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Pathways to an economy inside the planetary boundaries

Executive Summary

In order to preserve the natural habitats on which our livelihoods depend and to tackle the climate crisis, our society and economy must move towards a *«culture of sustainability»* and an *«economy within planetary boundaries»*. The primary goal is a *«good life for all»*.

This paper, *«Ways to an Economy within the Planetary Boundaries»*, shows what changes at systemic level can help the current and future generations of mankind to take this path.

This path can be divided into three: technical solutions to increase efficiency are important but are not sufficient. This is evidenced by past experience as well as the limits placed upon us by the laws of physics. This is why there is a need for additional measures to curb the demand for resource-intensive goods, whether by changes to general frameworks or by changes in individual behaviour. However, these measures will not be widely accepted unless simultaneous solutions are found in order to maintain current levels of social and economic development whilst reaching a higher level in developing countries and emerging economies in future.

What does this mean concretely? In this paper, WWF Switzerland specifies 11 spheres of activity that play a vital role in achieving the desired transformation. Successfully implemented examples show that the proposed ways are both feasible and practical. The 11 spheres of action are:

1 Introduce environmental taxes and abolish environmentally harmful subsidies
2 Introduce governance systems designed to lower emissions and resource consumption in the long term
3 Adjust financial and banking systems to have a positive impact on the environment and society
4 Establish equitable access to vital resources, pay fair prices for the use of resources
5 Strengthen the cohesion of society and reduce inequalities
6 Facilitate access to the legal system, create transparency and fight corruption
7 Introduce globally applicable regulations for a globalised economy
8 Expand infrastructures only insofar as necessary and only if they are environmentally friendly
9 Align corporate goals with sustainability and remove growth pressure from businesses
10 Adapt social security systems to function independent of economic growth
11 Develop progressive workplace practices and social lifestyles

About this paper

With this paper, WWF Switzerland would like to contribute to the debate on the future of our society in light of the growing challenges arising from how we deal with our environment. We do not claim to have all the answers, nor are we do actively work in all the aforementioned «spheres of action». Rather, we would like to incite an open dialogue – not only with our partners and interested members of the public, but also in those circles with very different views on how we should shape our future.

The paper intentionally keeps an eye on important social and economic contexts. Some would see the proposals made as forward-looking and visionary, whilst others would see them as utopian and naive. However, describing a vision and goals for an «ideal world» will help us to ask the right questions and identify ways that promise long-term success.

One thing is certainly clear: it cannot be done with a paper. It will only become a reality step by step in daily life, perhaps tomorrow, perhaps in ten or more years. This is what the WWF is already successfully doing every day: working with policymakers, business and people to develop, test and implement new solutions.

We see the paper as a living document that we will amend from time to time in line with current social debates and political developments.

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The consumption of resources, the destruction of natural habitats and the emission of pollutants have risen exponentially since the middle of the 20th century. The climate crisis, the deforestation of tropical forests and the plundering of the seas clearly show that we humans are destroying our own life-support systems by the way we live today. With an economy dependant on evergrowing material consumption, we have now reached the limits of our planet.

Yet what direction should economic and social development take from a global perspective? What should our goals be? WWF Switzerland advocates **"a good life for all within planetary boundaries"**. Good health, opportunities for personal development, participation in social and political life, and fulfilling work are more important than material wealth for many people once they have reached a minimum level that allows them to meet their basic needs. The essential focus of the Sustainable Development Goals (SDGs) of the United Nations (see Q13[1]) is on these aspects and they are also of crucial importance to the WWF.

In this paper on **"Ways to an Economy within Planetary Boundaries"**, WWF Switzerland describes how the paths leading to this goal might look.

Target framework for our economy: planetary boundaries and doughnut economy

The WWF uses two concepts that paraphrase the goal of a "good life for all" and make it measurable: planetary boundaries and the doughnut economy.

The concept of planetary boundaries (based on Johan Rockström, Q1) highlights the tipping points for nine environmental resources that are essential to life worldwide. If these limits are exceeded on a permanent basis over the long term, a safe life on Earth is no longer possible. Apart from climate change/climate system, other critical factors include changes in land use, the high levels of phosphorus and nitrogen into bodies of water and the overall availability of water.

[1]You will find all the information on sources marked 'Q' in the appendix to the document.

The model of the doughnut economy created by Kate Raworth (see figure on next page, right side of ring and Q2) serves as a framework for the economy of the future. Firstly, it defines minimum prosperity for all people (social foundation, dark green inner ring). This means prosperity in the wider sense, which includes the right to education or democratic participation. Secondly, it defines a maximum level of acceptable environmental impact in accordance with the concept of planetary boundaries (ecological ceiling, dark green outer ring). The light green ring between these two sets of requirements is the area in which the economy may develop. The goals of the doughnut economy are largely in line with the Sustainable Development Goals (SDGs) (Q13).

This target framework says nothing about the ways leading to these goals. The WWF outlines the possible ways in a **three-stage economic model** and with **11 spheres of activity.**

Three steps and 11 spheres of activity towards an economy within the limits of the planet

In order to stay within planetary boundaries (or to return to them), there is a need for **three steps** (see figure): **technical innovation (efficiency and consistency)**, measures at a **behavioural level (sufficiency)** and measures for the **protection of important social achievements (system innovation).**

Theory and empirical evidence show that measures designed to increase **efficiency** and **consistency** are not enough to remain within to planetary boundaries (see Appendix A1). Measures which facilitate **sufficiency** (sufficient behaviour) are also essential. These should lead to a decline in the overall consumption of energy and resources, whilst slowing down economic development and growth at the same time (see A1).

This is why we need solutions **to raise the standard of living to achieve a decent living conditions for all, whilst maintaining the existing standards for populations with strong social standards in the long term**, in an economy with little or no growth. Situations without economic growth will occur repeatedly, and not just because of limited resources. The levels of saturation in highly developed national economies slow economic growth, whilst crises such as the coronavirus epidemic even lead to economic slumps.

Measures in favour of **efficiency** and **sufficiency** would in principle be sufficient to offer adequate protection to the environment. However, they will never meet with acceptance unless additional solutions are found at the same time which maintain our standard of living and reach an accepted level of socio-economic security in developing countries. This is why the envisaged model also includes the **third, blue step to system innovation**.

What exactly do these three steps entail?

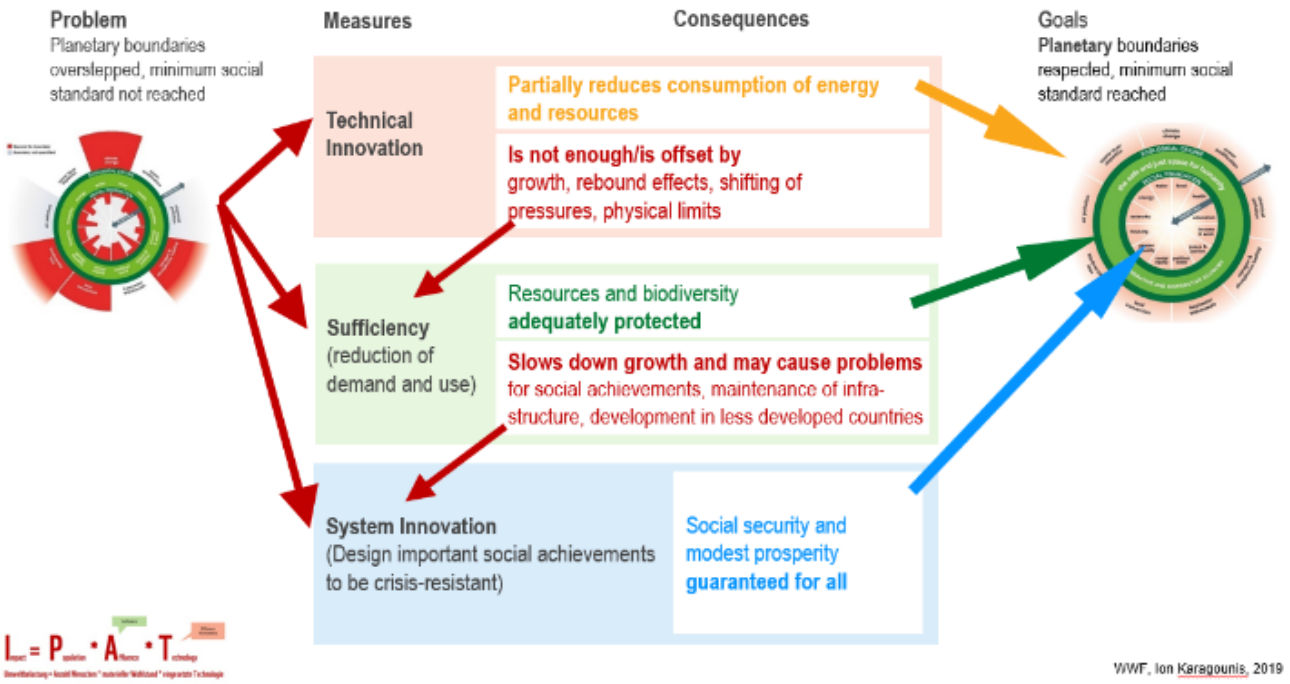
Technical innovation is needed in order to improve efficiency and design eco-friendly products and production processes. Entire socio-technical systems will be at the forefront in the future. It is not a matter of making an individual car somewhat more efficient, but of shaping the "mobility" system to be altogether more environmentally friendly.

Sufficiency: Changing political and financial frameworks as well as moderating individual consumption behaviour should ensure that the technical advances achieved do not turn into more production but are in fact used to stabilise or reduce the overall consumption of resources.

System innovation: This is a matter of safeguarding our social achievements and allowing the people of the world to share in them (social foundation in the doughnut economy). These can be divided into three groups as follows:

- Improved social security: Social security systems that function even when the economy is growing slowly or stagnating.
- Improved education, participation and transparency: Access to education and justice, and the opportunity to participate in political decision-making processes. Greater transparency is in these rights is needed here.
- More fairness: A fairer global system than is the case today where all people have access to resources and inequality in income and assets are reduced.

Based on these three steps, WWF Switzerland has defined **11 spheres of action** which require a fundamental development and realignment of economy and society (see next section).



1 | Introduce environmental taxes and abolish environmentally harmful subsidies

The problem: Anyone who causes damage to the environment or (over)uses resources today often does so free of charge or at very little cost. In a free market economy this leads to unjustified competitive advantages since environmental concerns often entail more time and effort and hence more cost. In addition, the costs of repairing damage to the environment are often met by the general public.

Possible solutions: Essentially, the solution consists in passing on the costs of environmental impact to the instigators (an individual, a firm). There is talk of internalizing external costs. The most important instrument to this end is the introduction of environmental taxes. Such taxes focus primarily on pollution caused by CO_2 emissions and energy consumption. In principle, however, this instrument can be applied wherever unwanted external costs exist. Ideally, such a taxation system would be introduced and coordinated worldwide, but it is just as important for individual States to take on a pioneering role in its implementation. Any potential drawbacks of environmental taxes can be minimised by means of a border tax adjustment.

The abolition of subsidies for practices that harm the environment is equally important. It is estimated, for example, that the extraction of fossil fuels worldwide is subsidised to the tune of 300 to 5300 billion dollars a year. In Switzerland, direct and indirect subsidies amount to 40 billion francs a year, causing damage to the landscape, the natural environment and biodiversity (Q15).

Status of implementation: The scientific community has a good understanding of the problem and there is wide acceptance of the main aspects of potential solutions. There are already individual forms of taxation in many states, but they are generally (much) too low to achieve the desired effect. To be sufficiently effective, a CO2 tax would have to be around 200 Swiss francs per tonne. However, there is a lack of political will and acceptance among the public for the introduction of an amount that would be effective. It may be helpful to introduce higher taxes incrementally, as is the case in Switzerland.

Successful examples: The introduction of the capacity-linked levy on heavy goods vehicles (Leistungsabhängige Schwerverkehrsabgabe - LSVA) in Switzerland has greatly reduced the number of empty journeys, whilst the introduction of the incentive tax on volatile organic compounds (VOC) has cut their use as solvents by around a third. Both measures have substantially relieved the burden on the environment. Another good example is Switzerland's CO2 tax on fuels, which currently stands at 96 francs per tonne CO2. The CO2 emissions generated by heating and industrial processes have decreased by around two per cent a year since the tax was introduced.

WWF activities: WWF Switzerland regularly campaigns for the introduction or increase of eco-taxes during legislative procedures, calling for the introduction of an airline ticket tax or of a CO2 tax on fuels similar to that on combustibles.

Key questions: How can we win over politicians and the public in favour of introducing taxation at a truly effective level?

How can we persuade individual sections of the population or sectors of the economy to agree to taxes or to the abolition of subsidies even if this will work to their disadvantage?

How can we introduce taxes at a global level in a coordinated fashion? Which influential countries or groups of countries would be prepared to play a pioneering role?

Problem relevant: globally and in Switzerland
Supports the implementation of following SDGs (Sustainable Development Goals of the United Nations, see Appendix 12):

The problem: The existing statutory provisions (bans, orders) and market economy-based steering mechanisms with strong price signals are not enough to attain the goal of an economy within planetary boundaries. The introduction of new or tighter provisions is usually politically controversial, however, and the tendency in an international context is a levelling down of requirements. On top of this, existing laws are inadequately implemented in many places. This is why the way in which policy-makers deal with major environmental problems – referred to as *governance* here – needs to be developed further.

Possible solutions: The management and careful handling of the environment and its resources should be depoliticised to a certain extent. Nevertheless, politicians still have important duties: They define goals, monitor whether these are achieved and, if necessary, demand compliance. In the same way, they define the essential features of the instruments that should be used (in which areas do we work with bans, in which with taxes?).

Instruments must be defined in greater detail and implemented more effectively than is the case today using knowledge-based approaches, with a long term perpectives and implemented independently of the politics of the day. Threshold values or the level of eco-taxes should be defined for the long term, they should be predictable and contingent on achieving the required effect. The implications of political decisions from all policy-making sectors should also be monitored in terms of their long-term effect on the environment (years, decades).

Possible strategies could include independent resource banks (by analogy with central banks), scientific advisory bodies or legally anchored resource consumption and emission controls or quotas. In addition, a periodic independent analysis of the effectiveness of existing instruments is recommended as well as creating an overview of areas where there is a systematic disregard for the basic principles of environmental protection (for example: where is the polluter pays principle systematically violated and how can this be changed?).

Successful examples: Other important areas of society already operate according to this principle today. Mention must be made of the central banks who assure the stability of the financial system largely independently of politics, or – specific to Switzerland – the debt limit, which ensures that the government does not spend more money than it earns over an economic cycle, regardless of political ambitions.

In terms of the environment, mention must be made of the Climate Change Committee (CCC) of Great Britain, which provides the government with independent advice on climate change and regularly reports to parliament on the progress made in the fight against climate change.

Status of implementation: The aforementioned problem analysis and the outlined solutions are available to WWF Switzerland at present.

Key questions: Are there any theoretical approaches that facilitate a more knowledge-based yet democratically legitimate control of resource consumption? Where is this being put into practice, and what lessons have been learnt from it?

Problem relevant: globally and in Switzerland
Supports the implementation of following SDGs:

The problem: Our financial and banking systems make it possible for funds to be swiftly supplied, moved and invested and are an essential prerequisite for our economy to function and grow. However, in their present form they are mostly blind to the effect of moving money around. It can be used for activities that both conserve and damage the environment. Little or no consideration is given to financial risks arising from activities harmful to the environment. Many financial institutions and institutional investors still see it as their sole objective to increase their assets without taking into account the effect of their investments on the environment and society.

Possible solutions: Solutions are feasible at a number of levels:

- Nationwide introduction of ESG (Environmental Social Governance) criteria for lending activity and risk assessment of investments. The risk term, which is limited primarily to business aspects and the market situation today, will thus be substantially extended and take into account the social relevance of corporate activity. The amount of interest can be differentiated at the same time, depending on the degree of risk taken.
- Increase in legally prescribed equity ratios which are based on a risk assessment of environmental impact caused by a company. This will make business dealings that are hazardous and harmful to the environment more expensive and less profitable. Higher equity ratios lead in principle to more careful business conduct, which slows things down and hence conserves resources.
- Both approaches require a consistent disclosure of sustainability risk.

Status of implementation: Awareness of the effect of money flows on the environment has increased in recent years. Accordingly, investment instruments have been created that take ESG criteria into consideration. Various evaluation and transparency systems are currently being developed, for example by the EU (green taxonomy) and other international working groups (TCFD, TNFD). There is still a lack of wide acceptance, however, and many questions remain as to methodology. In addition, there is still little discussion regarding the basic aspects of our financial system and its implications for the environment, for example the effect of interest rates (especially in what may be a prolonged period of negative interest), of financial market instruments or of financial firms that operate outside the banking system. The implications for the environment of the introduction of sovereign money systems are equally unclear.

Successful examples: Natixis, the investment bank of the French financial group BPCE, has developed a "green weighting factor". The factor corrects the analytical valuation of assets by the degree of sustainability achieved by the valued asset. Corrections of –24% to +50% are possible. Blackrock links the interest rate on loans to sustainability and diversity goals.

WWF activities: By reviewing financial institutions and doing political work, the WWF campaigns for the finance industry to incorporate the environmental implications of its activities into its risk assessments. It is developing instruments that make it easier to measure the influence of flows of capital on climate and biodiversity and is in dialogue with key stakeholders in the financial sector.

Key questions: How can financial institutions and investors be persuaded that they and their investment policies share a crucial responsibility for what happens with our environment?

Problem relevant: globally and in Switzerland
Supports the implementation of following SDGs:

4 | Establish equitable access to vital resources, pay fair prices for the use of resources

The problem: A significant proportion of people worldwide are still affected by poverty and do not have adequate and regulated access to vital resources (water, basic foodstuffs, sewage disposal, energy). Furthermore, these people have no access to other basic social amenities such as public health services, relief organisations or education.

Although the number of people in absolute poverty has steadily decreased over recent decades in relative and absolute terms, current projections in relation to poverty are rather pessimistic, not least due to the coronavirus crisis.

One consequence of poverty is that vital raw materials and goods are often procured by illegal methods that damage the environment (forest clearance, for example). The causes of poverty are varied; there is usually an absence of the basic preconditions that allow people to become self-sufficient and develop: no access to education, a lack of participation and a disregard for human rights. Gross failures on the part of government are usually behind this.

The absence of statutory regulations or enforcement also result in individual, often powerful companies obtaining access to raw materials or land without providing appropriate compensation for the local populace or the government. These firms and the countries behind them often procure raw materials that are scarce in their own countries (China, for example).

Possible solutions: Ostensibly, the conventional means of fighting poverty that have proven their worth over decades are available: improved education, the advancement of girls and women, and an increase in opportunities for participation.

For this to succeed, there is a need for a system of government and a political culture that are centred around the well-being of their citizens and willing to promote social mobility. However, this understanding of statehood is absent in many autocratic regimes and in countries where family clans play an important role. The preconditions for this are also inadequate in democracies with poorly developed institutions.

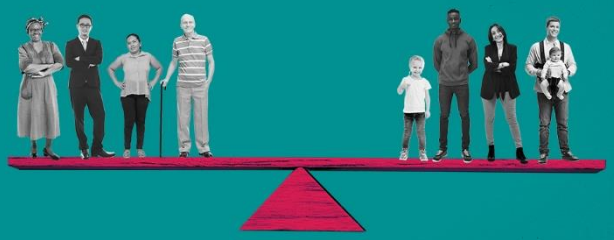
When it comes to the overuse of natural resources by companies, it must be ensured that licences are awarded in compliance with rule-of-law principles and that the companies pay fair compensation to local communities and licensers for the rights of use.

Successful examples: Barefoot College operates worldwide to promote the education of women who live in extremely poor regions. It teaches techniques that help to make everyday life more sustainable.

WWF activities: As part of its projects to promote renewable sources of energy, the WWF campaigns for poor segments of the population to have access to energy and other resources essential to life, for example in Madagascar, Tanzania and Uganda.

Problem relevant: mainly in countries in the Global South.
Supports the implementation of following SDGs:

5 | Strengthen the cohesion of society and reduce inequalities



The problem: There continues to be great inequality worldwide in terms of opportunities to develop as an individual or as a community. The greater the inequalities – between individuals as well as groups, regions and even countries – the greater the threat to social cohesion and the more difficult it becomes to find solutions to the major challenges of our time (climate crisis, food security, migration) that are accepted by all.

These inequalities are particularly marked in relation to material wealth (disposable income and assets), not only between different regions of the world but also within individual countries. There are three reasons why this can lead to an immoderate use of environmental resources that is not eco-friendly:

- People with above-average wealth or income lay claim to an above-average amount of resources. An Oxfam study in 2020 showed that the richest ten per cent of people account for half of all CO2 emissions.
- It is true that poor people use fewer resources, but this can still cause great damage to the local environment. In Madagascar, for example, the forest cover has fallen from 28% in the 1950s to 17% today because, among other things, people need the wood for cooking and heating.
- Economically poor and weak regions and countries often allow foreign companies or states to use an excessive amount of their natural resources in order to earn revenue. Their life-support systems are gradually being destroyed as a result.

Possible solutions: Irrespective of political stance, consideration must be given to greater distributional justice, both globally and in individual countries. The imbalance, which is progressively becoming worse, is increasingly regarded as a risk to the existing economic order even in spheres in favour of economic liberalism. Solutions at government level lie in the adjustment of taxation systems (progressive taxation, higher wealth and business taxes) and the prevention of tax avoidance. Also of central importance is the structuring of international trade policy and trade agreements.

Essential prerequisites are systems of government and politicians who put the well-being of their citizens ahead of staying in power and preserving their assets.

Successful examples: By adopting a social policy based on poverty relief and an economic policy focused on development, the Brazilian president Lula da Silva brought about a perceptible decrease in extreme poverty and hunger between 2003 and 2011 and developed Brazil into a regional power. The rate of deforestation in the Amazon was massively reduced at the same time.

Problem relevant: globally.
Supports the implementation of following SDGs: indirectly all related to the environment, as well as

6 | Facilitate access to the legal system, create transparency and fight corruption

The problem: Many projects that use public resources and damage the environment are launched and implemented in countries with less developed democracies. These projects are often launched without the knowledge or consent of the public or those directly affected by them (local populace, landowners). In many of these places there is also a lack of legal recourse to demand compliance with environmental laws, or it is too risky for individuals to take legal action. These problems are exacerbated often by corruption.

Possible solutions: More opportunities for civic participation need to be created in many countries, alongside reliable and independent legal systems. Local populations and civil society organisations who campaign for environmental protection and the rights of the affected people, must be granted unconditional access to legal recourse. Legal recourse must be introduced where it does not exist. The separation of power between politics and the judiciary must be put into effect. There is also a need for greater transparency in public and private schemes in which natural resources may be used or the environment may be adversely affected; corruption needs to be fought in the same way.

Status of implementation: The knowledge, processes and instruments required for functioning legal systems, the creation of transparency and the fight against corruption are in principle available and working. Progress in terms of implementation varies greatly worldwide, however. The prerequisite for implementation is a solid understanding of democratic processes and a legal system which is similar to those in democratically governed countries and underpinned, for example, by the Universal Declaration of Human Rights.

Successful examples: The Aarhus Convention came into force in 2001. It guarantees a citizen's access to information, participation in decision-making and justice in environmental matters. Forty-six countries, including Switzerland, have acceded to the convention.

WWF activities: The WWF has drawn up *social policies* and an *Environmental and Social Safeguard Framework* (ESSF) for its programmes and has duly trained all its employees. This should ensure that the WWF also respects the rights of people affected by WWF projects and involves them in the projects and any measures taken.

Key questions: People who live in democracies governed in compliance with rule-of-law principles see these systems as the best solution. It has long been the case that this view is not held everywhere, however. How can the debate on suitable forms of government and legal structures be held in countries and cultures that have completely different background experience? And how can people and institutions with a disproportionate amount of power at their disposal be persuaded to share that power with others?

Problem relevant: primarily in states with non-democratic systems of government

Supports the implementation of following SDG and all environment-related SDGs

7 | Introduce globally applicable regulations for a globalised economy

The problem: Laws to protect the environment and resources differ from country to country. As a rule, they are stricter in more highly developed economies than in other countries. In a globalised economy, the effect of this is that the extraction of resources and the production of goods causing harm to the environment often take place in countries with weaker laws as it is cheaper to do so. Efforts to harmonise laws at international level often result in the lowest standards being enforced.

Possible solutions: Solutions may take the form of international environmental agreements as well as bilateral and multilateral trade agreements. Sufficiently strict internationally binding environmental agreements under the umbrella of the United Nations are virtually impossible to enter into today because there needs to be agreement among all states as to their central elements (climate agreement, for example). One possible way out is for a sufficiently high number of relevant actors to lead the way by pushing through strict requirements on a voluntary basis (coalition of the willing). Minimum ecological and social standards should also be adopted in international trade agreements, or agreements must be structured in such a way that trade restrictions are possible on ecological and social grounds. This applies in particular to WTO rules. Global companies should also be made globally responsible for compliance with globally applicable standards and liabilities.

Status of implementation and successful examples: There are examples of international rules achieving success (Montreal Protocol to protect the ozone layer, Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal), but there are others where inadequate progress has been made (climate agreement, agreement on biodiversity).

There are signs that the adoption of ecological criteria in trade agreements is becoming socially acceptable. For the first time ever, environmental provisions have been incorporated into the trade partnership agreement between EFTA states and Indonesia (EFTA states are only allowed to import palm oil that meets minimum standards in terms of sustainability). Switzerland signed the agreement in March 2021.

In the same way, various European states are making sure that their multinationals discharge their legal obligations: Germany approved the Supply Chain Act in February 2021. Following the rejection of the Responsible Business Initiative, Switzerland introduced mandatory reporting for large companies, although this promises to have little effect in its present form.

WWF activities: The WWF network has delegations of experts involved in international negotiations and has initiated and co-developed various internationally recognised minimum standards (e.g. for palm oil, soya) or FSC. It campaigns for these to be enhanced in line with new requirements.

Key questions: How can it be ensured that states or companies who are willing to pioneer the introduction of progressive rules are not economically disadvantaged? What can be done to prevent standards from being watered down so that they are accepted by all stakeholders?

Problem relevant: globally and in Switzerland
Supports the implementation of following SDGs:
indirectly most SDGs

The problem: Good infrastructures for mobility and the supply and disposal of energy, water and other resources are one of the basic prerequisites for regions and countries to develop. At the same time, major physical infrastructure projects lead to the large-scale destruction and fragmentation of natural habitats. Forced relocations or impeded access to grazing land and forest can have dramatic consequences for the local population. What happened in Europe and North America in the 19th and 20th centuries is now happening in Africa, Asia and Latin America.

A particular problem with infrastructure projects is that they are designed with a long lifespan (often 50 to 100 years). This can hinder the transition to new technologies because existing infrastructures would lose a lot of value if demolished prematurely. Example: the move away from gas leaves behind pipelines that are no longer required.

Possible solutions: The following criteria should be applied to the construction of new infrastructures:

- Only build essential infrastructures of modest dimensions; weigh up centralised vs. decentralised solutions (decentralised energy supply systems tend to be more eco-friendly); examine alternatives (teleworking instead of new roads)
- There should be no infrastructure projects in ecologically valuable areas and conservation areas (no-go areas)
- Minimise negative impacts on natural habitats, biodiversity and climate during construction work
- Renature land lost during construction or compensate for it elsewhere
- Infrastructure for the extraction or transport of non-sustainable materials or technologies should no longer be built. This applies in particular to fossil fuels.
- Local people and those affected by construction work must be involved in the decision-making process and their fundamental rights must be guaranteed. Indigenous people must be given the right to free, prior and informed consent (FPIC).

Status of implementation and successful examples: Various initiatives support the ecologically considerate construction of infrastructures, for example the Sure Standard for Sustainable and Resilient Infrastructures or the Green Belt and Road Initiative Center, which aims to develop a new and greener Silk Road. No-go areas are protected in a selective manner by means of statutory provisions in individual countries, private enterprise standards and successful protests by civil society.

WWF activities: Among other things, the WWF was involved in the development of the Sure Standard. With its report «Ein Netz für die Biodiversität» (A Network for Biodiversity) it illustrated how biodiversity can be better protected during infrastructure projects in Switzerland.

Key questions: What kinds of infrastructure are desirable in principle and are there alternative ways of satisfying the same needs with substantially fewer resources? Digitalisation could do a lot of good. By way of example, digitally controlled driving systems can massively reduce the demand for land for roads because it is possible to reduce separation distances.

Problem relevant: in emerging and developing countries in particular as there is still substantially less infrastructure here
Supports the implementation of following SDGs:

9 | Align corporate goals with sustainability and remove growth pressure from businesses

The problem: Most companies operate with a view to expand. This applies in particular to listed companies as they are under pressure to return the highest possible profit for their shareholders. Pressure from competitors also call for expansion. Subsequently, businesses place an extra burden on the environment. This is a sensitive issue: more efficient processes generally lead to an increase in production, which often cancels out efforts to protect the environment by conserving resources (see A1.2)

Possible solutions: There are essentially three lines of attack to counter these trends:

- *Internal measures:* A company is basically free to align its corporate aims and business models more closely with adherence to planetary boundaries and to give them the same or more weight than profit targets. It may be helpful to choose a corporate structure appropriate to these aims (e.g. setting up a cooperative instead of a public limited company). A company can also draw on a reporting system geared towards long-term goals (instead of quarterly reporting) and adapt the reimbursement systems for their employees. Its accounting system can also optionally take external environmental costs into consideration and put a price on them.
- *Criteria for financing:* Lending institutions may demand compliance with specific ecological or social criteria (ESG criteria) before granting loans or impose a risk premium for business models with the potential to damage the environment. Investors can use various *impact investment* instruments to finance only those companies that are committed to sustainable goals.
- *Legal frameworks:* Frameworks may likewise be changed in such a way that achieving the biggest possible profit in the short term is no longer the sole object of an enterprise. An example of how this can be achieved is by rules requiring compliance with ESG criteria or by equity regulations. The bigger the risk to the climate and biodiversity arising from a company, the higher the equity ratio would be. Adapting regulations for compensation systems is another possibility.

Status of implementation: Businesses are becoming increasingly aware that they need to do more to move the economy towards planetary boundaries. However, many of them still rely on measures to increase efficiency. By contrast, it is difficult to conduct a debate with enterprises about realigning business goals or deliberately forgoing sales.

Successful examples: Many companies now rely completely on eco-friendly, socially responsible raw materials and products (e.g. Alnatura supermarkets or the mail order organic clothing firm Hessnatur), whilst others provide comprehensive repair and return services, even though this reduces turnover (outdoor products manufacturer Patagonia).

WWF activities: WWF Switzerland collaborates with large companies on an ongoing basis with the aim of boosting their ambitions with regard to sustainable development. This includes the application of *science-based targets* and assistance with the development of new business models.

Key questions: What factors trigger the pressure to grow on companies?

Can a company escape the pressure to grow by its own efforts or is there a need for mandatory changes to legal frameworks?

How can a company escape the pressure to grow in a competitive environment? How does a company gain if it escapes the pressure to grow?

Problem relevant: globally and in Switzerland
Supports the implementation of following SDGs: indirectly most SDGs, primarily those related to the environment

The problem in industrialised nations: Maintaining ever higher levels of prosperity, longer life expectancy, advances in medicine and a growing population in turn lead to ever-increasing pressure on social systems (retirement provision, public health services, social welfare etc.) particularly in highly developed countries. The present system means that the economy has to grow continuously in order to provide the necessary funds.

When the cake stops growing, however, and everyone needs a fair slice, then it is obvious that those with an above-average level of security must be content with less. However, there is little willingness to downgrade, let alone a modest redistribution at a high level. This is evident from discussions around the conversion rates for pension funds or the AHV pension age in Switzerland.

Possible solutions: Approaches such as non-monetary benefits are being discussed in order to be able to meet the demand. One example is time credits in the case of retirement provision: a person receives support services corresponding to public services that they have performed for free over the course of their life. The basis on which pension entitlements and insurance payments should be calculated must also be questioned. Today it is based mainly on earned income. This discriminates against people who have no, or hardly any, gainful employment

Successful examples: The "Betreuungsleistungen gegen Zeitguthaben" (support services against time credits) model is being trialled in at least 30 locations in Switzerland, where it is implemented by the KISS (fondation-kiss.ch) and Zeitvorsorge (www.zeitvorsorge.ch) foundations.

The problem in countries in the Global South: The initial situation is quite different in countries in the Global South, where in many countries the first step is setting up a social security system.

Possible solutions: Spheres of activity 4 and 5 come back into play here: it is important to secure access to vital resources and dismantle inequalities inside the countries and the world regions. Only in this way will it be possible to provide sufficient ressources to allow the economies in the Global South and its people to develop a decent standard of living and social security. There need to be fairer prices for the products we buy from developing countries, and a political culture and system of government in the countries themselves that prioritise the well-being of their population.

A further solution being discussed is the introduction of a universal basic income, primarily for people living in acute poverty. The idea behind this is that there will be too many people and too little work in the future due to population growth and technological advances. There is a great danger that poverty will become a permanent state, above all for sections of the population or countries already affected by poverty today.

Successful examples: The American non-profit organisation GiveDirectly supports around 21,000 people in different Kenyan villages with a monthly universal basic income of just over 20 Swiss francs. Its impact is to be investigated as part of a worldwide study.

Status of implementation: Many tests are already taking place on a smaller scale. In order to move away from the often ideologically dominated discussions, these tests must be expanded in the coming years.

Problem relevant: globally and in Switzerland
Supports the implementation of following SDGs: and indirectly those related to the environment

11 | Develop progressive workplace practices and lifestyles

The problem: People who have an above-average income (through work income or assets) place an above-average burden on the environment (see sphere of activity 5). At the same time, more and more people in more developed economies are suffering under increasing pressure placed on them at work (both in terms of time as well as the requirements of the job itself). Mental illness is on the rise as a result. There are also other illnesses typical of highly developed civilisations, such as cardiac and circulatory diseases or diabetes.

A gulf is also opening up between people who have a lot of – or too much – work and those who have none at all, and there are plenty of occupations in which even full-time workers barely earn enough to support themselves. These include the hospitality and retail sectors as well as nursing and cleaning jobs.

The unequal distribution of roles and tasks between men and women continues to accentuate the problems described.

Possible solutions: The way in which people in highly developed economies work and how work is rewarded will have to undergo fundamental changes in the coming decades. Two aims should be at the forefront here: firstly, to ensure a living wage for all, and secondly, to minimise the negative impact on the environment of (too much) work. Doing less paid work and escaping some of the stress in their lives is a potential alternative for people who have sufficient income to support themselves. The time gained can be used to engage with the community and volunteer for jobs that are not marketable.

Employers play an important role here: they must become more open towards part-time work, especially with management staff and in occupations where this is still far from the norm.

A redistribution of the tax burden in favour of an ecological tax reform ("tax energy instead of income") could significantly reduce the tax burden for people on a very low wage.

Status of implementation: What has been described as a desirable development is already under way. The hours worked per employed person have steadily decreased over the last 20 years in Switzerland, from around 1600 hours a year in 1998 to around 1460 hours in 2018. An increase in part-time work, among men too, and longer holidays account for this.

Key questions: How can we persuade policy makers and businesses to discuss the issue of future work models beyond existing ideologies and to test potential solutions without reservations?

How can the prestige and acceptance of part-time work and unpaid work be increased?

What mechanisms can be used in low-wage industries to guarantee living wages?

Would it be right to pay wages for unpaid activities such as housework? And what role could a universal basic income play?

Problem relevant: mainly in well-developed countries and people with above-average wages. In developing and emerging countries it is a matter of first creating opportunities to earn a living (see spheres of activity 4, 5 and 10).
Supports the implementation of following SDGs: and indirectly those related to the environment

Key factors for implementation

Existing economic systems and regulations are based on standards and values that have evolved over the centuries. They have moved sharply in the direction of a «culture of growth» during the rapid economic development of recent decades and nearly every area of life is now highly economised.

A «culture of sustainability» is desirable for the future (Q12). Without it, there will be a lack of understanding of the spheres of action in the previous section. A «culture of sustainability» cannot be decreed, however; it will need to evolve gradually. The following aspects are important on the way to this transformation:

- **Support changing values with education and communication**
  What makes us satisfied and happy? What constitutes a "good life"? Good health, family, friends and a fulfilling job are at the forefront for many people. Income plays a lesser role, at least above a certain level of income that allows basic needs to be met. Education and communication provide good opportunities to reflect on our value system and develop it further.
- **Extend innovation funding to social and systemic projects**
  When we talk about innovation and innovation funding today, most people think of technical progress, new products and more efficient production processes. However, the development of our social and economic systems is just as important – and funding should be used for this purpose too.
- **Increase cooperation to solve global problems**
  Whilst competition, rivalry and patent protection can promote innovation, they often prevent optimal ecological solutions from being put into practice or the available solutions are introduced over a wide area. When it comes to solving complex problems or speed is required, cooperation is essential.
- **Success is more than a high GDP: do a comprehensive assessment of social development**
  Gross domestic product (GDP) is often the only criterion for judging whether a country is in a good or bad state. Yet GDP only measures economic performance. It would be more helpful to choose an indicator that can be used for a more comprehensive assessment of development: apart from economic value added, these include the well-being of people and their opportunities for development as well as the state of the environment. Corresponding goals must be defined so that these can be measured in a meaningful way, as with the Sustainable Development Goals (SDGs) for example.
- **Digitalisation**
  Digitalisation will shape the economy and our lives markedly over the coming years. It can impact the environment both positively and negatively. Its use must be targeted in such a way as to relieve the pressure on natural resources and contribute to social progress.

Appendix

A1 Learn from the past

A1.1 Scarce and abundant resources:

A look at the history of economic progress

Until the start of the Industrial Revolution in the 19th century, most people lived in poverty and lacked many vital resources. The resources were there but people were not yet capable of exploiting them over a large area. The only exception was woodland, which people cut down on a large scale in order to produce energy. People lived in an economy of scarcity.

The process of industrialisation suddenly made it possible to use natural resources on a massive scale and at very low cost, especially fossil fuels (coal, oil gas). Many resources have been available cheaply and in abundance ever since, at least in developed countries.

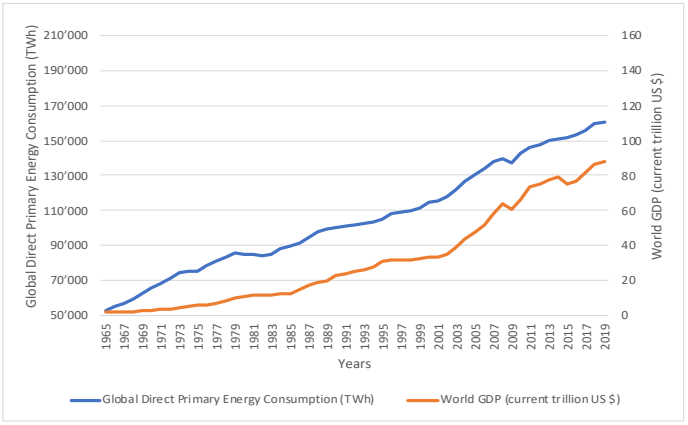
Today a large section of humanity lives in an economy of abundance and our economic systems – be it market economy or planned economy – are based on being able to use the resources more or less indefinitely. It has long been recognised that this can lead in some regions to resources being limited or overused, or to serious pollution, and some countermeasures have been taken with varying degrees of success.

What's new, however, is that in future important or system-relevant resources and sinks for pollutants (emissions) will no longer be available in abundance from a global perspective, because there are not enough of them or because we have to limit them by artificial means, as with CO_2 emissions. Once again, therefore, we will head into a period of limited resources and sinks, but for different reasons than before the era of industrialisation. We will live in an era of an economy limited by the planetary boundaries.

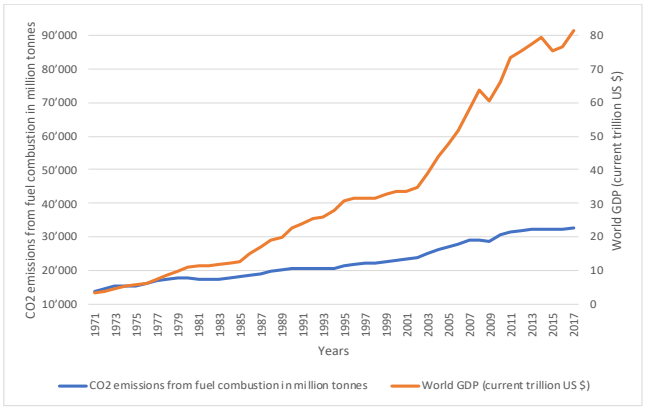
A1.2 Gigantic technical advances,

limited positive effects on the environment

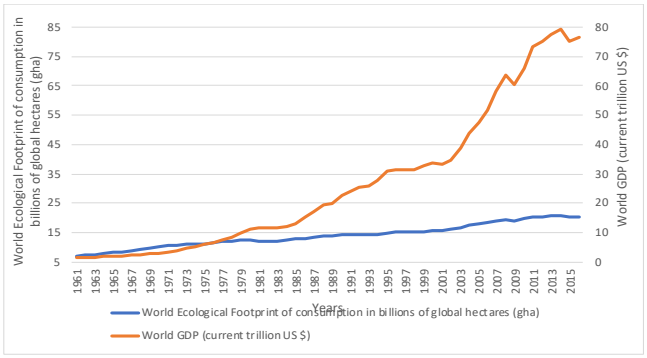
The industrial production of most goods has become (hugely) more efficient over the course of recent decades, as have the services that the products provide. Despite these advances, a marked improvement in the environmental situation and the stabilisation of resource consumption in some world regions, we have not succeeded in recent decades from a global perspective in capping, or even reducing, resource consumption and the resulting environmental impact. On the contrary: the consumption of energy has risen in parallel with economic growth (see graphs and source Q3). The consumption of other resources and emissions have also increased steadily, although less sharply. There has been, so to speak, a "relative" decoupling from economic performance. In order to effectively relieve the burden on the environment, however, there would need to be an "absolute" decoupling, i.e. the consumption of energy and resources would have to fall whilst economic output rises.



Global Direct Primary Energy Consumption (TWh) von Our World in Data gegenüber World GDP (current trillion US $) der Weltbank. (Global direct primary energy consumption does not take account of inefficiencies in fossil fuel production.)



CO_2 emissions from fuel combustion (in million tonnes) der International Energy Agency (IEA) gegenüber World GDP (current trillion US $) der Weltbank.



World Ecological Footprint of consumption in billions of global hectares (gha) des Global Footprint Networks gegenüber World GDP (current trillion US $) der Weltbank.

There are a number of reasons why the consumption of energy and resources and the associated environmental impact are not decreasing in spite of improved efficiency. They are referred to as "rebound effects" (Q4):

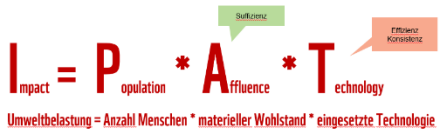
- Efficiency increases are offset by more production and consumption (Q5).
- Resource consumption is not reduced absolutely but shifted (to other world regions, other environmentally harmful materials, Q6).
- More and more people have an increasingly high standard of living and thus need more resources (Q7).

If there was a real desire to relieve the burden on the environment, then production and consumption would have to be maintained at the same level if efficiency increases.

Empirical observations show that we will not solve the problem of environmental impact with technical measures alone. Nevertheless, many people ask themselves whether things could look different in the future. This is unlikely for three reasons:

- There are physical limits to efficiency increase (Q8).
- Absolute decoupling does not seem to function at a global level (Q9).
- We are becoming less rather than more efficient in some areas, for example oil production (Q10).

Even a basic theoretical observation shows how difficult it is to attain environmental goals through technical measures alone. The IPAT formula shows this:



Environmental damage (Impact (I)) is the product of three factors: number of people (Population (P)), individual material wealth (Affluence (A)) and the efficiency with which this wealth is provided (Technology (T)). The product of P, A and T must remain constant in order to keep environmental impact constant. If P and A continue to rise – as is currently the case – T must fall (= efficiency increased) in order to offset the rise. This is exceptionally challenging and to some extent unfeasible as long as P and A rise at the same time, because there are physical limits to increasing efficiency.

Conclusion: Since technical solutions are not enough, it is also essential that people change their behaviour. The economy must develop in such a way that it can manage with substantially fewer material resources and hence lower material wealth per capita, above all in countries that are already highly developed. The number of people living on Earth certainly has an environmental impact too. However, the answer is not to actively limit population growth (birth control or such like), despite repeated calls to do so (see Q14 for more details).

A1.3 What system can handle limited resources?

As long as the economy grows, the consumption of resources and emissions increase (see Section A1.2). So the reverse is also true: the absence of resources or the deliberate regulation/restriction of resource consumption or harmful emissions will slow down economic development and hence growth.

This leads us to ask: how can our most important social achievements (social welfare, infrastructures, education, health care) be maintained and how can less developed regions of the world continue to make progress? Both of these have only been possible to date because we have been living in a steadily growing economy. In order to also make this possible in a limited economy, we need to refine present-day economic systems.

It's not simply a question of capitalism or socialism here. Rather, the question is how may our economy be developed in such a way that it can continue to function under completely different conditions (limited resources)? Neither the free market economy nor the planned economy has delivered satisfactory answers to date – but there are many approaches heading in the desired direction.

Approaches that provide for some kind of limitations on resources or emissions are particularly controversial – but what else can we do if the availability of a specific resource is limited? Should the strong and powerful prevail (those with more money receive more, right up to the point of violent conflict) or shall we strive for an intelligent and somewhat fairer system of distribution? Then we need control mechanisms, such as

- market-based instruments (taxes, certificate trading, subsidies etc.) or
- limits, consumption restrictions, bans.

To try and find differences between systems in these two categories is short-sighted. They are more closely interrelated than they appear at first glance. It is imperative to have a legal basis for market instruments as they do not adjust themselves. And some market-based instruments only work in combination with limits. The trading of CO_2 emissions permits, for example, only leads to a reduction in CO_2 emissions if a maximum level of CO_2 emissions is established by law.

A1.4 And what happens with growth?

An economy that massively reduces its resource consumption will grow less than today, or perhaps stop growing altogether. This is the global view. There are nevertheless areas of the economy in which growth is still possible or should even be promoted (Q11), for example:

- Education
- Recreational and leisure activities that take place locally and need few resources
- Renewable energy sector
- Sharing and second-hand economy

- Technologies that facilitate a circular economy
- Nature-based technologies and solutions
- Development of stable local economies in countries in the Global South.

In return, resource-intensive sectors must shrink. If humanity wishes to avoid using fossil fuels, then this sector must disappear. There will be no more extraction of coal, oil or gas – or at the most in small quantities for special purposes. There will not be any more transport pipelines or distribution infrastructure either.

The renewable energy sector will grow instead and people will make a living here. There technologies are already competitive today in comparison with the use of fossil fuels. Companies in the fossil fuel sector are capable of surviving – if they manage to switch their know-how in the supply of energy to renewable sources of energy in good time. If not, new companies will come along and do it.

Q Sources for important statements

Ref.	Statement/Subject	Evidence, links
Q1	Concept of planetary boundaries	• Video des BAFU: Die planetaren Belastbarkeitsgrenzen – und was sie für die Zukunft der Menschheit bedeuten • Video: Introduction of the Planetary Boundaries framework by Johan Rockström at TED Global 2010 • Website: Stockholm Resilience Centre • Website: A Good Life For All Within Planetary Boundaries
Q2	Model of doughnut economics based on Kate Raworth	• Website: Doughnut Economics • Video: Change the Goal • Video: A healthy economy should be designed to thrive, not grow • Website: Introducing the Amsterdam City Doughnut
Q3	Energy and resource consumption and CO_2 emissions develop in line with economic growth	• Zeitungsartikel: Wie sich Klima und Wachstum vertragen • Zeitungsartikel: Seit Beginn der Industrialisierung hat sich die Erde verstärkt erwärmt. Ist das der Preis des Wohlstands? • Bericht: Energieumwandlung, Entropieproduktion und Wirtschaftswachstum: Warum die ökosoziale Steuerreform notwendig ist
Q4	By rebound effect, we understand the fact that advances in efficiency are (partly) offset by more consumption	• Webseite Umwelt Bundesamt: Rebound-Effekte • Handbuch: Rebound-Effekte: Wie können sie effektiv begrenzt werden? • Video: Jevons Paradox & The Rebound Effect
Q5	Efficiency increases are offset by more production and consumption	• Report: Decoupling debunked • Video: Jevons Paradox & The Rebound Effect • Video: Rebound-Effekt - Interview mit Tilman Santarius • Bericht: Rebound-Effekte: Ihre Bedeutung für die Umweltpolitik • Bericht: Der Rebound-Effekt: Über die unerwünschten Folgen der erwünschten Energieeffizienz
Q6	Resource consumption is not reduced absolutely but shifted (to other world regions, other environmentally harmful materials)	• Bericht: Postwachstum- Krise, ökologische Grenzen und soziale Rechte • Report: Decoupling debunked • Webseite Deutsche Gesellschaft für die Vereinten Nationen e.V.: Ressourcenverbrauch: Ein gewaltiger „Fußabdruck“ schafft globale Probleme • Bericht: Globalisierung und die Verlagerung von Umweltbelastungen. Die Stoffströme des Handels der Europäischen Union – Welche Globalisierung ist zukunftsfähig?
Q7	More and more people have an increasingly high standard of living and thus need more resources	• Pressemitteilung der Bundesamt für Umwelt: Wer mehr verdient, lebt meist umweltschädlicher • Website Earth Overshoot Day: Countries Overshoot Days • Artikel: Wer mehr Geld hat, lebt umweltschädlicher • Artikel: Wohlstand: Ressourcenverbrauch unnötig hoch • Artikel: Reiche schädigen Klima stärker als Arme
Q8	There are physical limits to efficiency increase	• Bericht der Bundeszentrale für politische Bildung: "Das Anthropozän ist kein Schicksal, sondern eine Herausforderung" - Abschnitt Die Effizienzrevolution
Q9	Absolute decoupling does not work at global level	• Grafik: Der Mythos der Entkopplung

		• Report: Decoupling debunked, siehe insbesondere Kapitel Scale: Global or local • Webseite Peak-Oil.com: Kann ökonomisches Wachstum dauerhaft funktionieren? • Buch-Zusammenfassung: Wohlstand ohne Wachstum – Leben und Wirtschaften in einer endlichen Welt • Bericht: Wachstum und Umweltbelastung: Findet eine Entkopplung statt? • Webseite Deutsche Gesellschaft für die Vereinten Nationen e.V.: Ressourcenverbrauch: Ein gewaltiger „Fußabdruck“ schafft globale Probleme
Q10	We are becoming less rather than more efficient in some areas, for example oil production	• Video: EROI - Energy Return on Energy Investment Explained • Artikel: Kampf um Rohstoffe - Die Ära der Hochrisiko-Förderung beginnt • Bericht: Seltene Metalle. Rohstoffe für Zukunftstechnologien, siehe insbesondere Kapitel Eine rasante Entwicklung
Q11	Where growth is desirable and where it is undesirable from an environmental perspective	• Bericht: Ökologische Modernisierung der Wirtschaft durch eine moderne Umweltpolitik • Bericht: Ökologischer Strukturwandel und Weltumweltpolitik • Bericht: Wirtschaft, Wachstum und Umwelt. Skizze einer klimaverträglichen Schweizer Wirtschaft 2035
Q12	Culture of growth and culture of sustainability	• Bericht: Gesellschaftliches Wohlergehen innerhalb der planetaren Grenze • Video: A healthy economy should be designed to thrive, not grow - Kate Raworth • Webseite United Nation Development Program: Global Human Development Index • Video: What the Social Progress Index can reveal about your country • Webseite Social Progress Imperative: Global Index: Results • Bericht: Report by the Commission on the Measurement of Economic Performance and Social Progress • Webseiten Worl Economic Forum: Beyond GDP
Q13	Overview of the 17 SDGs	• Webseite Schweizerische Eidgenossenschaft: 17 Ziele für nachhaltige Entwicklung • Website United Nations: The 17 Goals • Website: Mapping of Sustainable Development Goals
Q14	Influence of population growth on the environment and possible measures	• Positionspapier des WWF Schweiz zur Frage des Bevölkerungswachstums: Bevölkerungswachstum: Die Diskussionsgrundlagen des WWF Schweiz
Q15	Examples of environmentally harmful subsidies	• Studie und Faktenblatt Forschungsanstalt WSL: Über 160 Subventionen schaden der Biodiversität in der Schweiz • Zukunftsblog, ETH Zürich: Subventionen für fossile Brennstoffe: Wie werden wir sie los? • Survey International Monetary Fund IMF: Counting the Cost of Energy Subsidies

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