

Case Study // Round Table SDG 12: Successful approaches to delivering on Sustainable Consumption and Production by 2030

Delivering on sustainable consumption and production: Phosphorous recovery and reuse from wastewater streams and separated organic fractions

Switzerland
Level: national

Summary

Switzerland has committed under the Batumi Initiative on Green Economy (BIG-E) to promote phosphorous recovery and reuse from wastewater. Guided by environmental and development policy considerations during the revision of the Technical Ordinance on Waste, the Swiss Federal Council introduced environmental standards to promote phosphorous recovery and reuse. As a result, Switzerland is the world's first country with compulsory phosphorus recovery and reuse from sewage sludge and separated organic fractions. The new regulation entered into force in 2016 with a transition period of 10 years for related technological development and adaptation of the existing infrastructure. The commitment will ensure long-term food production, increase of the lifespan of phosphorous, and minimise the environmental impacts from phosphorous extraction and processing.

Website: <http://www.greengrowthknowledge.org/big-e/switzerland-promote-phosphorous-recovery-and-reuse-wastewater>

Situation

Phosphorus is essential for the functioning of biological organisms, cells, plants and animals, and one of the main components of fertilizers. It is an essential element for food security, but a limited one.

Each year, Switzerland imports more than 6000 tonnes of fertilizer products already processed. Switzerland relies on phosphorus imports to cover the fertilizer needs of agriculture: 100% of phosphate fertilizers consumed in Swiss agriculture is imported. However, imported phosphate fertilizers do not always comply with the legal limit values. Depending on their origin, they are contaminated to varying degrees by heavy metals such as uranium and, especially, cadmium.

In 2015, the Federal Office of Agriculture (FOAG) carried out a market survey, which showed that almost half of the fertilizers analysed exceeded the limit values for pollutants. Heavy metals accumulate in soils, with adverse consequences for health and the environment.

Strategy

Switzerland could cover its phosphorus needs with recycling fertilizers from sewage sludge and animal meal; it would thus play a pioneering role in Europe.

With the revision of the Technical Ordinance on Waste entered into force in 2016, phosphorus contained in wastewater, sewage sludge and ashes will have to be recovered as early as 2026 and subject to material recovery. The resulting nutrients can be used to produce recycling fertilizers.

This solution has three advantages:

- Firstly, it provides primary phosphate reserves;
- Secondly, it avoids the introduction into Switzerland of harmful heavy metals such as uranium and cadmium through fertilizer imports;
- Thirdly, it protects Swiss farmers against unforeseeable changes in phosphate prices.

From an ecological and economic point of view, it is therefore worthwhile to recycle phosphorus. This represents a major step towards sustainable management of raw materials and sends a strong signal to Europe. To recover phosphorus, different techniques exist. The same criteria apply to all.

Quality requirements assume that pollutants are removed from the phosphorus cycle. In addition, phosphorus recovery must be efficient and existing disposal infrastructures must be used. Finally, costs are another decisive factor in the success of a process. The FOEN has carried out a survey to evaluate the different processes that are ready to be placed on the market.

Results and impact

Expected impact:

- Ensuring food production in the long term;
- Increase of the lifespan of phosphorous (a finite natural resource);
- Minimization of the environmental impacts from phosphorous extraction and processing.

Challenges and lessons learned

In Switzerland, a market for recycling fertilizers still needs to be set up. To achieve this, different conditions must be met, such as the availability of mineral recycling fertilizers, price and demand. Agriculture must be able to use recycling fertilizers in all production sectors, whether intensive, extensive or organic. At a first step, the FOEN and the office for agriculture will examine and implement appropriate instruments to strengthen the competitiveness of mineral recycling fertilizers.

In collaboration with experts, the FOEN will write the “Phosphorus-rich waste” module for implementation assistance. Due to lack of data, a detailed economic study of phosphorus recycling is still lacking in Switzerland. Such a study will answer questions about the total costs that phosphorus recycling represents for society and its utility for the environment. To institute phosphorus recycling and to allow recycling fertilizers to gain a foothold in the market, it is necessary to involve all stakeholders and encourage them to regularly exchange their knowledge and experiences.

Potential for replication

Switzerland is ready to share its experience and approach by putting interested national experts in contact with Swiss experts. Closing the phosphorus cycle is an important aspect to ensure long term food security, and creating a regional/European market for recycled phosphorus can accelerate the transition towards green economy. Exchange of experiences with the Netherlands took place thanks to BIG-E.

Contact

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