

## Macroscopic rebound effects as argument for economic degrowth

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### Abstract

*The rebound effect could be defined as the increase of consumption linked to the reduction of limits to use a technology. These limits might be monetary, temporal, social, physical, energetic, spatial, and organisational.*

*Consensus develops on the existence of primary and secondary rebound effects. An example of the direct rebound effect is increasing distances in time-efficient modes of transport. An example of secondary rebound is households energy saving reallocated to holiday spending. The size of the rebound effects is still subject to much discussion. This is especially the case when we deal with macroscopic rebound effects (economy-wide equilibrium shifts and transformational). These types of rebound effects are more difficult to describe and lead to much differences in analysis. But their existence is supported on the theoretical level and on the practical level explaining the incapacity of global efficiency increases to enable global reductions of environmental impacts.*

*The rebound effect in its widest understanding was quoted from the start of the wider degrowth debate in 2002 in France as an important argument for the idea of economic degrowth. Although economic growth is considered by some authors as independent from rebound effect, we defend here that the problematics of growth and rebound effect are closely related. Even Growth of an immaterial economy has the potential of a reallocation to the material economy.*

*The fact that there is not degrowth but growth (or even steady state) leads to actual or potential rebound effects. The result from this is that technological solutions, but actually also sufficiency solutions (and eventual demographic ones) would not function to their full potential if our economies do not degrow accordingly. For example material efficiency will not lead to dematerialisation if there is no decrease of raw material acquisitions, and in general there is no guarantee that we would avoid recoupling if the collective capacity to acquire natural resources increases with economic growth.*

*It follows a discussion on different measures for degrowth: the idea is to have a "debound" effect in link with an economic degrowth for sustainability and equity. Ecotaxes for example would not give space to a rebound effect if they manage to reduce problematic activities (and in the long run the associated taxes) and support a process of redistribution and transition.*

## 1- Introduction

Would improvement of techniques applied at a large scale be the solution to our environmental, social and economic problems? Although efficiency solutions have been widely applied, we are confronted with crisis: flows of material & energy have increased in an uneven manner leading to environmental and social crises; shortage of natural resources, including food & land, and high debts lead to social crises and prospects of wider economic crises. We have more and more evidence that the efficiency strategy is ruined by a wide rebound effect, so-called Jevons paradox or Khazzoom-Brookes postulate (Jevons 1865, Saunders 2000, Sanne 2000, Greening et al. 2000, Binswanger 2001, Alcott 2005, Dimitropoulos 2007...). We will develop that the rebound effect is made possible by economic growth policies and non acknowledgements of limits to consumption and production (Schneider 2001). As long as economic means encourage us to gain natural resources far above the sustainable levels, as long as our infrastructures open spaces to more cars on the roads, more planes, more trucks, more industrial processes and products, as long as the advertising industry is having so much influence on our strategies, there is a risk of failure. Even sufficiency solutions (Alcott 2008), negative demographic growth, or other preventive and specific policy solutions may lead to rebound effect. We will support the idea that all types of solutions may be ruined by the continuation and development of strategies, policies and institutions that favour elasticity, we could say unfulfilling, of demand. Jevons knew about the macro-rebound in 1865. It is now time to question the supremacy of growth economics and growth objectives, and design and implement degrowth economics as well as degrowth policies and strategies in the Northern countries, in general in affluent and influent parts of the world (Schneider 2002, 2003, 2003b, Schneider & Bayon 2006). In addition post-development (Rist 2000) challenging the western lifestyles appeal in the global South is required for a right-sizing of the economy (Degrowth conference declaration 2008).

## 2- Micro-rebound effect and rebound strategies

*Rebound Effect in Micro-economics (direct and secondary rebounds according to Greening et al. typology)*

The micro-rebound is easily understood; it enables to grasp the phenomenon. It may be considered in order to analyse more thoughtfully the impacts of a given action. It is often mentioned at the level of personal behaviours. Let us consider the rebound effect at the use phase: a car that consumes less gasoline per km leads to financial savings that may be spent on longer car distances if the travel budget remains the same or increases. A so-called secondary rebound exists when a house is better insulated and that reduced expenditures on heating are reinvested in buying a second car or travelling by plane. Efficiency basically creates revenue that can be spent on the same (primary rebound) or other commodities (secondary rebound). Let us imagine that improvement in the production system leads to reduction of resources use leading to savings in production costs per unit of production. At the same level of sales, the production can then increase in terms of units. As the thickness of plastic

bags reduce, producers reduced the costs of producing each unit of plastics bags, they may then sell more for the same price... This may also occur at the waste stage: an incinerator is economically more efficient to treat waste, we may then increase the amount of waste processed, possibly increasing in the same time some of the adverse impacts of this type of technology.

#### *Different types of limiting factors lead to rebound*

Rebound effect can exist with other limiting factors than the economic one: more generally the rebound effect could be defined as the increase of consumption linked to the reduction of limits to use a technology. These limits might be monetary, temporal, social, physical, energetic, spatial, and organisational (Schneider 2001). For example, rapid means of transport create the potential to save time, but very often the time saved in faster transportation is used to travel greater distances (Binswanger 2001, Jalas 2001). We will develop in part 5 that the understanding of these limiting factors may help for the design of appropriate preventive policy measures.

#### *Different types of impacts illustrate rebound*

Often dealing with energy issues, the rebound effect may actually deal with other types of impacts: time loss, social impact, environmental pollution, traffic jam<sup>1</sup>, carbon consumption, stress...

#### *Different types of solutions rebound*

Rebound occurs with efficiency<sup>2</sup>, it may also occur with other types of “solutions<sup>3</sup>”: in addition to efficiency rebound we may have:

- Sufficiency<sup>4</sup> rebound (Blake 2008); an air ticket to Dakar would be affordable with the savings made by heating less a house....
- Birth Decrease rebound; we could argue that having fewer children in a family liberates revenues to increase the material or energy consumption per person.
- Rationing rebound<sup>5</sup>; the rationing of a product may create rebound of consumption of another product.
- Caps rebound; Carbon caps may lead to uranium consumption and radioactive waste.
- Quotas rebound; a quota on iron imports and extraction may lead to use of renewable resources or extraction or import of Al.

- Reserve rebound; a natural reserve in one area may not prevent more extraction of resources in another unprotected site
- Laws rebound; laws preventing growth may be circumvented.

#### *Rebound has secondary impacts*

There are secondary impacts associated to rebound effect. For example an increased consumption due to rebound effect may cancel the expected benefits of energy saving but it may also bring other problems. For example the efficient car can travel further with the money saved which affects the environment with pollution, noise, accidents... Information technology leads to a greater consumption paper and transport (Schneider 2001). Among positive effects, a rebound could potentially represent a wealth transfer for social more justice<sup>6</sup> (see Alcott 2008a for a full study of this aspect).

#### *Size of micro-rebound*

A very important question concerning the rebound effect is its size. Different authors have come to very different conclusions. In the context of microeconomics, the rebound effect is seen as a small problem. Dimitropoulos talks of less than 30% for most energy services typically. Greening et al report rebounds between 0 and 50% linked energy efficiency solutions in residential end uses. Some question the phenomenon of Rebound like Lovins. In any case a more complete picture of rebound is only taken into accounts in the context of dynamic macroeconomics.

#### *Rebound strategies may be part of growth strategies*

Very often the increase of consumption linked to rebound effect is a planned effect of a company strategy. The development of the fast and efficient trains TGV in France for example has been accomplished with the clear goal of increasing travels between cities. The intention is then to remove limits to increased consumption. The demand for a product will be limited if it is too expensive, too time consuming, if it is too dangerous, if it requires too much effort, if it ruins our health, if it uses too much space, if it weighs too much, if it is too complicated to use. Usual innovation tend precisely to reduce all these limitations and to promote it in advertisements. The products become cheap, fast, safe, without effort, healthy, light and small, easy to use or good for the environment but secondary impacts are certainly not prevented. Similarly, economies of scale are often not designed for ecology but to sell more simply, to gain market shares.

We call all the strategies designed to reduce limits that exist to consumption or production in order to gain market shares or in order to develop new markets, the “rebound strategies”. We will now deal with implications of rebound effect on the global economy and policies in general, savings due to solutions are very likely to reallocated to new spending.

<sup>1</sup> Schneider et al. 2002

<sup>2</sup> Impact per unit

<sup>3</sup> We will continue using this terminology in the next chapters

<sup>4</sup> Units per person

<sup>5</sup> Alcott 2008 argues that solutions directed at impact reduction directly, the so-called « left side solutions » (directly dealing with Impacts I) in reference to the IPAT equation, would prevent the rebound occurring with right-side solutions (leading to efficiency, sufficiency and birth decrease rebound). We argue that left side solutions may also suffer from potential rebounds, but they deal with point sources easier to identify on the large scale.

<sup>6</sup> This is why we consider degrowth as differentiated see annex on EDSE

### 3- Macro-rebound effect and growth policies

Two types of macro-rebound effects may be considered: Economy wide & Transformational effects (Greening)

The economy wide rebound effect results from application of economic theory to a static situation but at the level of economy as whole with price and quantity readjustments: increased energy efficiency leads to reduced prices and increased demand use of energy and demand.

The transformational effect is defined as changes in technology that have the potential to change consumer preferences, alter social institutions, and rearrange the organization of production (Greening et al.). As our economy is a complex adaptive system, the global production and consumption system will rearrange (Polimeli & Polimeli 2006). For example, buying a car supports the road network, which has the effect of a reorganization of society and for example will encourage supermarkets in place of small businesses and may create more consumption by the creation of this socio-technical system.

Jevons in 1865 is considered the first economist to analyse a macro rebound effect phenomenon: *"it is a confusion of ideas to suppose that the economical use of fuel is equivalent to diminished consumption. The very contrary is the truth."* Jevons described a rebound effect of more than 100% in the area of coal extraction and use. The increase of coal consumption has notably exceeded the compensation of efficiency improvements. This type of rebound has been identified as "backfire" (Saunders 2000). A more recent example concerns the growth in the sector of computers which lead this sector to become a major contributor of environmental concern: instead of minimizing the impacts of the sector, the major efficiency increase from first computers to the last mini laptops enabled an explosion of number of computers units produced. If the degrowth of the sector would follow the increase of efficiency we could avoid the rebound, but this would be a very different societal choice. Such cases of clear backfires open the question of the size of the rebound effect in general considering the economy as whole, possibly with its dynamic properties.

Identifying the causal relation between efficiency and the rebound effect is not an easy task in our complex and globalized economy. Compiling different studies dedicated to this task Dimitropoulos cites for example estimates ranging between from 15% to 350%. Dimitropoulos concludes that there is a lack of sound theoretical framework that can explain sufficiently the complex interactions that accompany energy efficiency improvements in the macro level and inconclusive historical, empirical and econometric evidence. In most research on rebound experts have thus tempted to separate the responsibility of efficiency and the responsibility of structural changes or demand trajectories to evaluate the share of rebound effect. Binswanger mentions for example "the growth in economic activities is not necessarily connected to efficiency improvements due to new technologies. The growth effects may be due to structural changes and a general growth tendency of market economies" (Binswanger 2001). This is then the task of rebound analyses to evaluate the share of efficiency in the

growth effect. A reduced price of energy like the reduced price of coal in Jevons case enables the development of new coal consuming processes by making added value possible. The development of coal processing is caused by demand for the function it fulfils (for example transport by train) and by the cheap availability of coal: costs reduction and benefit increase are both reasons for the existence of coal processing.

We suggest here that it is inappropriate to say that efficiency in general or even more sufficiency (or other solutions) are "responsible" of the rebound effect. The existence of the rebound effect has led some experts and citizens to question the general solution of efficiency, and sometimes even sufficiency (and may question other solutions). The point is: the general dismissal of efficiency or other solutions is only made possible by setting growth as a precondition. What has been missing is the questioning of rebound strategies and policies and growth policies (which include rebound policies). The rebound should not lead to general dismissal of efficiency, sufficiency, birth control, or preventive policies as solutions, but growth should. Solutions within the framework of IPAT could be successful if we had degrowth (steady state at this stage is not enough). The rebound effect is favoured by rebound strategies and policies and fundamentally made possible by growth policies through infrastructures and creation of demand. Rebound effect is sometimes so much awaited that the avoidance of rebound within growth strategies sometimes leads to crises as it happens when demand is not fulfilled. We thus suggest that in addition to being impossible, it may be inappropriate to evaluate the share of the rebound effect in the growth effect. However favouring some efficiency types or other solutions is sometimes actually parts of growth strategies and policies. We will argue that we need degrowth policies, and above all economic degrowth policies, which should include a selection within types of solutions in addition to acknowledgement of limits to production and consumption.

### 4- Challenging rebound and growth policy with voluntary rebound and degrowth

The choice of solution has a strong relation with the demand elasticity. Some technologies are definitely more prone to rebound than other and also contribute to transformational effects towards growth. Different strategies of efficiencies or sufficiencies are not at all equivalent. One important question: what type of solution are we talking about? Is it suppressing limits to consumption (and create rebound) or is it acknowledging limits? We know that services like car-sharing or bicycle tend to reduce the number of kilometres travelled; the effect will be different with efficiency in the airplane industry for example.

Avoiding the use of a product or service, or using an ecological product or service can create other limits on consumption and thereby create a "debound" effect this time. The sharing of automobiles tends to reduce their use. Efficiency solutions consisting of sharing a product does not induce multiplication of products, everybody has a share, all needs are fulfilled, and includes by itself a limitation in use. Activities such as gardening, hiking, long

meals, bicycling are extremely environmentally friendly because their slowness reduces the time available for other more polluting activities, they create a time rebound. Buying products of good quality, or healthy as organic products may even make our budget useless to purchase products of poor quality and pollutants. Broadly speaking, all activities that acknowledge limits are best to avoid the rebound. The question that one is entitled to ask is how to convince companies to leave aside their strategies to grow ever more consumption (whether products or services) because it seems their basic way to operate.

Growth policy is here generally defined as policy centred at increasing the capacities to exploit natural resources.

Growth policies favour the risk of a rebound effect with any solution. True efficiency (like other solutions) is preventive, and really creates a reduction of costs, which can be reallocated to new consumptions destroying the awaited environmental benefits. It is then necessary to have an adjustment of the monetary mass to avoid this rebound effect. From the start of the discussion in France the rebound effect was thus used challenging the myths of green or sustainable economic growth. And what is true for financial capacity to consume is true for other limiting factors.

Global degrowth is a reduction of the collective capacity to exploit resources, it would definitely prevent the macro rebound effect. Actually we have two possibilities:

- Either the price of raw materials increases drastically, which will hit the disadvantaged first, it would be an enormous inflation, with high risks of important social inequity, social and economic crisis
- Or it is a reduction of the purchasing power of raw materials where the affluent and influent parts of the world decide to decrease a lot their purchasing power to allow resource availability to the disadvantaged.

This second scenario represents the result of so-called degrowth policies. It would be the so-called Economic Degrowth for Sustainability and Equity (EDSE, see Annex). We are talking about a degrowth of the total purchasing power, which should preferably be initiated by a reduction of the purchasing will (also called voluntary simplicity) in the same time than the reduction of production. The development of immaterial goods or “relational goods” is in general not a solution, first we transform social relations when they are paid for, and the immaterial source of revenues would not stop its concentration and a reallocation to material consumption later: a trainer of personal development might still buy a swimming pool.

## **5- Economic Degrowth for Sustainability and equity (EDSE)<sup>7</sup> with rebound strategies and degrowth policies: insights of degrowth pathways**

*Debound strategies for Degrowth (the bottom-up approach)*

Rebound strategy is the direct growth strategy, the bottom-up pendant of growth policy. It includes: choosing and

developing the right product without consumption limits, lobbying, advertising, socio-green washing...

Debound strategies is the opposite of the rebound ones, it consists of identifying and discouraging specific efficiency solutions (or others) that are prone to micro and macro-rebound, or favouring solutions in general that create rebound. Debound strategies imply to favour techniques and strategies that do not have the property of creating new needs: like the “convivial tools” of Ivan Illich. The different solutions leading to rebound in the context of rebound strategies and growth policies are important to adopt within IPAT solutions. When it comes to efficiency it is important favouring those types that do not create an important socio-technical system: local sharing, reuse, compost, renewable energy, public transport... We find also the 8Rs of Serge Latouche.

*Degrowth policies for Debound (the top-down approach)*

Growth policy includes: cash availability, promotion of demand, policies to favour products and services with higher consumption potentials, policies favouring longer working hours and later retirement, growth planning, reduced environmental and social standard, in general institutions that favour economic growth...

After giving up growth policies as suggested by Spangenberg 2008, Degrowth policies consist of understanding the limiting factors and adjusting them in order to prevent the rebound effect. It consists of policies for EDSE, which includes dealing limiting factors to exploitation of natural resources (which also includes ourselves in this interlinked economy). Understanding limiting factors enables also to develop the social constructive vision described in Vatn 2005.

Limiting factors to be dealt with are:

- Financial limiting factor

The idea is to develop policies to reduce the collective financial capacity to gain natural resources. This would represent a post Keynesian degrowth policy that is based on budget and currencies to reduce the demand instead of increasing it, reducing the monetary mass while distributing wealth more evenly. It is a reduction of the financial capacity to exploit.

- Awareness limiting factor

A second limiting factor is conscience: Information would be vital to increase the conscience. This rebound effect that destroys the ecological progress should be documented and disseminated, including information or ways to develop information on more environmentally and socially friendly choices per Euro to spend or per hour of activity. Greening has noted that awareness of rebound could reduce it. It is a conscious reduction of exploitation will. This would involve some kind of containment of advertising industry.

- Time limiting factor

Another limiting factor is the time to consume. This implies measure to limit speed (see Heran 2008), increase possibilities for convivial encounters or other time “non-consuming” habits. The idea is to reduce the time that we dedicate to consumption. The decrease of working time can reduce income and therefore consumption, while making

<sup>7</sup> Economic Degrowth for Sustainability and Equity

possible self-production. It is about time reduction for consumption, or said differently reduction of time for exploitation of natural resources.

– Physical limiting factor

Limiting physical space to consumption. We will obviously lower consumption of natural resources if there is no more to exploit (includes materials, space and energy).

– Infrastructures limiting factor

Reduction of infrastructures to consume and produce more is possible for example by maintaining levels of reduced capacity on roads or in promoting the local level in communications and trade. It is also about reducing extractive tools.

– Ownership or property limiting factor

Property rights on biota, soil and minerals are certainly a strong limiting factors. They fundamentally represents rights to exploit. See the discussion of Griethuysen 2008 on this issue.

Since the idea is to avoid developing new alternative on top of the rest, the simple development of alternatives eco-tax on polluting techniques or subsidies on alternatives is questioned if it does not involve an adjustment of limiting factors.

*Example of the eco-tax*

The ecological tax or ecological contribution is a solution but does not work well in the context of growth policies. If the ecological tax is so successful that a polluting, an energy intensive technique is replaced by an energy saving technique or is followed by a reduction of use of this technique, there are two positive aspects: on one hand the energy intensive technique reduces with its adverse effects and the rebound effect will be negligible since there would be no tax income to be reallocated. The result is a reduction of the global costs: all the direct and indirect costs linked to the technique reduce, the alternative, including not fulfilling this service at all is preferred. We have a net gain in terms of environmental impacts. However this all supports degrowth. On the other hand if the tax does not manage to reduce the use of the energy intensive taxed good or service, then the energy intensive technique does not reduce and it makes only more attractive other techniques that come on top of the rest and the tax money is creating a rebound. For growth supporters this is perfect: growing money flows can find uses, but the eco-tax is counter-productive in terms of global environmental impacts, even if it may still improve the situation in specific sectors, time frames and locations.

## 6- Discussion

Rebound resembles the failure of individualist thinking, partial solutions alone, missing the inputs of social constructivism with appropriate deliberative participative institutions (Vatn 2005).

Limits are often seen as restraints to liberty. But our planet is limited, we share a common good (Sachs 1999), and collectively agreed limits might be liberating when we

share a common good<sup>8</sup>. Let us not forget that limiting factors are limits to exploitation of nature which includes exploitation of each others. However limits need to be designed by the right participatory processes, setting up the right institutions (not in the meaning of institutional bodies). We need participatory institutions to deal with limits, dealing with questions such as: how do we set limits? What are needs? how shall we organize? What is the right level of natural resource extraction? This in includes the discussion on usage that should be free and mis-usage that should be costly according to Paul Ariès.

This includes lots of debates and involvements that are not included in today's democracy. There are real steps of collective thinking to install (Rumpala 2008). Resolving the question of needs cannot come from so-called normal science. Deliberation about needs may demand so-called "post-normal science" (Funtowicz and Ravetz, 1991) which includes civil society involvement. Degrowth process towards dynamic and inhomogeneous equilibrium steady state should not occur by constraint, it would take some homogeneous character. Participative processes are required to deal with the central question of needs motivating actions (Rosenberg 2001) where degrowth develop a context of possible cooperation (Wallenborn 2008).

The causal chains linked to rebound effect, in particular feedback loops, need to be studied to make the right choice of solutions in order to reduce the pressure building towards growth policies. Deliberative processes may sometimes be complemented with some kind of formal approaches, why not mediated modelling techniques and social multi-criteria assessment (Antunes et al.).

Another question concerns development. Are we going to give more space or less space to consumption of natural resources? How do we measure exploitation of nature and humans? We agree that sustainability is the goal, but development is too often interpreted as following the western model of high consumption (Sachs), which is impossible for everybody on earth. The dream of western lifestyle of the lifestyles of the richer ones (Veblen 1899, Kempf 2007), is a strong motor for rebound.

Could sometimes Rebound effect participate to the transfer of wealth? We definitely need to work on the process of wealth transfer, we should certainly look into different models of development: post-development. Self-limitation by the West would give other societies room to explore their own political space and develop appropriate systems of production and social organization (Sachs 1999).

Another issue concerns the deep analysis of solutions (efficiency, sufficiency, preventive policies...) and limiting factors at different scales in complex systems (in the line with e.g Giampietro et al approach to complex adaptive systems).

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<sup>8</sup> For example a car free city opens space for pedestrians, children, other means of transportation creating more liberty for the majority.

## Conclusion

Economic growth is seen as a solution more than a problem, when it could be seen as a general failure of efficiency on a larger scale. Continuous growth outstrips gains of efficiency, this is not bad luck, it is the result of growth strategies and policies at the micro and macro level.

We should really deal with what blows the balloon, and deblow it, or degrow it, instead pressing one side: another side inflates even more. We need just, fair, eco, right-sizing of the global economy that would give everybody its sufficient share. In the OECD, it would mean absolute reduction of material, energy and land use taking into account a cradle to grave vision, in the Global South this would mean post-developments (Rist 1997) away from the present affluent and influent consumption and production model. Because of the rebound effect we cannot limit goals to physical degrowth, economic degrowth, EDSE is needed. More than a good analysis, the rebound effect is a central argument for economic degrowth: degrowth of environmental impacts cannot be obtained without an economic degrowth of industrial countries, it also gives an approach to understand the implication of specific policies and technical choices for growth or degrowth. Economic degrowth could be seen as long term risk prevention: immaterial economy is at risks to become material again, sequestration of carbon is at risks of liberating carbon... The only real prevention could be degrowth.

The present growth paradigm involves rebound strategies inducing growth and these are reinforced by growth policies that promote rebound strategies again. For degrowth paradigm shift we suggest instead pathways combining rebound strategies supporting degrowth policies and degrowth policies supporting rebound, taking into account of limits to consumption and production and adjusting limiting factors.

Real societal benefits are actually prevented with growth or would be enabled with degrowth. The rebound effect or so-called Jevons paradox is the failure of attempts to reduce exploitation of natural resources. We intended to reduce this exploitation of natural resources while neglecting the degrowth of capacities to exploit those.

*Capacities to exploit natural resources* require among other things:

- time available for production and consumption
- willingness to produce and consume
- property rights on biota, soil and minerals
- transport, transformation, distribution and storage infrastructure
- transaction facilities and cash availability

The degrowth of capacities and the prevention of rebound effect implies to succeed in reducing one or more of these requirements in addition to typical measures consisting of efficiency, sufficiency, birth rate decrease and possibly caps, rationing and quotas (we should deliberate about that). Localised or specific measures fail when collective limiting factors are unchallenged.

Jevons knew already. But growth has not been challenged as political and societal objective and it has not been

challenged since then. Time has passed enough. The triple crisis makes it now an absolute necessity. Further degrowth research and action are needed in order to open new perspectives of true progress.

The realisation that rebound limiting factors are not restricted to today's economics should make us aware that it may exist many other systems that still develop natural resource exploitation, that would be the ultimate rebound: the "paradigm shift rebound effect"! So let us be sure that we evolve towards a society that puts forward a degrowth of the collective capacity to exploit natural resources.

Thanks to all degrowth conference participants.

Thanks to Blake Alcott, looking forward to more discussions.

## References

- Alcott B. 2008a, the sufficiency strategy: would rich-world frugality lower environmental impact? *Ecological Economics* 64 (2008) 770-786
- Alcott B. 2008b, Country carbon rationing, In: *Proceedings of degrowth conference*. Paris 18-19 April 2008, Eds: Flipo & Schneider, Research & Degrowth, INT
- Alcott Blake 2005, Jevons Paradox, *Ecological Economics* 54 (2005) 9-21
- Antunes Paula, Rui Santos, Nuno Videira, 2006. Participatory decision making for sustainable development—the use of mediated modelling techniques, *Land Use Policy* 23, 44–52
- Aries Paul 2007, *Mésusage, Essai sur l'hypercapitalisme*, Parangon/Vs
- Binswanger M. 2001, Technological progress and sustainable development: what about the rebound effect? *Ecological Economics* 36 119–132
- Degrowth conference declaration 2008, in this volume.
- Dimitropoulos John, Energy productivity improvements and the rebound effect: An overview of the state of knowledge *Energy Policy*, Volume 35, Issue 12, December 2007, Pages 6354-6363
- Funtowicz, S., Ravetz, J., 1991. A new scientific methodology for global environmental issues. In: Costanza, R. (Ed.), *Ecological Economics. The Science and Management of Sustainability*. Columbia University Press, New York.
- Giampietro Mario, Tim Allen and Kozo Mayumi 2006, Science for governance: the implications of the complexity revolution In: *Interfaces between science and society*, Edited by Ângela Guimarães Pereira, Sofia Guedes Vaz and Sylvia Tognetti, European Commission Joint Research Centre, Italy, 366 pp ISBN 978-1-874719-97-7
- Greening Lorna A., David L. Greene, Carmen Difiglio Energy efficiency and consumption — the rebound effect a survey *Energy Policy*, Volume 28, Issues 6-7, June 2000, Pages 389-401

Gruythuisen, P. 2008. Involutive development of the West, *Proceedings of degrowth conference*. Paris 18-19 April 2008, Eds: Flipo & Schneider, Research & Degrowth, INT

Héran. F. 2008. Le mythe des effets positifs de la vitesse en agglomération, *Proceedings of degrowth conference*. Paris 18-19 April 2008, Eds: Flipo & Schneider, Research & Degrowth, INT

Illich Ivan 1973, La convivialité, Editions du seuil

Jalas Mikko 2001, A time-use approach on the materials intensity of consumption, 7th European Roundtable on Cleaner Production, Lund 2-4 May 2001

Jevons 1865 The coal Question, citation from Alcott 2005 and many others.

Kempf Hervé 2007, Comment les riches détruisent la planète, Editions du Seuil

Latouche Serge 2006, Le pari de la Décroissance, Fayard

Lovins Amory 1988 Energy saving from more efficient appliances: another view. *Energy journal* 9, 155-162

Rosenberg M. 2001. Nonviolent Communication: A Language of Life. PuddleDancer Press: Encinitas, CA.

Polimeni John M. & Raluca Iorgulescu Polimeni Jevons Paradox and the myth of technological liberation *Ecological Complexity*, Volume 3, Issue 4, December 2006 Pages 344-353

Rist Gilbert, The History of Development, From Western Origins to Global Faith, Zed Books, London & New York, 1997, 276p

Sachs Wolfgang, Planet dialectics: Exploration in Environment and Development, Zed Books 1999

Sanne Christer, Dealing with environmental savings in a dynamical economy- how to stop chasing your tail in the pursuit of sustainability, *Energy Policy*, 2000, 28 (6-7): 487-96.

Saunders Harry D. 2000 A view from the macro side: rebound, backfire, and Khazzoom-Brookes, *Energy Policy*, Volume 28, Issues 6-7, June 2000, Pages 439-449

Schneider Francois, Hinterberger F., Mesicek R., Luks F., 2001. *ECO-INFOSOCIETY: Strategies for an Ecological Information Society*, in "Sustainability in the Information Society", Hilty, M.L., P.W.Gilgen (Eds.), part 2, p.831-839, Metropolis-Verlag, Marburg.

Schneider François, Axel Nordmann, Fritz Hinterberger, *Road Traffic Congestion, Extend of the Problem*, World Transport Policy & Practice, Volume 8, Number 1, 2002, pp34-41, <http://wTransport.org>

Schneider François, 2002/2003. *Point d'efficacité sans sobriété* In: Silence Feb 2002 & In: « Objectif Décroissance », Eds Bernard M, Cheynet V, Clémentin B, Parangon et Silence, collection L'Après-développement, ISBN 2-84190-121-1 p.34-43

Schneider François 2003. L'effet Rebond (Rebound Effect) *l'Ecologiste*, French Edition of The Ecologist, n°11 Oct 2003, Vol 4, n°3, p45

Schneider F. 2003b pres. Lyon Degrowth Conference at [http://www.decroissance.org/francois/recherche/schneider\\_lyon\\_english.pdf](http://www.decroissance.org/francois/recherche/schneider_lyon_english.pdf)

Schneider F, Bayon D, 2006. Dematerialization and Sustainable Degrowth, Research Framework for a Fair and Ecological Economic Degrowth, Dematerialization across scales : Measurements, empirical evidence, future options, 2006 Conaccount meeting, September 13-14, Vienna, Austria.

Spangenberg 2008, Growth and Sustainable Development. *Proceedings of degrowth conference*. Paris 18-19 April 2008, Eds: Flipo & Schneider, Research & Degrowth, INT

Vatn Arild 2005 Rationality, institutions and environmental policy, *Ecological Economics* 55 (2005) 203-217

Veblen 1899, quoted by Kempf

Wallenborn. 2008. Degrowth vs. sustainable development: how to open the space of ontological negotiation? *Proceedings of degrowth conference*. Paris 18-19 April 2008, Eds: Flipo & Schneider, Research & Degrowth, INT

## Annex

***EDSE (Economic degrowth for sustainability and equity) has been formally described by Research and degrowth in 2006, see [www.degrowth.net](http://www.degrowth.net)***

*De-growth can be described as a process involving:*

- a switch of cultural paradigm
- diverse personal and collective physical and economic processes at local and global levels
- less quantity, more quality
- democracy at all levels
- reduction of global imbalance and unfulfilling of basic needs
- avoidance of recession
- transition towards a sustainable society

*Achieving de-growth will also require innovation and understanding of global implications*

In general, de-growth is the state of that which "de-grows", i.e. reduces.

More specifically, de-growth presents two aspects:

1 - As a slogan which calls into question the consensus for growth (including economic growth).

It is a question then of a key word to defy, amongst other things, economicism (merchandisation of nature and human relations) and the growth fetish (the belief that any economy should increase the value of its exchanges and production to avoid crisis or disaster).

*The goal today is to launch a debate in society.*

2 - As a concrete and voluntary process toward a just *and* ecologically sustainable society. To expand:

De-growth represents a multitude of individual (voluntary simplicity) and collective steps, based on the reduction:

▮ of direct appropriation, or via intermediary products or services, of natural resources, i.e. of materials, energy and space (physical de-growth)

▮ of the capacity for appropriation of natural resources (economic de-growth). It is too risky that a capacity for appropriation of resources be transformed into an effective appropriation in the form of a “rebound effect”.

As a political project in the broad sense, de-growth is directed at individual, local, regional and world levels, and is understood at the same time as sustainable, balanced, democratic, convivial, ecological, social, positive, cultural, equitable, innovative, diversified, targeted, local, global and transitory.

Let us elaborate: sustainable (supportable) growth in a finite world leads us either to crises or general collapse, to a “modern feudalism”, with an increasingly smaller privileged minority continuing “to grow”, while misbelieving it will protect itself from crises, from environmental damage and from the poor majority. The idea of this intentional sustainable de-growth is to avoid these unbearable recessions and feudalism, while safeguarding human rights and ecosystems, through;

- balance (in harmonious proportion). To avoid crises, and so that no one is excluded, three processes must combine simultaneously: reduction of consumption (of the “desire to purchase”), reduction of production, and sharing (of work in particular);
- democracy (empowerment of all humans). Reorganization at various levels of society and sharing require more democracy: more participatory and more direct.
- conviviality (taking account the interests of others as much as one’s own), ecological (respect for ecosystems), social (respect between humans), positive, cultural (...) Physical and economic de-growth must leave space for many other growths (mainly qualitative): disinterested relations, time for oneself and for others, equity, minimal public services, health, human rights, women’s and minority rights, non-violence, human warmth, nature, security, art, perception of the world surrounding us, poetry, empathy and all this in large variety...
- equity (from the Latin *oequitas*, equality). It applies in the first place to the 20% most favoured of this world mainly based in industrialized countries, but concerns everyone when it is a question “of decolonizing the imaginary” linked to consumerist and productivist models. It is about a differentiated de-growth, in order to move towards a more just society in industrialized countries and universally;
- innovation (introducing novelties). It is about a questioning of the current situation (with for example motorways and nuclear power plants..), in order to live

with a minimum consumption of resources. Innovation thus integrates the concept of limits, rather than attempts at withdrawal. Innovations should be the object of democratic debates and can be refused if they suppress ethical or ecological limits (as may be the case with GMOs, nuclear, arms, nanotechnologies, cloning, etc...).

- diversification. The goal of de-growth is to reach a sustainable society where each lifestyle is unique, while being potentially generalizable. The urgency and gravity of our eco-social problems implies steps with diverse scopes and time frames. Diversity also includes ideological or spiritual beliefs or non-beliefs, without any one being favoured;
- targeted intervention. It does not imply de-growth on all levels taken separately. Instead sustainable alternatives (for example organic agriculture, renewable energy, or sustainable transport (bicycles, public transport...)) should grow, but by creating a greater reduction of the unsustainable portions of the economy (e.g.: chemical agriculture, nuclear or fossil fuel energy, automobile or air transport...);
- local and global foci. Based on open local economies (“neo-localism”) with local diversity of cultures, but including understanding at higher and global levels. For this reason local de-growth which involves growth elsewhere, or in the future, is not de-growth;
- transition. De-growth constitutes a stage toward a sustainable, just, ecologically lasting, democratic, participative, responsive to human needs, localised, everywhere culturally, ecologically and ethnically diverse, global, open society - whose capacity of appropriation of natural resources is stabilized on a viable level which allows their renewal. This sustainable society constitutes a “realizable, renewable, constantly renewing Utopia”, whose specific characteristics are readjusted repeatedly.