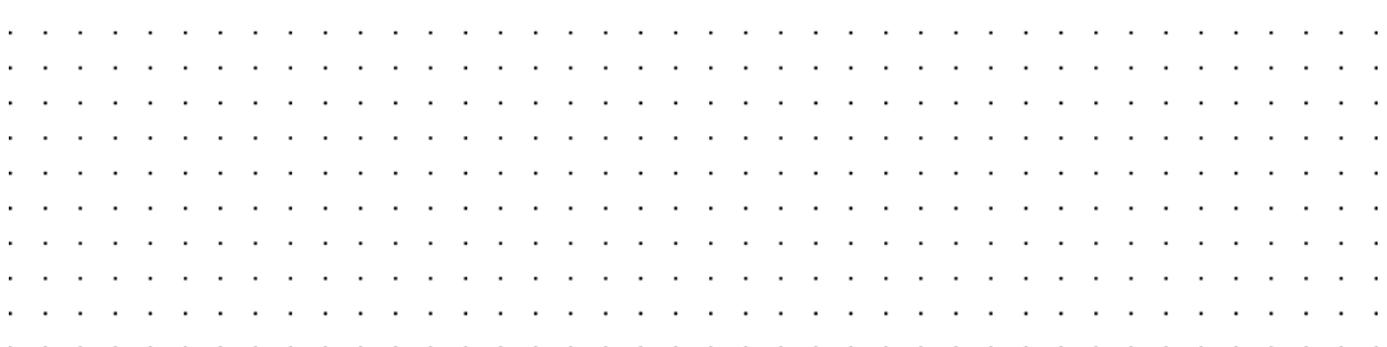


# REFF Swiss Resource Efficiency Project

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Background report on resource efficiency and raw materials use

Final report, January 2013



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The FOEN is an office of the Swiss Federal Department of the Environment, Transport, Energy and Communications (DETEC).

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In two sessions, the experts reviewed the approach, the identified areas of action and the orders of magnitude of the reduction potentials and then prioritised the instruments. This report reflects the assessment of the entire group of experts and authors, and not their individual assessments.

## **Cover photo**

Fotos: fotolia.com

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The study was written on behalf of the Federal Office of the Environment (FOEN). The agent is alone responsible for its content.

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# Summary

## Background and goals

In October 2010, the Federal Council commissioned the DETEC and other government departments to improve the framework for managing natural resources. Switzerland's resource efficiency project (REFF) establishes the required basic principles for this task and identifies the key areas of action where resource efficiency can be enhanced in Switzerland. This project has produced estimates for reduction potentials in each area of action and related the potential measures, policy instruments and priorities in the various areas of action.

## Areas of action

Analyses of the resources required by Switzerland's final demand and economy reveal areas where action can be taken to increase resource efficiency. These areas of action were derived from different perspectives:

- From the perspective of *Swiss final demand*, the areas of nutrition, housing and private mobility account for around 60% of all resource requirements.
- As far as the *Swiss economy* is concerned, resource requirements are distributed over several sectors. In line with the final demand figures, nutrition and the primary sector require a great deal of natural resources. Other areas with comparatively high resource requirements are the chemical industry, energy supply and building industry.
- Evaluations of the *materials and goods categories* indicate high resource requirements for metals and electricity production.

Many of the impacts associated with resource requirements in all areas of action arise outside of Switzerland. Therefore, measures to increase resource efficiency in Switzerland's final demand and economy may also have positive effects outside of Switzerland.

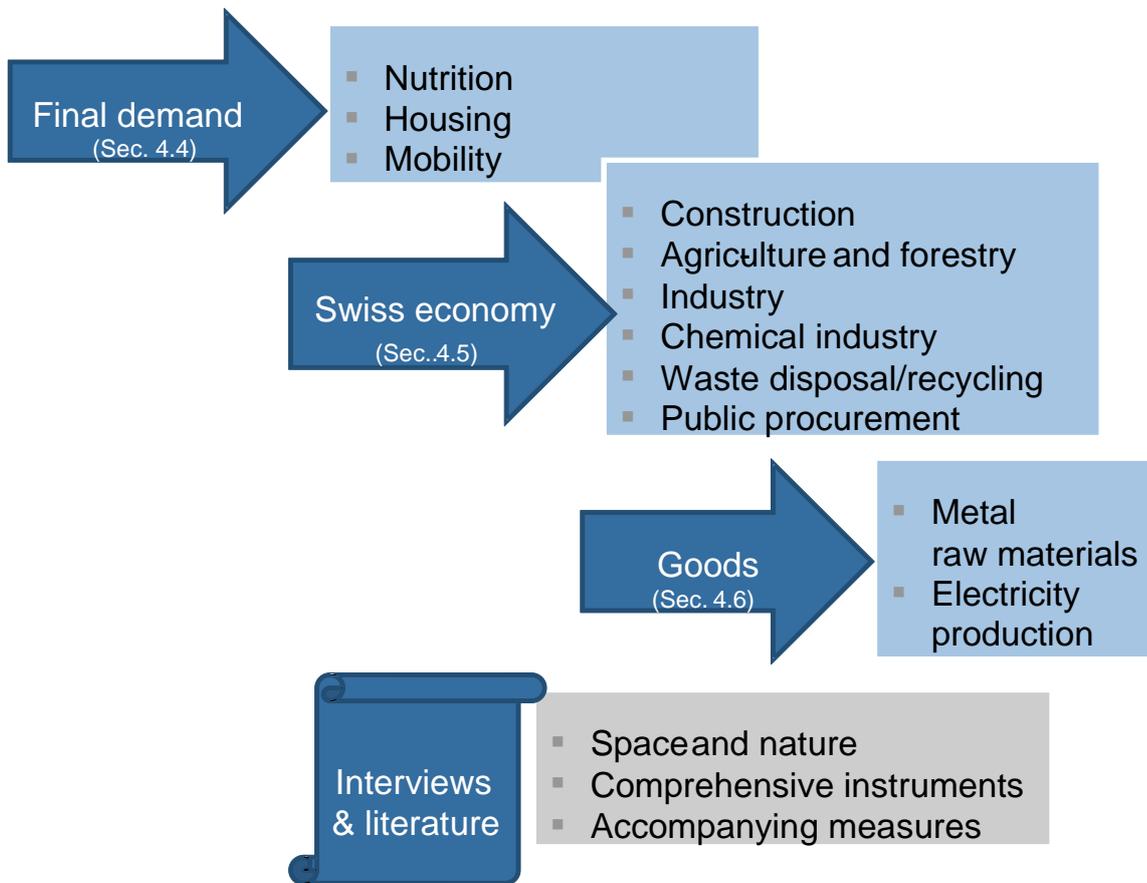


Figure I-1: Derivation of areas of action

### Reduction potentials

The areas of action reveal high reduction potentials. From the perspective of Switzerland's final demand, resource requirements translate into around 20 million eco-points (EP<sup>1</sup>) per capita and year. The reduction potentials estimated by specialist consultants, FOEN experts and authors amount to around 8 million EP per capita and year, as shown in the table below.

1) Eco-points are an approximate measure of resource requirements.

	Actual situation million EP/cap./a	Domestic Energy share	Actual situation million EP/cap./a without	Reduction potential % versus today	Reduction potential absolute in EP/cap./a
<b>Final demand</b>					
Nutrition	5.6	30%	3.9	45%	1.8
Housing	3.7	65%	1.3	40%	0.5
Mobility	2.4	80%	0.5	30%	0.1
<b>Reduction potential of consumption-related measures (without domestic energy consumption)</b>					<b>2.4</b>
<b>Domestic energy consumption</b>					
Energy-related environmental impact	8.4	100%		50%	4.2
<b>Reduction potential of additional production-related measures</b>					<b>4.2</b>
<b>Swiss economy</b>					
Remaining environmental impact after subtracting the reduction potential of final demand and domestic energy consumption	13.4*			10%	1.3
<b>Potentiel d'économie lié aux mesures sup-plémentaires portant sur la production</b>					<b>1.3</b>
<b>Total reduction potential, without energy-related measures</b>					<b>3.7</b>
<b>Total reduction potential including energy-related measures</b>					<b>7.9</b>

\* In order to avoid double counting and subtractions, the reduction potential related to final demand (2.3 million EP/cap./a) and domestic energy consumption (4.2 EP/cap./a) is subtracted from the total environmental impact of 20 million EP/cap./a.

Table I-1: Reduction potentials

This estimate is based on the following principles and assumptions:

- Reduction potentials range from 30% to 45% in the areas of nutrition, housing and private mobility.
- Based on the energy perspectives for 2050, we assume that energy-related environmental pollution can be reduced by roughly half, which means that the reduction potential is around 4.2 million EP.
- Reduction potentials are estimated at a total of 20%-35% for the six priority production-related areas of action. They should be corrected downward due to double counting (energy-related and consumption-related reduction) and factor in 10% for the remaining environmental impact caused by the Swiss economy.

As a result, reduction potentials from the perspective of final demand are generally higher than those from the perspective of the Swiss economy. This can be explained by the fact that consumption is also subject to changes in behaviour. It should be noted that less than half of the total environmental impacts are caused by domestic energy consumption.

**Is the goal of “one Earth by 2050” achievable?**

The “footprint 1” target is the metaphor for limiting resource requirements to naturally sustainable levels. This target is supposed to be achieved by 2050. According to calculations based on various methods, this means that resource requirements per capita must be reduced by 65% by 2050 from a statistical perspective (not including population and economic growth and rebound effects).

The reduction potentials we estimated (around 8 million EP) correspond to a 40% reduction, which is not enough to achieve resource requirement levels that will make possible to achieve the abovementioned target. In a dynamic view based on annual growth of 0.5%, resource efficiency would have to be increased by a factor of four by 2050, which is quite a substantial increase.

**Instruments and legal adaptations**

Measures and instruments were selected for each area of action to determine the areas and actors that could help steer efforts to achieve the reduction potentials in the respective areas of action. The importance of the reduction potential to each area of action was taken into account in the selection of the recommended instruments. However, while instruments were subjected to an initial economic and legal assessment, improving their content and estimating their political feasibility on the basis of current or past debates, for instance, were not part of the mandate.

Priority instruments address both final demand and production, but focus primarily on the entire value creation chain, from the extraction of raw materials to the use and disposal or recycling of products, in each case. Comprehensive instruments regarding resource taxes and accompanying measures are also considered important.

**Conclusions**

These analyses reveal that there is a pressing need to step up efforts to increase resource efficiency. In order to implement the necessary measures for Switzerland’s final demand and economy, long-term goals need to be quantified and additional incentives and requirements need to be set out in policy instruments. To that end, it is important for energy and climate policies to be closely coordinated, as they certainly have a great deal of influence on resource efficiency. Still, less than half of the total environmental impacts are caused by domestic energy consumption. Therefore, it is important for all measures and instruments to espouse a broader view that includes all natural resources, especially when it comes to shaping environmental tax reform. Indeed, other countries’ experiences have shown that accompanying

measures for resource efficiency, such as those of a communicative or institutional nature, are necessary to achieve the desired effect.



