

### **Input for workshop “Energy Efficiency Policies and the Rebound Effect”**

Rebound Effects are known since a long time but are until now not really recognized by politicians. The debate in public, science and policy on efficiency and efficiency gains and targets does not reflect the issue of Rebound-Effect. Reasons for that might be:

- **Lack of Knowledge:** Rebound effects beyond the direct effects are difficult to define and to measure. We do not understand them good enough.
- **Rebound as growth phenomenon:** Rebound effects have also positive aspects as they may bring more prosperity (e.g. travelling becoming cheaper (and quicker) – we can enjoy more often vacation in overseas)
- **Need of new policies:** Rebound effects might be difficult to communicate and will make efficiency policies much more complicated.

#### **Rebound effects – our current knowledge is limited**

Rebound effects are difficult to define, to estimate and to understand as there are different types and indirect effects are manifold. Furthermore there exist only poor knowledge on the effects of combined efficiency improvements e.g. for energy and labour. With this limited knowledge it is not easy to take account for rebound effects in policy targets and instruments. Following the typical distinction of rebound effects this means:

**Direct and indirect rebound effects** are at least to a certain extent quantifiable. Therefore as a first step policy could take account for it when setting efficiency targets. As a second step instruments should be designed in such a way that they avoid or reduce rebound effects where necessary and possible.

**Economy wide rebound effects** are the big unknown. It seems practical impossible to calculate them fully. Even the definition is difficult. This type of rebound effect shows that the boundary between rebound effects and economic growth is blurred. Rebound effects result in growth of living standards and economic activities. Thus we need rebound effects at least to a certain extent to improve our prosperity. Questions arise like: How much rebound effects are sustainable? What is the role of overall energy use for economic growth? What does this mean for energy, environmental and economic policy?

#### **Conclusions for Energy and climate policy**

From the perspective of sustainability only the absolute energy use/GHG emission/resource use is relevant. Efficiency increases are mainly a means to the end reduction or resource use. Thus we need as a central aim of our climate and energy policy absolute (reduction) targets. Only policies that focus on the absolute level of energy use are able to tackle the rebound effects consequently. Therefore energy and climate policy should build very much on economic instruments like quantitative restrictions (e.g. emission trading) or taxing. Nevertheless prices may not give everywhere sufficient signals. Just some examples for illustration:

- In households electricity prices are often not really known, buying or using decisions does not account for it: price elasticity of electricity is rather low.
- The agency dilemma between landlords and tenants: Increasing prices for heating are an issue for the tenants but only the landlord can insulate the house.

- Long investment cycles; credit restrictions may make necessary investment in energy saving technologies impossible.

This shows on the other hand the need for policies that focus on efficiency enhancements (e.g. minimum efficiency standards or investment incentives) even though they may be prone to rebound effects. We need a policy mix of different kind of instruments.

The discussion of economy-wide rebound effect shows that probably a certain rebound effect should be unavoidable to increase our prosperity. But what will be the consequences? How much can we confine rebound effects? Can we probably redirect the economy-wide rebound effects: e.g. instead of using more energy we increase our free time or we use only more renewable energy?

### **What has to be done?**

More scientific work on the following issues is necessary:

- Estimation of rebound effects to improve current efficiency policies,
- Gather knowledge on the importance and extension of indirect and economy wide rebound effects,
- A clearer disjunction of rebound effects and economic growth,
- More information on the behaviour of people: are there means to overcome the rebound effect other than classical economic instruments?
- Time rebound: as time is absolutely fixed for everybody, the connection of time spent and energy used could be of interest. Energy efficiency gains that lead not to time gains may not be prone to significant rebound effects as there is less incentive to extend the activity.

Integration of rebound effects into policy:

- Adjustment of efficiency targets for (at least direct) rebound effects,
- More emphasis on policies that focus on the absolute amount of energy/GHG gases (e.g. challenge Clean Development Mechanism),
- Introduction of policies that challenge the growth paradigm and show alternative ways to improve our prosperity.