

## Transformation Research:

### Research for and on the “Great Transformation”

- Theme cluster: PhD funding through the Heinrich Boell Foundation -

#### Background and general aims of the theme cluster “Transformation Research”

The “Great Transformation”, the ecological conversion of industrial societies into a climate-compatible, resource-conserving and sustainable world economic order, requires far-reaching and manifold tasks to shape it, which, in their make-up, are neither purely scientific and technological nor purely social or political. The transformation process should lead to just and sustainable governance over the use and management of global, regional and local commons. Apart from the atmosphere, this relates, above all, to natural resources such as oceans, fish stocks, soil, woods and forests and bio-diversity. In the meantime, there is widespread consensus on the *status quo* and the need to take action. A wide variety of individual scientific articles and proposals for specific options on how to shape the transformation is also available. Too little is still understood about the impending transformation process itself, however. Added to this comes the challenge of time constraints brought about pressing global problems in the light of which the design options and proposals thus far submitted either cannot take effect or be translated into policies to a sufficient degree. With this in mind, it is vital that the transformation process be accelerated if it is to have any chance of success.

These challenges raise an abundance of questions: what mechanisms does the transformation underlie? What potential paths exist and what might be the guardrails for the impending and envisaged transformation process? What dynamics will the transformation process display and how can these be assessed and evaluated? What conflicts of goals and what barriers, but also what “triggers” and driving forces, globally influence the dynamics of the Great Transformation? Where and at what levels is there potential for change and how can this be mobilised? What “catalysts” (e.g. governance structures) might speed up the transformation process if subjected to loss-making governance structures and different performance potential? What contributions can the scientific and research communities make?

Shaping the Great Transformation necessitates finding answers to all these questions. Its success will depend largely on being able to find people to bring together the various individual scientific perspectives and to integrate them in the light of transformation-relevant issues and perspectives. One particular challenge in this context is that of interfaces between the biosphere and social, political and economic development. These questions require networking social and natural or technological sciences; networking technical, social and political innovations. Only by doing so can we grasp and shape the interactions between society, the economy, the earth system and science and technology development.

#### Structure and thematic focus of the “Transformation Research” theme cluster

The establishment of “transformation research” as a focus of research within the bounds of the PhD funding offered by the Heinrich Boell Foundation falls within the Foundation’s programme focus on the Great Transformation. The theme cluster is a response to a central demand of the German Advisory Council on Global Change (WBGU) on “*World in Transition: A Social Contract for Sustainability*” (WBGU 2011) in order to implement the “Green New Deal”: in focusing on this issue, the Heinrich Boell Foundation is contributing towards establishing the new field of research of transformation research. The core of this field is made up of transition processes, their dynamics, framework conditions and interdependencies as well as potential moments of acceleration, for it is the task of the scientific community to develop knowledge and educate and train responsibly-acting knowledge carriers who are capable of formulating answers to the global challenges posed by the Great Transformation and of promoting global justice and the development of an ecologically

sustainable global economy (ICSU 2010). By focusing on this area of funding, the Heinrich Boell Foundation is seeking to provide impetus for a concerted, coordinated qualification strategy within the area of transformation research.

The focal point of the funding, “transformation research”, has been designed as a theme cluster. It provides a common framework for PhD students to bring together existing scientific approaches and achievements and re-combine and re-integrate them in the light of transformation-relevant issues. In doing this, we are seeking to support the training of “environmental literacy” (Scholz 2011) among future decision-makers and promoters of the Great Transformation. In this context, the thematic focus is placed on the interactions between social systems and the natural environment, the feedback and learning loops and the avoidance of rebound effects. The subject of the focal point of “transformation research” is the actual task of shaping the “Great Transformation”. The aim of the PhD funding theme cluster is to train future decision-makers so that they are qualified to handle scientific-based challenges related to the transformation towards a climate-compatible and sustainable social and economic order.

The theme cluster format that has been chosen is intended to promote exchanges between the relevant research and scientific institutions. As such, we are looking for “disciplined inter-disciplinarity”, i.e. we would like to empower future experts from the various disciplines to conduct a goal- and problem-oriented dialogue with representatives from other disciplines. Through its theme cluster, the Heinrich Boell Foundation is also seeking to build a network of scientists to work on the future issues that the Great Transformation poses. The doctoral theses should address core aspects of the transformation processes and take up transformation-relevant issues and items from the new field of transformation research. We especially sponsor those PhD projects that deal with transformation-relevant issues using examples from the following fields of transformation:

- Energy
- Urbanisation and spatial infrastructures (esp. urban development and mobility)
- Land use (esp. agriculture and food)
- Resource-effective economic management

The theses should develop “robust knowledge” of transformation processes and, in particular, also perspectives on sectoral transformation strategies. In this context, achieving connectivity both with the academic system and with players outside the field of science is also of importance to us. The theses should therefore take up transformation-relevant issues in the light of the following two aspects: (a.) guardrails and paths for the transformation process, and (b.) the dynamics and shaping of the Great Transformation.

#### *(a) Guardrails and paths for the Great Transformation*

The theses on this area of focus should ideally be cross-disciplinary and cover political and socio-economic development paths, the fundamental assumptions of natural science (e.g. of climatology) on the priorities and guardrails of the Great Transformation. One of the core issues here is whether and how sustainable growth is possible given the world's limited natural spaces. To this end, practicable ways or paths should be explored within this dichotomy. The issue of the sustainable and fair use of global commons takes on a central aspect in this regard. Are there practicable ways to achieve sustainable growth and general welfare, on the one hand, and reductions in greenhouse gas emissions and a lowering of resource consumption, on the other?

The Foundation sponsors theses that address the interactions between your own subject of research from the aforementioned fields of transformation and other transformation-relevant aspects. At the same time, expertise should be applied to the transformation-relevant issues. These may, for example, be the interactions between other environmental problems, the impact of sustainable growth or issues of global distributive justice. We especially sponsor theses that link natural or technology science and social or societal studies. These may, for example, be theses that draw on technical or engineering expertise in order to assess the technological potential with regard to specific transformation paths, or theses concerning the interactions between socio-

economic development paths and the biosphere. We are equally interested in theses from the field of futurology or model-aided scenario development that explore potential transformation paths and dynamics. Other theses of interest would be those covering the spatial aspects and dimensions of transformation processes, e.g. on the dynamics of global agglomeration processes or, more locally oriented, on the impact of planned or existing infrastructures. Such theses could, for example, investigate various scenarios relating to the building of new infrastructures vs. the “clever adaptation” of existing infrastructures (e.g. the utilisation of conventional sustainable urban structures) or the dynamics and path dependencies which arise when “channelling” exponentially growing urbanisation processes, especially in emerging nations.

#### **(b) Governance of the transformation dynamic**

Theses from this field should address the issues of transformation-oriented innovation, the dynamic, shaping, diffusion and speeding-up of the Great Transformation and of the transformation process. We especially sponsor projects that deal with:

- *determining the innovation gaps and barriers which hamper transformation*: where do we need innovation from a technical, social and fiscal viewpoint? How can these gaps be closed? How can a search process be organised to promote innovation and transformation? What contribution can science and research make and what changes in the academic system are required in order to accomplish the upcoming transformation tasks? Do the conventional means (e.g. project funding, patent regime) need to be revisited? What form might innovation-boosting business models take? Or what might be the guiding principles for product development in terms of closed-loop recycling management (e.g. cradle-to-cradle)? The theses may cover sectoral transformation strategies from an innovation standpoint (see e.g. the automotive industry or green chemistry). Other issues of interest are e.g. how infrastructure investments react to extreme weather events.
  - *Dynamic and diffusion of the transformation process*: theses from this field can address, e.g. sustainable innovations for the Great Transformation and their dissemination conditions, e.g. in terms of the global diffusion conditions or the national and/or international framework conditions. Of special interest here are also those projects which address the options and conditions for speeding up the transformation process, above all under loss-making governance structure conditions.
  - *Institutional and substantive principles for the successful cooperation on the sustainable governance of global commons*: conflicts of distribution and interest on essential issues of global environmental and climate change which impede the process show that successfully implementing the Great Transformation requires a new level of international (but also regional) and cross-sectoral cooperation, both substantively and institutionally. The main focus here will especially lie in developing the basis and models for cooperation based on varying levels of economic performance but with separate or collective responsibility (and historical commitment) and as part of democratic legitimisation.
- Institutional framework conditions for successful cooperation on the sustainable governance of global commons: theses in this field could address institutional framework conditions and policy models that help to improve global cooperation. A vital question in terms of the institutional design of the Great Transformation will be how it can be brought into line with a free global economic and social order. One concrete challenge facing institutional governance is e.g. that of “multi-scale transitions”, i.e. change processes which are implemented at various levels, both globally and also at the national, local or even urban level. Here, the theses could focus on the interaction between the various governance levels. At the same time, sub-global players should be examined in addition to governmental and non-governmental players. Examples include city conglomerates and transition towns. The theses could examine transition towns as microcosms of the governance of commons. The type of questions being addressed could include the extent to which the global governance of commons can be found at the behavioural level in transition towns and whether and to what extent up-scaling is possible and necessary.

- Substantive principles of successful cooperation on the sustainable governance of global commons: other theses from this field could, for example, address the principles of successful international cooperation that are necessary for a shift in trend towards a Great Transformation. These could be projects dealing with the issue of how far, for example, psychological, behavioural-economic or game-theory findings about cooperation at the micro-level can be transferred to cooperation at the macro-level. These may also include theses, however, which delve into the relationship, balance or perhaps even complementarity between top-down and bottom-up approaches. Such questions could, for example, relate to cultural usage patterns or to how and whether the change in infrastructure is reflected in the value or behaviour system. Or to how and according to what patterns behavioural changes (e.g. in the areas of land use or food) spread and what strategies cause this to be promoted (cf. e.g. “social contagion”).
- *Instruments for shaping the Great Transformation*: theses from this field should tie in with questions relating to the political, economic and legal instruments required to implement and spread the Great Transformation (e.g. resource taxes, ecological fiscal reform or the reform of global environmental governance). The issues covered could include, e.g. rebound effects or unintended knock-on effects. For example, a thesis could address conflicts of goals and the connection or trade-off between food, land use and economic welfare and combine social and ecological effects with high spatial resolution with global trade and demand models.

#### **(c) sustainable energy, water and land use**

In the future, a sustainable energy supply will not rely on nuclear and fossil energy anymore; ideally, the energy supply will be restructured to be based on 100% renewable sources. This restructuring will not only have to go together with a considerable improvement of energy efficiency, but also involve a complete restructuring, and more specifically, a decarbonisation of all economic sectors including industry, transport, buildings as well as agriculture. In order to achieve the ambitious aim of complete and sustainable decarbonisation, an integrated approach beyond the boundaries of individual energy or industrial sectors is essential.

The German “Energiewende” i.e. the project of 100% renewable energy supply in Germany) needs to be examined as a potential blueprint for other economies. This area of research will focus on a use of resources which is both sustainable and economically, ecologically and socially efficient. Here, the term “resources” does not only refer to renewable and non-renewable energy - and non-energy resources but also to water and land, which are essential for the provision of food. All depletable resources are characterized by scarcity, which requires an efficient allocation of these resources. Similar institutions, e.g. markets or regulation, are used to facilitate these allocation processes. Here, energy, water and land form a special nexus. On the one hand, they are closely connected when used in different sectors; on the other hand, individual sectors compete for the use of scarce resources. Therefore, an integrated investigation of the individual sectors’ modes of action, their interactions as well as future developments is required. In addition to model-based and quantitative analyses, institutional studies of the status quo and of perspectives for a sustainable future in an international context need to be carried out.

If a society pursues additional goals like diversification, and security of supply beyond mere competitive prices, an efficient allocation of water, land and other resources requires a regulation beyond the mere market mechanism. Consequently, the economic analysis of resource markets (in the broadest sense) must be expanded to include considerations of sustainability and it must become integrated towards the energy, water and land nexus. This research task will be especially important for qualitative and model-based research on resource markets, which has so far mostly focused on market mechanisms of cost minimization and a balance between demand and supply. Additionally, institutional research needs to contribute to a better understanding of the existing and the possible future institutional frameworks on a national, supranational and global level.

The concept of sustainability is also central to the nuclear phase-out, however, it has not yet been sufficiently reflected in the processes. Provision and financing of dismantling and decommissioning of nuclear power plants is a societal challenge. Potential synergy effects, interdependencies and bottlenecks associated with this challenge have not yet been sufficiently examined. Currently, many countries in the world are intensively searching for an appropriate repository for high-level radioactive, heat-generating waste. There are different approaches to do this which differ in their sustainability as well as their economic and social efficiency. However, these different approaches have not yet been sufficiently compared to each other on the basis of clear criteria. While examining the sector from all perspectives, the interdependence between civil and military use must be considered. They are particularly evident in the complex market for uranium as an energy source, but also as a military raw material.

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The Foundation intends to set up a group of science mentors for the area of focus receiving funding. Moreover, starting in 2013, events will be held to enable a meeting of minds in the respective field and networking within the bounds of a non-material supporting programme of the Scholarship Department and in cooperation with the specialist departments of the Foundation. It is also envisaged that the supporting programme will be further developed in collaboration with leading institutes in the field of transformation research, among them the following institutes:

*German Development Institute (d.i.e.)*

<http://www.die-gdi.de>

Contact: Prof. Dr. Dirk Messner ([dirk.messner@die-gdi.de](mailto:dirk.messner@die-gdi.de))

*Mercator Research Institute on Global Commons and Climate Change (MCC)*

<http://www.mcc-berlin.net>

Contact: Dr. Christian Flachsland ([christian.flachsland@mcc-berlin.net](mailto:christian.flachsland@mcc-berlin.net))

*Wuppertal Institute for Climate, Environment and Energy*

<http://www.wupperinst.org>

Contact: Prof. Dr. Uwe Schneidewind ([uwe.schneidewind@wupperinst.org](mailto:uwe.schneidewind@wupperinst.org))

*German Institute for Economic Research (DIW Berlin)*

<http://www.diw.de/en>

Contact: Prof. Dr. Claudia Kemfert ([ckemfert@diw.de](mailto:ckemfert@diw.de))

Prof. Dr. Christian von Hirschhausen ([cvh@wip.tu-berlin.de](mailto:cvh@wip.tu-berlin.de))

**Application process:** see [www.boell.de/Stipendien](http://www.boell.de/Stipendien)

**Deadlines for applications:** expected March, 1 2019 and September, 1 2019 (see further information: [www.boell.de/Studienwerk](http://www.boell.de/Studienwerk))

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