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Competitive Tenders for Energy Efficiency

Lessons Learnt in Switzerland

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ProKilowatt

Background

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- The Swiss Parliament decided to introduce competitive tenders for energy efficiency as a supplement to feed in tariffs for renewables.
- The overall legal framework for the competitive tenders is laid down ion the Swiss Energy Ordonnance (730.01 Energieverordnung, EnV) based on the Swiss Federal Energy Law
- The competitive tenders are set out once a year for energy efficiency measures in the area of electrical energy use
- The competitive tender for energy efficiency in Switzerland is labelled “ProKilowatt”
- The measures supported should have the least costs per kWh saved
- Privat and public is entitled top apply for funding
- Only projects and programmes are eligible which would not be implemented without financial support (principle of additionally)
- Project = Support for measures at one client
  Program = Coordinated action for similar measures with different clients
- The first call for proposals was launched in 2010

Energy Efficiency Auctions in Switzerland

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- Switzerland neither has an **energy efficiency obligation scheme (EEO)** such as white certificates, nor a **subsidies scheme** for cross-cutting electricity consuming technologies (such as lighting, motors, electrical appliances, and others)
- There is **no specific quantitative target** for the quantity of electricity savings that should be achieved by ProKilowatt. Instead there is a limit for the budget made available for the auctions.
- Available budget is stemming from a levy on the electricity transmission grid. **Up to 0.1 Rappen per kWh electricity transported is available to promote energy efficiency measures**, including the administrative costs.
- In contrast to white certificates, **ProKilowatt is a voluntary instrument**. It does not oblige utilities to buy certificates for a certain amount of electricity savings.
- ProKilowatt is using **tendering for price-setting** in order to minimize funds needed for energy savings.
- ProKilowatt can be described as a **sealed-bid one-shot discriminatory price auction** (Swiss Federal Office for Energy (SFOE) as buyer, corporations and public entities as sellers)
- A **bidder can resubmit his bid again in a later year**, but has to take into account that the conditions of the auction may differ significantly from one year to another.
- ProKilowatt is a “discriminatory” and not uniform auction. **SFOE buys multiple bids, but all to the price asked by the individual seller** (and not to one uniform price).
- **Price per kWh saved is the only criteria** to decide whether a bid succeeds in the auction or not

Budget for Pro Kilowatt

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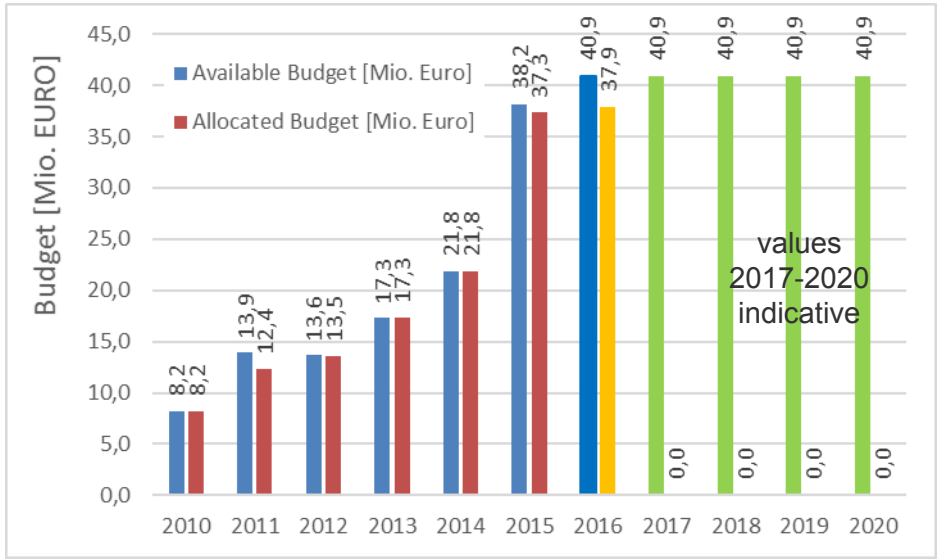
- Since the start in 2010, the available budget increased from about 6 to 40 Million Euro.
- Unspent budget in one year will be forwarded to the next call
- To keep the competitive pressure, the allocated budget should be at least 20% lower than the total requested budget and can not exceed 100%



Available budget	Requested budget	Allocated Budget
10 Mio. Euro	11.0 Mio. Euro	9.2 Mio. Euro
10 Mio. Euro	6.0 Mio Euro	5.0 Mio. Euro
10 Mio. Euro	15.0 Mio Euro	10.0 Mio Euro

Offered Price Supply Curve for Energy Savings under ProKilowatt

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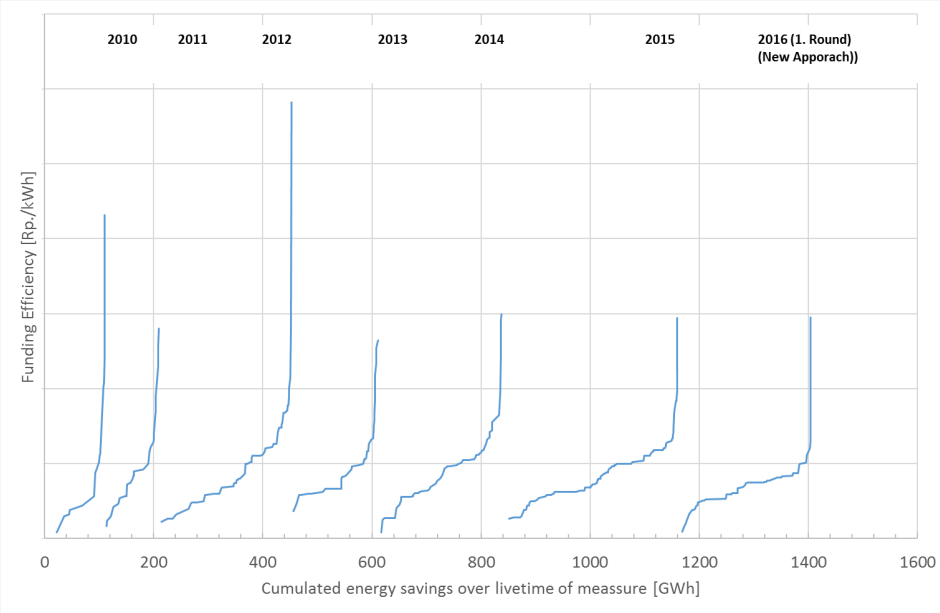
- Offered price unequal cost for energy saving (Applicants are free to request lower funding)
- Broad range of prices offered
- Steep supply curves flattening out over time as more bids are submitted
- Upper limit price to avoid purchase of to expensive measures



Development of Price Spread and Average Price for Energy Savings Offered

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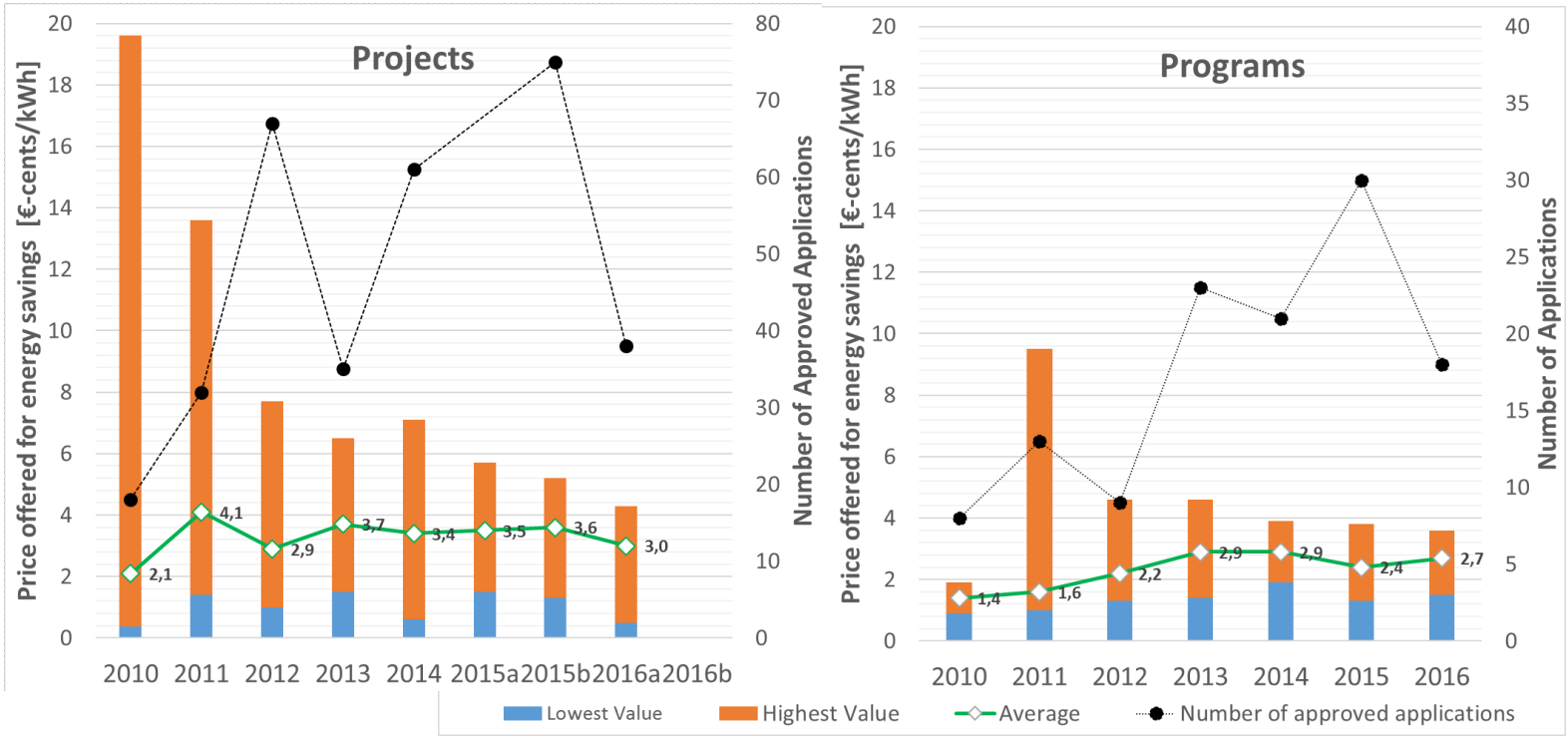
- Separate Auctions for Programs and Projects lead to separate prices
- Competition keeps price for savings stable over time



Remarks: Maximum program size was increased from 1 Mio to 3 Mio. CHF between 2015 and 2016

Distribution of Funding (2010-2015) for Programs by Technology

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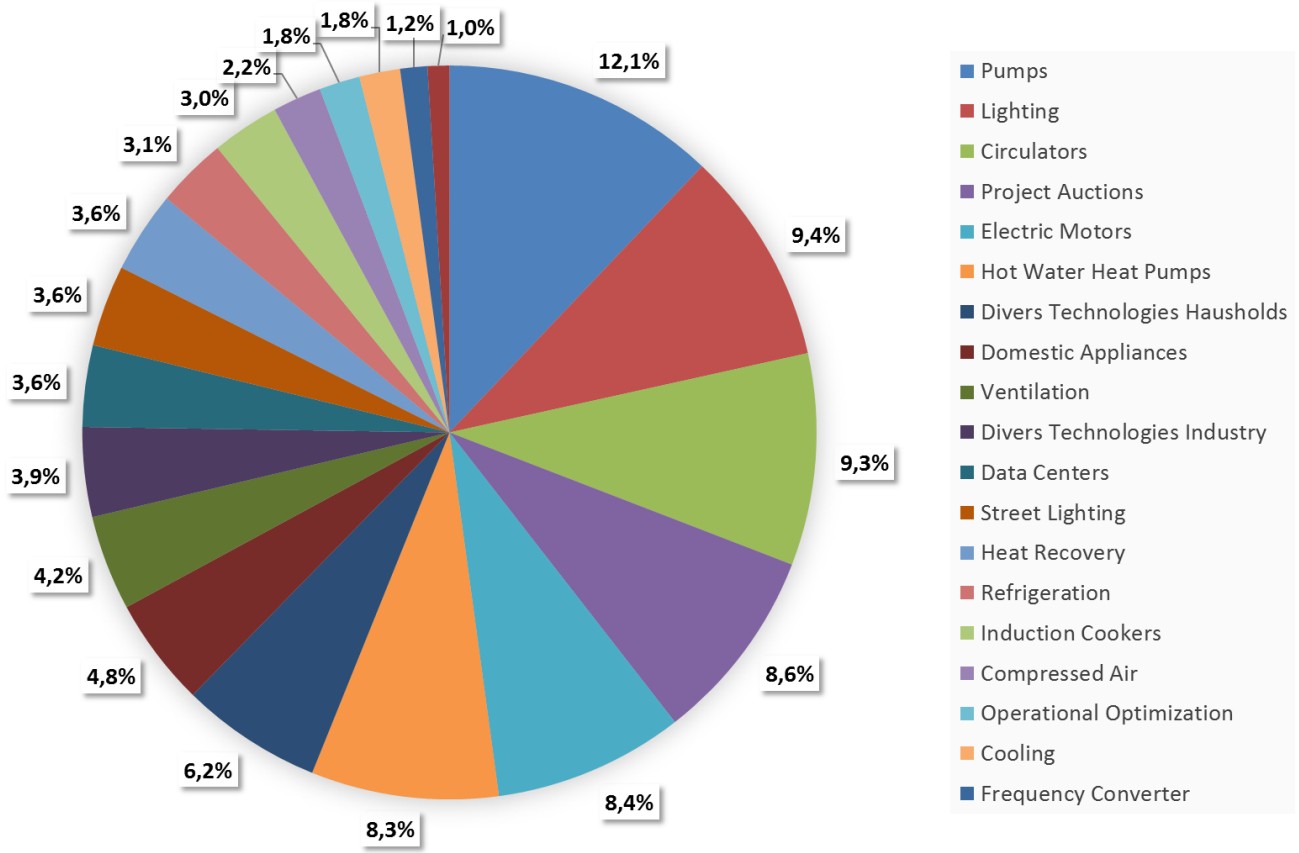

Case Study ProKilowatt Program Efficient Compressed Air Systems (ProEDA)

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- Program started in 2011 and was running for 3 years
- Program managed by engineering company Enerprice
- Composed of financial support for Basic Analysis, Detailed Analysis and Implementation of Efficiency Measures
- In total 81 Basic and 49 Detailed Analysis's where conducted within the program.
- In 44 companies, energy efficiency measures in the compressed air systems had been implemented
- Total cost of the action was 676 000 Euro (744 000 CHF)
- Total savings achieved 57.6 GWh (1.2 €-ct/kWh saved)
- Follow up program ProEDA2 currently running

ProEDA2
Zweites Programm für energie-effiziente Druckluftanlagen

Case Study ProKilowatt Project Feldschlösschen Brewery

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- Renewal of Compressd Air (160 kW):
  - Investment: 191 k€ (210 k CHF); Subsidy: 41.8 k€ (46 k CHF; 21%)
  - Funding efficiency: 1.2 €-ct (1.3 Rp./kWh)
  - Payback: 10.4 a → 8.2 a
  - Energy savings: -11.9%

- Renewal of Ice Water supply
  - Investment: 133 k€ (146 k CHF); Subsidy: 38 k€ (42 k CHF; 29%)
  - Funding efficiency: 1.2 €-ct/kWh (1.3 Rp./kWh)
  - Payback: 7.3 a → 5.4 a
  - Energy savings: -56.3%

- Renewal of 99 electric motors (permanent magnet motor; frequency converter
  - Investment: 502 k€ (552 k CHF); Subsidy: 109 k€ (120 k CHF; 22%)
  - Funding efficiency: 3.0 €-ct/kWh (3.3 Rp./kWh)
  - Payback: 6.5 a → 5.1 a
  - Energy savings: -73.1%

Strengths and Weaknesses of Projects and Programs

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	Strengths	Weaknesses
Projects	• **Custom-tailored** by a company and fits its particular situation • **Low risk** that planned project and realisation differ • **Auctioneer can assess** planned technical measures in advance and **in detail**	• Relatively **high entry costs** for bidders (risk of dropping out of the auction) • **High assessment costs** for small projects for the auctioneer
Programs	• Enables **realisation of small-scale** technical measures (i.a. in households and small companies) • Almost **no entry costs for end-consumers** as they can participate in a program that already passed the auction • **Existing customer-basis** or members of an intermediaries can be reached	• **Overhead costs** on behalf of intermediaries incur • Significant **risk that targets are not achieved** (planned and realised measures in numbers differ) • **Significant efforts for auctioneer** to verify achievements

Programs with internal Auctioning Scheme Synergies with Cantonal Obligations

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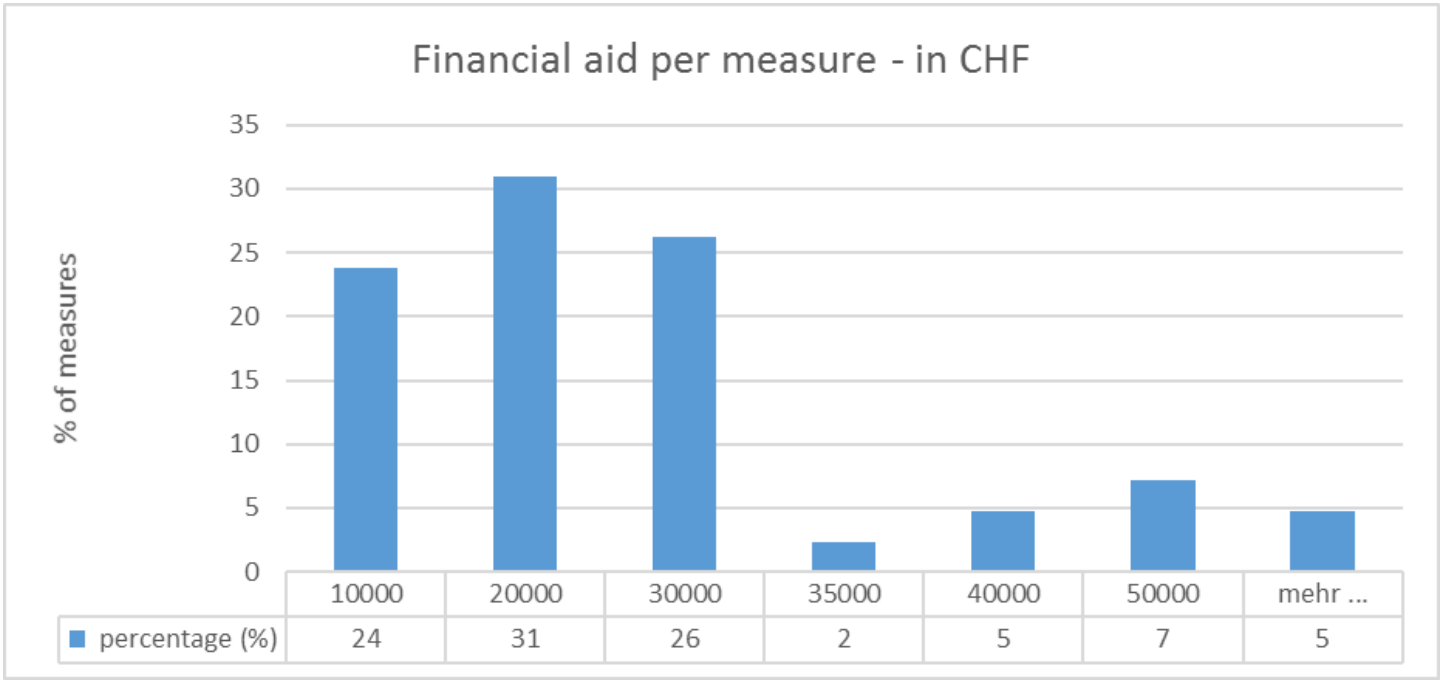
- Special type of program in which the supported measures are not defined upfront
- Support allocation within the program to the end customers via an internal auctioning scheme
- Can be linked to obligations for large customers (>0.5 GWh/a) to perform energy audits and to implement economic measures. Identified non economic measures can than be used in the internal auction
- If such a auctioning program is run by the auditing institution (in Switzerland often an utility company), this helps to realize measures that are uneconomic without financial support.
- Main advantage is that the customers are supported over the whole chain from identification, implementation to verification of savings.

Allocated Financial Aid per Measure in a Program with Internal Auctioning Scheme



- Program Auctions can cannibalize project applications
- Difficulty to ensure the additionallity of measures
- Difficulty to monitor the achievements of the program

Continuous Development of Requirements for the Competitive Tenders

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- To ensure additionality of measures to avoid deadweight effects
  - Related to the type of measure
  - Related to the amount of savings
- To ensure the lowest efforts for the application by the applicant
- To reduce the efforts to validate and monitor the success of the competitive tenders
- To keep the funding conditions for applicant attractive enough to trigger actions
- To adapt the framework to technical progress and legal developments

Key Changes in Conditions for ProKilowatt calls in 2016

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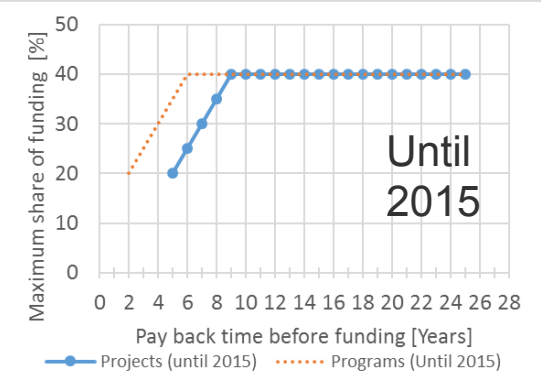
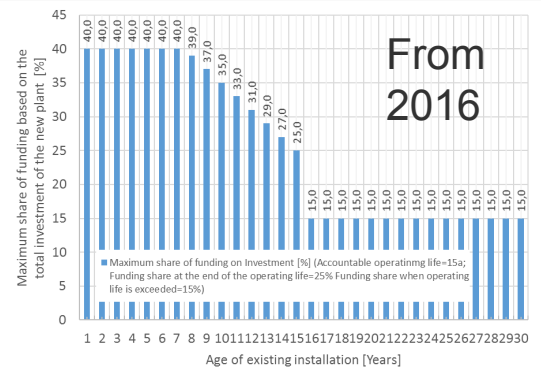
- Avoid the use of a reference measure to calculate eligible costs and accountable savings. Now based on the cost of the new equipment and the difference in electricity consumption between existing and new installation
- Accountable savings only 75 % of achieved savings to account for autonomous efficiency improvements
- Linking maximum share of funding to the age of the existing installation instead of the payback time for the investment
- Harmonisation of required payback time for project and programs (should be above 4 years)
- Increased minimum technical requirements, e.g. support for street lighting only with sophisticated control, electric motors at least IE4 or IE3 with frequency converter, no longer support for efficient appliances for households
- Increased requirements for prove of achieved electricity savings





Audits for Verifications of Achievements

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- Significant budgets are spend to support investment in electricity saving technologies, therefore proper use of the provided funds has to be ensured by SFOE.
- Audits focus on technical implementation, financial management and saving achievements.

- Typical questions to be answered
  - Implementation of the action as described in the application ?
  - Is the new technical equipment in place (physically), properly functioning and the old equipment properly disposed ?
  - Are contact details of all end customers (in case of programs) available ?
  - Are invoices for all purchases and costs available?
  - Is money forwarded to the end customer (programs) ?
  - Is VAT properly handled?
  - Is the saving calculation well documented, credible and if possible supported by measurement data?

Audits require significant time and efforts but are needed to ensure success of a support action such as competitive tenders

Conclusions and Outlook

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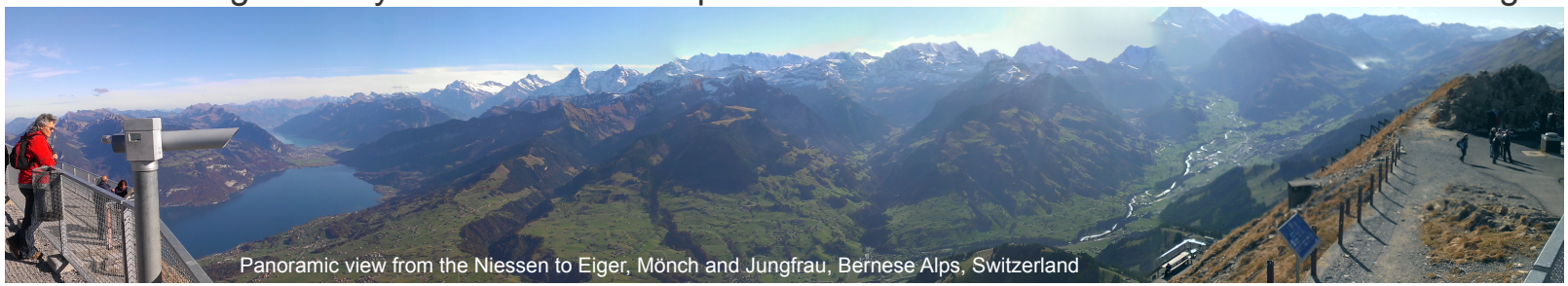
- 6 years of competitive tenders in Switzerland haven proven that the instrument is valuable in triggering cost effective electricity savings
- Further development of condition for 2017 (e.g. further reduction of management share in programs, street lighting only together with sensor control, reduced number of hours for savings calculation for indoor lighting)
- Competitive tenders are technology open but favour established technologies with low risks
- Competitive tenders as voluntary measure with market elements typically gets more political support
- Competitive tenders or white certificates tends to deliver similar results, but competitive tenders are more flexible
- Care should be taken when comparing results from different support instruments as baselines, autonomous learning effects, methods for estimating/measuring savings can differ significantly and therefore comparison on the basis of €-ct/kWh can be misleading



Panoramic view from the Niessen to Eiger, Mönch and Jungfrau, Bernese Alps, Switzerland

You can contact us for further questions

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