CHULALONGKORN UNIVERSITY
Social Science Research Institute
Winter School on
Transformative Social Science
for Sustainability and Social Justice
9-13 December 2013

The Dual Focus of Sustainability Transition
The Supply vs. the Demand Side

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SpringerBriefs on Pioneers in Science & Practice

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Contents

1. Introduction

- The **sustainable energy transition** is (most important) one of several crucial sectors considered by the KSI & STRN
- Others are **transportation, industrial & agriculture production, urbanization but also water, land (soil) food & health**
- They are part of the **supply side** that my offer **less carbon intensive (decarbonized) goods (products) & services**
- They are **necessary but not sufficient**: we need citizens & consumers that are aware, convinced & willing to vote for alternative policies, development policies
- This requires changes in **values, attitudes, preferences & behaviour, way of life, life style, diet, overcome consumerism, waste economy, move to sustain-able consumption**

2. Theoretical Approaches to Sustainability Transition Focus on the Supply Side

Review two theory-guided approaches:

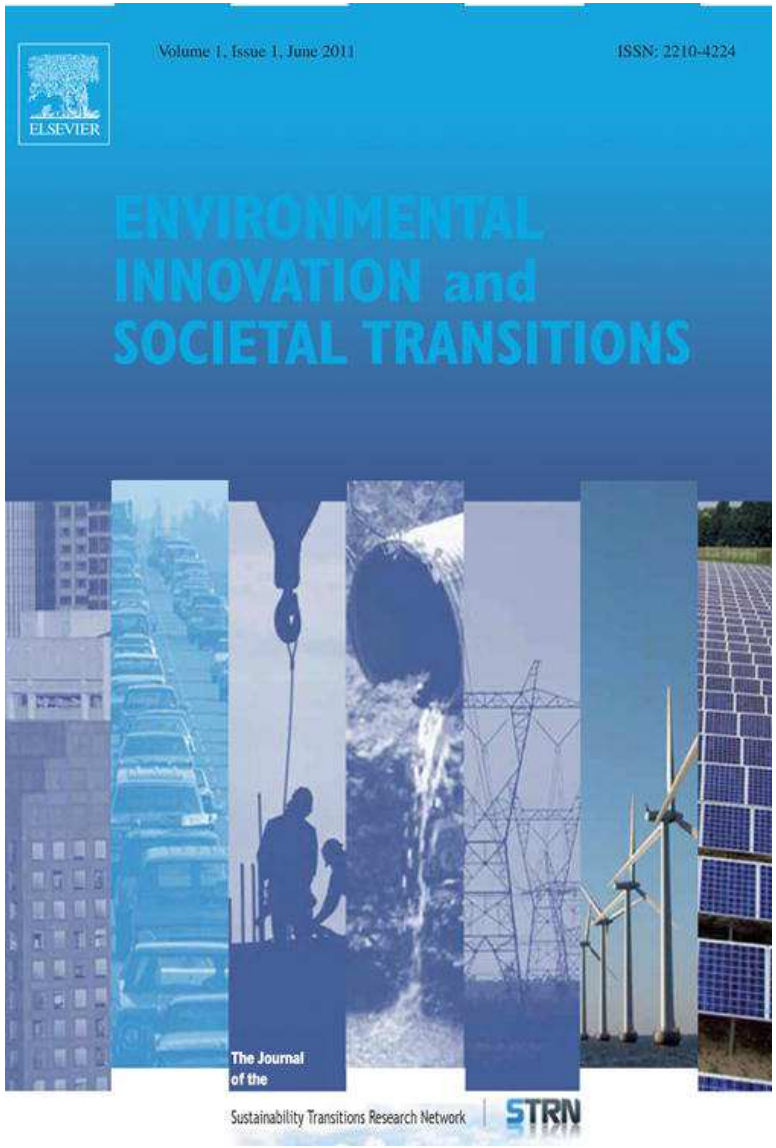
- **Dutch Knowledge Network Network on Systems Innovation and Transition (KSI) & Routledge Studies in Sustainability Transitions:**
  - Vol. 1: Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change by John Grin, Jan Rotmans, Johan Schot
  - Vol. 2: Automobility in Transition? A Socio-Technical Analysis of Sustainable Transport Ed. F. W. Geels, R. Kemp, G. Dudley, G. Lyons
  - Vol. 3: Food Practices in Transition - Changing Food Consumption, Retail and Production in the Age of Reflexive Modernity Ed. by G.Spaargaren, P. Oosterveer, A.Loeber
  - Vol. 4: Governing the Energy Transition - Reality, Illusion or Necessity? Ed. by Geert Verbong, Derk Loorbach
- **German Advisory Council on Global Change (WBGU) Reports**
  - Towards Sustainable Energy Systems (2003)
  - Security Risk climate Change (2007)
  - World in Transition: Future Bioenergy and Sustainable Land Use (2008)
  - A Social Contract for Sustainability (2011)

2.1. Theoretical approach of KSI: vol. 1: by John Grin, Jan Rotmans, Johan Schot

- Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change
- Two central questions:
  - How may we understand transitions?
  - How may we influence transitions into a desired direction, i.e. sustainable development
- Structure of the book
  1. Dynamics of Transition: Socio-Technical Perspective (F. Geels, J. Schot)
  2. Towards a Better Understanding of Transitions and their Governance: A systemic and Reflexive Approach (Rotmans, Loorbach)
  3. Understanding Transitions from a Governance Perspective (J. Grin)

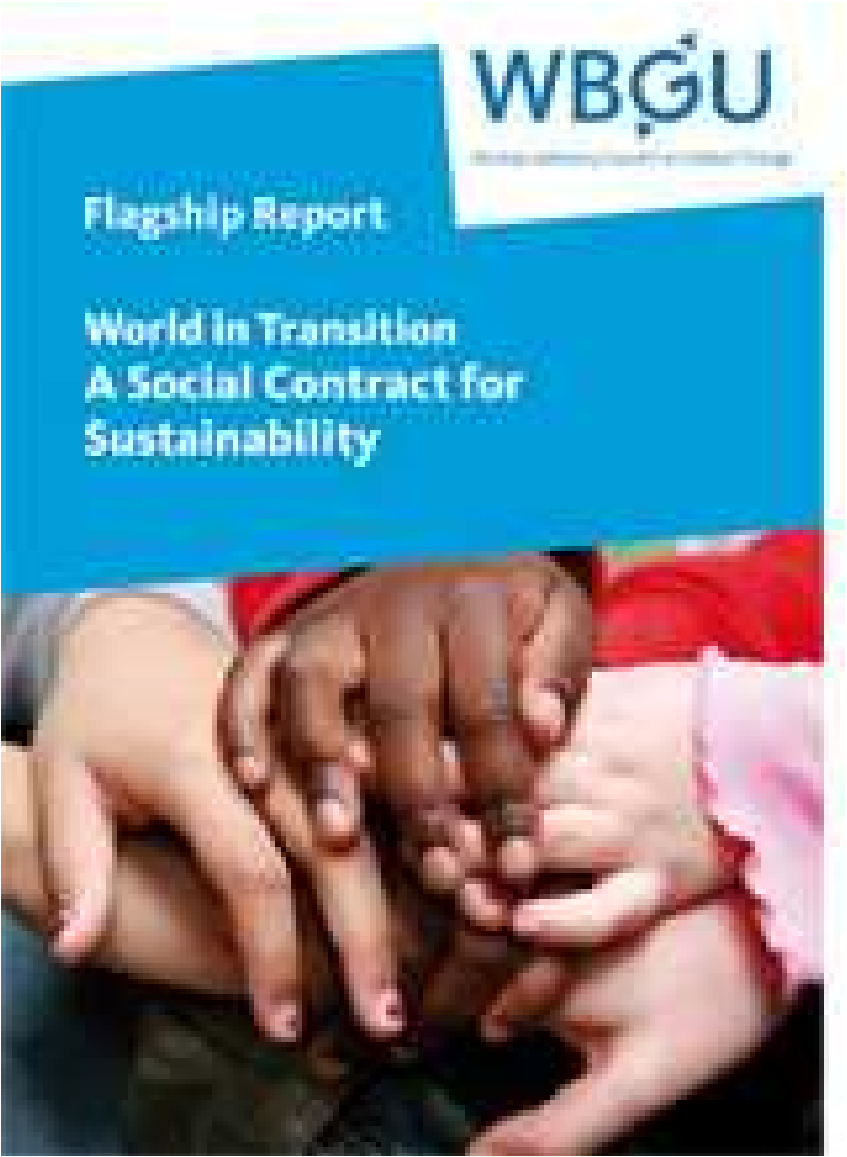
  Conclusions (J. Grin, J. Rotmans, J. Schot)

2.2. Environmental Innovation and Sustainability Transitions Journal



- offers a platform **for reporting studies of innovations and socio-economic transitions** to enhance an environmentally sustainable economy and thus solve structural resource scarcity and environmental problems, notably related to fossil energy use and climate change.
- **This involves attention for technological, organizational, economic, institutional & political innovations** as well as economy-wide & sector changes, such as in the areas of energy, transport, agriculture and water management.”. The journal focuses on “social, economic, behavioral-psycholo-gical & political barriers and opportunities as well as their complex interaction.

2.3. WBGU Report on a ‘Social Contract for Sustainability’ (2011)



argued that the transformation to a low-carbon society requires us

- not just [to] **accelerate the pace of innovation**; we must also **cease to obstruct** it. …
- Adequate **investment dynamics towards a sustainable global economy** can only develop if subsidies for fossil energy carriers, currently in the region of high three-digit billion figures worldwide, are abolished.
- We must consider**external costs of high-carbon (fossil energy-based) economic growth** to set price signals, and thereby to provide **incentives for low-carbon enterprises**. Climate protection is, without a doubt, a vital fundamental condition for sustainable development on a global level. …
- **Sustainable development means more than climate protection, though, as the natural life-support systems also include many other natural resources, such as fertile soil and biological diversity.**

2.4. WBGU: Focus on Supply & Demand Side German Advisory Council on Global Change 2011: A Social Contract for Sustainability

The WBGU is an independent, scientific advisory body to the German Federal Government set up in 1992 in the run-up to the Rio Earth Summit. The Council has nine members, appointed for a term of four years by the federal cabinet. The Council is supported by an interministerial committee of the federal government comprising representatives of all ministries and of the federal chancellery. The Council's principal task is to provide scientifically-based policy advice on global change issues to the German Federal Government. The Council:

- analyses global environment and development problems and reports on these,
- reviews and evaluates national and international research in the field of global change,
- provides early warning of new issue areas,
- identifies gaps in research and initiates new research,
- monitors and assesses national and international policies for the achievement of sustainable development,
- elaborates recommendations for action, and
- raises public awareness and heightens the media profile of global change issues.

The WBGU publishes flagship reports every two years, making its own choice of focal themes. In addition, the German government can commission the Council to prepare special reports and policy papers.

More at: www.wbgu.de

2.5. What are transitions?

- **F. W. Geels, J. Schot: Definition of transitions**

1. **Transitions are co-evolution processes that require multiple changes in socio-technical systems or configurations**. Transitions involve both technical innovations (new knowledge, science, industries) and their use (selection & adoption) application domains. Use by consumers (markets), societal embedding of new technologies (markets, infrastrcuture, cutlural symbols).
2. **Transitions are multi-actor processes**, involving interactions between social groups**. Scientific communities, policymakers, social movements and special interest groups**
3. **Transitions are radical shifts from one system or configuration** to another. (radical. Scope of change not speed), may be sudden: creative destruction and can be slow to proceed step-by step.
4. **Transitions are long-term processes (40-50 years), while breakthroughs may be fast (10 years),** innovative journays of new socio-technical systems gradually emerge are much longer (20-30 years).
5. **Transitions are macroscopic**: level of analysis: „organized fields“

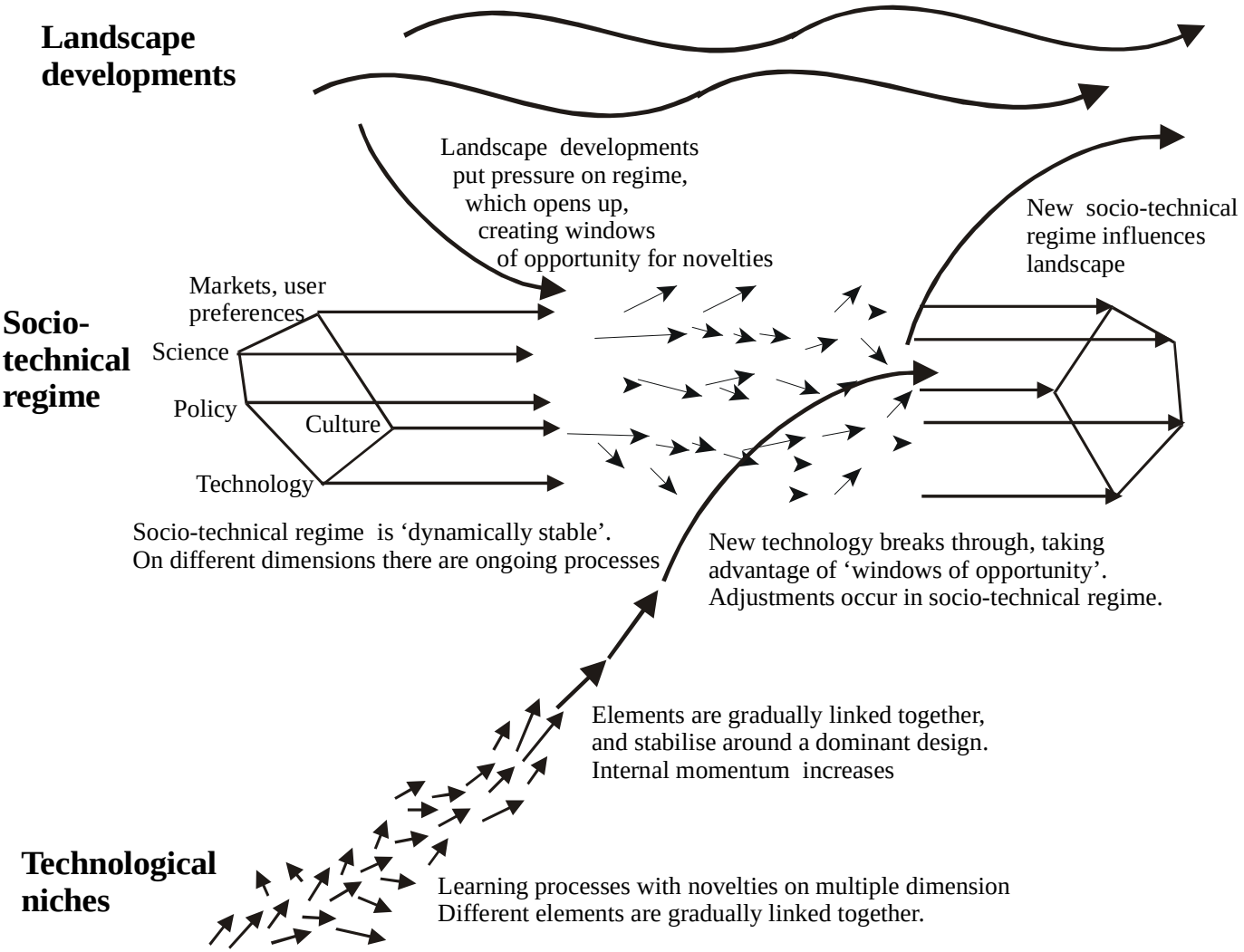
2.6. Time Goal & Scales of Transition

- **Goal of transition process: sustainable development/sustainability**
  - **Political Concept of Brundtland Commission (1987)**
  - **From Earth Systems Science: Clark, Crutzen, Schellnhuber (2004)**
    - **A new Scientific Revolution (Kuhn) of Sustainability: Change of Worldview**
    - **A New Contract for Sustainability (Rousseau after 1789)**
- **Braudel: 3 Historical Times**
  - **Structures: geological, geographic, social, mental structures (centuries)**
  - **Conjunctures: economic and demographic cycles (decades)**
  - **Events (grand events, inventions driving change): e.g. key inventions like** Watts (steam engine), Edison (electricity); Benz, Daimler (car), Zuse (computer)
- **My two additions:**
  - **Geological time: Holocene -> anthropocene**
  - **Technical time: technical revolutions (millenia, centuries): agricultural, industrial**

2.7. Deadlocks & Obstacles Against Change

- **Persistent problems – e.g. economic growth = more energy use = more GHG production**
- **Why can we not do good without doing harm?**
  - Side effects of established practices,
  - … embedded in and privileged by structures
  - … that have co-evolved with these practices
- **Transition:** mutually consistent and reinforcing changes in practices and associate structures ('regime')
- **These changes** may be influenced by 'autonomous' changes (the **'landscape'**) that press on (destabilize, challenge) incumbent structures and practices:

2.3. Multi-Level Perspective on Transitions: Socio-technical Approach of F. Geels



Relies on:

- Contextual history = historiography +STS
- Evolutionary theory
- (social theory)

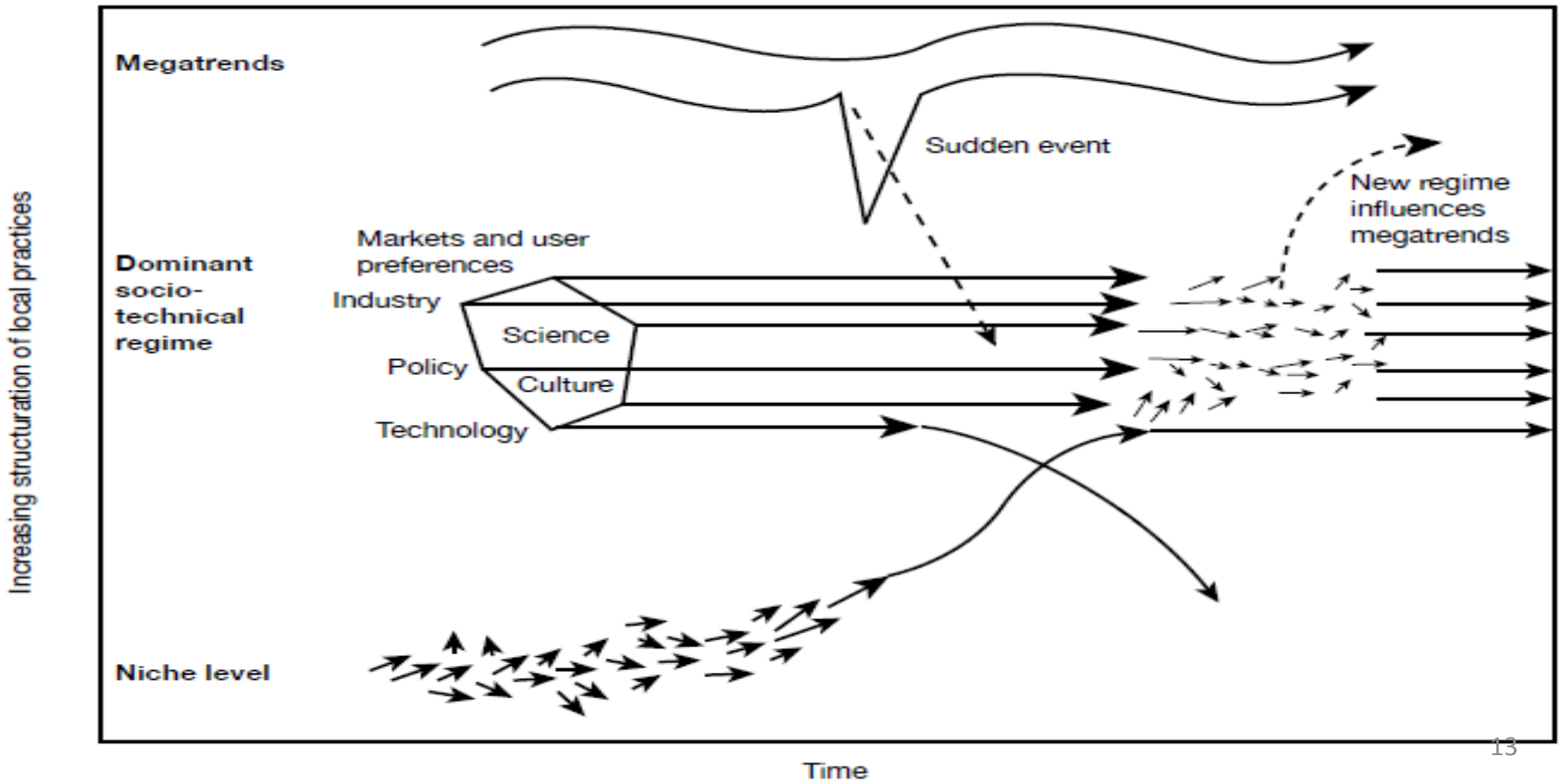
Three Levels:

- **Socio-technical landscape (exogen.)** present system (structures, interests, worldview) stable. E.g. market economy high carbon footprint
- **Socio-technical regime** (political realm: sciene-policy-technology-market)
- **Niche innovations** (knowledge, inven-tions, innovations)

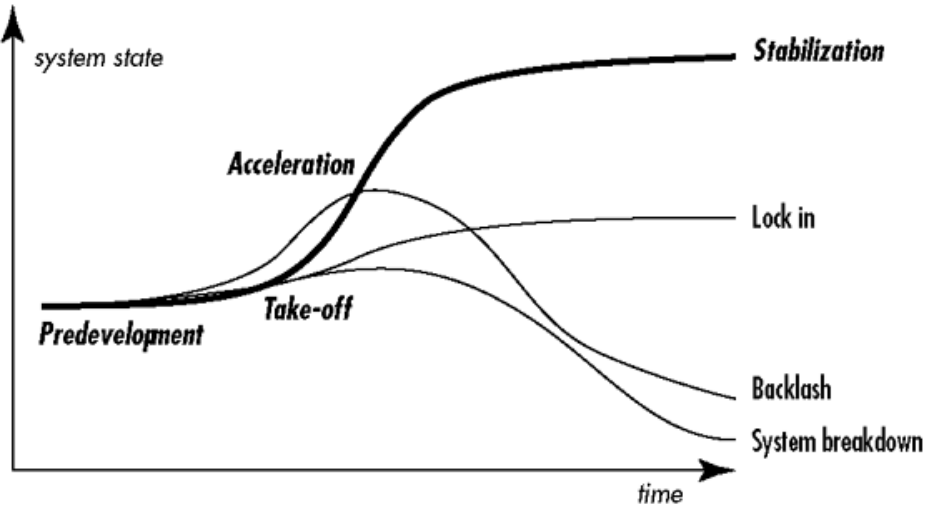
Dynamic multilevel interaction

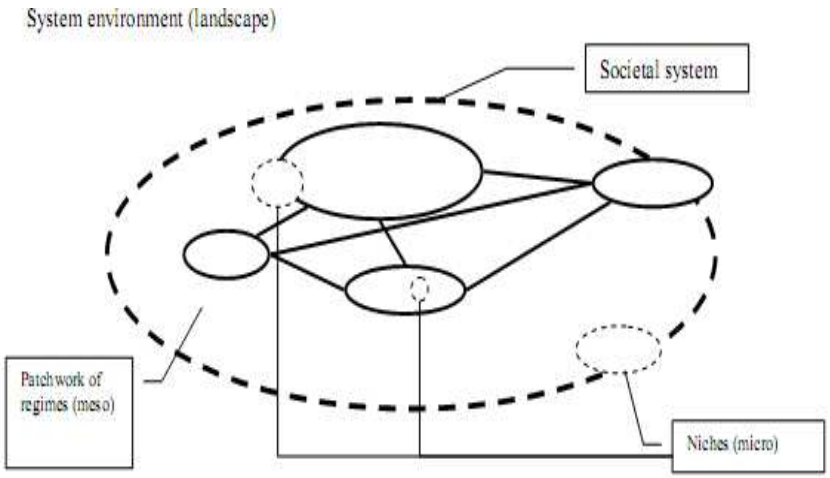
2.9. WBGU‘s Adaptation of KSI Model (Geels)

- **WBGU added Megatrends:**
  - **Earth System:** climate, biodiversity, land degradation, water, raw materials
  - **Human System:** development, democratization, energy, urbanization, food



2.10. Complexity Theory Approach (J. Grin's interpretation)

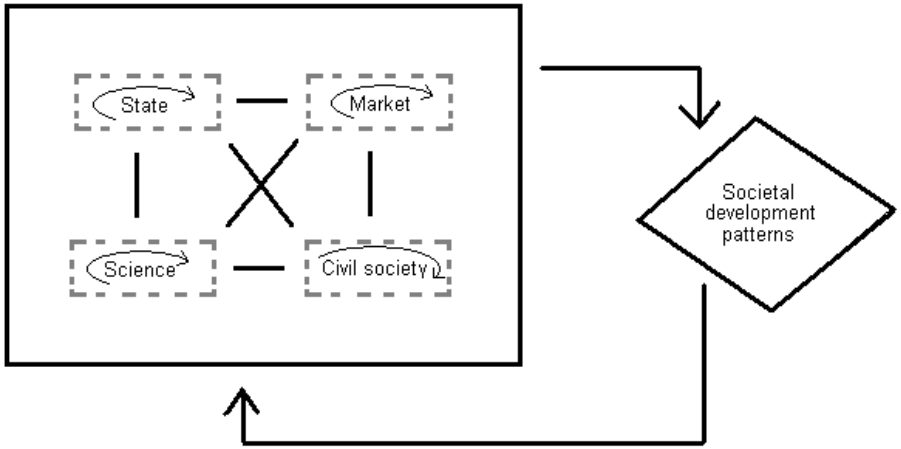


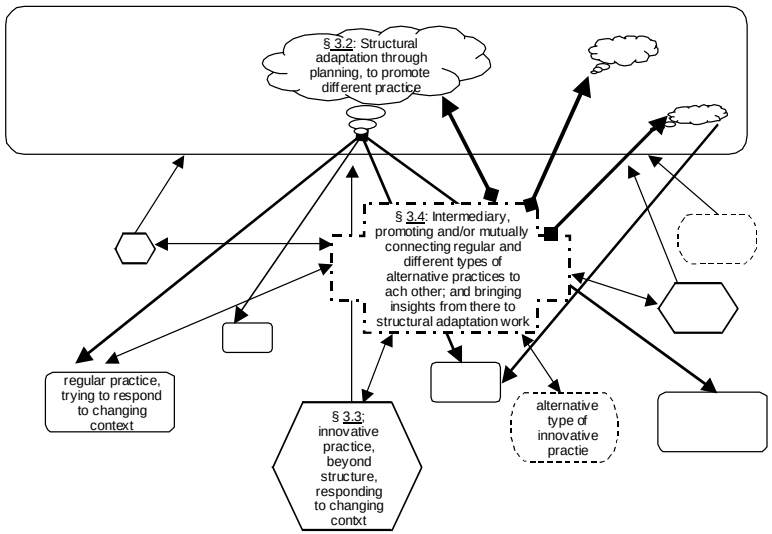


- **Objectives**
  - Understanding of systemic transition mechanisms
  - Typology of transition pathways
- **Relies on**
  - Complex adaptive systems theory
  - Integrated assessment
  - Evolutionary theory

2.11. Reflexive governance approach

J. Grin's approach, influenced by Giddens, Beck





- **Objectives**
  - Understanding transition dynamics in the real world
  - Understanding reflexive agency involved, incl. politics (legitimacy power, trust aspects)
- **Relies on**
  - Political science
  - Modernization theory
  - Structuration theory
  - (STS)

2.12. Towards Energy Transition (J. Grin)

- **Energy has a dual character**
  - A domain in and of itself
  - Servant of other societal domains
    - Multitude of practices, regimes involved
    - Interaction between lifeworld and systems of provision quintessential
- **Sociotechnical and complexity approaches:**
  - Typology of transition pathways
    - i.e. different routes along which changes at the three levels may reinforce each other
    - May start with niche, or regime changes
  - Causal mechanisms of transition dyn., flows & cycles (complexity)
  - Phenomenology transition dyn. middle-range theories (sociotech.)
- **On the above typology:**
  - Pathways derived from historical studies: what have globalization and emancipation of civil society meant for the mechanisms?
  - Relating complex dynamics more clearly to everyday experience
  - Further integrate both perspectives
- **More insight in multi-domain transition dynamics**

2.13. Strategic niche management (SNM)
[sociotechnical approach & transition management]

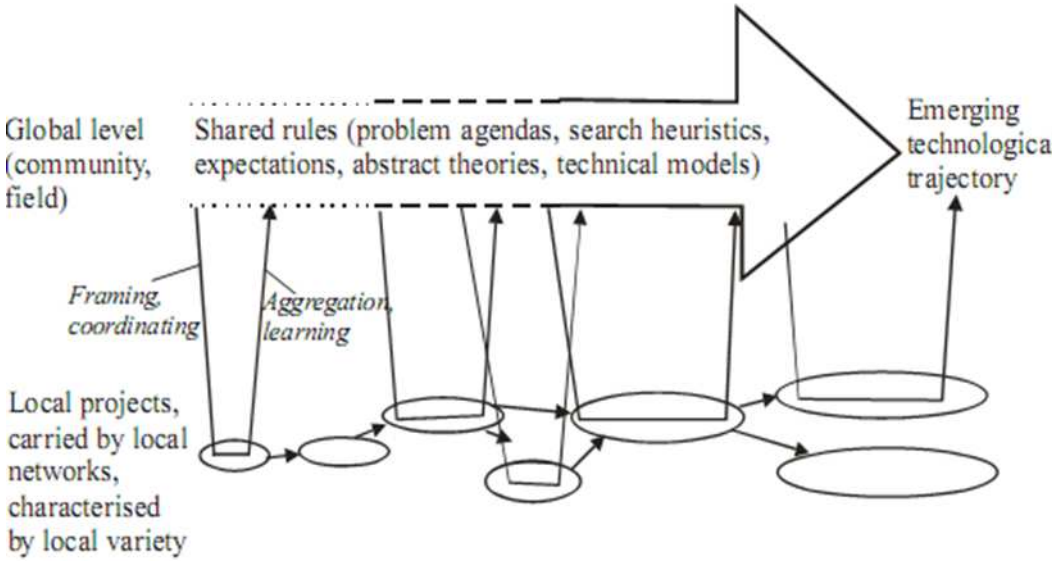
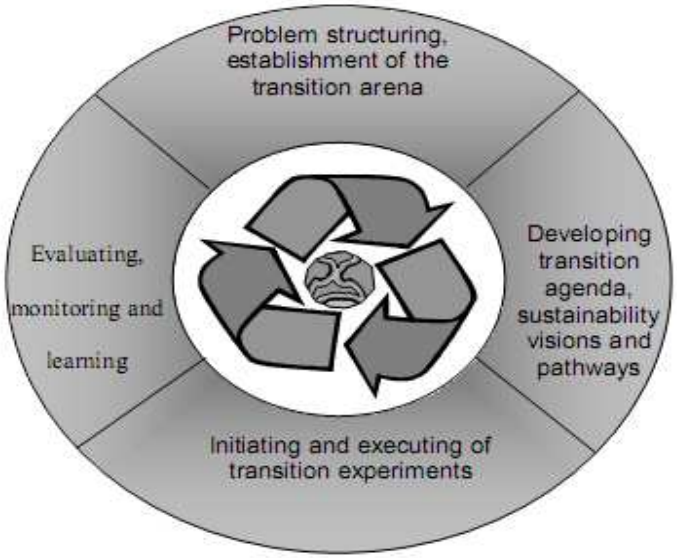


Figure 5.3. Emerging technical trajectory carried by local projects (Geels and Raven, op cit. Ref.33, p. 379)

- Interactions between local experiments and global niches: <u>not</u> self-evident, <u>not</u> linear



- Requires steering at different levels
- Politics needs be better accounted for

Three TM story lines (Smith/Kern, 2009):

- Steering society towards SD
- … through experimentation
- with main actors' co-operation

•discursively presented as in line with liberalisation

•… and institutionally organized with many incumbent actors in key roles

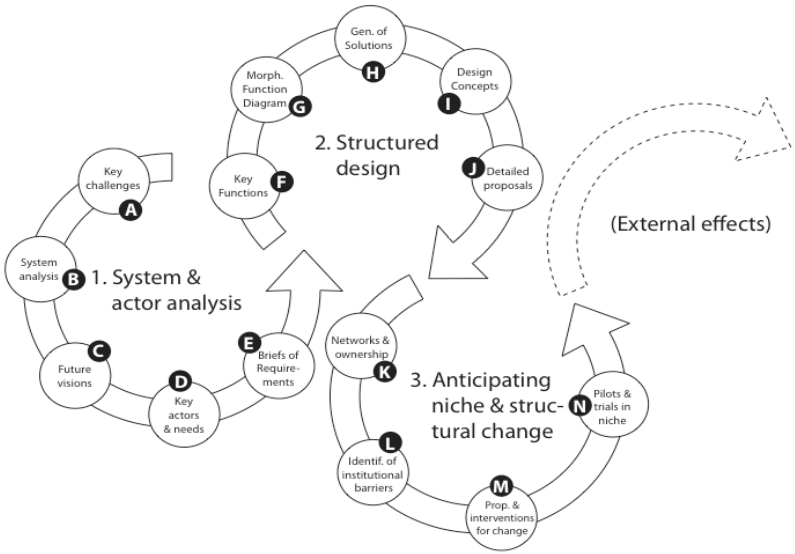
2.14 Transition Management in Energy Sector

- **Transition Management:** issues for further research
- Issues:
  - Further understanding of powering and legitimization in TM networks
  - TM and social movements
  - Comparative studies > role of political structure and culture
  - TM and transnationalization
  - How to do visioning
  - Defining unit of analysis
    - Cf. Grin et al (2010) Concluding chapter
    - Spaeth & Rohracher, Research Policy, vol. 39(4), 2010

- **Reflexive governance (1): Grin: rationale, power, institutional loci, role of objects in reflexive design of niches**
- **Rationale:**
  - Deal with resistance & inertia in niche projects, rooted in incumbent regime…
  - … by identifying 'guilty' regime factors…
  - … and designing strategies for regime change
    - Grin, *Poiesis & Praxis*, 2004
    - Grin et al, *Int J. Foresight Innov Pol.*, 2004
- **Power:**
  - Rooted in incumbent regime
  - Enscribe novel regime elements in objects
    - Grin, paper 4S Annual Conference - 2009
- **Institutional loci**
  - Legitimization at interfaces with established practices
  - Nurture diversity; promote connections
    - Hendriks&Grin, *J. Env Pol. Planning*, 2007
    - Grin, paper 4S Annual Conference - 2010

2.15. Reflexive designs: (2):

⬇ Bram Bos – documented experiences, towards a systematic method



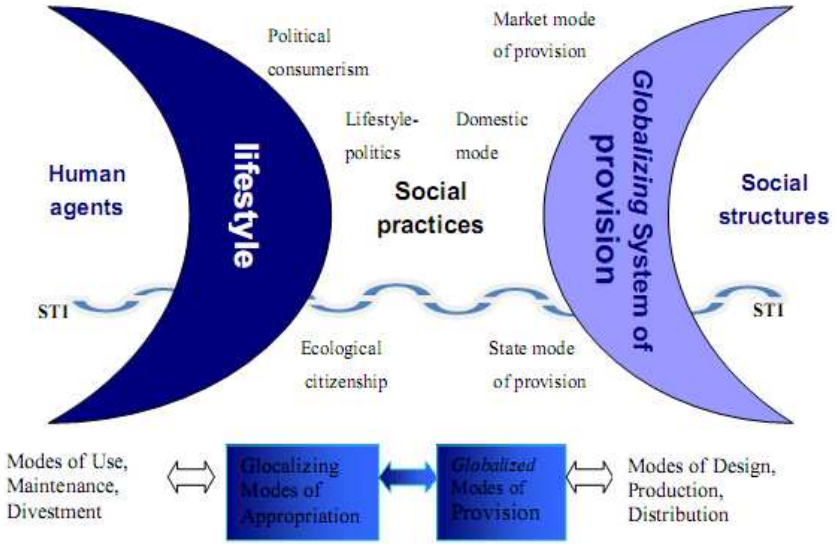
- Bos & Grin, *Science, Technology and Human Values, 33 (4): 480–507.*
- Bos (2009), *Social Epistemology*, 22 (1): 29–50.
- Bos et al. (2009), *Outlook on Agriculture,* Vol 38**,** No 2, pp 137-145

Reflexive governance reflexive planning – lessons from Amsterdam Port

- Enza Lissandrello:
  - Emirbayer & Miche (< Bourdieu): reflexivity = re-ordering temporal dimensions of agency in practices
    - from: past experience > expectations > current action > future
    - To: future vision > re-evaluate past experience, re-define expectations > current action > different future
  - Then planning become a matter of proper designing institutional setting and method.
    - Lissandrello & Grin (2011). *Planning Theory and Practice*, vol. 12 (no. 2)

2.16. Social Practice Approach (Grin)

Figure 4. Globalizing modes of provision and the appropriation of socio-technical innovations (STI) within social practices.



Objectives

Add to structuration theory the role of objects and infra
Synthesize with MLP

Relies on

Structuration theory, especially Giddens + Warde, Reckwitz, Schatzki)
Reflexive modernization, globalization theory (MLP)

Outcomes

- **Conceptual scheme on**
  - practices between lifestyle and SoP
  - Idealtypes of citizen-consumers
- **Empirical studies food, home maintenance, tourism**
  - Differences between housing (supply-led) and food (more understanding of meaning of food consumers) markets
  - Idealtypes differ in appropriation
  - Role of transnationalization
- **'Holistic' study of agrofood system**
  - (discursive) power of consumers; dynamic and ambiguous roles retail; role physical infrastructure; transnationalization

Issues for further study

- Further development of connection to MLP
- Studies with > 1 SoP (e.g. housing + energy)
- More (comparative: < transnationalization!) empirical studies

2.17. Innovation System Approach (Grin)

Marko Hekkert, Simona Negro, Ruud Smits,Stefan Kuhlman

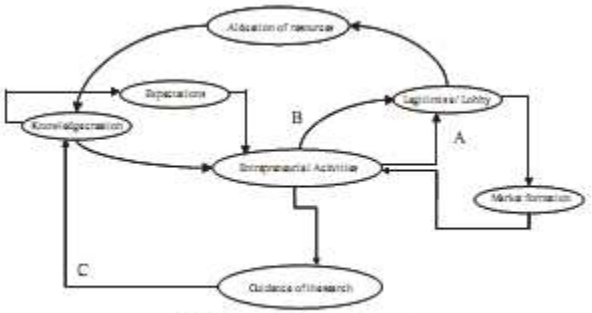


Fig. 2. Three typical motors of change

IS literature: IS fulfill 7 functions

- Stimulate learning,
- Manage interfaces in networks,
- Provide resources,
- Develop knowledge…
- Systemic instruments
- (intermediary organizations)
- may fill gaps

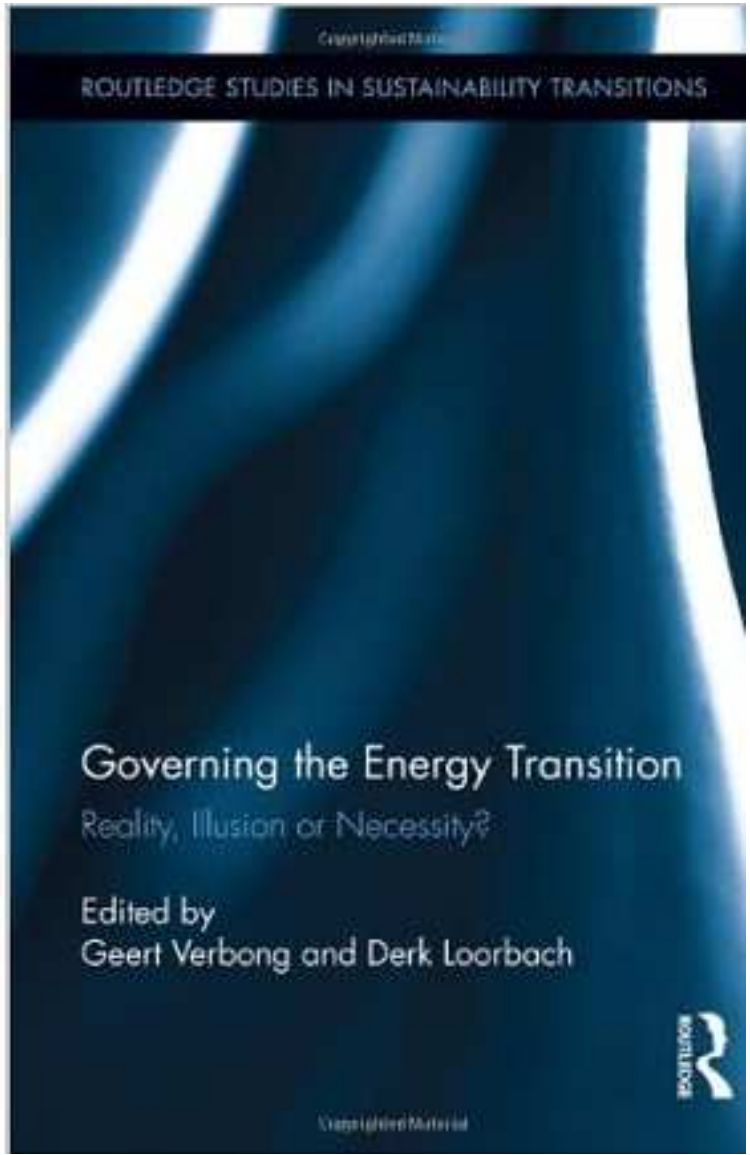
Outcomes

- Application to a wide range of energy cases
- Functions matter
- Functions interact
- There are patterns around ‘motors’ for transition: knowledge-legitimacy; resources-rule creation

Issues for further study

- role of power in systemic instruments
- Power strategies of incumbents and niche players
- Relations between changes in IS and pressure towards sustainable development

2.18. Governing Energy Transitions



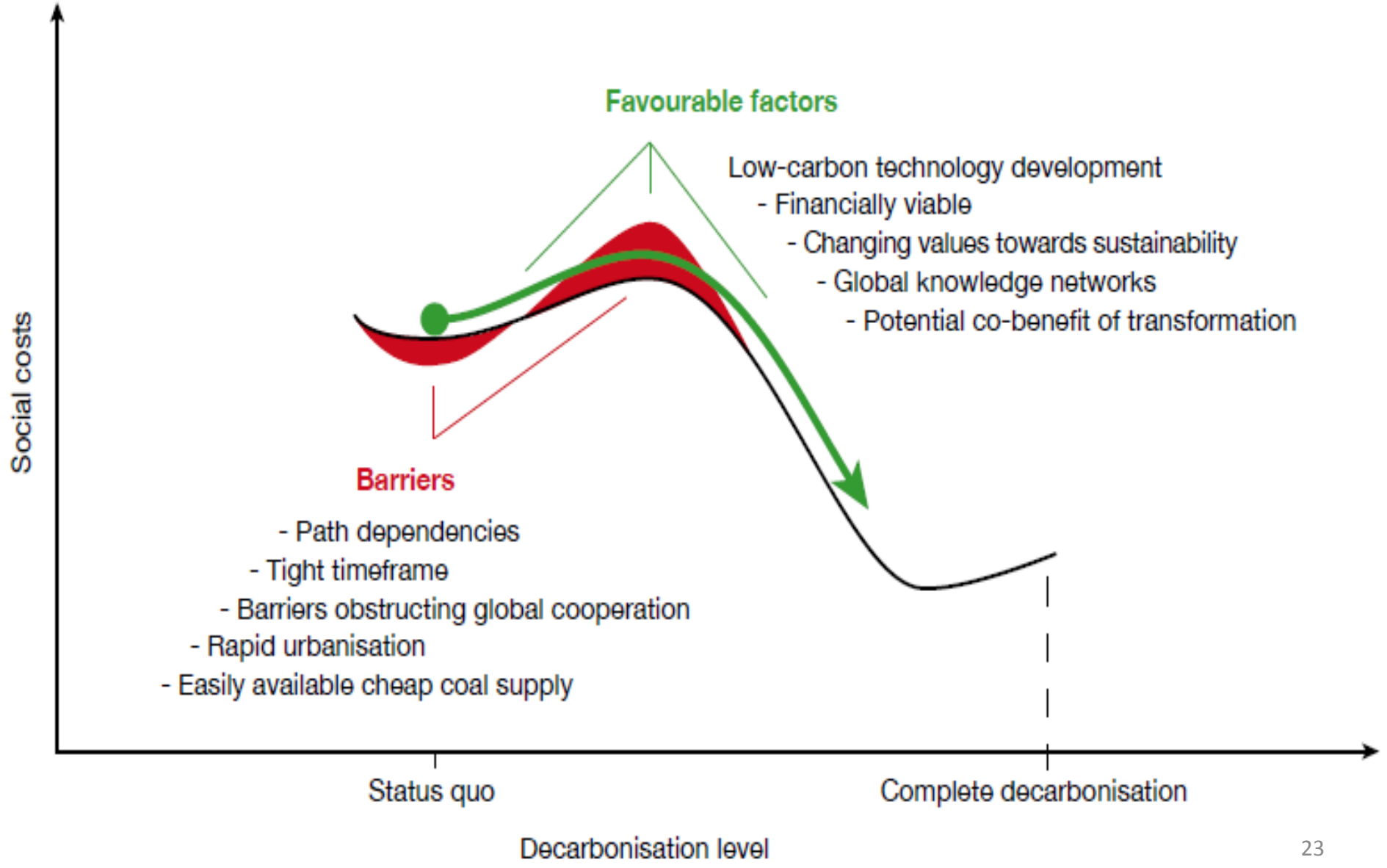
John Grin's Assessment:

- **EU's energy policies** are varied & diverse, but overall tend to stabilize current regimes in e.g. electricity production and distribution.
- **Supply security, climate change and internal market policies are major drivers** that in general reinforce current strategies, patterns of investment and power relationships within the regime.
- Policies in fields such as **innovation and renewable energy** have gained increasing clout & contribute (often at member state level rather than the EU level) to challen-ging, if not destabilizing, the regime
- **Still an open question whether a low carbon energy transition is really contingent on a regime destabilization.**

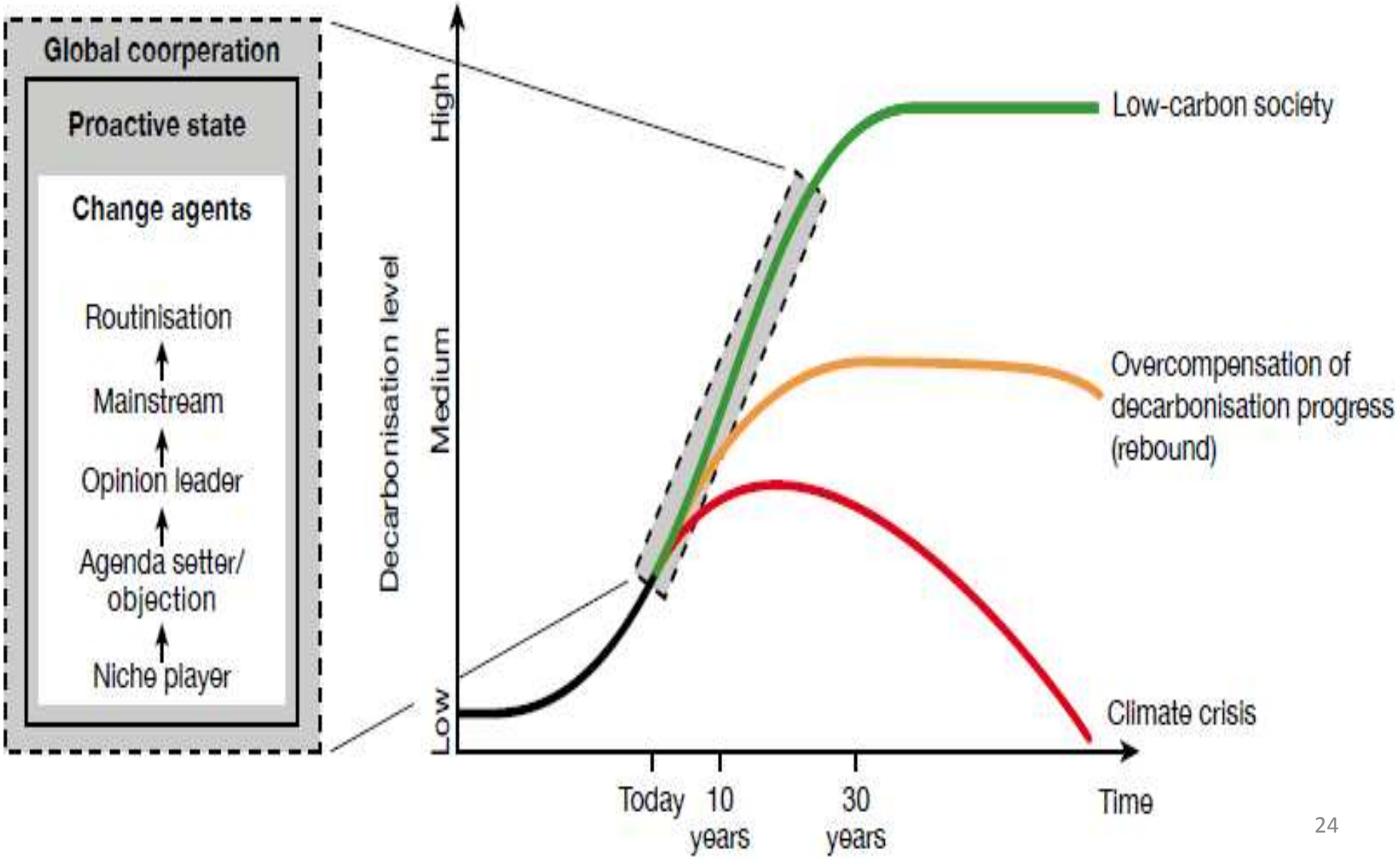
Issues for further research:

- **How may innovations within and outside the regime start to reinforce each other**
- **How could a diverse, secure future energy system combine different options?**
- **How to better align user practices and supply system?**

2.19. WBGU Focus is Wider



2.20. WBGU: Transformation to a Low-carbon Society: Temporal Dynamics & Action Levels

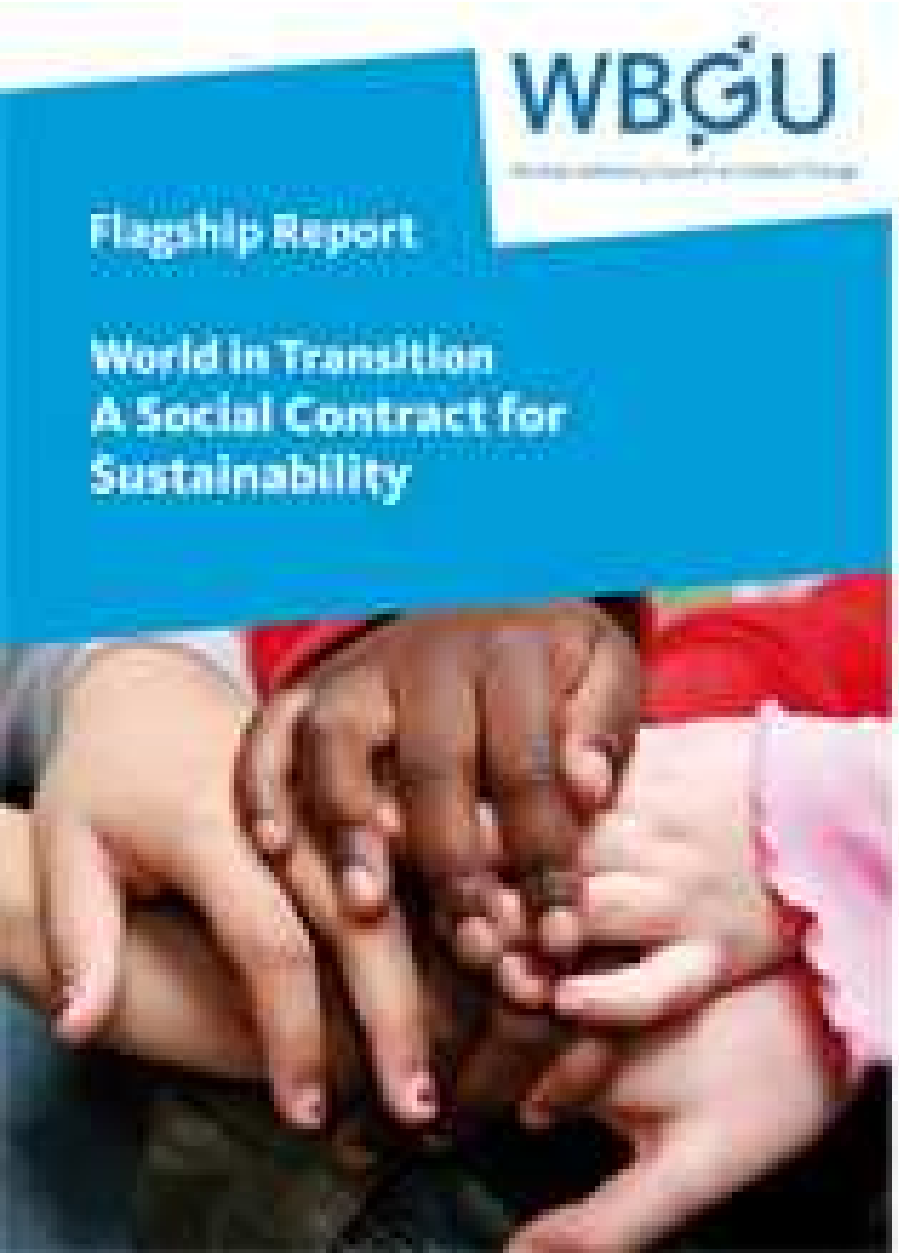


3. Theoretical Approaches to Demand Side: Anthropology, Social Psychology, Sociology, Religion

We are the threat, the victims and may be the solution!

- **We as consumers have a different carbon footprint (2011):**
  - **American (16.9),** S.Korean (11.8), **Japanese (9.3), German (9.1) Chinese (5.9), Thai (2005: 5.6),** Brazilian (2.1), Indian (1.4) tons
- **Are the people aware of the linkage: beteween energy consumption and greenhouse gas effects -> disasters?**
- **Focus: human values, attitudes, preferences, behvaviour as consumers & voters**
- **The analysis of the demand side of sustainabiltiy tran-sition requires the insights of scholars from many disci-plines: anthropology, social psychology, sociology, religion**

3.1. WBGU: Global Transformation of Values



Ch. 2: Global Transformation of Values has already begun

2.1 Values & Value Change

2.2 Changing Values & Environmental Consciousness

- Postmaterialist values?
- Attitude to Environment & sustainability in countries & world religions
- Openness to innovation

2.3 GDP: Changing Values

2.4 Gap between Attitutes and Values

- No Longterm orientation
- Path Dependency

2.5 Share Global Transformation vision

3.3 Societal Dimension of ST

- **WBGU (2011: 67)** argued "the necessary transformation into a low-carbon society already corresponds to some of the prevalent attitudes and value systems in many of the world's countries ... Secondly, the transformation can be viewed as a **positive factor in the sense of increasing subjective life satisfaction for large parts of the population**". WBGU noted
  - terms **'values', 'attitudes' and 'opinions**' have different meanings in psychology, sociology and political sciences (see Häcker/Stapf 1994). For the most part, it is assumed that attitudes are based on values, and that these attitudes influence people's behavior, even if research (Eckes/Six 1994) assumes that there is no particularly close connection between attitudes and behavior. In this report, the WBGU uses these terms as follows:
  - **1. Personal and cultural values:** Cultural values refer to something that has evolved socio-culturally, something that exists independent of individuals. Personal values, refer to the subjective concepts of desire and specific value orientation. Personal values describe the individuals' relatively stable preferences with regard to different values.
  - **2. Attitudes:** Contrary to the rather abstract 'values' and 'value systems', attitudes relate to certain objects, people (groups), ideas and ideologies, or specific situations (Häcker/Stapf 1994). Attitudes represent evaluation and action tendencies with regard to attitude objects, and are usually stable in the medium-term. They are therefore neither long-term value systems, nor short-term intentions.
  - **3. Opinions:** Are generally considered as verbalization of attitudes and values.

3.4. Ingelhart‘s post materialist values

- **Ingelhart’s (1977, 1998) on value change addressed post-materialist values since the end of World War II** that have found an expression in the “emergence & increasing power **of new social movements—like the conservation, peace or homosexual movements** - as the expression of a wider cultural value change (Inglehart 2008)” (WBGU 2011: 69).
- However, this observed **value change and the global contextual change since 1989 has not affected the prevailing world view in US society and in the mindset of many of its policymakers**.
- During the fifth wave of the **World Value Survey (WVS 2010),** close to **eighty per cent of the US population saw global warming or the green-house effect as serious or very serious;**
- Nevertheless, between 2009 and 2011 President Obama has failed under both Democratic and Republican majorities in both houses of the US Congress to get any climate change legislation adopted (Klein 2011).
- This is a clear indication of the high volatility of these WVS as well as an indication that the values did not result in any major behavioural change & made no difference politically, given the powerful economic & ideological interests of the climate change opponents and sceptics.

3.5. From Value to Behavioural Change

- For a **behavioural change towards a sustainability transition**, a temporal change in **public preferences and attitudes is insufficient**. A fundamental change in **human behaviour** is needed that will lead to major changes in **lifestyles and in preferences and patterns of consumption that will result in a lower ecological footprint** & in a reduction of individual carbon emissions.
- However, this **cannot be achieved by changes only on the demand side**; it also requires a **major change on the supply side** with regard to **green and renewable energy systems, public and low carbon transport systems, and products with a much lower carbon footprint.**
- **New social movements and political parties** may contribute to creating both awareness of and positive political frameworks for a change in the lifestyles and preferred way of life for a majority of the people.
- **Changing the 'soft' human & societal side of 'sustainability transition' may be as difficult if not more difficult than changing socio-technolo-gical framework on which most of the research has so far focused.**
- While new **scientific results & new publicly shared knowledge does not change values, attitudes, preferences, and behaviour**,
- changes of soft factors require **simultaneous changes in hard factors of economic system, in processes of production. consumption, & policy process.**

3.6. Cultural Dimension of ST

- While many studies on ST have focused on issues of technological innovation in relevant industrial sectors, especially on energy, and on governance aspects, the societal and cultural dimension has been less prominent.
- In the social and political sciences there has been an intensive debate on postmodern values and value changes and on the changers of attitudes and preferences towards sustainability .
- The WBGU used values as “a shared perception of something worth striving for”, where cultural values refer “to something that has evolved socio-culturally, something that exists independent of individuals”. It stated that “attitudes relate to certain objects, people (groups), ideas, and ideologies, or specific situations”.
- In contrast to short-term intentions and long-term value systems, attitudes “represent evaluations and action tendencies with regard to attitude objects, and are usually stable over the medium-term”, while opinions are understood as “verbalizations of attitudes and values”.

3.7. Studies on Cultural Dimension of ST

- The **WBGU** (2011: 77) argued, based on Leiserowitz et al. (2006), that there are **various barriers that prevent "value systems from impacting on behavior**, at both individual and social or structural level" and that a change in behaviour requires "a material and cognitive basis".
- A transition towards sustainability is structurally constrained by the **prevailing path dependence** and the extensive high-carbon infrastructure and its political and electoral influence on decision-makers in parliaments and in the executive sector.
- **Analysis of the so-called soft aspects of sustainability transition, e.g. of the constraints, obstacles, and barriers to changes in opinion, attitudes, value systems and behavior, requires the expertise of sociologists, social psycholo-gists, and anthropologists, but it also needs political scientists who can analyse cognitive perceptual and evaluative barriers created by the established traditional world views of scientists and the mindsets of policymakers**

4. The Societal Level: Overcome Consumerism, From Waste Economy to Sustain-able Consumption

- **The King's Concept of Sufficiency Economy**
  - **Broad guidlines of a development vision, theory, model?**
  - **Anchor sustainability transition debate within this theory?**
  - **Education for sustainability & sustainability transition**
- **Implementation of this Vision into Policies?**
  - **Reconsider the Western Way of Life**
  - **From Waste Economy to Sustainable Consumption: Incentives**
  - **Energy from Urban and Rural Waste**
- **Values: Role of Schools & Monasteries: Teachers & Monks**
- **Knowledge: Traditional Knowledge & Universities**
- **Policies: Translation of Vision into Operational Goals**

4.1. Goal of a Sufficiency Economy (UNEP)

- **His Majesty King Bhumibol Adulyadej** developed the philosophy of the **Sufficiency Economy to** lead his people to a **balanced way of life as the main sustainable development theory for Thailand.** The theory is based upon a Middle Path between society at the local level and the market in the global context.
- By highlighting a **balanced approach**, the philosophy allows the nation to modernize without resisting globalization, but provides a means to counteract negative outcomes from rapid economic and cultural transitions.
- The **Sufficiency Economy became critical during the economic crisis in 1997**, in which Thailand needed to maintain stability to persist on self-reliance and develop important policies to recover. **By creating a self-supporting economy, Thai citizens will have what they need to survive but not excess, which would turn into waste.**
- **His Majesty proposed** that it **was not important** for Thailand to remain an "economic tiger," or become characterized as a **newly industrialized country**.
- **His Majesty explained that sufficiency is living in moderation and being self-reliant in order to protect against changes that could destabilize the country. The Sufficiency Economy is believed to adapt well within existing social and cultural structures in a given community, if the following two factors are met:**
  - subsistence production with equitable linkage between production/consumption
  - the community has the potential to manage its own resources
- **Sufficiency Economy should enable the community to maintain adequate population size, enable proper technology usage, preserve the richness of ecosystems and survive without the necessity of intervention from external factors.** The

4.2. The Principle of Self-Reliance (UNEP)

His Majesty has recommended a secure balance in the five following aspects to achieve the principle of self-reliance:

- **State of Mind:** One should be strong, self-reliant, compassionate and flexible. Besides, one should possess a good conscience and place public interests as a higher priority than one's own.
- **Social Affairs:** People should help one another, strengthen the community, maintain unity and develop a learning process that stems from a stable foundation.
- **Natural Resource & Environmental Management:** Thailand's resources must be used efficiently and carefully to create sustainable benefits and to develop the nation's stability progressively.
- **Technology: Technological development** should be used appropriately while encouraging new developments to come from the villagers' local wisdom.
- **Economic Affairs:** One needs to increase earnings, reduce expenses, and pursue a decent life.

His Majesty has stated, "If we contain our wants, with less greed, we would be less belligerent towards others. If all countries entertain this - this is not an economic system - the idea that we all should be self-sufficient, which implies moderation, not to the extreme, not blinded with greed, we can all live happily."

The **Self Sufficiency Economy theory** has led to diverse interpretations by many different groups. His Majesty has rejected extreme perspectives on his ideology, stating that self-sufficiency does not require families to grow food and make clothes for themselves. **But, each village should have some quantity of sufficiency**. For instance, if agricultural production exceeds the amount needed for the village they should sell the remaining amount to a nearby village, close in distance, to avoid unnecessary transportation costs.

4.3. Theory: New Sufficiency Economy (UNEP)

His Majesty's self-sufficient ideology has a strong linkage to his New Theory, initiated in 1992. Seeking ways to help the people engaging in agriculture, His Majesty introduced the **New Theory, to be implemented at the Royally-initiated Wat Mongkol Chaipattana Area Develop-ment Project**, to serve as a model of land and water management for farmers. Accordingly the land is divided into four parts with a ratio of 30:30:30:10. Based on this ratio, 30% is set aside for pond and fish culture, 30% for rice cultivation, 30% for growing fruit and perennial trees, and the remaining 10% for housing, raising animals &other activities. New Theory consists of following 3 phases:

1.To live at a self-sufficient level which allows farmers to become self-reliant and maintain their living on a frugal basis.

2.To cooperate as a group in order to handle the production, marketing, management, and educational welfare, as well as social development.

3.To build up connections within various occupation groups and to expand businesses through cooperation with the private sector, NGOs and the government, in order to assist the farmers in the areas of investment, marketing, production, management and information management.

Self Sufficiency Economy and its outcomes are summarized, by His Majesty himself; "Sufficiency Economy is a philosophy that guides the livelihood and behavior of people at all levels, from the family to the community to the country, on matters concerning national development and administration. It calls for a 'middle way' to be observed, especially in pursuing economic development in keeping with the world of globalization…At the same time we must build up the spiritual foundation of all people in the nation, especially state officials, scholars, and business people at all levels, so they are conscious of moral integrity and honesty and they strive for the appropriate wisdom to live life with forbearance, diligence, self-awareness, intelligence, and attentiveness. In this way we can hope to maintain balance and be ready to cope with

4.4. The Family Level: Way of Life, Life Style & Food Diet

- **Sufficiency Economy: as a National Vision & Guideline?**
- **Education of Values & Belief System**
  - **Influence of parents**
  - **Influence of school education**
  - **Influence of religious beliefs & religious education (monks)**
- **Determinants of Lifestyle and Food Diet**
  - Role **of modern media**, especially advertisement on TV (generation of demand): promotion of consumerism of the market economy (in a (state) capitalist system)
  - **Societal conditions** (status symbols, new big car)
  - **Societal debates in Thailand: on (lack of) implementation of the King‘s Sufficiency Economy Concept and Theory**

4.5. Social Science Research in ASEAN Countries and in Thailand on Demand Side of ST

- **ASEAN Summit Documents have addressed:**
  - Climate Change
  - Disasters
  - Energy Policy (primarily of eneergy security, supply security)
  - Sustainability goals
  - Need for research & research cooperation
- **Is there social science research cooperation in ASEAN on:**
  - Climate Change Research in ASEAN countries?
  - Societal effects of climate change for ASEAN countries?
  - Multidisciplianry approaches of natural & social scientists?
  - Sustainable energy policies and strategies for a sustainable energy transtion?

5. Two Opposite Visions

Anthropocene Two Ideal Type Future Visions:

- ***Business-as-usual*** where economic and strategic interests and behaviour prevail leading to a major crisis of humankind, in inter-state relations and destroying the Earth ('security' and 'market first' scenarios, UNEP 2007)
- The need for a ***transformation*** of global cultural, environmental, economic (productive and consumptive patterns) and political (with regard to human and interstate) relations ('sustainability first' scenario, UNEP 2007).

5.1. Two Alternative Strategies

Both visions refer to different coping strategies :

- Vision of ***business-as-usual*** suggests primarily technical fixes (such as geo-engineering, increase in energy efficiency or renewables), defence of economic, strategic and national interests with adaptation strategies that are in the interest of and affordable for the ‘top billion’ of OECD countries.
- Alternative vision of **comprehensive transformation** a ***sustainable perspective*** has to be developed and implemented into effective new strategies and policies with different goals and means based on global equity and social justice.

5.2. Coping Strategies: Business-as-Usual

- **Instant Response: Discredit the message & attack the messenger: 2009: Attack on IPCC**
- **Coping with Climate Change Impacts:**
  - **Market will provide means** for coping with physical climate change effects: **Washington neoliberal consens.**
  - **Military Protection:** Adjust military strategies, missions and tools to be able to operate under conditions of dangerous climate change („militarization“): **Hobbesian**
  - **Develop the technologies:** Geo-engineering schemes, strategy of energy independence: **Cornucopian**
- **No Need for a Sustainability Transition**

5.3. Business-as-Usual: Hobbesian World

- *Business-as-usual* in a **Hobbesian world** where economic and strategic interests and behaviour prevail leading to a major crisis of humankind, in inter-state relations and destroying the Earth as the habitat for humans and ecosystems putting the survival of the vulnerable at risk.
- In this vision of ***cornucopian perspectives*** prevail that suggest primarily technical fixes (geo-engineering, increase in energy efficiency or renewables), defence of economic, strategic and national interests with adaptation strategies that are in the interest of and affordable for the 'top billion' of OECD countries in a new geopolitical framework, possibly based on a condominium of a few major countries.
- This vision with minimal reactive adaptation and mitigation strategies will increase the probability of a '**dangerous climate change' or catastrophic GEC** with both linear and chaotic changes in the climate system and their socio-political consequences that represent a high-risk approach.

5.4. Fourth Sustainability Revolution or Sustainability Transition

- 2nd vision for a *transformation* of global cultural, environmental, economic (productive and consumptive patterns) and political (with regard to human & interstate) relations
- In the alternative vision of a comprehensive transformation a *sustainable perspective* has to be developed and implemented into effective new strategies and policies with different goals and means based on global equity and social justice.

5.4. Alternative Vision

- The alternative sustainability perspective requires a change in *culture* (thinking on the human-nature interface), ***worldviews*** (thinking on the systems of rule, e.g. democracy vs. autocracy and on domestic priorities and policies, interstate relations), ***mindsets*** (strategic perspectives of policy-makers) and new forms of national and global *governance*.
- This alternative vision refers to the need for a "**new paradigm for global sustainability**" (Clark/Crutzen/Schellnhuber 2004), for a "transition to [a] much more sustainable global society", aimed at peace, freedom, material well-being and environmental health. Changes in technology and management systems alone will not be sufficient, but "significant changes in governance, institutions and value systems" are needed, resulting in a fourth major transformation after "the stone age, early civilization and the modern era". These alternative strategies should be "more integrated, more long-term in outlook, more attuned to the natural dynamics of the Earth System and more visionary"

5.5. WBG (2011): New Social Contract for a „Global Transformation“

- **WBGU explains reasons for a ‚post fossil-nuclear metabolism‘ concluding that the transition to sustainability is achievable.**

A New Social Contract

- **Transformation into a sustainable society requires a modern framework for nine billion people for living with each other, and with nature: a new Contrat Social.**
- **This virtual social contract relies on each individual’s self-concept as a responsible global citizen. This contract is also a contract between generations.**
- **Science plays an essential role here, as for the first time in history, a profound transition is not caused by imminent necessity, but by precaution and well-founded insight. In this respect, the social contract also represents a special agreement between science and society.**
- **A new culture of democratic participation through the appointment of ombudsmen … to ensure the protection of future-oriented interests. Sustainability-oriented approach can be given a secure, firm footing through the inclusion of ‘climate protection’ in the constitution as a national objective, and through establishing a climate protection law.**
- **A low-carbon transformation can only be successful if it is a common goal, pursued simultaneously in many of the world’s regions.**
- **Therefore, the social contract also encompasses new ways of shaping global political decision-making and cooperation beyond the nation state.**

5.6. Ten Packages of Measures

GHG emissions are caused by energy industry & land-use, rapid global urbanisation: 3 key areas for transition.

Ten measures for a transition to sustainability.

- **The state should show an enabling and proactive role to advance global decarbonisation. Citizens with extensive opportunities for participation.**
- **GHG CO2 should globally be given an 'commensurate' global price .**
- **European energy policy aiming for decarbonized energy system by 2050**
- **Feed-in tariffs for renewable energies should be introduced worldwide.**
- **Access to sustainable energy to 2.5 to 3 billion people in devel. countries.**
- **Steer the world's accelerating urbanisation towards sustainability.**
- **Land-use should become climate-friendly, forestry & agriculture.**
- **Financing transformation & investments should use new business models.**
- **States should work towards an ambitious global climate treaty. Multilateral energy policy promote global transfer of low-carbon techn.**
- **UN should make effective contributions to the transformation.**

6. Four Actors for Sustainability Transition: State, Society, Economic Sector, Knowledge

Key actors for policy development and implementation:

Role of the State as Norm Setter, Regulator & Financer:

–**Task:** initiate, develop, fund and implement strategies, policies & measures for Sustainable Transition Policies

Role of Society: Parties, interest groups, NGOs, lobbyists:

–**Public awareness**, discourse, social movements for sustainability transformation

–**Citizen's and Social Movements** for Sustainability

Role of the Economy (Ed´conomic Sector): as an Innovator: Need Customers

–**Economic sector :** develops and offers technical and economic solutions

–**Opposition**: powerful economic interest groups (lobbies)

–**Support:** emerging innovative sectors of the economy (NGOs)

Role of Universities & Research Institutes

–**Knowledge** (generation & education): source for innovation

–**Initiate researsch and a national debate on goals & strategies**

–Role: **Transformative Social Science:** analysing multiple deadlocks

7. Role of Knowledge

- Sustainability transition must be knowledge-based!
- The great transformation of the industrial revolution relied on new innovative scientific and technological knowledge that is either the result of inventions or resulted in new innovations.
- Despite its already widely accepted objectives and the many viable low-carbon technologies already available to us, the transformation is a joint quest.
- Research and education are tasked with developing sustainable visions, in co-operation with policy-makers and citizens; identifying suitable development pathways, and realising low-carbon and sustainable innovations.
- The WBGU recommends intensified refocusing of national and international research towards the Great Transformation, and the provision of the requisite funds. The relevant scientific findings must also be made accessible and understandable to allow people to accept the change and to participate democratically in the transformation.

7.1. Four Knowledge-based Concepts of for Alternative Vision

- Key concepts of the alternative vision of a new fourth 'sustainable revolution' are a radical change in *culture, worldview, mindset* and *participative governance* in the thinking and action on sustainability laying out an alternative development path with a total transformation of productive and consumptive processes aiming at equity, social justice, and solidarity with the most vulnerable and marginal people and the poorest countries.
- This lays out an alternative development path with a **total transformation of productive and consumptive processes** aiming at equity, social justice, and solidarity with the most vulnerable and marginal people and the poorest countries.

7.2. Worldview of Scientists

- *Worldview* concept evolved from ‘Weltanschauung’ that refers to a wide world perception and to a **framework of ideas and beliefs through which individuals interpret the world &** interact with it.
- A comprehensive worldview includes the **fundamental cognitive orientation of a society, its values, emotions, and ethics** through which a society or a group interprets the world in which it interacts.
- Worldview is the **fundamental cognitive, affective, & evaluative presupposition a group of people makes about the nature of things**, & which they use to order their lives.
- The **‘construction of integrating worldviews’** begins from fragments of worldviews offered to us by different scientific disciplines and various systems of knowledge to which different perspectives contribute in the world’s cultures.
- **Gert Krell** used this concept for distinguishing among several macro-theoretical approaches in international relations.

7.3. Mindset of Policymakers

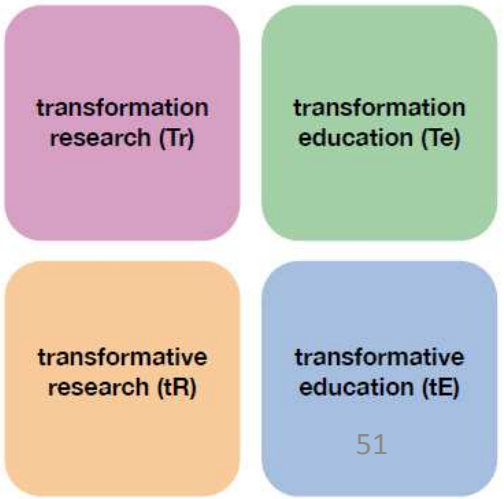
- The concept of *mindset* includes a fixed mental attitude or disposition that predetermines a person's responses to and interpretations of situations by referring to different patterns of perceiving and reasoning.
- Fisher used it as 'cultural lenses' that filter our view of and reaction to the world. With regard to the 'Fourth Sustainable Revolution' this concept refers to a discussion of a post-carbon society, where solidarity, equity, and social justice are the key drivers instead of the maximization of profits and the destruction of the Earth without thinking of the next generations or of the collapse of ecosystems.
- **Ken Booth** mindsets "freeze international relations into crude images, portray its processes as mechanistic responses of power and characterize other nations as stereotypes". Many mindsets have survived the fundamental global contextual change of 1989/1990, as the Cold War "exists as our living past, and it exerts a powerful presence by being both remembered and forgotten in complex ways".

7.4. Knowledge Society in Transformation Process: Recommendations for Research and Education

- **Transformation is a societal search process supported by experts**. With politics, economy, society, research & education are tasked with developing **visions for a low-carbon society**, different **development paths, developing sustainable technological & social innovations**.
- **Social framework for participation to be strengthened**.
- **Education should enable people** to develop an awareness, to learn systemic thinking, & act responsibly. Promoting research & education is a key task for the modern, proactive state, to support integration of the scientific expert community into the social c

Transform. Pillars of Knowledge Society

- **Transformation Research**
- **Transformative Research**
- **Transformation Education**
- **Transformative Education**



7.5 Transformation Research (WBGU)

Establishment of a new scientific discipline, 'transformation research' (Tr),

- **address future challenge** of transformation realisation.
- **explore transitory processes** to come to conclusions on factors and causal relations of transformation processes.
- **analyse observed past transformative moments**.,
  - e.g integration of the steam engine into the mechanisation of cotton processing around 1785. This led to a rapid rise in textile production efficiency, which in turn led to a rise in demand for raw materials, thus (co-)triggering the Industrial Revolution.
  - It was embedded in a complex causal network of further factors and historically evolved framework conditions. This equally applies to transformations at another level, for example the normatively motivated abolition of slavery.
- **Transformation research** should draw conclusions for **transformation to sustainability** based on understanding of **decisive dynamics of such processes**, their **conditions and interdependencies**.
- **learn how to anticipate acceleration moments** to create relevant favourable framework conditions.
- **A challenge for transformation research is creation of a network of social, natural & engineering sciences to understand the interaction between society, the Earth system, and technological development.**

7.6. Transformative Research (WBGU)

Transformative research: research that advances transformation.

•Transformative research supports transformation processes with innovations in key sectors, e.g. consumer research, needed for new business models, e.g. shared use of resource-intensive infrastructure, & research for technological innovations like efficiency technologies.

•Transformative research can have a wider transformative impact if, as of a certain development stage, **development activities for low-carbon innovations are embedded in a systemic context,** impact on climate and sustainability, reflect conditions for transformative impact.

• **This applies to development of new investment models for energy efficient technologies**.

•Their intercultural transferability should be considered at an early stage, attention should be paid to measures against rebound effects and potential path dependencies.

•Transformative research encompasses a spectrum that reaches from discipline-based to system-based research. application-oriented exploration of highly-efficient storage technologies can have a transformative impact as an interdisciplinary project for development and implementation of **SuperSmart Grids.**

•Exchange of information between both types of research leads to 'cross-fertilisation', with society, the economy, & politics, offer **transformation** ring the best possible support to transformation. Absolutely crucial is a **higher level of science communication, including the targeted utilisation of the new media.**

•Wide range of opportunities for interactive, participative shaping of the social dialogue. In this context, the education sector must also take on more responsibility.

•For knowledge communication, education provides foundations for each individual's knowledge-based self-concept, creating the social preconditions needed for transformation. Transformation research should be linked closely to transformation education.

7.7. Transformation Education (WBGU)

- **Transformation education makes scientific findings of transformation research available to society.**
- **'Education for participation', it critically reflects on the requisite basic requirements – like a thorough understanding of pressure to act, & a global sense of responsibility – & generates a systemic awareness of the different action paths.**
- Communication of knowledge at interface of engineering, social & Earth system sciences. Suitable narratives of change should be fed into everyday discourse through creative forms of knowledge communication.
- Focus on change agents, awareness of preconditions for transformation can be firmly ensconced in education. Change can only be imagined through a dynamic view of the world.
- **Educational institutes should increasingly teach sustainability-oriented knowledge, and the skills necessary for lifelong learning and systemic thinking**. This also includes a better understanding of the **scientific research process**, its possibilities, and its limits.

7.8. **Transformative Education**

- **Transformative education generates an understanding of action paths & possible solutions. Educational content are innovations that already had or are likely to have transformative impact.**
- Current research should be made understandable, and actively shared with society. Education should attempt to establish a relation to key factors of transformation.
- E.g., **renewable energies could be a topic in physics lessons**, whilst concurrently, **international energy partnerships are discussed in social science** subjects.
- **Geography lessons** might be about **low carbon cities**. Transformative education should **create a basic general problem awareness**, which is reflected in theme-specific educational opportunities.
- Boundaries between the different disciplines should be less strict, and comprehension of broader, interdisciplinary & global contexts should be strived for.
- In economics global material flows, from resources to waste products such as CO2, could be analysed. Lesson would be about embedding economy into planetary boundaries. **Both types of education should regard society as stakeholder in trans-formation process, with the aim of allowing participation in education process**
- **People can only comprehend the transformative power of their actions if they see them-selves as an active factor. Educational structures are an essential precondition for this.**

8. Political Urgency and Research Agenda: Towards a Fourth Sustainability Revolution

Glooming Prospects for Post-Kyoto Regime: Paralysis

- Prospects for Post-Kyoto climate regime at COP 17 in Durban are low
- At present it becomes increasingly unlikely to realize the 2°C world
- Probability of 'dangerous climate change' increases dramatically
- This increases the probability that thresholds in the climate system may be crossed, that tipping points may be unleashed, triggering cascading processes as: 'Arabellion' and 'Fukushima nuclear disaster'

Business-as-usual paradigm prevails in politics & media

- In light of global financial crisis, the sense of urgency for proactive climate action has declined since 2009 prior to Copenhagen (COP 15)
- The US government is paralyzed due to ideological confrontation within the US Congress and between the Senate & the House
- Lack of urgency among BASIC countries to accept commitments.

8.1 Emerging Research Agendas

Strategy for Sustainable Transition Requires Changes in the Scientific System of Knowledge Production

- **Edward O. Wilson (1998)** noted a growing *consilience* (interlocking of causal explanations across disciplines) in which the "interfaces between disciplines become as important as the disciplines themselves" that would "touch the borders of the social sciences and humanities."
- **Clark, Crutzen and Schellnhuber (2004)** called for a 'second Copernican Revolution in earth systems science' & a 'new paradigm of sustainability' and new 'Contract for a Planetary Stewardship'
- **Grin, Rotmans and Schot (2010)** reviewed "Transitions to Sustainable Development: New Directions in the Study of Long Term Transformative Change"
- **Huff (2011)** discussed past "Intellectual Curiosity and the Scientific Revolution" in Western and Non-western Cultures (Confucianism, Hinduism and Islam)
- **Brauch, Dalby and Oswald Spring (2011)** suggested a new 'Political Geo-ecology for the Anthropocene" by bringing politics and security into Earth Systems Science and its key results into the social sciences
- **WBGU (2011)** proposed a new "Social Contract for a Global Transformation"

8.2. Universities Major Part of Solution:
Cooperation: Sharing of Knowledge & Technology

Knowledge is Free & Scientific Cooperation Matters

–The King's sufficiency economy theory offers framework.

–Codevelopment and Sharing of Knowledge

- **Exchanges are crucial for global learning and friendships**
- **Send your experts and students to best schools, research centres**

–Awareness Raising for Policymakers, Media and People

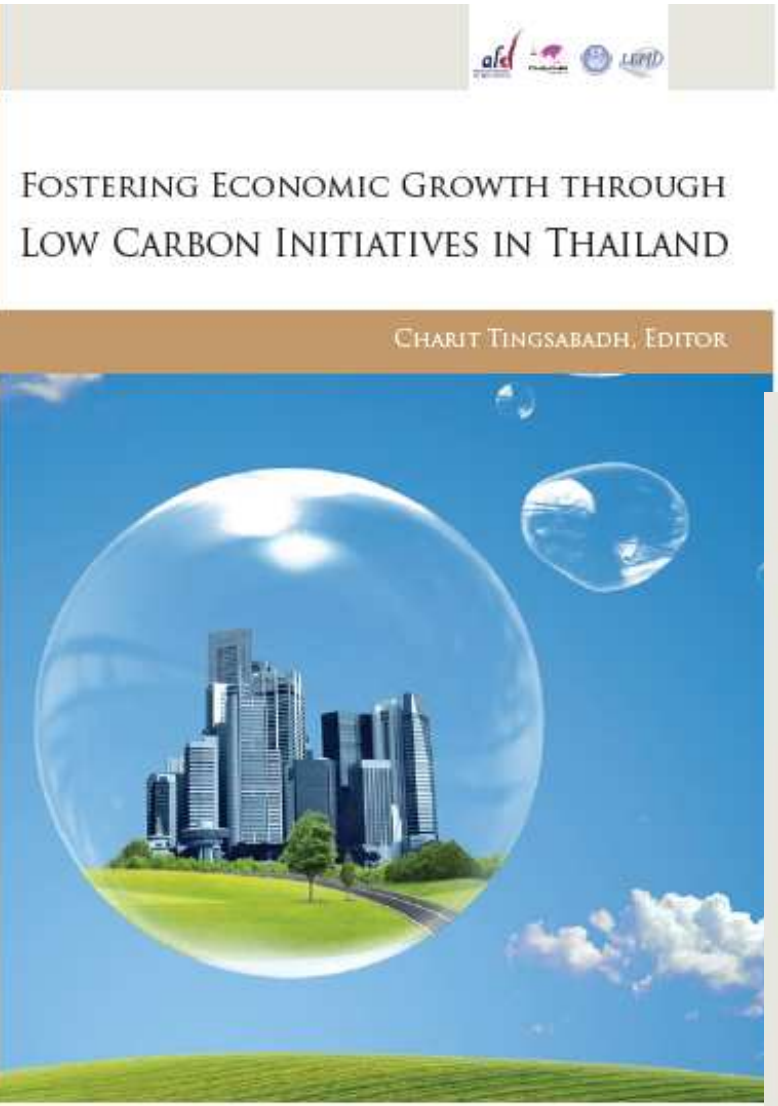
- **President of Chulalongkorn University has encouraged all of us**

–Multidisciplinary Research is needed:

- **Cluster Approach: for Natural, Engineerung &Social Sciences**
- **Sustainable Social Development for Social Justice**

–Task of Transformative Social Science and Education to Advance the goal of sustainable Development and to inspire strategies & policies of transition to that goal

8.3. A Chula Contribution on Sustainability Transition: Low Carbon Initiatives in Thailand



This volume contains papers presented at the AFD-CGN Seminar on Fostering Economic Growth through Low-carbon Initiatives in Thailand, held in January 2010 at Chulalongkorn University, Bangkok, Thailand. Contributors were selected from those who submitted their interest to present their papers at the conference.

The subjects covered by the papers are divided into 5 sessions: energy and economic growth, sustainable agriculture and forestry, green urban environment, low carbon initiatives and the institutional framework. Though not explicitly "low carbon" in their titles, the papers deal with various aspects of the "low carbon" development strategy approach.

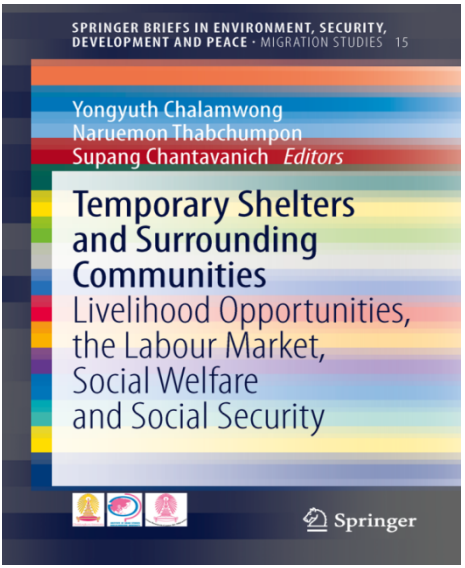
The seminar was organized with the collaboration of NESDB and provides a platform for discussion on policy issues that would be part of Thailand's 11th Economic and Social Development Plan.

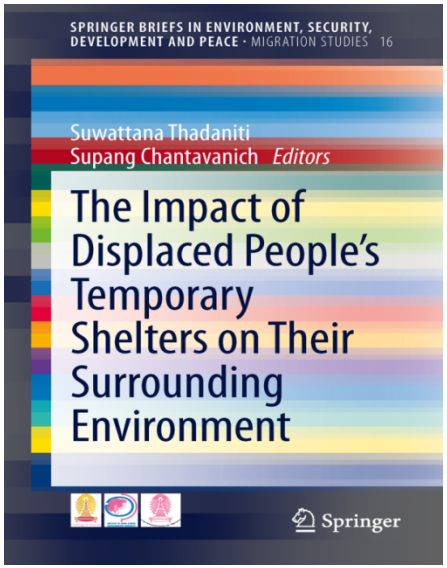
Thank you for your attention and patience

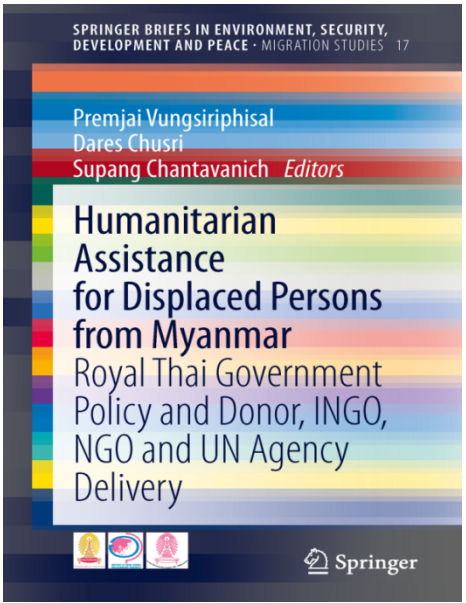
Text soon for download at:

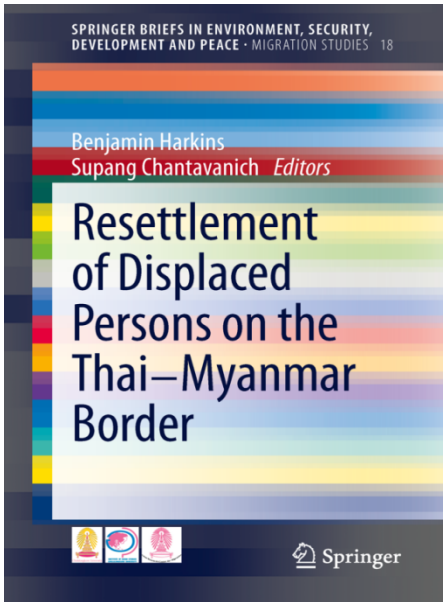
http://www.afes-

Possible Venue for Winter School Results









- Yongyuth Chalamwong - Naruemon Thab-chumpon, Supang Chantavanich (Eds.): *Temporary Sheltered and Surrounding Communities. Liveli-hood Opportunities, the Labour Market, Social Welfare and Social Security* (Springer-Verlag, 2014).
- Suwattana Thadaniti, Supang Chanta-vanich (Ed.): *The Impact of Displaced People's Temporary Shelters on their Surrounding Environment* (Springer-Verlag, 2014).
- Premjai Vungsiriphisal, Dares Chusri, , Supang Chantavanich (Eds.): *Humanitarian Assistance for Displaced Persons from Myanmar. Royal Thai Government Policy and Donor, INGO/NGO and UN Agency Delivery* (Springer-Verlag, 2014).
- Benjamin Harkins, Supang Chantavanich (Eds.): *Resettlement of Displaced Persons on the Thai-Myanmar Border.* (Cham – Heidel-berg – New York – London: Springer, 2014).