

The role of science in the context of the SDGs and climate Policy after Paris  
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# The role/potential of transdisciplinary processes after the Paris 2016 agreement

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## Three inputs

1

What is (Mode 2) Transdisciplinarity (Td)?

2

Role(s) of science in Td processes (before and after COP21)

3

Two options for global Td processes after the Paris Agreement

# Objectives of LCS-Rnet

([http://lcs-rnet.org/about\\_lcsrnet/](http://lcs-rnet.org/about_lcsrnet/); retrieved Sept. 5, 2016)

- Promotion of information exchange and research cooperation that cover various issues relating to low carbon societies,
- Promotion of understanding about LCS through dialogues between researchers and various stakeholders including policy-makers, businesses, citizens and others to share national and sub-national visions on low-carbon societies, and
- Contribution to international policy-making processes on climate change including G8 process by providing research outcomes and recommendations.

Science oriented

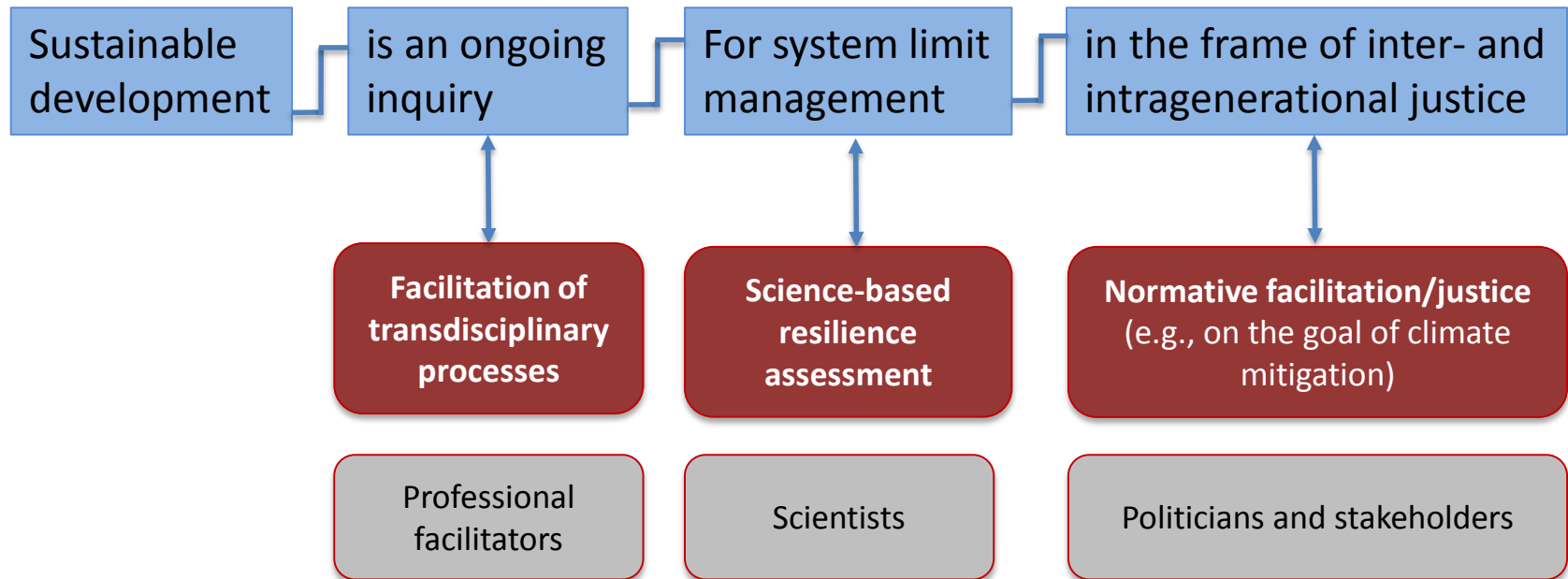
Stakeholder –  
policy oriented

Political oriented

# The use of sustainability as a regulative idea and the Differentiation of Tasks/and Roles for SDG

Sustainability is conceived as a regulative idea of social order (Kant, 1781, Schneidewind et al. 1997).

A minimum systemic definition of sustainability reads (Laws et al., 2004; based on interviews with 21 project leaders of the AGS – MIT, ETH, Chalmers, University of Tokyo)



Laws, D., Scholz, R. W., Shiroyama, H., Susskind, L., Suzuki, T., & Weber, O. (2004). Expert views on sustainability and technology implementation. *International Journal of Sustainable Development and World Ecology*, 11(3), 247-261.

Kant, I. (1881). *Immanuel Kants Kritik der reinen Vernunft*. Riga: Hartknoch.

Schneidewind, U., Feindt, P. H., Meister, H. P., Minsch, J., Schulz, T., & Tscheulin, J. (1997). Institutionelle Reformen für eine Politik der Nachhaltigkeit: Vom Was zum Wie in der Nachhaltigkeitsdebatte. *GAIA*, 6(3), 182-182.

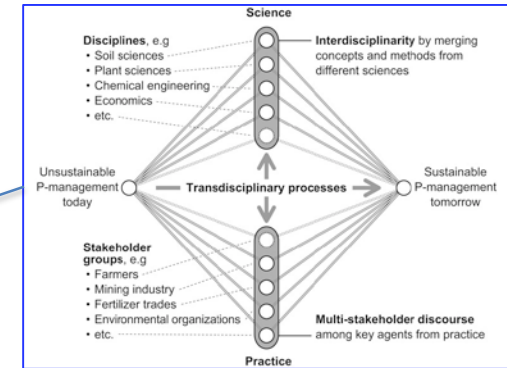
# Transdisciplinarity: a mode of science-practice collaboration

<b>“Normal Science Methods” of Sc-Pra-Intera.</b>	<b>“Interactive” Methods of Sc-Pra-Interact.</b>
<b>Applied research/science</b> a. Theme/topic centered interaction b. Team sciences	<b>Transition research</b> • Transformative science (normative) • Transforming science (process oriented)
<b>Consultancy</b> a. Commercial (e.g., medicine, engineering, ) b. Political consultancy/advocacy	<b>Mode 2 transdisciplinarity (since 1970)</b> 1. “Contemplative Mode 1 Td” 2. Zurich 2000 approach 3. Postmodern transdisciplinarity 4. Charta of (spiritual) transdisciplinarity
<b>Knowledge transfer (Science shops)</b>	
<b>Mediation and consensus building</b>	
<b>Grassroots politics research</b>	<b>Action research (since 1946)</b> a. Actionistic (shallow) action research b. Deconstructive action research. c. Inductive action research d. Participatory action research e. Experimental action research f. Community-based participatory action research
<b>Translational research (since 1915: “bench to bedside”)</b>	
<b>(Field-based) Ethnographic research (Methodology)</b> Participatory observation	
<b>Open Innovation</b>	<b>Real-Laborforschung</b>
	<b>Public participation (e.g., Planning cell)</b>
	<b>Triple Helix</b>
	<b>Citizen Science</b>

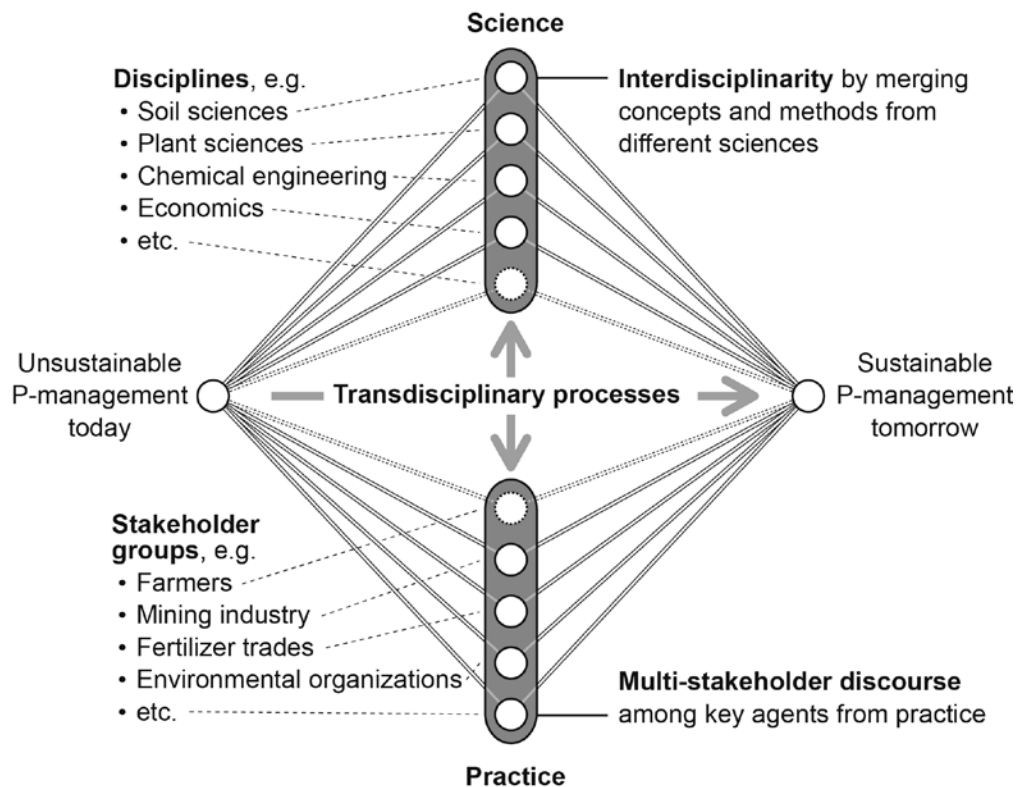
# Transdisciplinarity in a nutshell

## Transdisciplinarity

- Has become a **third mode** (methodology) of doing and utilizing science (in sustainable transitioning)
- Means **going beyond sciences** (not only beyond disciplines) and **switching from doing science for to science with society**
- Start from an **ill-defined, complex, socially relevant problems**
- Include(s) three types of processes
  - i. a **targeted interdisciplinary process**
  - ii. a moderated processes of **stakeholder** discourse or **mitigation**
  - iii. a **facilitated process of relating science and practice**
- Follow(s) four functions
  1. **Capacity building** (for scientists and practitioners)
  2. **Consensus building**, primarily on what is the “problem”
  3. **(Analytic) Mediation**, i.e., anticipatory management of losses and benefits of (sustainable) transitions/transformations
  4. **Political legitimation**
- Is based on **mutual learning** by relating and/or integrating different epistemics
  - Dimensions of integration: (1) disciplines, (2) subsystems, (3) modes of thought, (4) interests/perspectives, and (5) cultures
- Asks for **theory-practice discourses with equal rights** when **accepting the otherness** (of roles and knowledge) **of the other** which can be best realized by **co-leadership**
- Provide **socially robust orientations** (not solutions) which are of interest for practice and sciences
- Is an important way for **strategic sustainable planning**



# There are three main processes in a (Mode 2) transdisciplinary process on sustainable transitioning



i. A targeted interdisciplinary process

iii. A facilitated td-process relating 1. and 2.

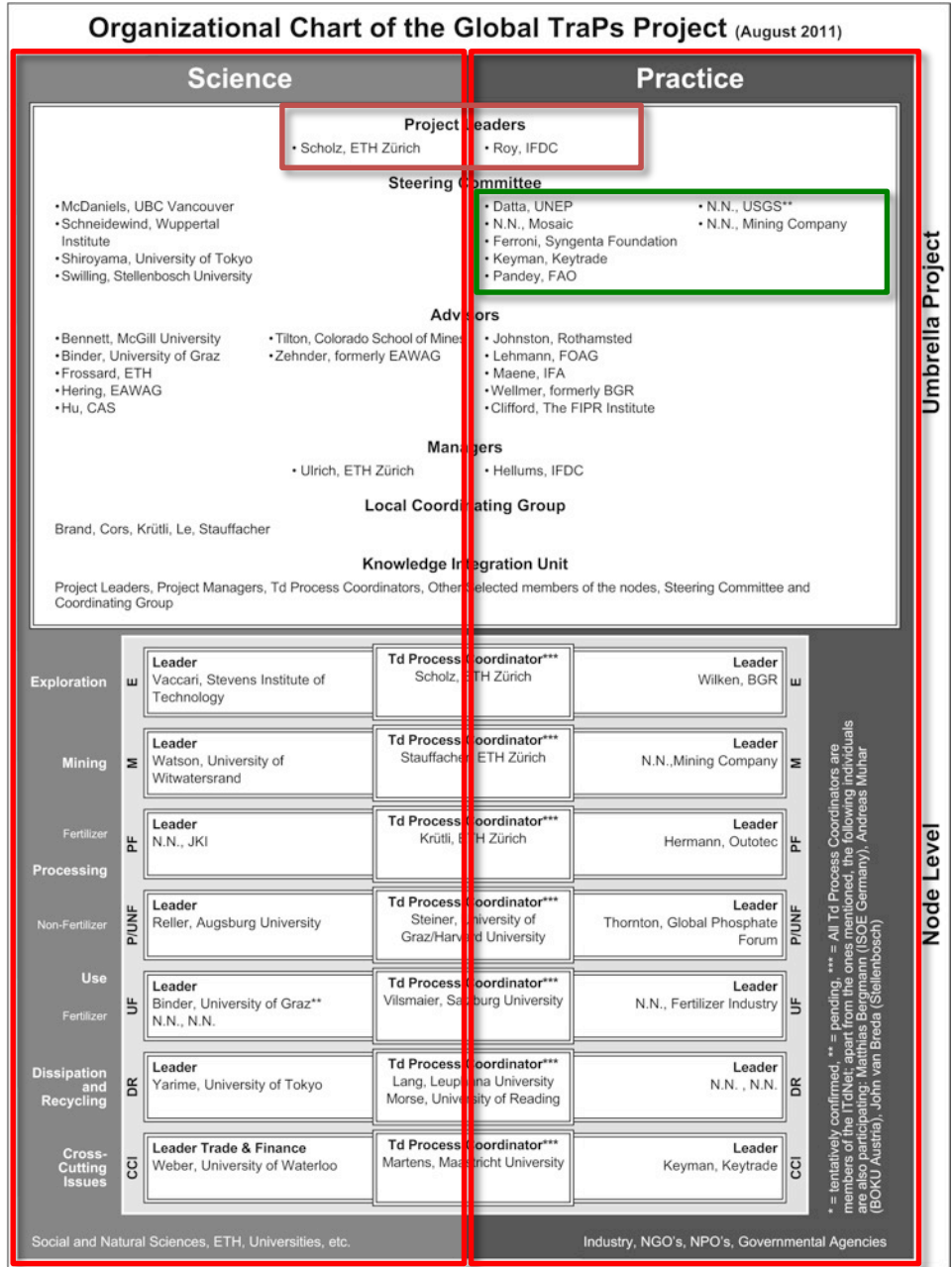
ii. A facilitated Multi-stakeholder discourse

Td-projects realize co-leadership on all levels of the project

The example of Global TraPs (global phosphorus management)



Key practitioners who participated



Umbrella Project

Node Level



## A much discussed issue

### In what way are scientists legitimized to political action?



Some consider science to be a public good and differentiate between scientists and (democratically) legitimized stakeholders

- Differentiation of roles
- Differentiation between knowledge and values

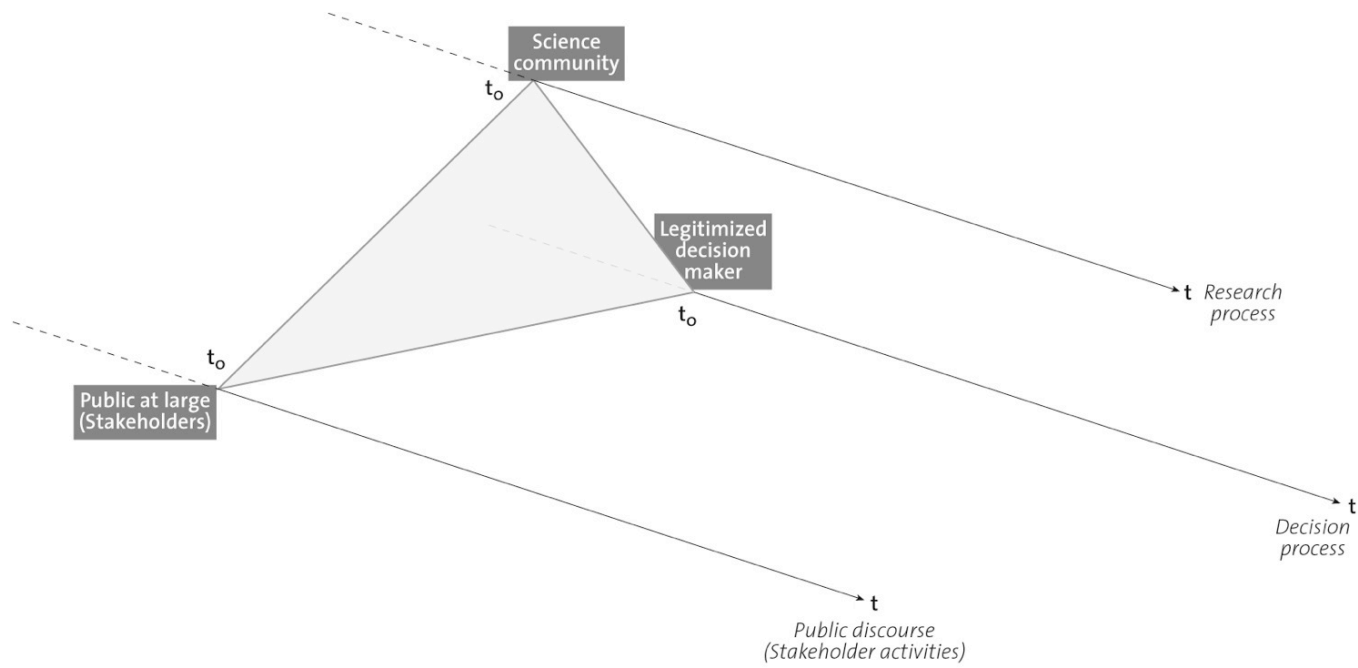
Others postulate “SDGs serve as a new narrative that describes the necessary change processes; they offer a comprehensive framework for coordinating sustainable development efforts and strategies at regional, national and international levels, and for integrating them in a shared vision of a globally just and much less resource-intensive world society.” (Schneidwind et. al, 2016, p. 124)

# In what way are scientists legitimized to political action?

Public knowledge institutions/ universities need a "governmental mandate", also after COP21

Science as a public good ("serving all values")

~~Science the principal agent of the great transition~~



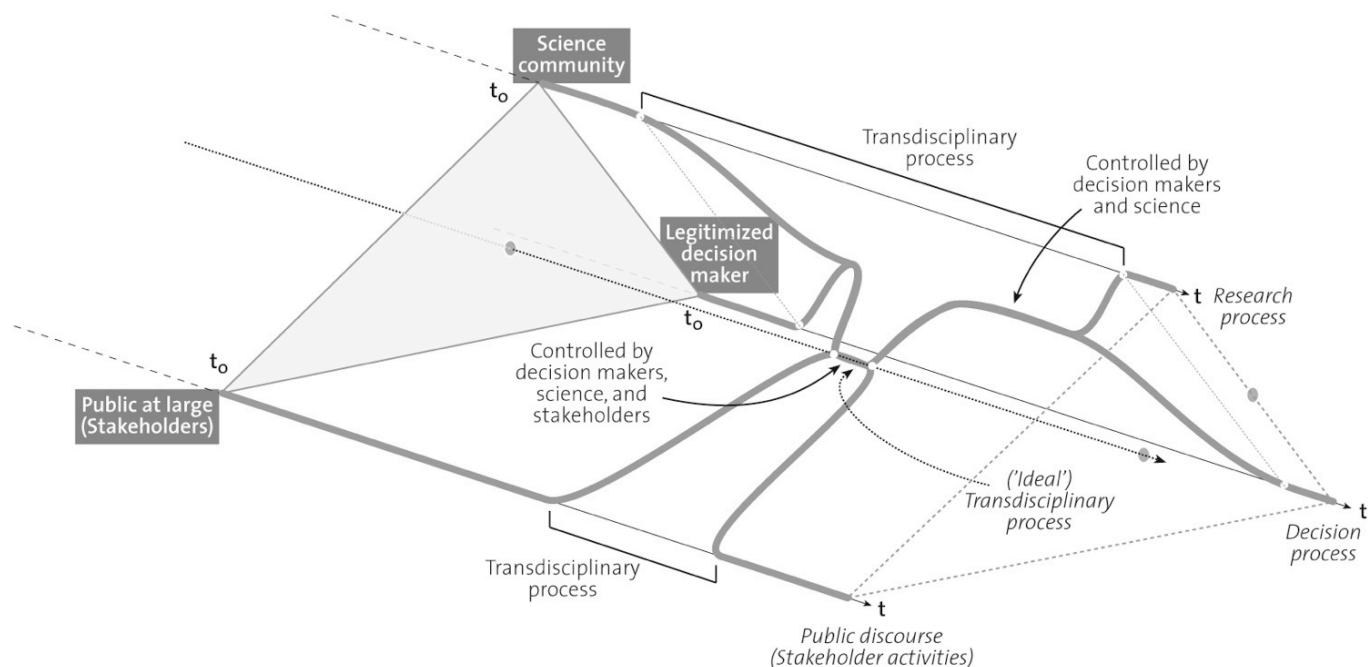
# In the Zurich 2000 conception scientists are a public good

Public knowledge  
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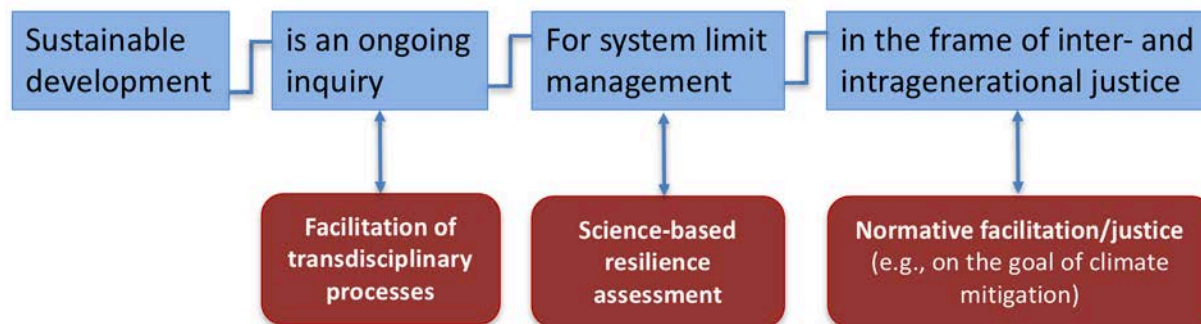
## Illustrating Transdisciplinarity



# Where may be the role of transdisciplinary processes after COP21?

There may be a shift of frontiers/tasks

- **ONGOING INQUIRY:** From search on who contributed how much to climate change **to what contribution for mitigation should be given by whom**
- **RESILIENCE:** What threats is a warming planet facing **to who can theoretical provide what contribution**
- **JUSTICE:** From intergenerational justice (how does temperature change) **to intragenerational justice (who has to contribute how much)**



# What does COP 21 change?

## Various Articles define “tasks for Td-processes”

- A global social **contract/quantitative goals** (Art 2(a))
- Request for **national assessment** for mitigation (Art 4.9)
- Regional economic organizations and (negotiation) processes among the parties are ...”responsible for its emission level” (Art 4.18)
- ”**Intencitize and facilitate participation ...**” (Art 6(b))

## The call for transdisciplinary processes is given in Art 7.5

- Parties acknowledge that adaptation action should follow a country-driven, **gender-responsive, participatory and fully transparent approach, taking into consideration vulnerable groups, communities and ecosystems, and should be based on and guided by the best available science and, as appropriate, traditional knowledge, knowledge of indigenous peoples and local knowledge systems, with a view to integrating adaptation into relevant socioeconomic and environmental policies and actions, where appropriate.**

# Two examples for prospective Global Transdisciplinary Processes for LCS

1. Crosscultural leaning about efficient and socially accepted CO2 emission reduction in different countries
  - Reducing fossile energy life-cycle costs of housing (from construction via heating/airconditioning and behavior of users to destruction) – “a little ‘cross’-cost-benefit like”
2. Critical industries strategic sustainability learning in global transdisciplinary processes (such as Global TraPs) – Where is consensus what direction to move necessary
  - Airplane producers and airlines (e.g., prerequisites of a hydrogene fuel cell future
  - Car industry on infrastructure of electric and hydrogene fuel cell infrastructure/supply

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Andrea E. Ulrich *Editors*

## Sustainable Phosphorus Management

A Global Transdisciplinary Roadmap