

Impact of rebate programmes: Swiss case studies

Abstract

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Eric Bush, Topten GmbH, Zurich, Switzerland, www.topten.ch, eric.bush@topten.ch
Dionys Hallenbarter, ewz Power Utility of the City of Zurich, Switzerland, dionys.hallenbarter@ewz.ch

Rebate programmes for energy-efficient appliances are an effective measure to increase energy efficiency and reduce electricity consumption. In Switzerland, there are rebate programmes for appliances from the central government, municipalities, and electricity utilities. Various strategies are used, different types of programme schemes are applied, and several target groups are addressed. Depending on the initial situation and objectives, the focus is set on different impact mechanisms. Simple rebate programmes only target the replacement of inefficient products. More sophisticated rebate programmes address the market as a whole and aim to accelerate the market transformation and increase market transparency. This is necessary for the development of measurement methods and effective policy instruments such as energy labels or minimum energy efficiency requirements. Market transparency is also the basis for good purchasing decisions and enables fair and motivating competition between manufacturers. In Switzerland, most of the regional rebate programs are well harmonized with identical product criteria because they are in general based on topten.ch, the national platform for sustainable products. This empowers manufacturers and retailers to make effective use of the programmes (e.g. in optimizing the range of products). Communication measures and the cooperation with retailers and manufacturers are also part of the programme. Using examples from Switzerland, this article aims to provide an insight into the various types of rebate programmes. Experiences, impact mechanisms and cost efficiency are discussed based on completed and current programmes.

Keywords: Appliances, market transformation, market transparency, best available technologies, energy efficiency requirements, energy label, subsidies.

Introduction

In Switzerland, there are various rebate programmes for diverse target groups and energy-saving measures. This article describes the rebates programmes for appliances and discusses the associated experience. These programmes are classified into 6 keys categories. Their importance to the beneficiaries- the sellers or the buyers - as well as their advantage, disadvantages, risks, success factors and cost efficiency will be addressed.

#	Applicant	Beneficiary	User	Product categories
1	Private end users	Private end users	Private end users	Household appliances, building components, solar energy devices, electric charging stations
2	Large buyers, landlords	Large buyers, landlords	Private end users	Household appliances, building components, solar energy devices, electric charging stations
3	Companies	Companies	Companies	Office equipment, professional kitchen appliances, vending appliances, building components, solar energy devices, electric charging stations
4	Food and beverage industry	Food and beverage industry	Shops, gastronomy	Branded ice cream freezers, beverage coolers, minibars
5	Retailers, installers	Private end users	Private end users	Household appliances, building components
6	Retailers	Retailers	Private end users	Household appliances, building components

Table 1: Types of programme schemes

Applications from purchasers

Purchasers can be end-users (type 1 and 3), owners who make equipment available to third parties such as landlords for household appliances (type 2) or food industry for beverage coolers or ice cream chests (type 4).

- Replacement only (early replacement: e.g. halogen lamps, direct electric heaters, electric boilers, circulating pumps)

Examples are programmes which are described on the internet: replacement of luminaires [1], energetic renewal of buildings [2], replacement of electric water heaters [3]

- New appliances and replacements: most of the rebate programmes for household appliances cover the purchase of new appliances as well as replacements [4]

Subsidies for retailers or installers

Subsidies can be given to retailers or installers for sales of authorised energy-efficient products. That way the purchaser gets the subsidies indirectly (type 5 and 6).

Replacement programmes

There are programmes which are restricted to subsidies for renewal and replacement measures but not for new investments.

Programme duration

Short programme duration mainly supports awareness raising and communication. It has little sustainable impact and little impact on manufacturers and trade. Long-term programmes empower all stakeholders to contribute to the impact. Actions of retailers and manufacturers need enough preparation time and planning security.

Overview on impact mechanisms of rebate programmes

1. Direct effect of rebate programmes in the directly affected area: Every purchase of an efficient product results in an energy saving compared to the purchase of an average product. The aim is to achieve a natural replacement cycle. Early replacement with additional costs and material input can only be recommended with good justification.
It should be noted that the beneficiaries may be private households, professionally managed properties, and companies. The calculation of energy savings usually assumes a typical lifetime of 15 years for household appliances. The evaluations are based in each case on the difference in electricity consumption between an average and a top-of-the-range appliance. The values are based on market research and sales figures.
2. Optimised purchasing behaviour of professional procurers and consumers due to communication measures of the promotion programme and partners.
3. Optimising and adapting the product ranges of manufacturers, importers, and wholesalers due to increased demand for efficient products. Promotion programmes and Topten platforms [5] (national projects for energy efficient products) motivate manufacturers to develop better products and shops to include these eligible products in their assortments.
4. International impact: Rebate programmes have the most intensive impact in the promotion area but may extend their effect internationally. It is particularly effective if the directives on the European energy label and the minimum requirements can be optimised in the process.
5. The impact can be multiplied if other organisations and electricity suppliers take over promotion actions.

Focus of rebate programmes

- Concrete specific energy saving effect (project, replacement, purchase results in savings, effect results from before/after comparison)
- Economic promotion with considering of environmental aspects (e.g. scrapping bonus for cars); programmes with weak requirements risk to become promotions according to the watering can principle
- Promotion of market transparency, e.g. for commercial appliances without binding standards, without declaration requirements or without energy labels
- Acceleration of market transformation: support for technological leaps such as LED lamps, heat pump dryers

Case studies

The following chapters describe rebate programmes for appliances in Switzerland.

ProKilowatt: the umbrella for national rebate programmes

There are many national rebate programmes in Switzerland. ProKilowatt is the umbrella programme that organises competitive calls for tenders. More information and an overview of the funding programmes can be found on their website [7].

According to the Swiss Federal Office of Energy [5] the ProKilowatt programme reduces electricity consumption by companies in the industry and services sectors, as well as by private households, through the financial support of measures to increase its efficient use. Only replacement or renewal measures are allowed. It supports projects and programmes that meet the specified requirements and save as much electricity as possible per provided Swiss franc. The source of the funding is an electricity network surcharge which accumulates up to 50 million euros per year.

The savings are calculated conservatively based on the direct effect of the subsidized measures (difference in electricity consumption between new and old situation over life cycle). These programmes have a high cost-effectiveness of about 3 eurocents per kWh.

Discussion:

The framework of these national ProKilowatt programmes invites and empowers any organisation to apply for funding in favour of electricity savings. It opens the floor for everybody to present best ideas. The suggested projects are checked regarding feasibility and specified requirements. The focus is on best value for money. It is a great instrument to discover and implement a wide variety of energy saving measures. The challenge is to find pragmatic ways in defining effective requirements [7] and monitoring requests without obstructing successful implementation with too much bureaucracy.

Rebate programme of the City of Zurich

There are many regional and municipal rebate programmes that support energy-efficient household appliances. Most of these programmes are based on the platform Topten.ch [4] for sustainable products. In concrete terms, only appliances that are labelled on Topten.ch are eligible for subsidies. An overview of these programmes can be found on www.topten.ch/foerderprogramme. One example, the programme of the city of Zurich is described below.

In a public vote in 1991, the population of the city of Zurich decided that the electrical utility ewz should promote electricity-saving measures and renewable energies that support the energy goals of Zurich.



Figure 1: Advertising for the rebate programme for energy efficient Topten-appliances of the City of Zurich

ewz has commissioned Topten to manage the entire programme, see specific site on Topten [9]. All eligible products are listed on the Topten.ch platform.

The city of Zurich is very open regarding types of programme schemes and is interested in experimenting with it in order to find an optimal mix of instruments and to maximise its funds towards increasing energy efficient appliances. The following types are currently in the focus and refer to the types of programme schemes according to table 1 “Types of programme schemes” above.

Private applications (Type 1)

Private consumers can submit applications via an input window on the Topten.ch platform. To do so, applicants must enter information about the purchased product, their person and bank details and

upload the device invoice. The process is completely electronic and simplified as far as possible. Every year, several hundred applications are made in this way, which represents approximately 20% of all subsidized devices. However, for the public, the effort required to get subsidies of some 100 euros is considerably high.

Large buyers and landlords (Type 2)

Unlike many European countries, in Switzerland the large kitchen appliances as well as the washing machines and the dryers are usually bought by the building owners and made available to the tenants. In the city of Zurich, about 90% of the residents are tenants and therefore do not buy their large household appliances themselves but are provided to them by the property owners.

Applications with many appliances from large properties can be submitted using Excel templates. Again, the process is completely electronic and simplified as far as possible. About 80% of all subsidised appliances are from applications from institutional property owners. Most of these applications are from building cooperatives and from the public sector (city as owner of real estate) although they only own about 25% of the flats. The remaining 10% of applications are from non-public real estate owners (like banks, pension funds).

We assume that this has to do with the “landlord-tenant dilemma”. If landlords incur additional costs for energy-efficient appliances, this reduces their return on investment. However, the owners cannot profit from the advantage, the electricity cost savings, but only the tenants. In contrast, the public sector and building cooperatives seem to optimise the full benefit of a comprehensive assessment, purchase price plus electricity costs.

Rebate programmes can mitigate this conflict of interest by allowing not only tenants but also owners to benefit from the subsidy. For this to happen, the subsidies must be high enough to cover a sufficiently large share of the additional prices for the appliances.

Retailers and installers (Type 5)

The model of direct payment of the subsidies as price-offs in the shops with central reimbursement of the shops was tried with the rebate programme of the city of Zurich and negotiations were conducted with the national shops (online and offline). This means, no bureaucratic action (like submitting of forms) of the consumer is required to get the rebate. However, the nationwide operating shops have not been able to implement this just locally for one city, as the programming of the cash registers and customer communication are standardised nationally and special solutions for one city was too costly. Now, in conjunction with the national rebate this approach works. Both in the city of Zurich and throughout Switzerland, shops and installers reimburse the payments directly at the time of sale.

Retailers and installers are reimbursed for the subsidies based on a monitoring system that provides evidence of the subsidies.

Table 2: Rebates in the City of Zurich and in Switzerland

Product categories	Rebates in CHF ¹	
	Zurich	Switzerland
Refrigerators and freezers	70.-	70.-
Induction hobs	25.-	-
Dishwashers	70.-	70.-
Washing machines for apartments	70.-	70.-
Washing machines for the communal laundry	250.-	250.-
Tumble dryer	100.-	-
Comfort fans	20.-	-
TVs and PC monitors	40.-	-
Heat pump water heaters	800.-	-

¹ Rebates per piece in January 2022 (1 CHF = ca. 0.95 euros = ca. 1 US\$)

Table 3: Overview on the subsidies of Zurich in 2021

Product category	Pieces	Impact in kWh
Refrigerators and freezers	530	467'400
Induction hobs	73	13'870
Dish washers	341	73'950
Washing machines for apartments	107	80'250
Washing machines for the communal laundry	127	266'700
Tumble dryers	221	182'325
Ventilators	7	3'500
Television sets	9	2'700
Heat pump water heaters	9	270'000
Total	1'424	1'360'695

In 2021 the City of Zurich supported 1424 appliances, generating an energy-saving impact of 1.4 million kWh. It is planned to increase the volume strongly by implementing the programme type 5 with retailers and installers.

Rebate programme Energy Efficiency in Trade



Figure 2: Advertising for the Swiss-wide rebate programme for energy efficient Tipten-appliances

Initial situation and goals

On behalf of the Swiss Federal Office of Energy and ProKilowatt, Tipten is coordinating the Swiss-wide rebate programme Energy Efficiency in Trade [10]. The programme started in March 2021 and will run for 2 years with a budget of 2.7 million euros. The main objective is to promote the energy efficiency of household appliances by motivating consumers to prefer efficient appliances with a subsidy.

Rebate contribution directly in the shop as a discount

The strength of this nationwide programme is its customer-friendliness and efficiency. The rebate is a flat rate of CHF 70 (ca. 64 euros) for all eligible appliances. It is to be given to customers directly at the time of purchase in the shop. For the customer, this eliminates the tedious filling out of applications. The following energy-efficient appliances with new energy labels are promoted:

Table 4: Energy efficiency requirements of the programme

Product category	Eligible classes
Dish washer	A - B
Washing machine < 8kg	A - D
Washing machine => 8 kg	A - B
Refrigerators	A - D
Freezers	A - D

The appliances must be declared in the shop with the new energy label, which was introduced in March 2021. Appliances with the old energy label (with classes A+++ - D) are not eligible. Besides of the direct savings of energy, this programme intends to support communication for the new energy label.

Role of the shops

1. The shops grant their customers the subsidy directly at the time of purchase as a discount for the eligible devices. The rebates are regularly reimbursed by Tipten according to the monitoring.

2. The shops carry out the necessary software and cash register adjustments so that the discounts for the correct products can be granted fully automatically for all customers throughout Switzerland (online and/or in the branches). The eligible models are made available in a daily updated feed from Topten.
3. The shops provide clear and comprehensible monitoring in accordance with the requirements of the federal government.
4. The shops communicate the subsidies to their customers in a suitable form on the invoice receipts, in the shop, online and in advertising.

The implementation of these rebates in the shops needed far more efforts and time than expected and was challenging regarding shop-software, monitoring and communication. By April 2022 9 shops have joined the programme, covering the majority of all sales in Switzerland.



Figure 3: Communication of a large online shop on the rebate programme
(www.nettoshop.ch/save-energy)

The approach is most successful. By the end of April 2022 more than 30'000 appliances have received rebates with a total amount of more than 2.1 million Euros.

Rebate programme "Lower electricity costs for tenants".

Initial situation and goals

On behalf of the Swiss Federal Office of Energy and ProKilowatt, Topten is coordinating the nationwide rebate programme "Lower electricity costs for tenants" [11]. The 3-years-programme has a budget of 2.7 million euros. The main objective is to promote the energy efficiency of household appliances by motivating property owners, building cooperatives and administrations to give preference to efficient appliances by means of a subsidy. The programme also aims to contribute to solving the owner-tenant dilemma. The subsidies take over part of the additional costs of the owners for efficient appliances and thus favour lower electricity costs for the tenants.

The programme is a combination of the types 2 and 5. On the one hand the large buyers and landlords can apply for subsidies, on the other hand installers can give the rebates directly and are reimbursed by Topten. By May 2022, already 20 installers provide the rebates directly.

Rebate programme for professional and commercial appliances

Topten's ProKilowatt rebate programme "Energy-efficient professional and commercial appliances" supported saving of energy and money. When purchasing Topten appliances, subsidies were provided of up to 30% of the purchase price. Eligible for subsidies were appliances with the highest energy efficiency and climate-friendly refrigerant. The programme was supported by ProKilowatt under the lead of the Swiss Federal Office of Energy.

Table 5: Overview on rebates (extract)

Product category	Rebate in CHF
Beverage cooler	200
Ice cream freezer	100
Display cabinets	500
Storage refrigerators and freezers	500
Minibars	100
Drug cabinets	500
Commercial coffee machines	150
Commercial heat-pump dryers	3'000

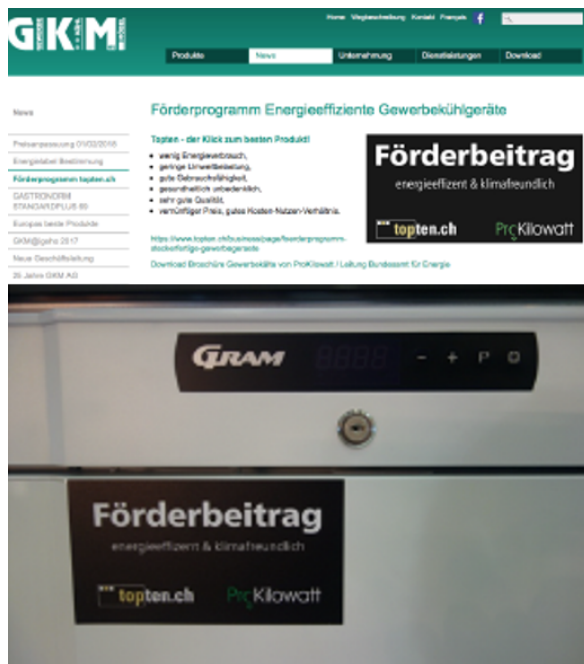


Figure 4: Suppliers used the label for rebates “Förderbeitrag” on homepages (www.gkm-ag.ch/de/news/foerderprogramm#0) and on products.

With this rebate programme, 10'964 appliances were subsidised. By replacing inefficient models, savings of 119 million kWh were achieved. The impact achieved amounted to 160% of the original total target.

The total costs for rebates plus management summed up to 1.9 million euros. The programme had a cost effectiveness of 1.6 eurocents per kWh electricity saved.

A follow-up programme [12] with similar conditions and a budget of 1.3 million euros and the obligation to save at least 53 million kWh runs from 2021 until 2023.

National bonus programme for best appliances

The "National Bonus Programme for Best Appliances" [13] was a ProKilowatt programme implemented by Topten in cooperation with the retailers Coop, Fust, Interdiscount and Lumimart with a budget of one million Swiss francs (900'000 euros) in 2011. The bonus programme used targeted promotions to motivate customers to buy highly efficient products instead of typical models with higher electricity consumption values.

The retailers were obliged to communicate precisely which products were energy efficient and benefited of the federal rebate (claim: This rebate-promotion is supported by ProKilowatt as especially energy efficient).

For the monitoring the retailers had to report, how many eligible appliances were sold within the promotions. The monitoring was straight forward and was free of irrelevant information as who received in which outlet the subsidy. Thanks of this lean monitoring, the programme was very attractive for consumers and costs for bureaucracy could be avoided.

The total savings added up to 106 million kWh and exceeded the original target of 56 million kWh significantly (by 89%). This was possible due to the high commitment of the involved retailers, which carried out significantly more promotions and was thus able to sell far more energy-efficient appliances than expected. The electricity savings reduced household electricity bills by a total of 19 million euros over the lifetime of the appliances. The subsidy efficiency of 0.86 eurocents per kWh of electricity saved was very high and clearly exceeded the original target of 1.63 eurocents per kWh. This programme was thus extraordinarily successful both ecologically and economically.



Figure 5: Promotions of the retailers Interdiscount and Fust in their customer brochures

Success factor: Steering of promotions

The key factor of this programme was, that it built on the traditional sales strategy of retailers, the promotions with high discounts. Around half of the turnover in the retail trade is generated with these promotions. The role of the governmental rebates was to influence and steer the promotions.

Promotions are an essential sales tool for wholesalers, and they are carried out anyway. The selection of products for promotions usually is optimised according to the best purchasing conditions and the best sales arguments. It was surprising, however, that even with relatively small contributions, the campaigns could be directed towards specific products, here for products with best energy efficiency. The subsidies did not a priori trigger additional actions, but they directed the actions to the desired products. This was how this big lever was created, which multiplied the effect of the governmental funds.

According to the evaluation of the retailers they invested over 10 million Swiss francs in the purchase of these energy-efficient appliances and a further 7 million in the rebates, which amounted to up to 40 percent of the sales price depending on the type of appliance.

Table 6: Federal subsidies can generate high price-offs in shops

Categories	Federal Subsidies	Retailers Price-offs
Refrigerators	16.68	Up to 600
TV sets	17.13	50 - 500
Tumble dryers	69.38	Up to 1'200
Fully automatic coffee machines	17.90	200 - 500
Coffee Capsule Machines	17.90	22 - 135
Humidifier	38.27	Up to 79

The column "Federal Subsidies" shows the contribution in CHF which the retailers received per sold piece of efficient appliances. This amount was based on the agreed saving impact. The column "Retailers Price-offs" shows the discounts effectively granted in the promotions. Obviously, the federal subsidies were multiplied strongly by the retailers.

Discussion: Multiplication only with pragmatic requirements and planning certainty

This mechanism, however, only works if market-oriented and realistic criteria as well as feasible conditions are demanded. For example, the requirements for lamps were too stringent and did not match the wishes of consumers: durability and efficiency requests were only possible for extremely expensive lamps. Accordingly, it was not possible for retailers to promote this category. In addition, the wholesalers need planning security over several months. This time is needed from the investment decisions for promotions to the last sale. The wholesalers cannot plan their calculations under the risk that federal subsidies will not be paid out unexpectedly due to tightening measures. Likewise, the determination of the amount of the contribution must be bindingly fixed in advance.

Discussion and conclusions

Cost efficiency

The rebate programmes in Switzerland have a very high support efficiency of about 3 €-cents per kWh. The effect is carefully and conservatively calculated. The energy saved is significantly cheaper than newly produced energy. Economically and ecologically, it would make sense in many other countries to increase investment in energy conservation programs rather than relying on investments in new power plant capacities.

Rebate programmes can be combined with other goals. Currently, promotion programmes for household appliances are at the same time a communication measure for the introduction of the new energy label. Therefore, a lower promotion efficiency can be accepted.

Success factors

- Sufficiently strict requirements (no watering can promotion)
- Requirements coordinated or harmonised as far as possible at national or even international level (e.g. class limits of the energy labels).
- Augmentation of the impact with additional benefits (market transparency, communication, acceleration of market transformation)
- Abandonment of unnecessary sophisticated programme requirements. Even if requirements may look simple on a first glance, they may cause lots of costs, complicate the communication and can make programmes unattractive for the target groups.
- The programmes must be attractive for the target groups. It should be easy to find eligible products (e.g. on platforms for sustainable products), easy applications with no unnecessary questions and requests

Long-term innovation goals or short-term volume effects?

With funding criteria, either innovation goals or volume goals can be targeted. Innovations can be achieved with very high requirements that may not yet be fulfilled by any product at the time of introduction. However, this requires sufficiently long lead times. The effect is therefore delayed until after the first products can be sold. If immediate volume gains are sought, the criteria must be so pragmatic that the requirements are fulfilled by a minimum product offer.

Optimally, the two instruments are combined with a good mix. However, for ProKilowatt funding programmes, the volume component is mandatory, the innovation approach would require longer durations, the impact is more difficult to calculate and thus is not considered in the monitoring of the impact (conservative approach).

More innovative designs of rebate programmes

Many rebate programmes are very simple, apply for subsidies by submitting applications. This is a lot of work for the applicants, often too much to receive subsidies of some 100 euros. At the same time, processing the applications and paying out the contributions is also considerably work.

The approaches of involving the shops or installers allow for much more efficient programmes. No applications and no separate transfers are necessary (programme type 5 or 6).

It would be even more promising to work "only" with incentives, as described in the bonus programme above (programme type 6). Here, retailers were motivated with astonishingly small amounts to carry out their price-off campaigns in favour of energy-efficient products. The effect was many times greater. The argument that the impact may be more difficult to quantify and less precisely attributable to a funder should not be overweighted. We would welcome and recommend more experiments in such innovative approaches.

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