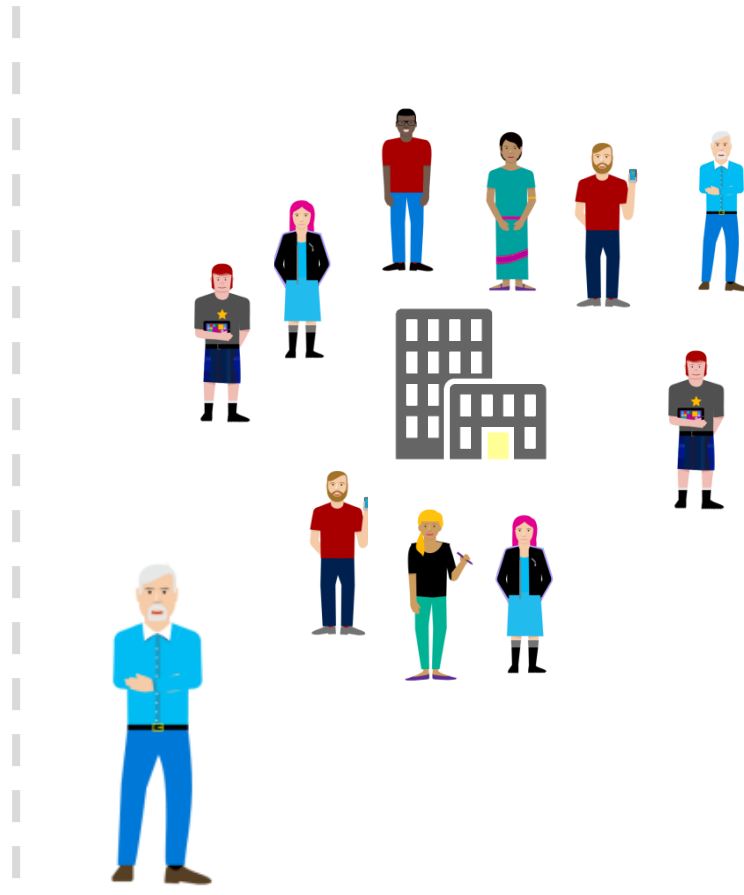


# Limitation On Traditional Design Process

## Complex Rules and Self-perpetuating Process of Externalization



Environmental Expert



Architectural Design Team

# Limitation On Traditional Design Process

## Top-down Command Control



Organisers:



International Co-owners:

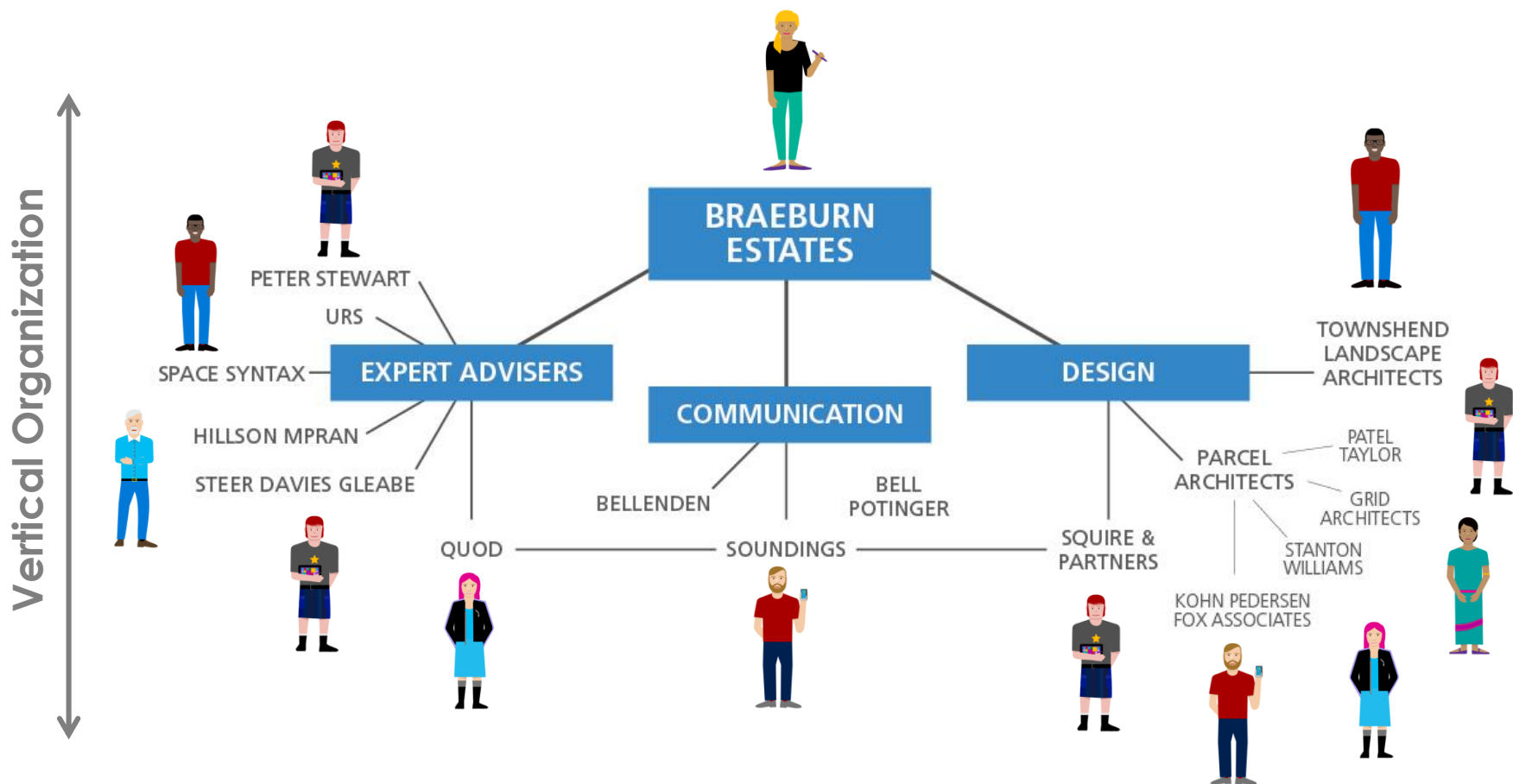


Sustainable Buildings and Climate Initiative  
Promoting Policies and Practices for Sustainability



# Limitation On Traditional Design Process

## Top-down Command Control



Organisers:

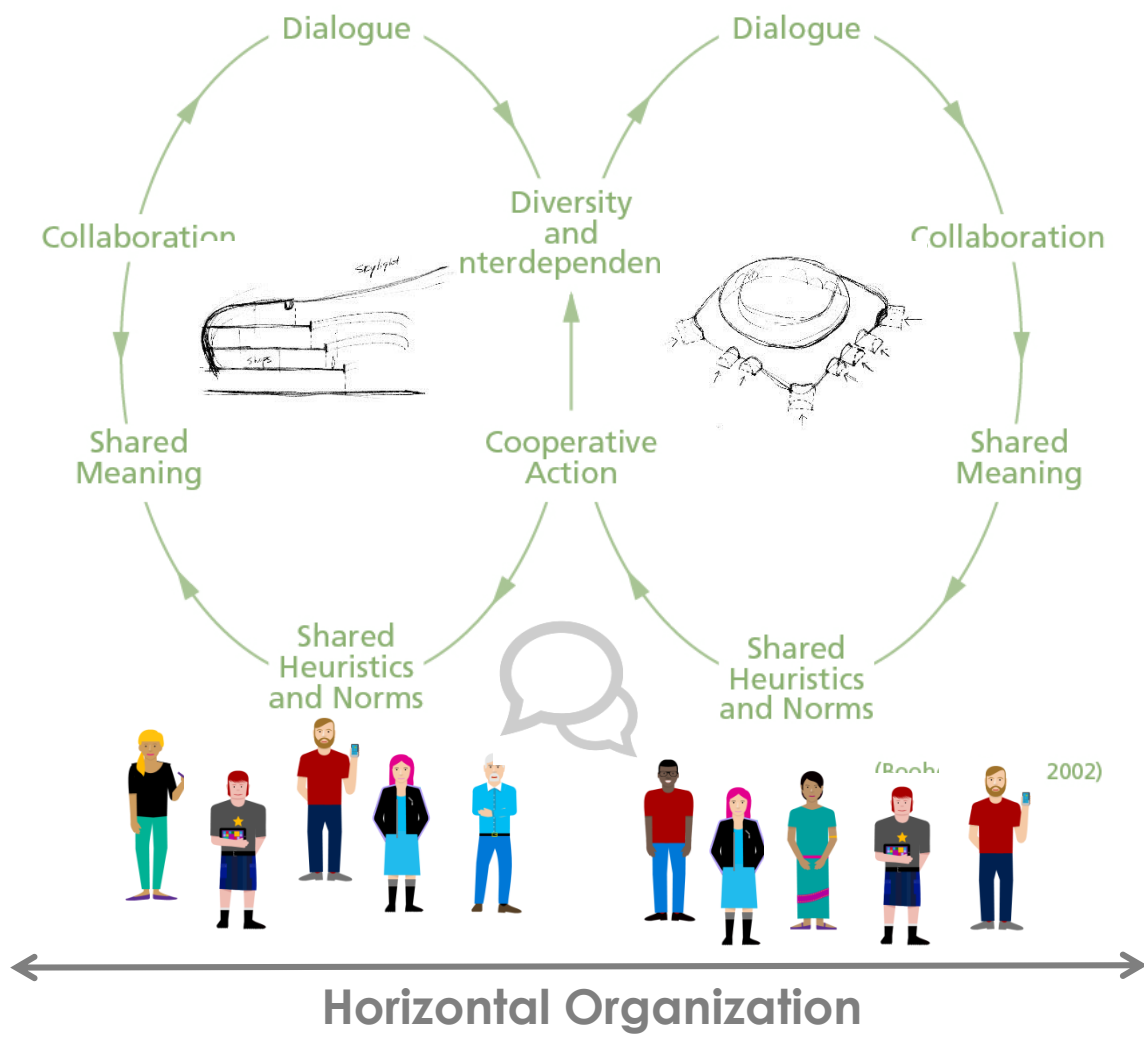


International Co-owners:



# Limitation On Traditional Design Process

Top-down Command Control



# Limitation On Traditional Design Process

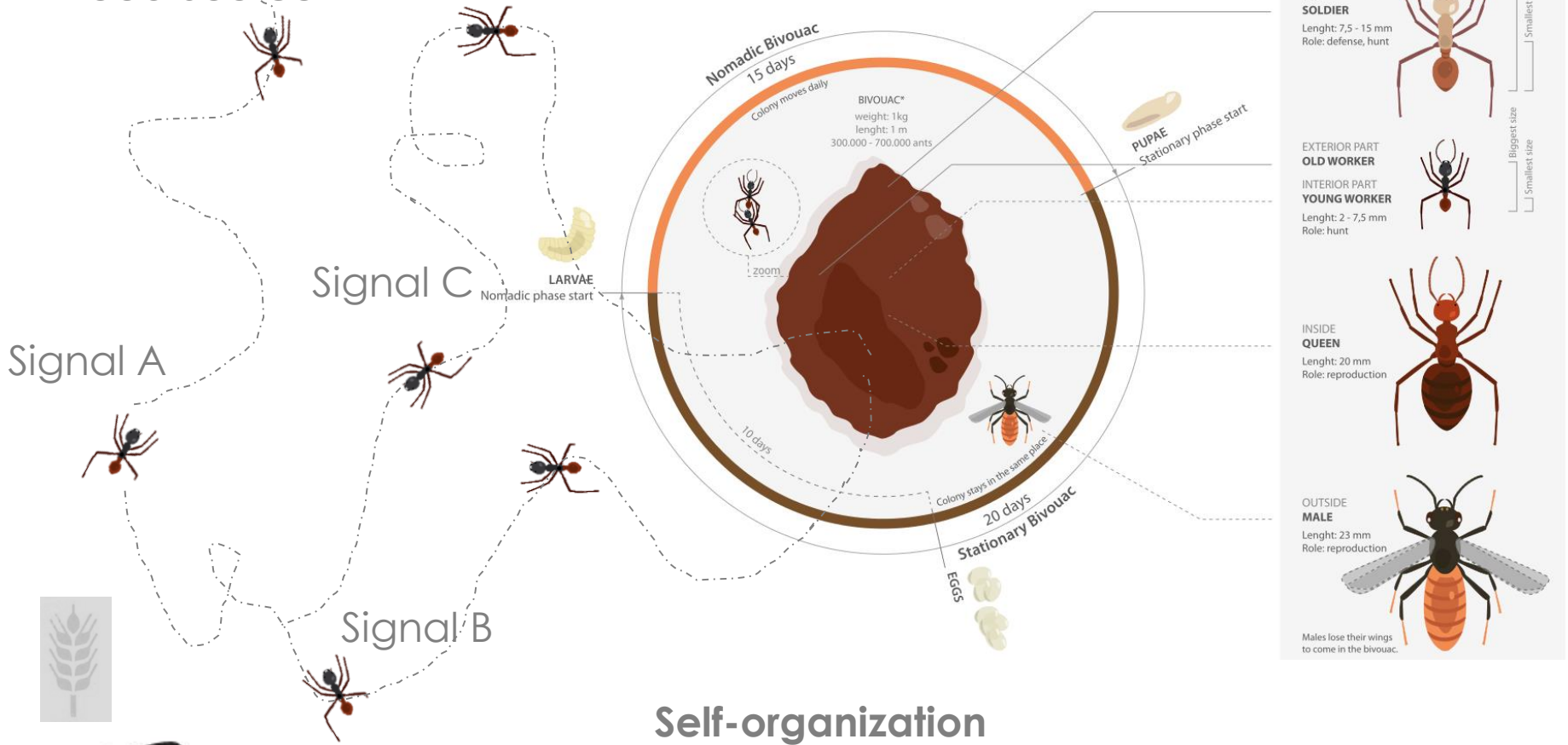
## Top-down Command Control



Food Source

ARMY ANTS  
*Eciton Burchelli*

Behavioral cycle and organization of bivouac



Self-organization



Organisers:



International Co-owners:



# Integral Design Conceptual Framework

## Theory of Integral, Ecological and Regenerative Design



Organisers:



International Co-owners:



Sustainable Buildings and Climate Initiative  
Promoting Policies and Practices for Sustainability



# Integral Design Conceptual Framework

Theory of Integral, Ecological and Regenerative Design



**Design thinking** conceptual framework (Dorst 2011)



Organisers:

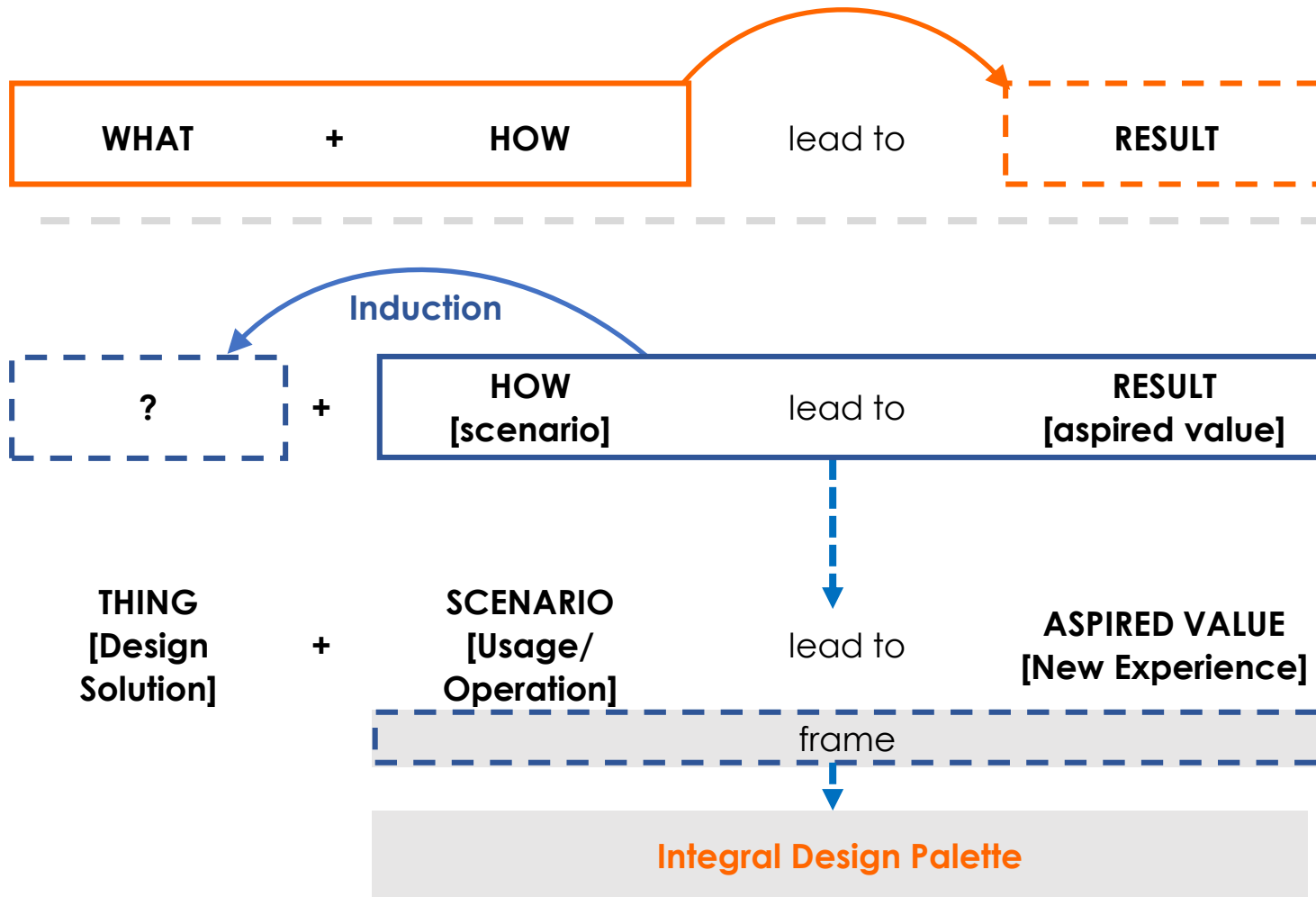


International Co-owners:



# Integral Design Conceptual Framework

Theory of Integral, Ecological and Regenerative Design





# Integral Design Conceptual Framework

## Fundamental Shift of Values from Bottom-up



Organisers:



International Co-owners:

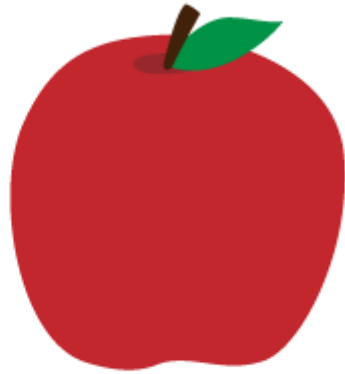


Sustainable Buildings and Climate Initiative  
Promoting Policies and Practices for Sustainability

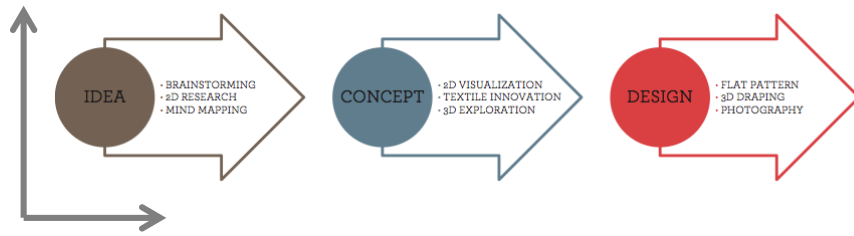


# Integral Design Conceptual Framework

## Fundamental Shift of Values from Bottom-up



Traditional design process



Linear design



Ecological & Regenerative design process



Integrated design



Organisers:

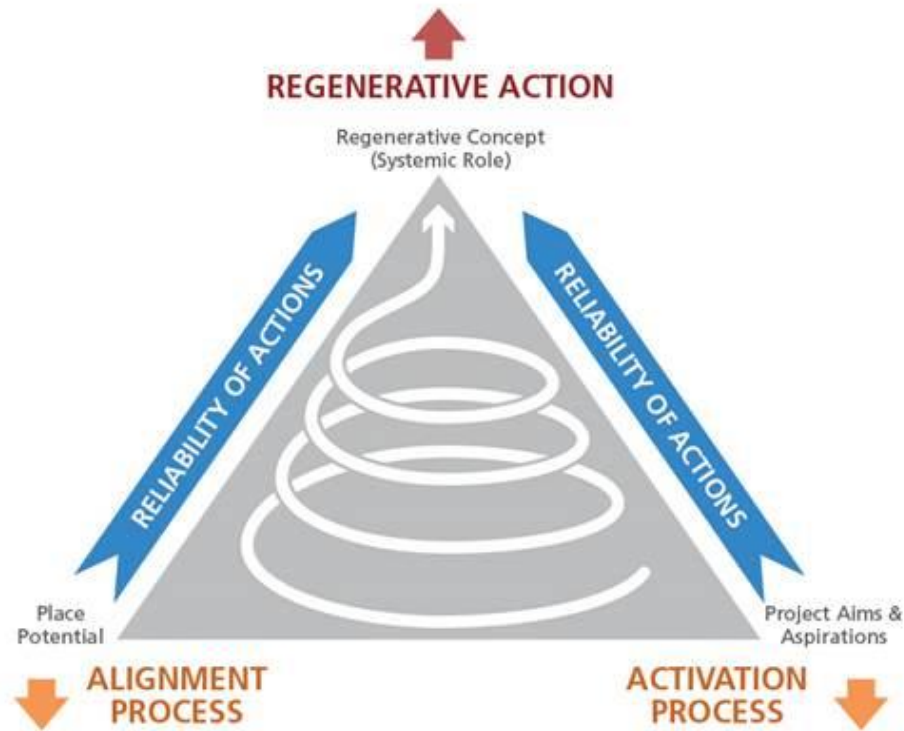


International Co-owners:



# Integral Design Conceptual Framework

## Fundamental Shift of Values from Bottom-up



Dynamic creation of a regenerative concept at the operational level for **regenerative action**  
(Mang and Reed 2012)

# Integral Design Conceptual Framework

## Fundamental Shift of Values from Bottom-up

### Time Factor



Organisers:



International Co-owners:



# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process



Organisers:



International Co-owners:



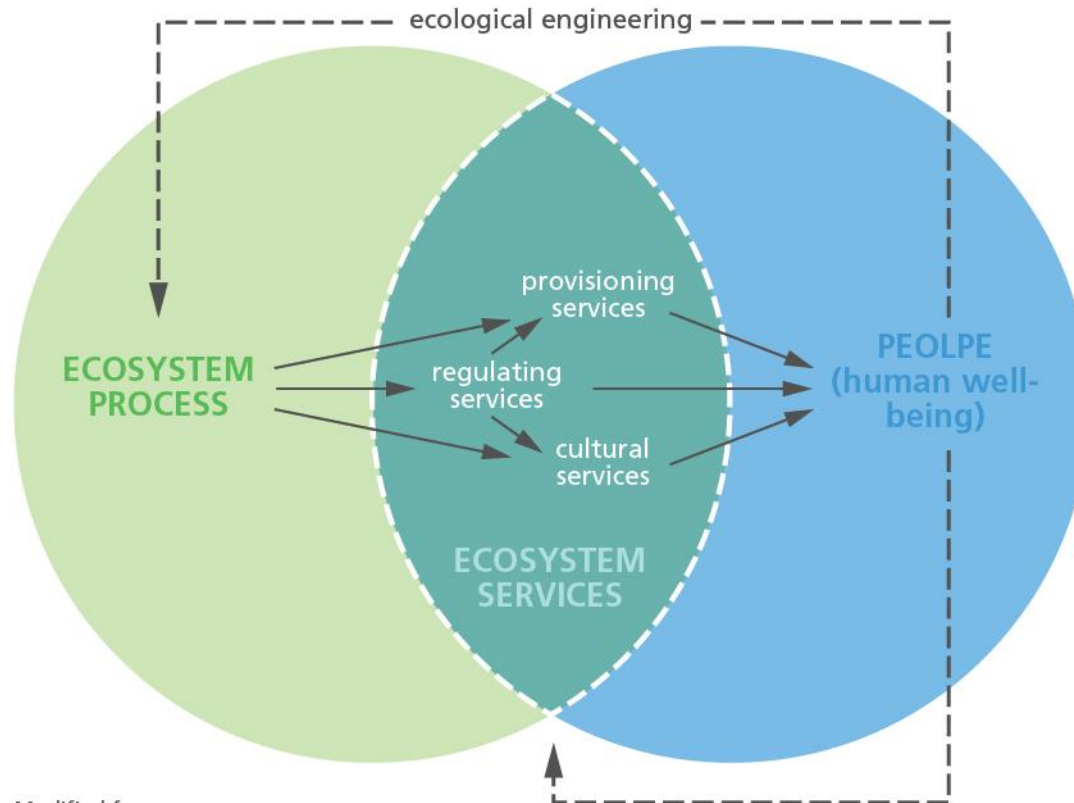
Sustainable Buildings and Climate Initiative  
Promoting Policies and Practices for Sustainability



# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process

### ECOSYSTEM SERVICES - Link social and ecological systems



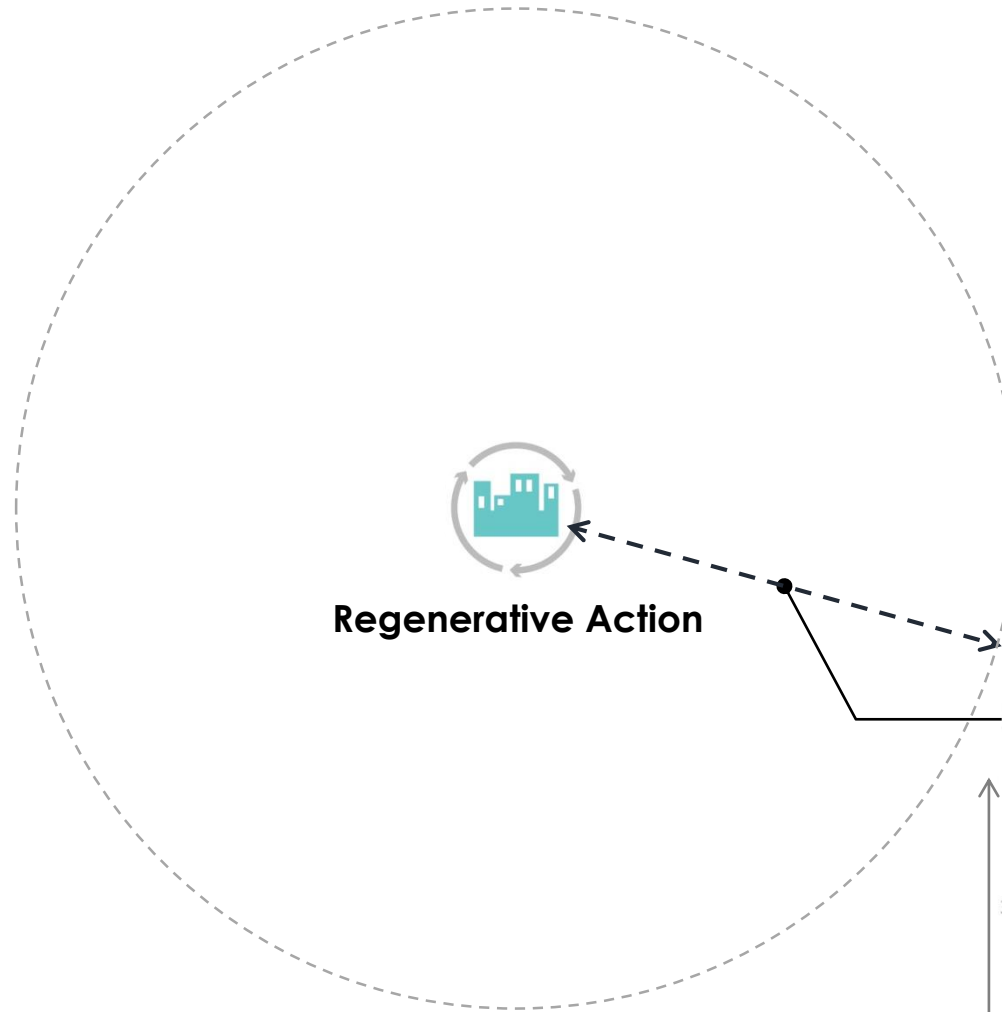
Modified from  
Bennett, Peterson, Gordon 2009 Ecological Letters

Organisers:

International Co-owners:

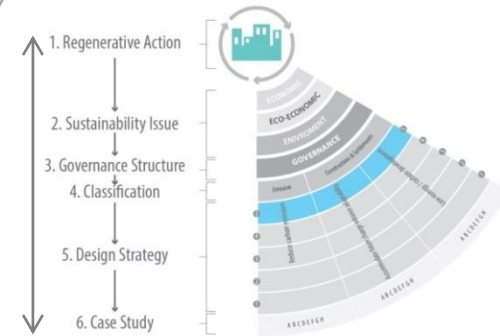
# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process



Regenerative Action

DESIGN FROM CENTER OUT



**Integral Design Palette** for qualitative reflection process from a **socio-ecological system** (SES) perspective (Leigh & Orange 2016)



Organisers:



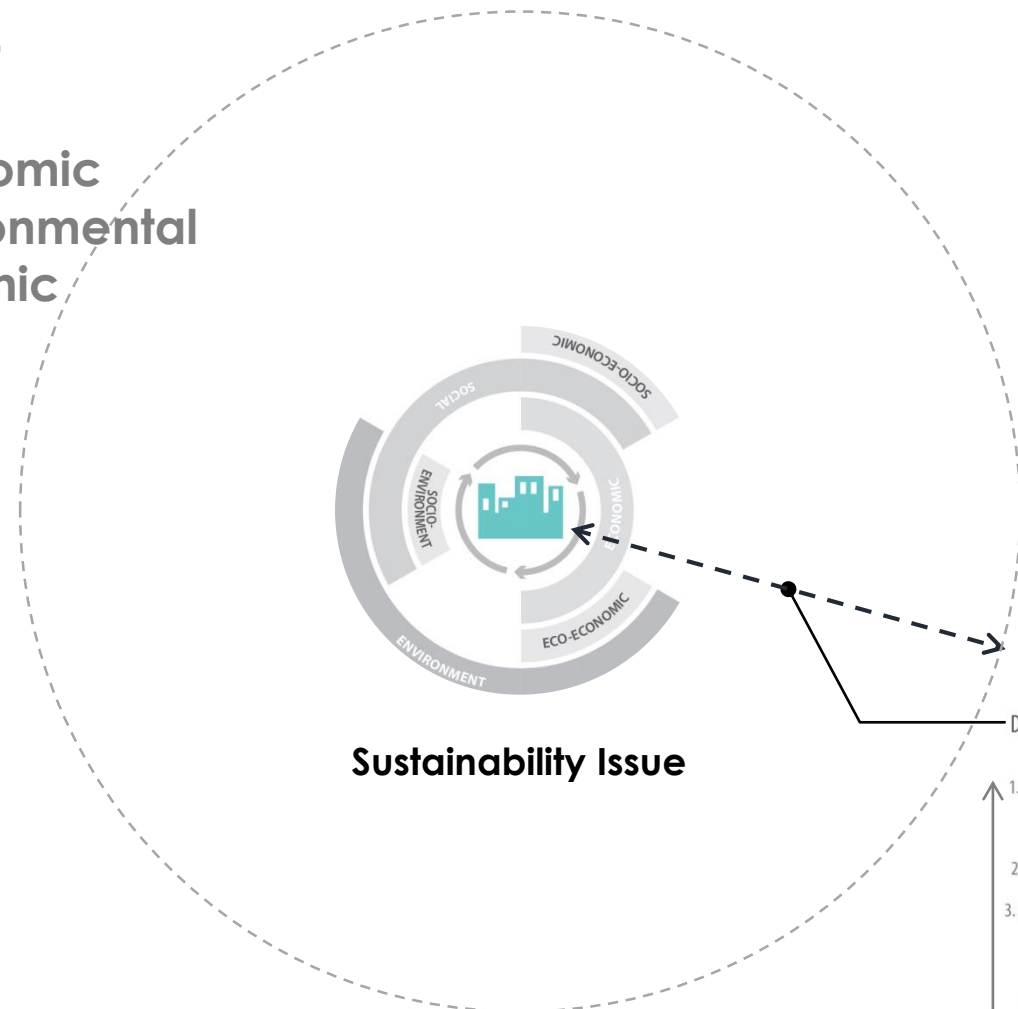
International Co-owners:



# Integral Design Conceptual Framework

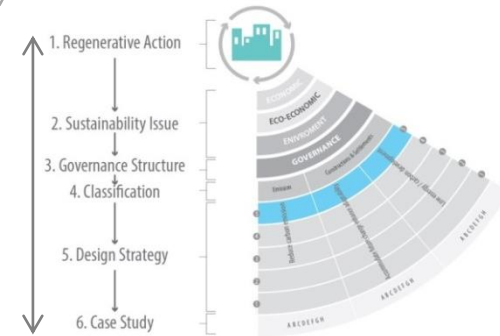
## Integral Design Palette for Qualitative Reflection Process

1. Social
2. Environment
3. Economic
4. Socio-economic
5. Socio-environmental
6. Eco-economic



**Sustainability Issue**

DESIGN FROM CENTER OUT



**Integral Design Palette** for qualitative reflection process from a **socio-ecological system** (SES) perspective (Leigh & Orange 2016)

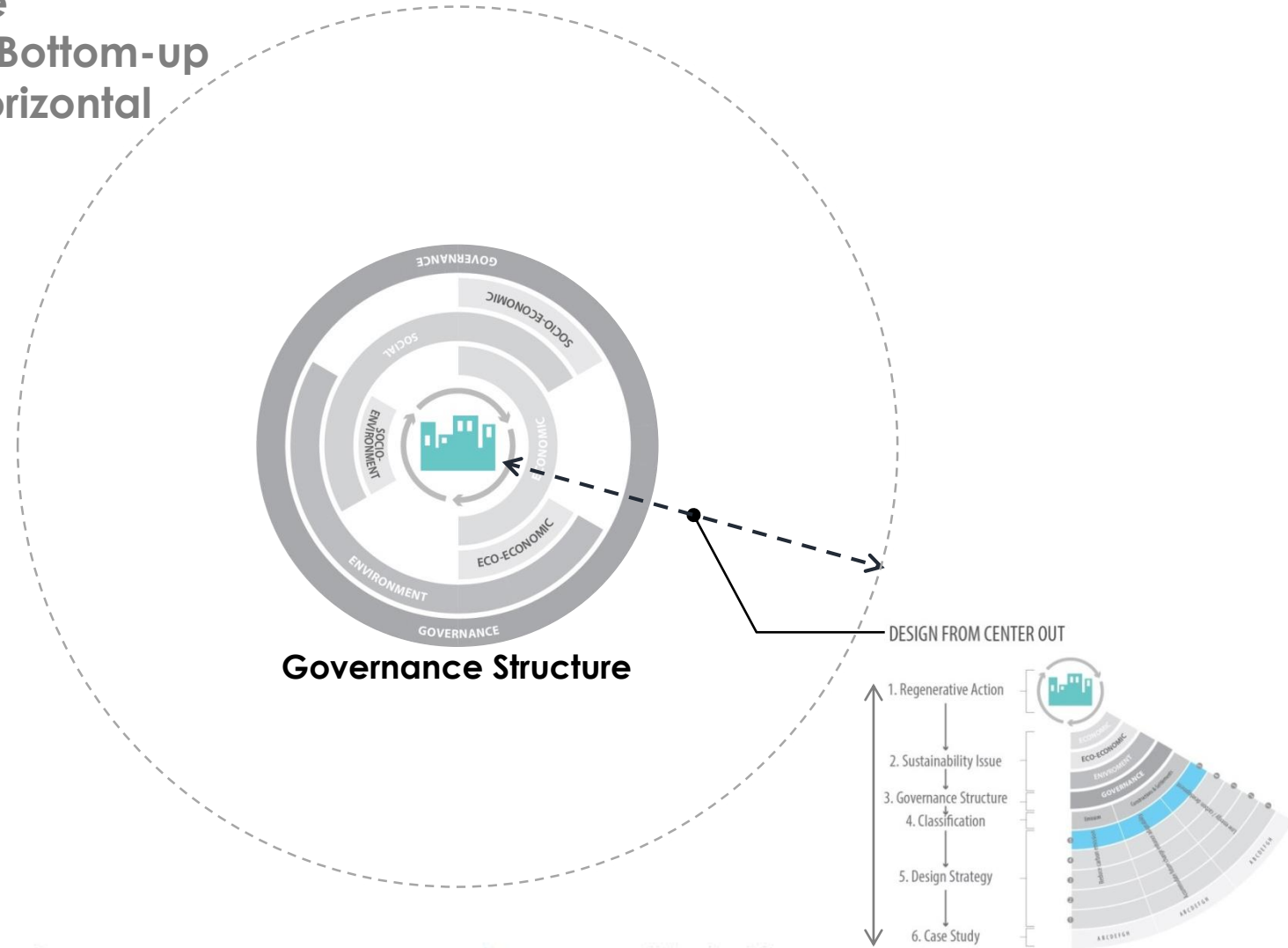




# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process

1. Governance
2. Top-down / Bottom-up
3. Vertical / Horizontal



**Integral Design Palette** for qualitative reflection process from a **socio-ecological system (SES)** perspective (Leigh & Orange 2016)



Organisers:



International Co-owners:

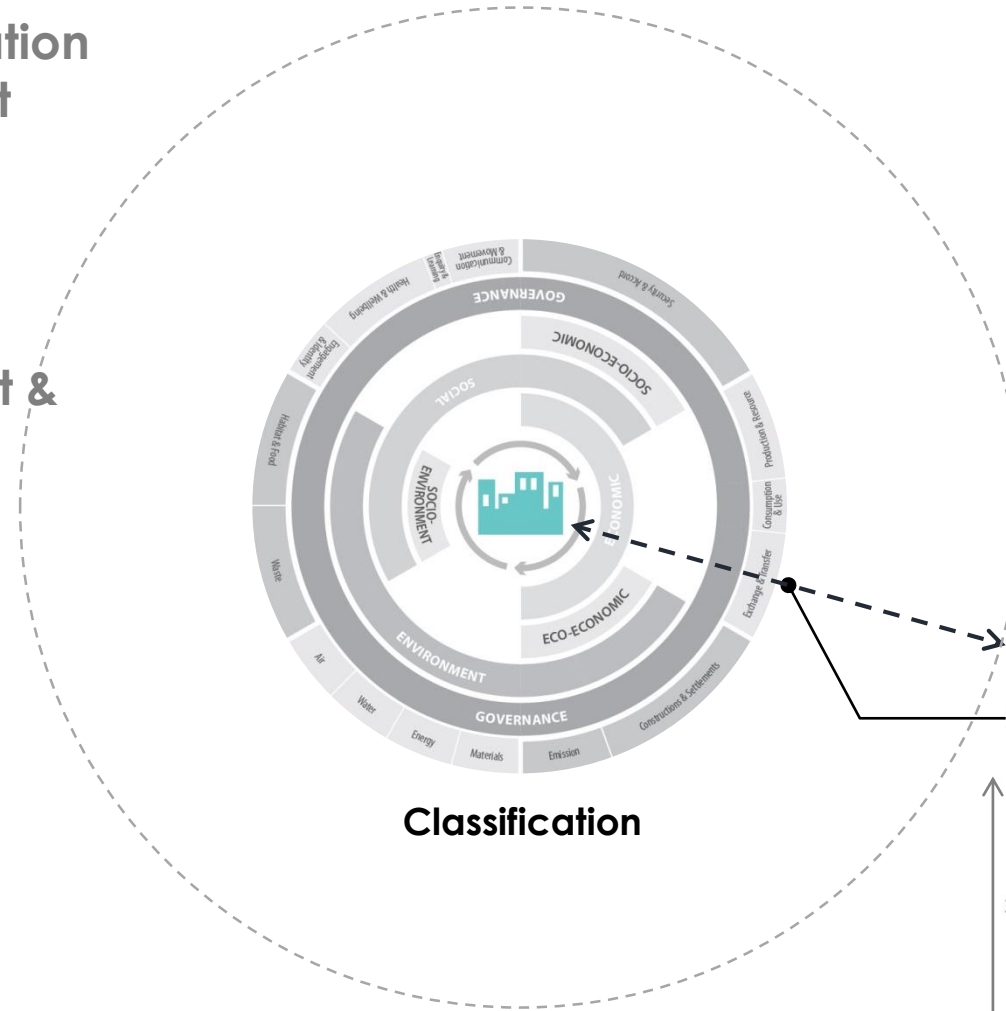


# Integral Design Conceptual Framework

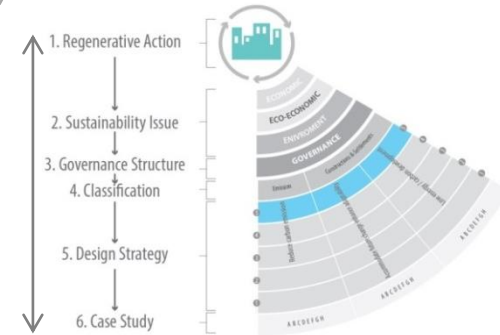
## Integral Design Palette for Qualitative Reflection Process

### Social

1. Communication & Movement
2. Enquiry & Learning
3. Health & Wellbeing
4. Engagement & Identity



DESIGN FROM CENTER OUT



**Integral Design Palette** for qualitative reflection process from a **socio-ecological system (SES)** perspective (Leigh & Orange 2016)



Organisers:



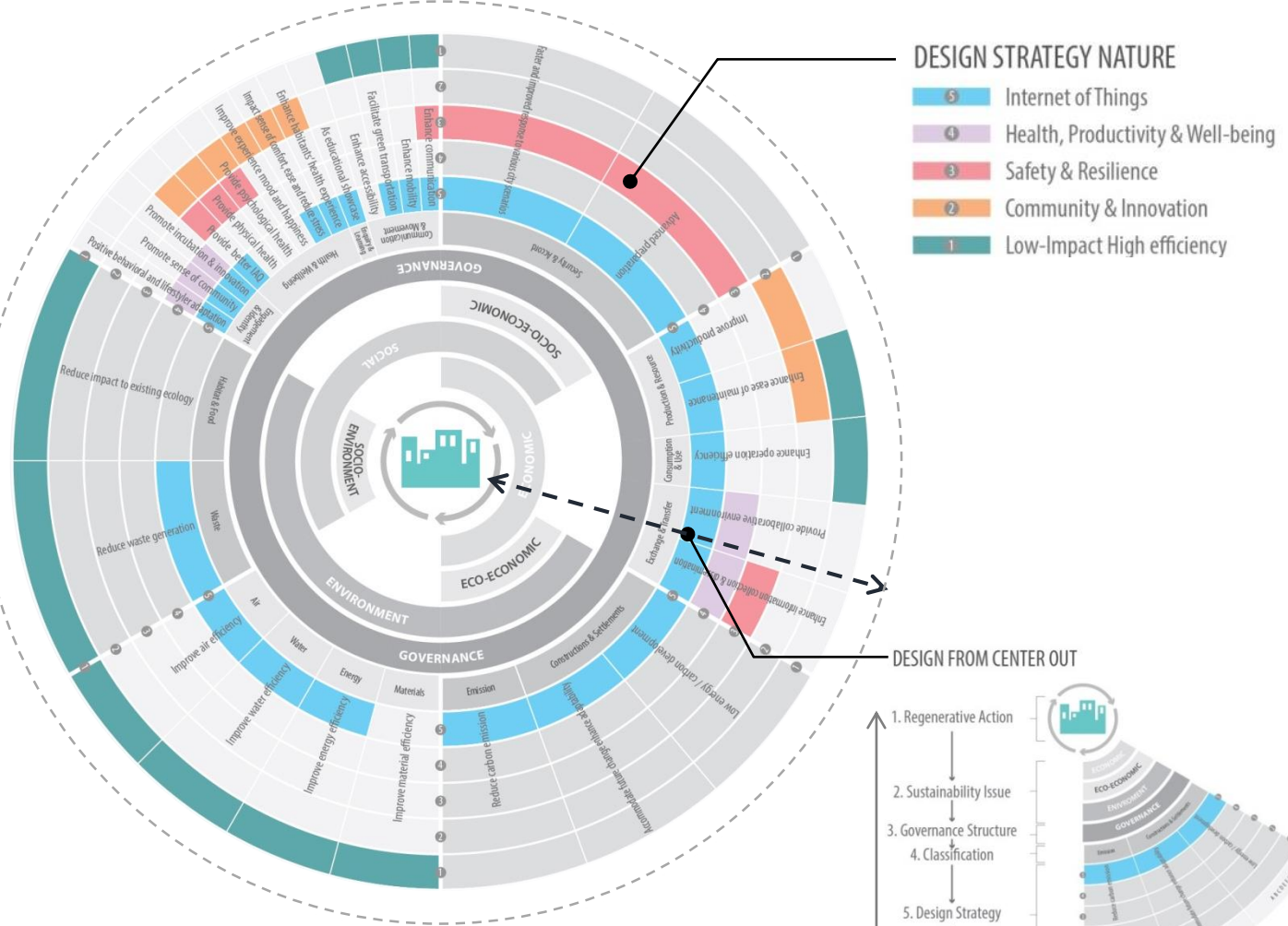
International Co-owners:



# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process

### Design Strategy Nature

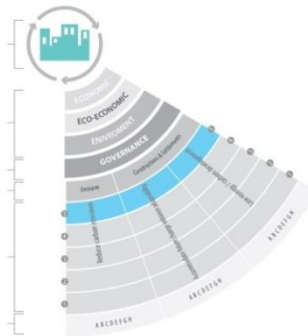


#### DESIGN STRATEGY NATURE

- 5 Internet of Things
- 4 Health, Productivity & Well-being
- 3 Safety & Resilience
- 2 Community & Innovation
- 1 Low-Impact High efficiency

#### DESIGN FROM CENTER OUT

1. Regenerative Action
2. Sustainability Issue
3. Governance Structure
4. Classification
5. Design Strategy
6. Case Study



**Integral Design Palette** for qualitative reflection process from a **socio-ecological system** (SES) perspective (Leigh & Orange 2016)

### Design Strategy



Organisers:



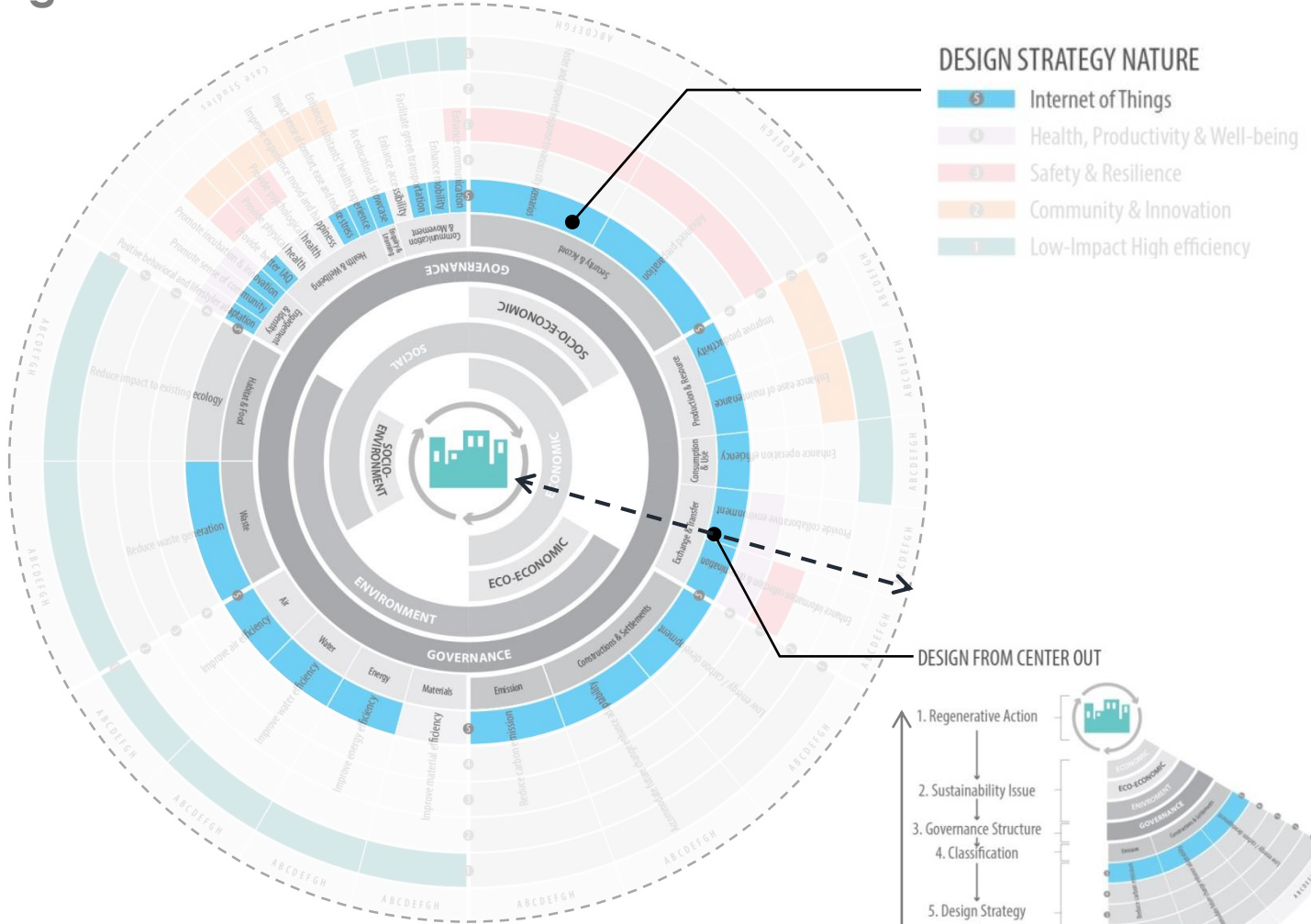
International Co-owners:



# Integral Design Conceptual Framework

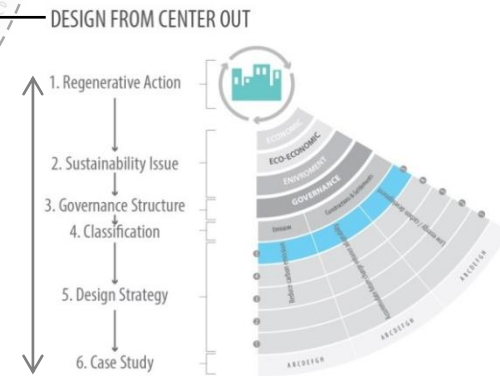
## Integral Design Palette for Qualitative Reflection Process

### A. Internet of Things



**Integral Design Palette** for qualitative reflection process from a **socio-ecological system (SES)** perspective (Leigh & Orange 2016)

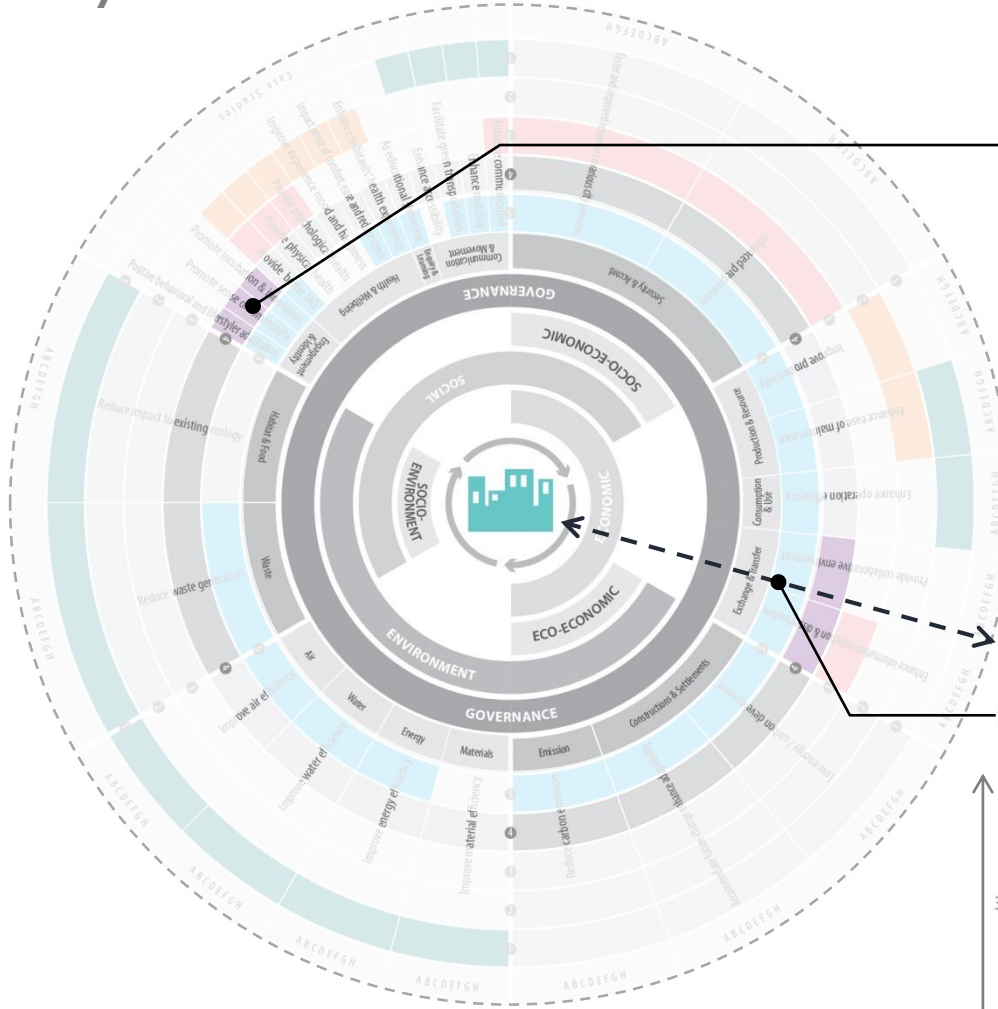
### Design Strategy



# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process

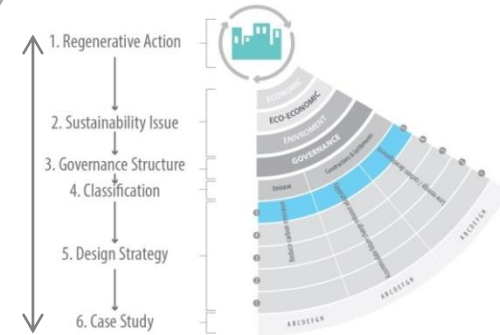
### B. Health Productivity



#### DESIGN STRATEGY NATURE

- 5 Internet of Things
- 4 Health, Productivity & Well-being
- 3 Safety & Resilience
- 2 Community & Innovation
- 1 Low-Impact High efficiency

DESIGN FROM CENTER OUT



Integral Design Palette for qualitative reflection process from a **socio-ecological system** (SES) perspective (Leigh & Orange 2016)

### Design Strategy



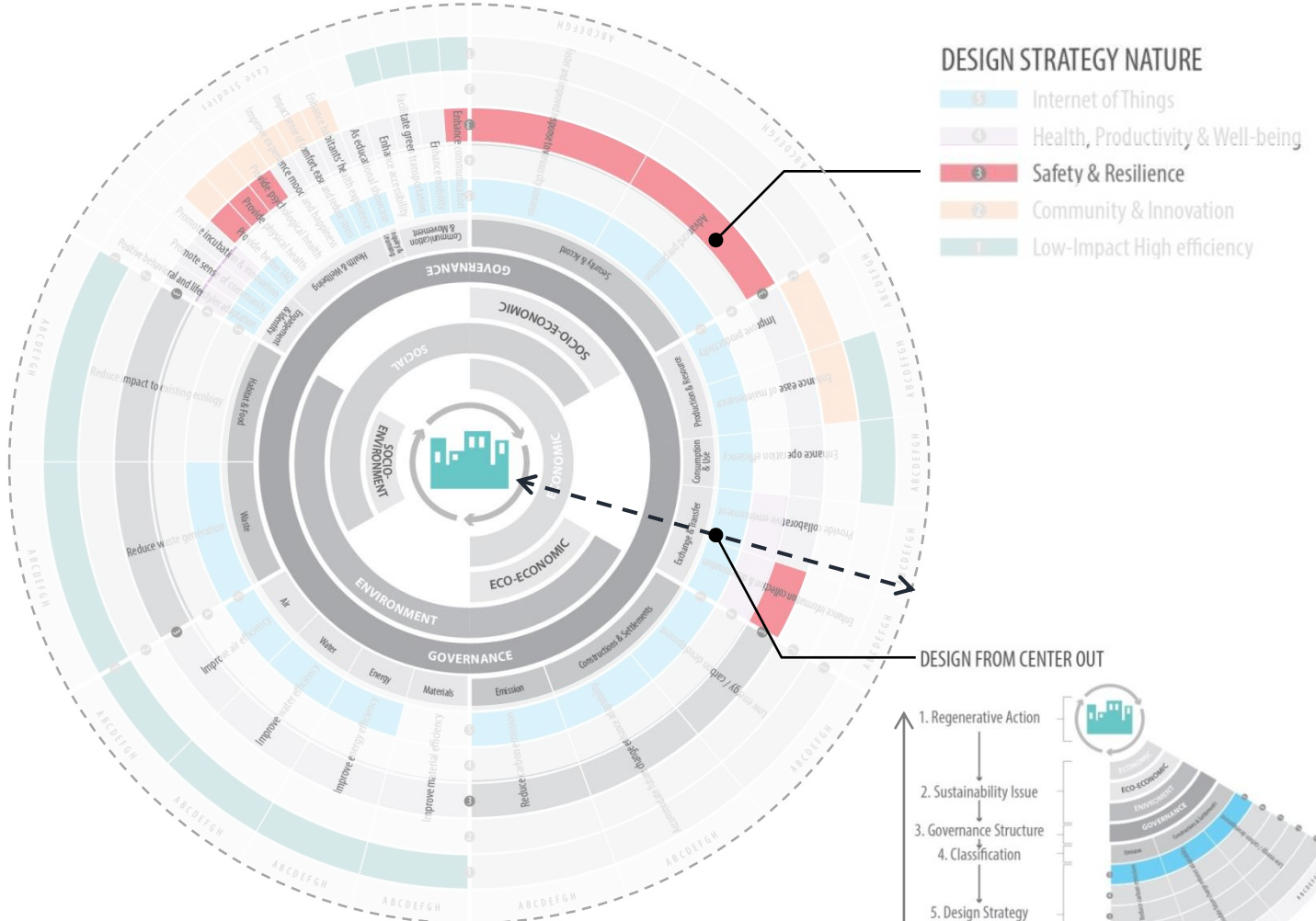
International Co-owners:



# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process

### C. Safety & Resilience



**Integral Design Palette** for qualitative reflection process from a **socio-ecological system (SES)** perspective (Leigh & Orange 2016)

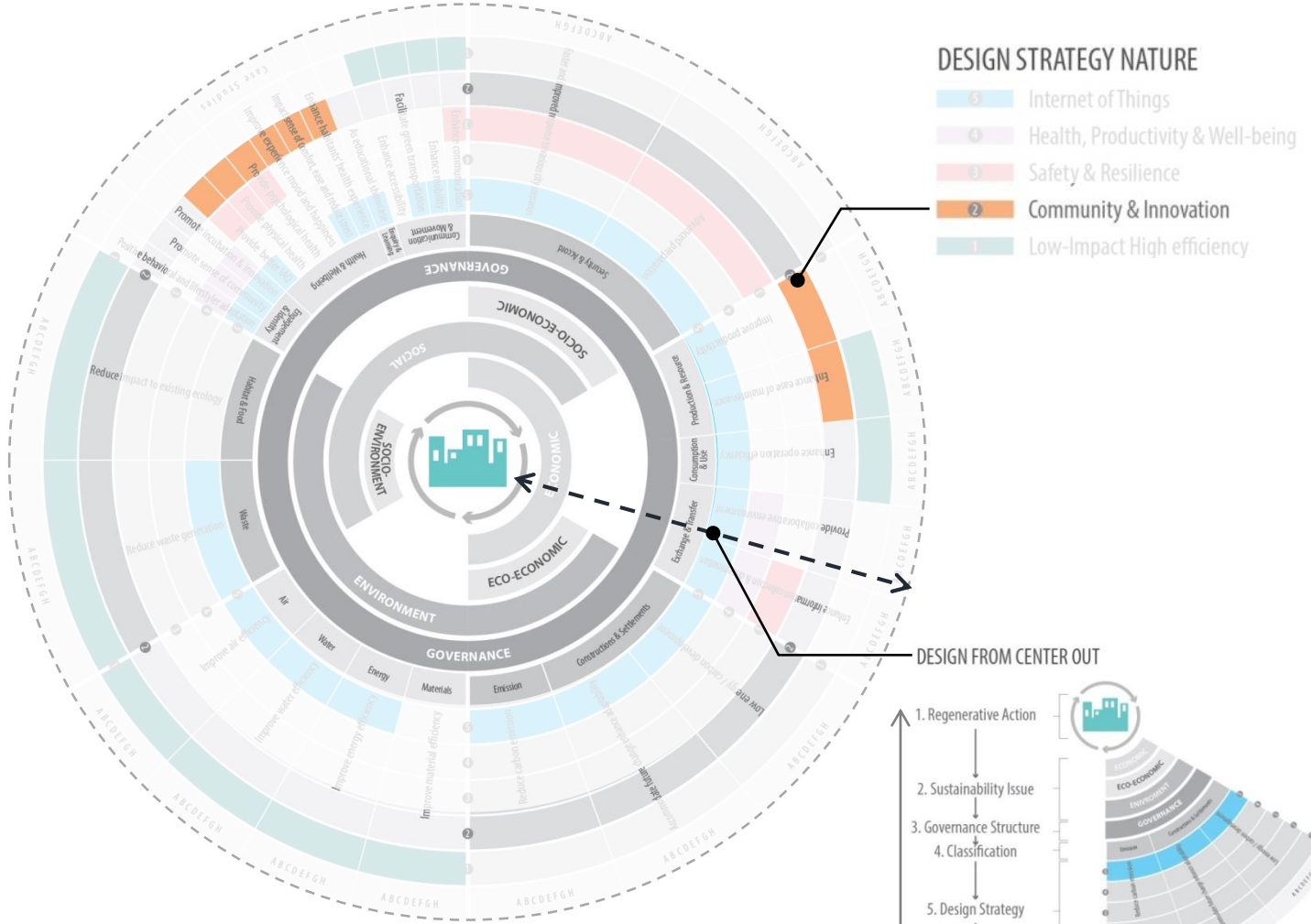
### Design Strategy



# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process

### D. Community & Innovation



**Integral Design Palette** for qualitative reflection process from a **socio-ecological system (SES)** perspective (Leigh & Orange 2016)

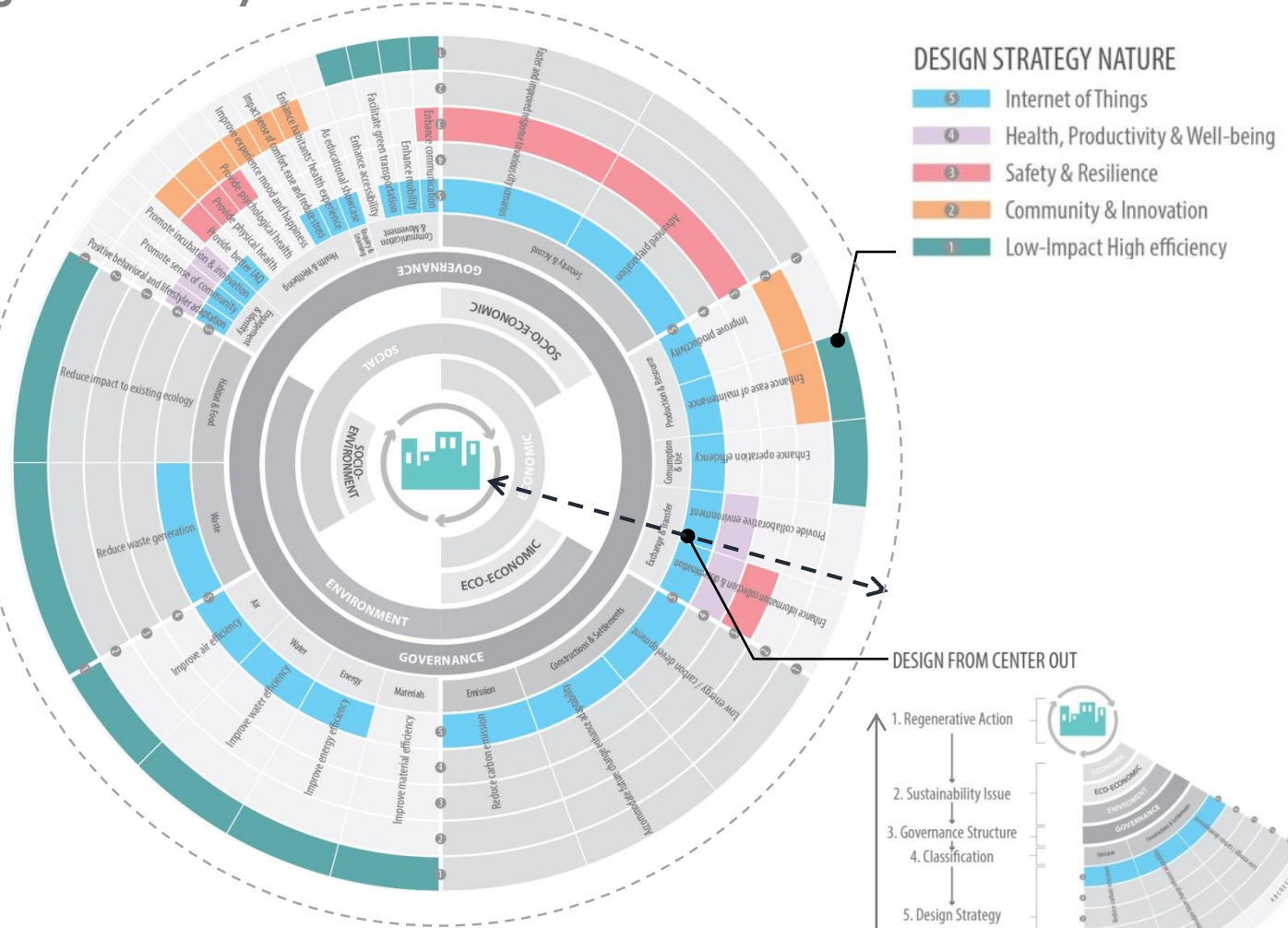
**Design Strategy**



# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process

### E. Low-Impact High Efficiency



**Integral Design Palette** for qualitative reflection process from a **socio-ecological system (SES)** perspective (Leigh & Orange 2016)

### Design Strategy



Organisers:



International Co-owners:





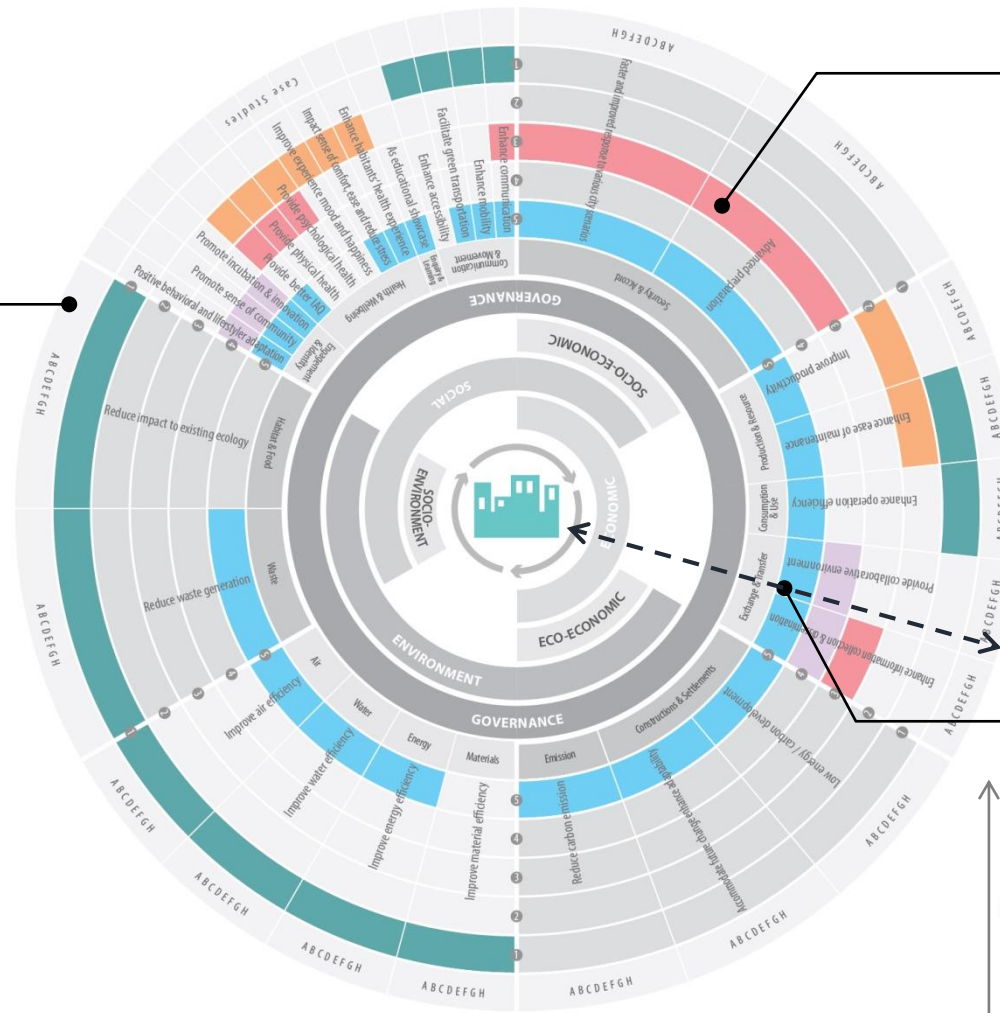
# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process

### Case Study

#### CASE STUDY (A-H)

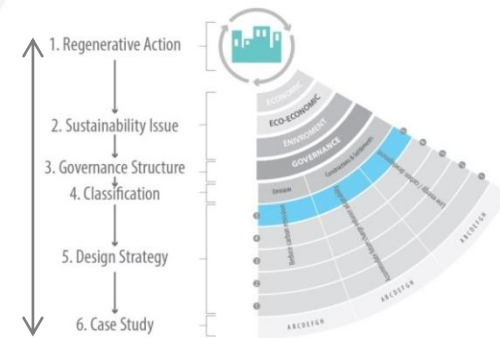
- A Background
- B Issues
- C Principles
- D Settings
- E Support
- F Experience
- G Project
- H Ideas



#### DESIGN STRATEGY NATURE

- 5 Internet of Things
- 4 Health, Productivity & Well-being
- 3 Safety & Resilience
- 2 Community & Innovation
- 1 Low-Impact High efficiency

#### DESIGN FROM CENTER OUT



Integral Design Palette for qualitative reflection process from a socio-ecological system (SES) perspective (Leigh & Orange 2016)

### Case Study



Organisers:

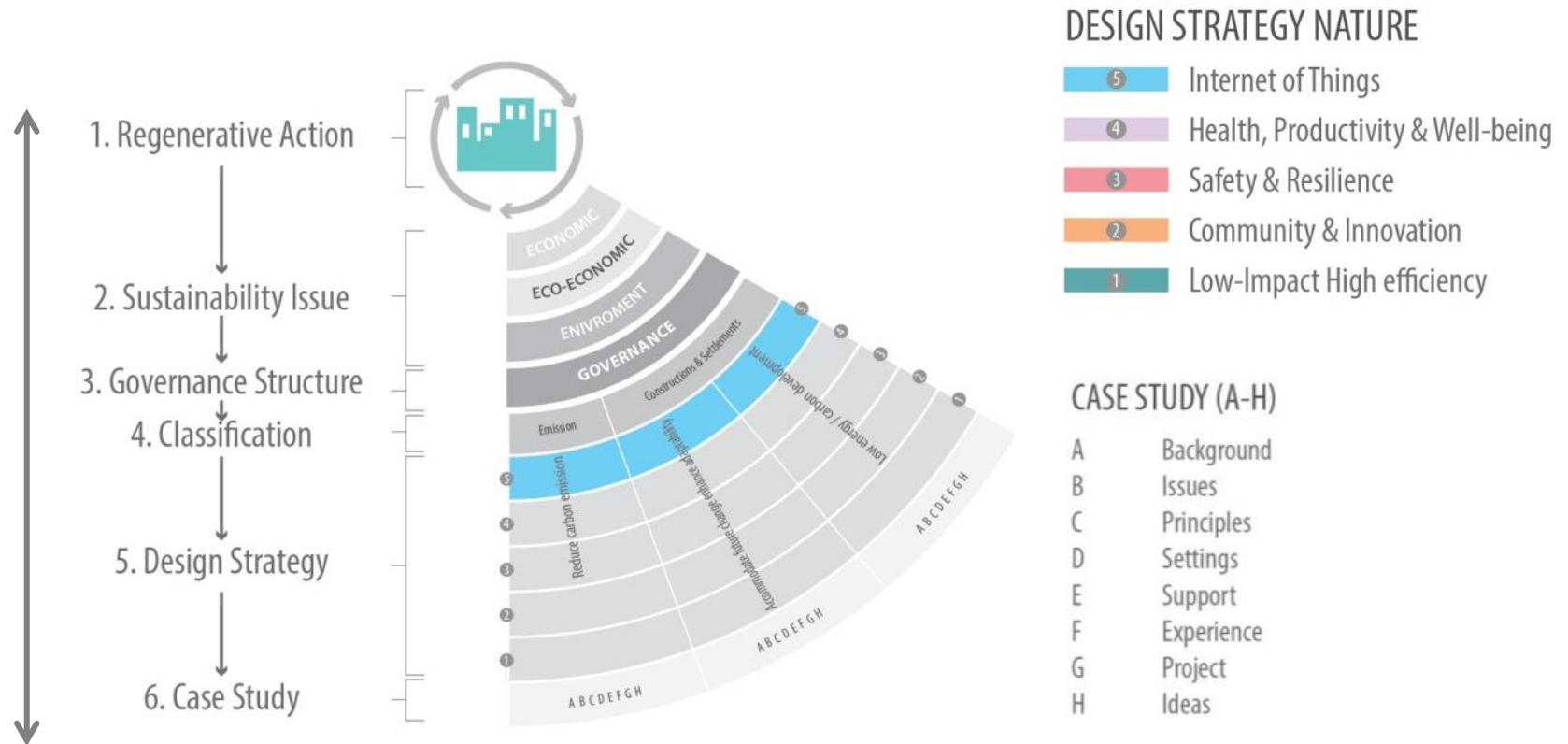


International Co-owners:



# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process



**Integral Design Palette** for qualitative reflection process from a **socio-ecological system (SES)** perspective (Leigh & Orange 2016)



International Co-owners:

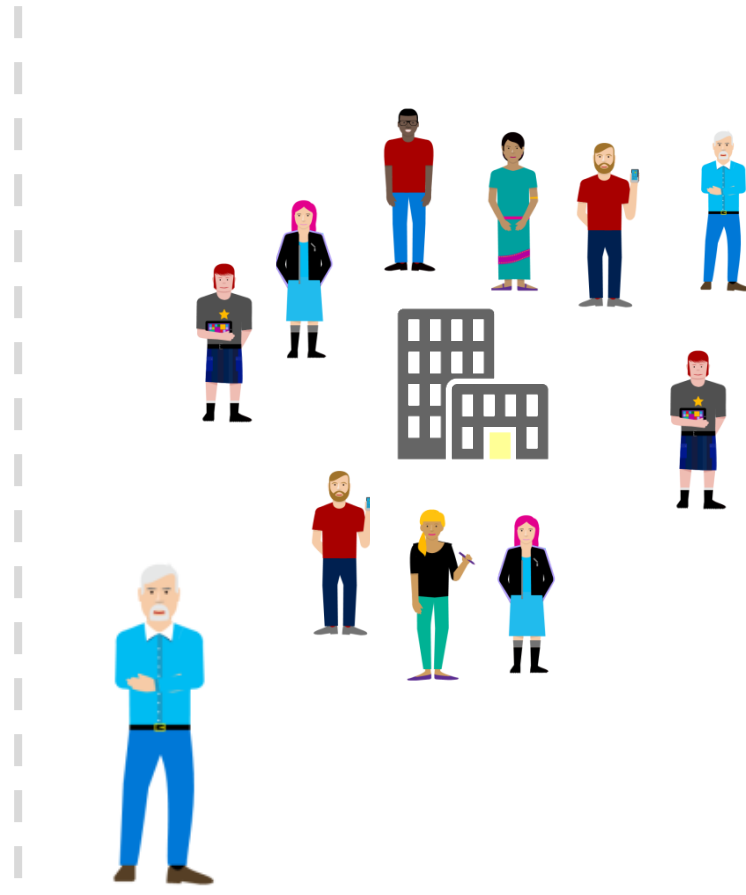


# Limitation On Traditional Design Process

## Complex Rules and Self-perpetuating Process of Externalization



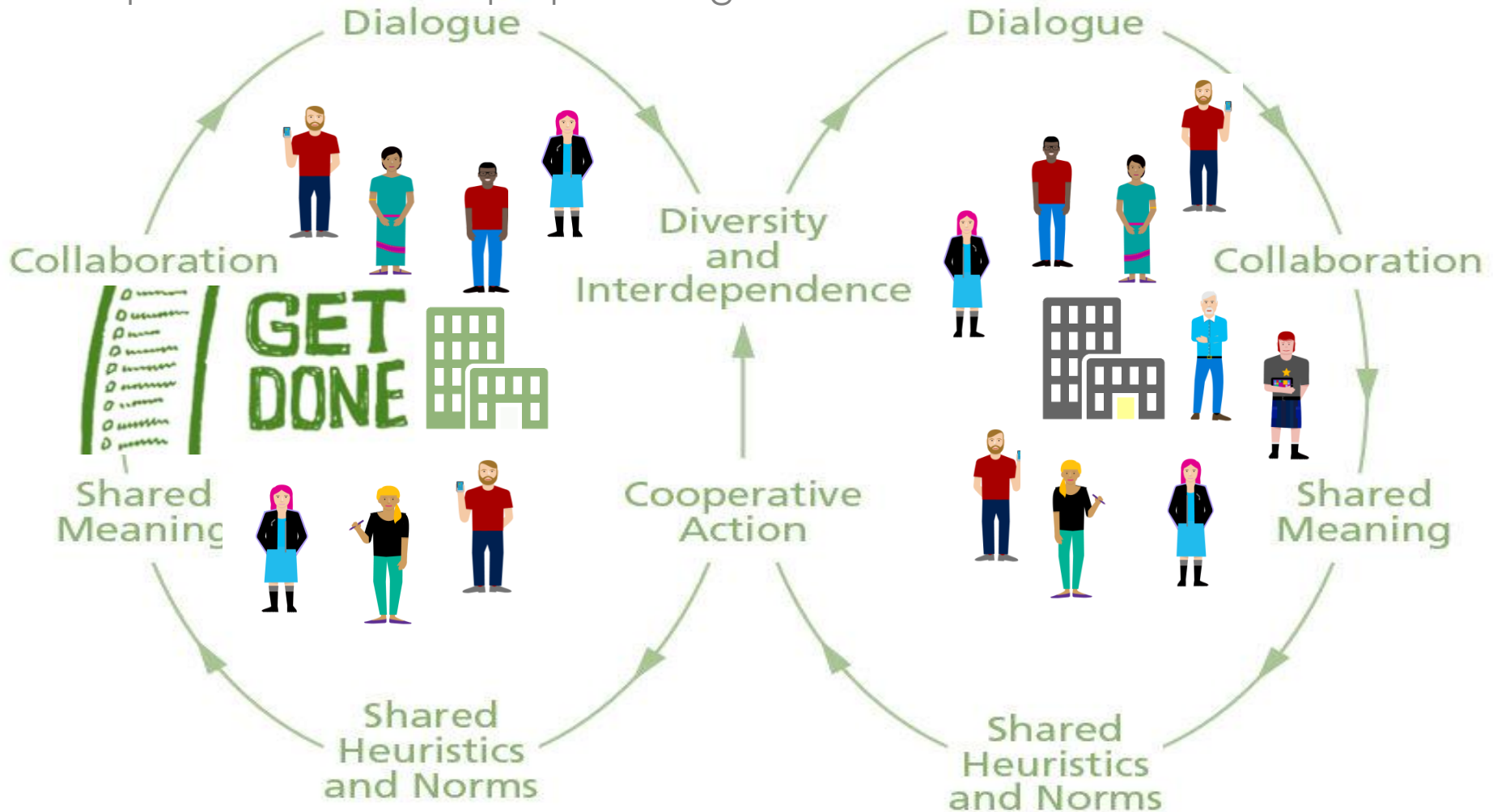
Environmental Expert



Architectural Design Team

# Limitation On Traditional Design Process

Complex Rules and Self-perpetuating Process of Externalization



(Booher & Innes 2002)

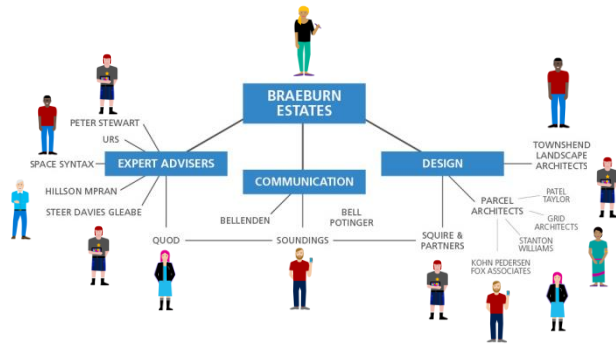
# Integral Design Conceptual Framework

## Integral Design Palette for Qualitative Reflection Process

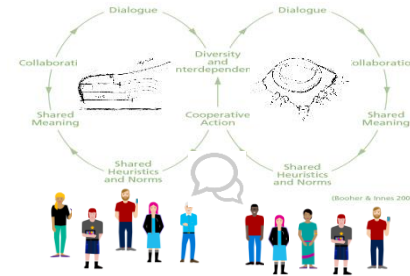


### Traditional design process

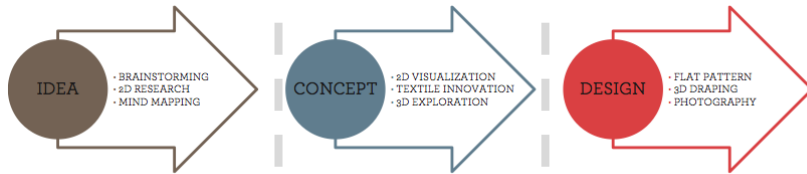
Vertical Organization



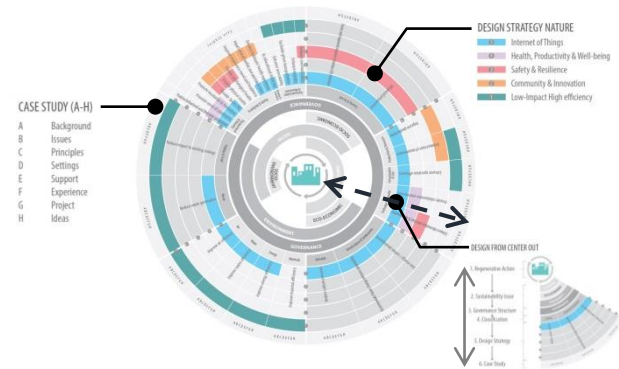
### Ecological & Regenerative design process



Horizontal Organization



Linear design  
Ecological Value get Lost



Integrated design  
Alignment of Ecological Value



International Co-owners:



# Leigh & Orange

*DELIVERING EXCELLENCE FOR 140 YEARS*

**Thank you**



Organisers:



International Co-owners:

