

# **Title: Investigating the potential of applying theories on rebound effects to the climate discourse: The case of climate change adaptation in winter tourism**

## **Keywords**

Rebound effects, climate change mitigation, climate change adaptation, tourism

## **Narrative step**

To investigate the potential of applying theories on rebound effects to the climate discourse

## **Short summary**

An increasing number of studies advocate the need to handle the challenges of mitigating and adapting to climate change in context and not separately. This relates to both research and policymaking. If treated separately there is an obvious danger that adaptation policies may trigger increases in GHG emissions (maladaptation) and mitigating policies can trigger increases in societal vulnerability to climate change (malmitigation), and furthermore that climate change mitigation and adaptation research may enforce this unfortunate situation. In this paper I will investigate the potential of applying theories on rebound effects to shed light on the consequences of not uniting mitigation and adaptation. I will use the current climate policy discourse from the tourism sector in Norway as a concrete illustration of these relationships and the potential of applying rebound theory on the climate change discourse.

## **Contribution to a special session**

The paper is intended to contribute to the special session “Energy, Efficiency, and Growth – Analyzing the Rebound Effect”

## **Long abstract**

In his article “Seven Theses on CO<sub>2</sub>-Reductionism and its Interdisciplinary Counteraction” Karl Georg Høyer (2010) claims that the contemporary discourse on climate change is dominated by what he calls *CO<sub>2</sub>-reductionism*, in which complex phenomena interconnecting both nature and society are reduced to one singular issue: emissions of CO<sub>2</sub>. This kind of misconception will according to Høyer inevitably lead to suboptimal and even contra productive policies. The solution to this situation is to reunite CO<sub>2</sub> with the other factors from which it has become disconnected during the last two decades, namely that of greenhouse gases, fossil energy, energy, consumption, economic growth, sustainable development and the post-carbon society.

Similar to what is described above regarding the mitigation part of the climate change discourse, it could be claimed that the contemporary discourse on climate change adaptation is dominated by what we could call *resilience-reductionism*, in which the complex options for society on how to respond to climate change is reduced to the one task: To protect society from major negative impacts of climate change, and thus to maintain society as it is today (Amundsen, 2012; 2014). Thus, there is an obvious danger that this modus operandi for how society should respond to climate change may very well lead to the maintaining of business-as-usual; in other words to secure the continuation of those structures that initially are the causes of climate change and therefore also to

obstruct the need for society to enter into a level of transformative changes (Pelling, 2011; O'Brien, 2012).

Both of these approaches – the CO<sub>2</sub>-reductionism to that of climate change mitigation and the resilience-reductionism to that of adapting to climate change – are examples of how complex phenomena in nature and society are reduced to a limited number of issues which in addition mostly involves numerical mechanisms (Schneider et al, 2000; Orlov, 2009). Bhaskar and colleagues (2010) argues that in order to address properly the complex issues of both creating a sustainable development and avoiding climate change, society needs to take into account the very important non-reductionistic and complex relationships within and between nature and society. Thus, according to scholars like Bhaskar there is a need to 'open up' the climate change discourse into a more holistic one. This should be done at two levels: *Within* the two sub-discourses of climate change mitigation (Høyer, 2010) and climate change adaptation (Amundsen, 2014); and *between* the two of them. This article seeks to open up the latter discussion and further develop the two aspects of the first one. My idea is to investigate the potential of applying theories on rebound effects to shed light on the consequences of not uniting mitigation and adaptation; that is to reveal potential rebound effects of GHG mitigation on climate change vulnerability, and of climate change adaptation of GHG emissions. I will use the current climate policy discourse from the tourism sector in Norway as a concrete illustration of these relationships.

The so far dominating strategy in the sustainable development discourse has been that of 'eco-efficiency', coined in 1992 by the Business Council for Sustainable Development (WBCSD, 1992), and endorsed later the same year at the UN Conference on Environment and Development in Rio de Janeiro (UNCED). The strategy of eco-efficiency entails more being produced with less input; the intention being that the production of economically valuable goods and services cause as little ecological impact as possible. It originates from a more general idea of how society could be changed in order to solve environmental problems: the reform-oriented school of ecological modernization which emerged in Europe during the early 1980s (Spaargaren et al., 2000). A basic assumption of ecological modernization is the idea of environmental re-adaptation of economic growth and industrial development, as echoed by the aforementioned notion of producing more with less. The debate on eco-efficiency and ecological modernization has focused on the marginal environmental efficiency of industrial production measured e.g. in the form of energy per unit of production or per price unit – later extended to that of measuring the energy use (or other measures of environmental pressure) per unit of Gross Domestic Product (GDP). However, the final output has been subject to less attention; that is, whether applying a strategy of eco-efficiency or ecological modernization has actually reduced the environmental pressure in society as a whole, or just literally moved the pressure to other regions or related economic activities, often referred to as *rebound effects* (Hertwich, 2005).

The *rebound effect* has been presented as a possible explanation why major success is still lacking in trying to curve down the energy use in rich industrialised countries; a task which is crucial for achieving the goal of a sustainable development (Høyer, 1997). Basically the rebound effect refers to behavioural or other systemic responses to the implementation of new technologies or other measures to save energy use (Saunders, 2000). Santorius (2012) identifies a whole range of possible rebound mechanisms, and differs at a subordinate level between economy and other-than-economy-related rebound mechanisms. Relating to the economy mechanism he differs between actor and societal-level mechanisms, and furthermore relating to the actor-level he differs between

direct/indirect effects and consumer/producer actors. Relating to other-than-economy-related rebound mechanisms he differs between a number of possible sub-categories, such as re-designing and life-cycle effects (both taking place within the domain of production) and supplementary, moral hazard, moral leaking and the moral licensing effects (all of which taking place within the domain of consumption). He also relates to a cross/material, cross/multi, cross factor and consumption efficiency effect – all of which are defined as cross-factor related perspectives on rebound mechanisms.

According to Hertwich (2005) the environmental benefits of any environmental policy measures can under certain conditions be less than anticipated (rebound effect) or even negative (backfire effect). Thus, Hertwich (2005) underlines the importance of getting a clear understanding of the rebound and backfire effects. Several authors have tried to sum up the controversies relating to rebound effects of energy policies. Some tend to conclude that the rebound effects are limited and therefore of minor importance (e.g. Greening et al., 2000). Others conclude that rebound effects are at least of some importance, but they need not result in energy efficiency policies becoming substantially ineffective (Sorrell et al., 2007). Others again state that the rebound effect is significant and challenge the belief that improving the efficiency of energy use will lead to a substantial reduction in energy use (Herring, 2006; Santarius, 2012; Saunders, 2013). These seemingly contradictory conclusions could stem from applying different definitions of what is meant by rebound effects and the application of different system boundaries in rebound analysis, ranging from direct, via indirect to economy-wide (or macro) rebound effects (Sorrell et al., 2007).

The idea that both the climate change mitigation and the adaptation discourse need to be changed is emerging in the current climate change literature. A briefing note issued from the Learning Hub on the concept of *transformation* at the UK Institute of Development Studies sums up the rationale for moving from what they describe as a traditional approach of incremental change to a new transformation approach in the climate change debate in the following manner (Bahadur and Tanner, 2012: 1): “There is growing debate on the need for transformational approaches to tackle the challenges facing development in the face of climate change. If current incremental approaches to preventing dangerous climate change and adapting to the change we are already locked into are insufficient, then more radical approaches may be required”. A similar view can be found in some of the recent works of the Intergovernmental Panel on Climate Change (IPCC, 2012: 4).

Tourism is a sector which is vulnerable to both mitigation policies and climate change. An anticipated radical increase in costs relating to carbon emissions will most likely have a negative effect on tourism travels (Gössling, 2010), and changes in climatic conditions may have a negative effect to many tourism destinations – e.g. loss of snow in winter tourism destinations (Aall and Høyer, 2005; Scott et al, 2009). In the article I will present concrete examples of maladaptation and malmitigation currently taking place in tourism development in Norway, and discuss the extent that current theories on rebound effects can contribute in revealing and understanding these relationships in the first place, and in secondly if this also can form the basis for discussing possible policy measures to avoid maladaptation and malmitigation.

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