

## WHY ENERGY USE LIMITATION SHOULD GO HAND IN HAND WITH ENSURING SUSTAINABLE ENERGY FOR ALL?

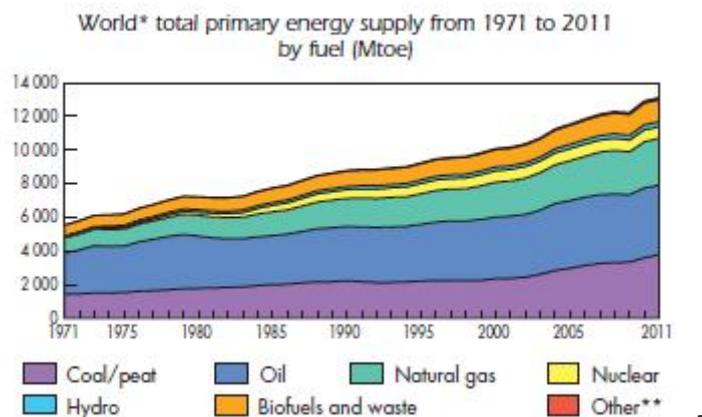
### THE INTERTWINNED CRISES

Since the beginning of the economic crisis it has been widely discussed by prominent economists and ecologists<sup>1</sup> that the social, economic and environmental crises are clearly interrelated. We are currently at a time of increasing resource use, accelerating energy prices, carbon constraints, intense competition for resources and markets as well as increasing inequalities and social challenges. Just as the depletion of natural capital introduces new and exacerbates old socioeconomic challenges, slow economic development<sup>2</sup> and weakened social cohesion reduce the political and fiscal space needed for robust, creative responses to regional and global ecological challenges. Governments everywhere face difficult tasks of doing more with less. Economic growth and unsustainable consumption and production patterns are the main drivers or the root causes of rising global resource demand. This,— in combination with climate change—could lead to increasing pressure on the so called ecosystem or natural services<sup>3</sup> all humans are dependent on. Hence, more and more argue, that **deeper changes are urgently needed**<sup>4</sup>. We also need to move beyond the perception that sustainable development will decrease our quality of life. It is possible to imagine high quality of life and healthier societies in a sustainable future, where planetary boundaries are recognized.

Many think that the MDGs did not adequately take into account the sustainability of human development gains. The MDG framework largely omitted environment, energy and natural capital. In the post-MDG development agenda, all countries need to **effectively address issues such as sustainable consumption and production using policies and measures that go beyond the current toolbox**.

### ENERGY USE AND ITS ENVIRONMENTAL PRESSURE

While an unusually stable global environment has been the precondition for unprecedented human development over the last ten thousand years, this stability is now under threat from human activity. **Most critically, energy consumption has skyrocketed owing to consumption and urbanization patterns and economic growth**, resulting in record concentrations of CO<sub>2</sub> in the atmosphere and anthropogenic climate change.



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<sup>1</sup> Muhammed Yunus, Pavan Sukhdev, Ernst Ulrich von Weizsäcker, Dennis Meadows

<sup>2</sup> We use the term economic development instead of economic growth, since in a finite system such as the Earth the economy can not grow unlimitedly. At the same time development, which means being more complex, diversified and thus better to adapt to the changing environment, can be improved unlimited.

<sup>3</sup> Humankind benefits from a multitude of resources and processes that are supplied by ecosystems. Collectively, these benefits are known as ecosystem services and include products like clean drinking water and processes such as the decomposition of wastes.

<sup>4</sup> Building more inclusive, sustainable and prosperous societies in Europe and Central Asia – A common UN vision for the post-2015 development agenda

<sup>5</sup> Key World Energy Statistics, IEA, 2013. \* World includes international aviation and marine bunkers. \*\*Other includes geothermal, solar, wind, etc.

**Currently, 85 per cent of primary energy is fossil fuel based.** Use of fossil fuels accounts for 57 per cent of all anthropogenic GHG emissions, with CO<sub>2</sub> concentrations having exceeded 390 ppm, or 39 per cent above preindustrial levels, by the end of 2010.<sup>6</sup> Based on a business as usual scenario (current policies scenario), the world's energy demand will increase by 47 per cent by 2035, resulting in rising CO<sub>2</sub> concentrations and enhanced global warming.<sup>7</sup>

In a number of other areas beside climate change, damage to the global environment is reaching critical levels and further threatens to lead to irreversible changes in global ecosystems. Rockstrom and others<sup>10</sup> have identified interlinked planetary boundaries, and found that in some areas, including most prominently biodiversity beside global warming, boundaries have already been exceeded. There is also strong evidence for tipping points to exist for ocean acidification, the phosphorous cycle, and stratospheric ozone depletion, while in other areas, the impacts of environmental degradation may be limited to local and regional ecosystems<sup>11</sup>.

Overwhelmingly, these changes are driven by **the reliance on fossil fuels to power economic growth**, and by industrialized forms of agriculture, necessary to feed a growing and increasingly wealthy global population.<sup>14</sup> Therefore, **while ensuring access to sufficient energy in the “Global South”, energy use limitation should be put in place**, which would lead to an **economic transformation from fossil fuel-based system** to another more environmentally friendly model.

#### ENVIRONMENTAL PRESSURES AND ECONOMIC ACTIVITY

Environmentally Extended Input Output Analysis (EE-IOA) allows the environmental intensity (environmental pressure per monetary unit of output) of economic sectors to be compared. Based on a European survey using EE-IOA the electricity and the mainly intensive agriculture sectors<sup>15</sup> provide only 4 % of gross value added and 7 % of total employment of the EU25 economy but together emit 47 % and 57 % of GHG emissions and acidifying emissions, respectively. These sectors don't contribute significantly to the European economy, while having very high environmental pressure intensities (high pressure per euro of output). In contrast service industries, with the exception of transport, typically have low eco-intensities.<sup>16</sup> Hence a good option to achieve sustainable energy use is to turn **high environmental pressure intensity industries into low intensity ones**, which would also contribute to reduce the harmful impact the consumption of the “Global North” puts on the rest of the world. **Later in this paper we will show, which tools are most effective to support this transformation**

#### SOLUTIONS TILL NOW – TACKLING PROBLEMS FROM THE END OF THE PIPE

The social, economic and environmental crises are clearly interrelated. However, until now we have been focusing on problems within the established sectoral framework, developed separate solutions. We have continued to apply ‘end-of pipe’ solutions without tackling the drivers behind social, economic and environmental challenges. However, as drivers remain unchanged, they continuously regenerate the problems.

Developing Sustainable Development Goals **gives the momentum** to change this trend and has the potential to reveal the importance of applying holistic approaches instead of sectoral ones. It is crucial that the members of the Open Working Group on SDGs **look beyond the pressures and consider the driving forces behind them**. These driving forces are threefold:

- **Structural drivers** include production and consumption patterns as well as urban and spatial structures leading to environmental pressures such as pollution, habitat degradation or the

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<sup>6</sup> [http://srren.ipcc-wg3.de/report/IPCC\\_SRREN\\_Ch01.pdf](http://srren.ipcc-wg3.de/report/IPCC_SRREN_Ch01.pdf)

<sup>7</sup> IEA, World Energy Outlook, 2012.

<sup>10</sup> Planetary Boundaries: Exploring the Safe Operating Space for Humanity

<sup>11</sup> Nordhaus and others, 2012

<sup>14</sup> World Economic and Social Survey 2013

<sup>15</sup> The following studies clearly demonstrate that organic farming is better equipped to feed humanity now and well into the ever changing future:

- Organic agriculture and the global food supply – Badgley et al
- ORGANIC AGRICULTURE AND ENVIRONMENTAL STABILITY OF THE FOOD SUPPLY – Biggle et al
- Can organic agriculture feed the world? - Badgley & Perfecto

<sup>16</sup> Environmental pressures from European consumption and production - A study in integrated environmental and economic analysis

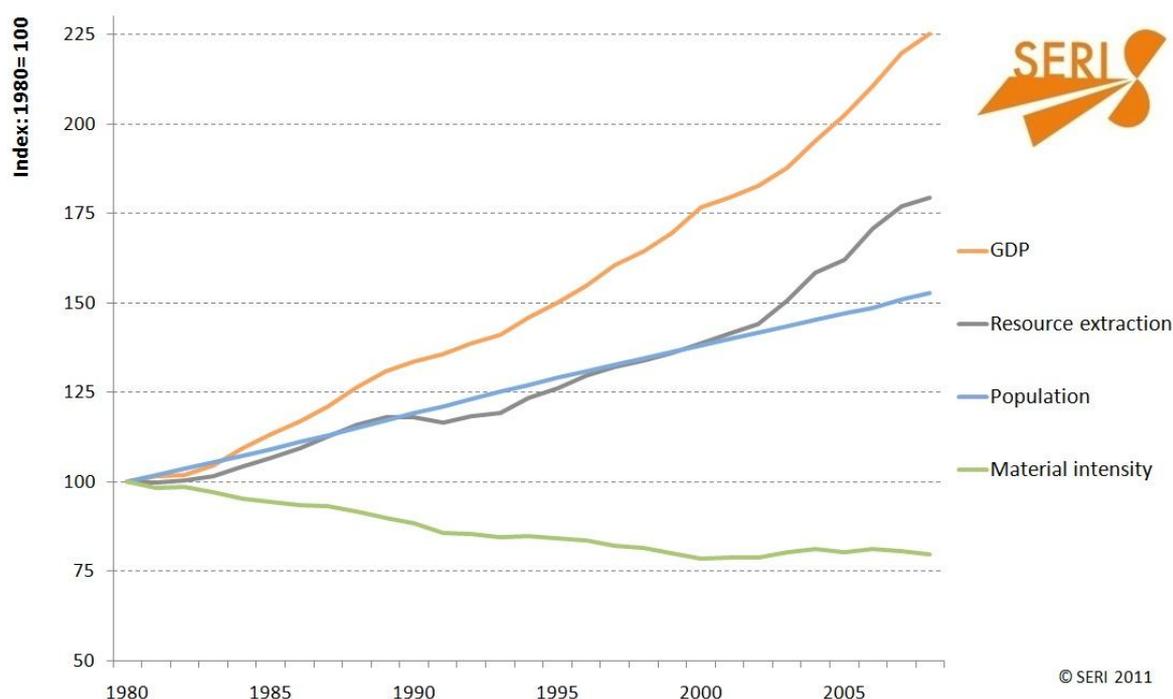
exploitation of natural resources. Besides creating environmental pressures, resource intensive production processes also require less human labor and thus increase unemployment.

- **Institutional drivers** determine the structural ones. These are the current legislative and economic regulatory frameworks, such as the national budget, economic regulations, the institutional structure, which enable energy intensive products and services to flourish due to unlimited access to cheap natural resources. Consequently, the loss of natural heritage is able to continue without any compensation.
- **Cultural drivers** provide the basis for the two above. These include our history, common beliefs, customs, behavior, etc. All of them are determined by societal values, of which by far the most dominant is the value placed on material wealth and the continuous growth of GDP. This is often at the expense of other values such as a healthy environment, family, community relationships or security. According to recent indices the more balanced people's values are (i.e. when values are taken into account equally), the happier they are. Societies with more balanced values would contribute to achieving a fair distribution of resources, which in turn would lead to greater global environmental and social equity. Ecological justice would also have a positive effect by cutting the ecological debt from the "north" to the "south", caused by centuries of social and economic exploitation.

### WHY ENHANCING ACCESS TO ENERGY, ENERGY EFFICIENCY AND RENEWABLE ENERGY USE ARE NOT ENOUGH TO PROVIDE SUSTAINABLE ENERGY FOR ALL?

Energy is central to sustainable development<sup>18</sup>. On one hand, it accelerates social and economic progress and enhances productivity; on the other hand it causes climate change, biodiversity loss, decline in ecosystem services and thus in human wellbeing, unemployment and other social challenges. Therefore, it is essential to ensure **both: the access to sufficient energy, as well as capping the use of unsustainable fossil fuels.**

Trends in global resource extraction, GDP and material intensity 1980-2008



The above graph shows that even though material intensity has been decreased, resource extraction has been accelerated worldwide causing environmental and social problems. This phenomenon is the so called relative decoupling and can be observed in the case of energy efficiency too due to the so-called **rebound effect**, which refers to the behavioral or other systemic responses to the introduction of new technologies that increase the efficiency of resource use. These responses tend to offset the beneficial effects of the new technology or other measures taken. Therefore, enhancing energy efficiency alone does not result in energy use reduction.

<sup>18</sup> TST Issue Brief: ENERGY

In order to reach sustainable levels of resource use, including energy the International Resource Panel developed its *Tough contraction and convergence* scenario.<sup>19</sup> This scenario requires far-reaching **absolute resource use decoupling and reductions** in the industrialized countries, by a factor of 3 to 5. Countries classified as ‘developing’ in the year 2000 would have to achieve 10–20% reductions in their average metabolic rates.

In light of the above facts the order of promoting energy related policies would be the following<sup>20</sup>:

### 1. energy saving

Saving in this case means saving over and beyond technical and technological efficiency solutions – or to put it simple: it is the energy saved by not using it at all. These occur when someone uses less energy (e.g. reduces car use) either due to conviction or enforced by the regulatory system. Wasting energy is not an inherent characteristic of people, but it is embedded in their habits when they buy goods, or when they use services. For this reason, it is important to have a regulatory instrument that clearly indicates the right set and weight of values, and which ensures that the proper consumer behaviour is rewarded.

### 2. energy efficiency

When the full potential of energy saving has been used, further opportunity is given by energy efficiency. The potential of efficiency is huge. Efficiency needs to be improved over the entire lifespan of energy resources, beginning with the exploitation of primary energy resources through burning or transforming, transporting, as well as the end use. The rate of efficiency can be improved by developing more efficient tools for the whole lifespan or by enhancing the grid itself, including right setup, control and distribution of grid elements, as well as by creating smart grids. New technological and social inventions and eco-businesses<sup>21</sup> will contribute towards catalyse energy efficiency, too.

### 3. energy substitution

Improving efficiency shall be followed by the substitution of non-renewable energy resource with renewables, but the knowledge for fully replacing non-renewable energy resources is still insufficient. Due to the availability of cheap non-renewable energy in the market, enhancing this knowledge has not been forced and due to the lack of high demand, the techniques of full substitution have not been developed either. However, as mentioned above, lower energy use will create better conditions for substitution. On the other hand using renewable, but depletable energy sources can be sustainable only with applying them with great precaution and respecting their regeneration time and needs. Therefore we do not recommend including industrial biomass utilization in the range of preferred energy resources.

The presently known substitution options are definitely inseparable from fossil energy use, since raw materials, their transportation, and most of energy generation related activities require their use. This situation will persist until sufficient amount of alternative energy is available, which is a strange paradox. When the cost of non-renewable energy is low, alternative resources are not competitive and thus not exploited. When non-renewable energy becomes expensive, alternative resources become competitive, but we will not be able to finance their exploitation. Therefore, strong state policies supporting the breakthrough of substituting resources and making them part of the system is inevitable.

## A HOLISTIC POLICY TOOL - WHY LIMITING ENERGY USE IS THE SOLUTION?

Analyzing the complex system of structural, institutional and cultural drivers, it becomes clear that introducing energy use cap would change their course. As a result of legally set limits, fewer natural resources would be used across the globe, which would lead to an increase in products and services with low energy and natural resource demand. At the same time human labour would become more competitive and more jobs would be created in different sectors such as agriculture, forestry or fishery. Moreover, people would start consuming less, appreciate more ecosystems, which deliver indispensable services for them, and thus material wealth would become relatively less important in their set of values.

Developing and implementing energy use cap worldwide would **not only contribute to achieve sustainable energy for all, but would contribute to achieve biodiversity, climate and employment related SDGs.**

## NON-RENEWABLE ENERGY ENTITLEMENT SCHEME

The proposed regulatory system is based on 3 + 1 pillars.

### ***Pillar 1: The Energy Entitlement***

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<sup>19</sup> Decoupling Report of UNEP's International Resource Panel

<sup>20</sup> Proposed Climate Change Act for Hungary based on energy quota system

<sup>21</sup> Climate-KIC, an EU-funded public-private innovation partnership focused on climate change, supports start-ups based on climate innovation and social change. <http://www.climate-kic.org>

The use of fossil and nuclear energy sources shall be reduced through direct savings, increasing efficiency, or shifting to renewable energy sources. An effective tool for realizing this reduction is the energy entitlement system. Energy consumption entitlements of annually decreasing quantities would be allocated among the individual consumers and public and private consumer groups. Those, who save a part of their allocated entitlements, can sell their remaining entitlements through the entitlement managing organization to those who have consumed more than their allocated consumption entitlement. The entitlement managing organization sells the entitlement in the national currency, and buys the remaining entitlement for entitlement money.

**Pillar 2: The Market for Environmental Goods and Services**

The market for environmental goods and services is an open market operating according to environmental and ethical rules including aspects of sustainability and market considerations. The entitlement money received from selling energy consumption entitlements could be exchanged to products in this ‘eco-labelled’ secondary market.

**Pillar 3: The Revolving Fund**

The Revolving Fund provides the opportunity for everyone, both energy producers and consumers, to be able to achieve savings through energy efficiency and renewable energy investments. The Revolving Fund provides interest free loan in entitlement money with a payback period adjusted to the energy savings or income generation realised through the investment.

**Pillar +1: Advisory Service**

The Advisory Service aims to provide advice on lifestyle, planning, social and environmental issues, as well as information on the functioning of the scheme to consumers.

**ENVIRONMENTAL, SOCIAL AND ECONOMIC BENEFITS OF THE ENERGY ENTITLEMENT SCHEME AND THEIR LINKS TO THE SDGs CLUSTERS <sup>22</sup>**

<b>Economic benefits</b>	<b>SDGs clusters:</b>
Reducing dependency on non-renewable energy through the reduction of their use,	<b>Conflict prevention related to energy resource scarcities and availability</b>
Increasing the competitiveness of businesses, as on one hand they become more efficient in the operation, and on the other hand they can develop more resource and energy efficient products for the global market,	<b>Sustained and inclusive economic growth</b>
Providing the necessary investment capital also for SMEs to invest in energy efficient operation, as well as to develop goods and services with high energy efficiency,	<b>Sustained and inclusive economic growth</b>
Providing the necessary investment capital for households to realise energy efficiency investments,	<b>Sustainable cities and human settlements</b>
Boosting the demand for energy efficient goods and services as a result of the entitlements,	<b>Sustainable consumption and production, Food security and Nutrition / Sustainable Agriculture</b>
Boosting the demand of environmentally friendly goods (e.g. organic products) and services through the use of entitlement money on the secondary market,	<b>Sustainable consumption and production, Food security and Nutrition / Sustainable Agriculture</b>
Freeing up funds from the state and international budget, such as ODA for other social purposes, as after the kickoff stage the revolving fund and the scheme	<b>Sustainable development financing</b>

<sup>22</sup> <http://sustainabledevelopment.un.org/index.php?menu=1565>

itself is fully maintained by the public and private consumers directly (no need for continuous expensive investments for energy efficiency from state budgets).	
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<b>Social benefits</b>	<b>SDGs clusters:</b>
Creating green jobs directly (in renewable energy and housing sectors, R&D, etc.)	<b>Employment, decent work and social inclusion</b>
Creating jobs indirectly in the more labour intensive sectors through the need to reduce nonrenewable energy use (as a substitution of human labour in production)	<b>Employment, decent work and social inclusion</b>
Reducing the expenses of households, especially of the poor (those consuming less energy)	<b>Employment, decent work and social inclusion</b>
Transforming values and consumer behaviour through creating personal interests with the entitlements	<b>Sustainable consumption and production, Food security and Nutrition / Sustainable Agriculture</b>
Greater access of consumers to environmentally friendly goods and services with the use of entitlement money, which contributes to wellbeing (in)directly.	<b>Sustainable consumption and production, Food security and Nutrition / Sustainable Agriculture, Employment, decent work and social inclusion</b>

<b>Environmental benefits</b>	<b>SDGs clusters:</b>
Radically reducing non-renewable (also fossil) energy use at a scale necessary to limit global warming to 2°	<b>Climate change,</b>
Effectively mitigating climate change with the use of an input side regulatory tool (which covers all sectors in the economy preventing carbon leakage),	<b>Climate change</b>
Indirectly reducing resource use through the reduction non-renewable energy use, a main environmental pressure leading ecosystem degradation and biodiversity loss.	<b>Forest and biodiversity, Desertification, land degradation and draught</b>

The detailed version on the Non-renewable energy entitlement scheme and how it can be implemented at EU level can be downloaded at: [http://www.ceeweb.org/wp-content/uploads/2012/03/non\\_renewable\\_energy\\_entitlement\\_RCC.pdf](http://www.ceeweb.org/wp-content/uploads/2012/03/non_renewable_energy_entitlement_RCC.pdf).

Due to the fact that humanity is now facing intertwined crises, which are driven by the reliance on fossil fuels to power economic growth, fundamental changes in international policy responses are urgently needed. Therefore, while ensuring access to sufficient energy in the “Global South”, **energy use limitation** should be put in place worldwide in line with the proposals of the *Tough contraction and convergence* scenario proposed by the UN International Resource Panel, which **would lead to an economic transformation from fossil fuel-based system to a sustainable model**.

Therefore, CEEweb urge the Steering Committee, Members and Contributors of the **Open Working Group to consider energy use limitation within the Energy SDG and use the proposed Non-renewable energy entitlement scheme** as the starting point for how the needed absolute reduction can be achieved globally with the view to implement.

**CEEweb for Biodiversity is a network of non-governmental organizations in the Central and Eastern European region. Our mission is the conservation of biodiversity through the promotion of sustainable development.**