



Energy Efficiency Certificates

Design and Application of a New Market-Based Instrument for Industry and Service Sector

Marcel Wickart, ewz (Zurich Municipal Electric Utility)

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Background.

Main Idea and Basic Concepts.

Main idea

Saved energy as a **tradable** commodity: Additional energy savings due to an increase in energy efficiency compared to a well defined baseline can be traded as certificates

Basic concepts

- **Agreement on energy efficiency** deployed by the Swiss Federal Office of Energy and several Cantons.¹⁾
- **Guidelines and processes** designed by the Association for Environmentally Sound Energy for a **green energy market**.²⁾

Project «Efficiency Market»

Adopting existing concepts to design a market for energy efficiency & piloting the new design.³⁾

¹⁾ SFOE, Zielvereinbarungen mit dem Bund zur Steigerung der Energieeffizienz, Berne, March 2014.

²⁾ www.naturemade.org

³⁾ D. Hallenbarter, S. Eggimann, P. Steingruber, M. Wickart (ewz), Effizienzsertifikate, Zurich, October 2012.

Background. Project Setup.

Responsible

- Association for Environmentally Sound Energy (VUE)
- Swiss Agency for Energy (EnAW/AEnEc)
- Zurich Municipal Electric Utility (ewz)

Financial partner

- **energieschweiz**
- Stromsparfonds der Stadt Zürich
- Energieforschung Stadt Zürich

Duration: July 2014 to December 2015

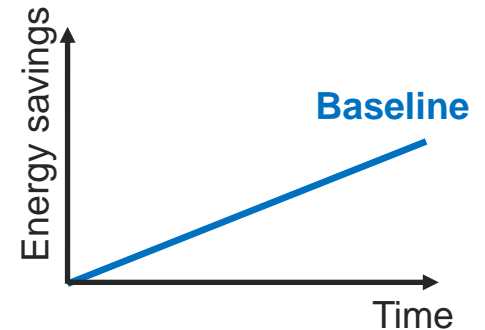
Basic Concept. Energy Efficiency Agreement.

Identification of
energy savings
potential

An energy consultant identifies the technically and economically viable energy savings potential and defines an action plan to exploit the economic potential.

Definition of baseline

Based on the action plan, the energy consultant defines the baseline for a given period (e.g. 10 years).



Agreement between
company and agency

The energy efficiency baseline is stipulated in an agreement between the company and the (federal or cantonal) agency. The company has to report annually the realized energy savings. It complies with the agreement, if does not fail the baseline three times in a row.

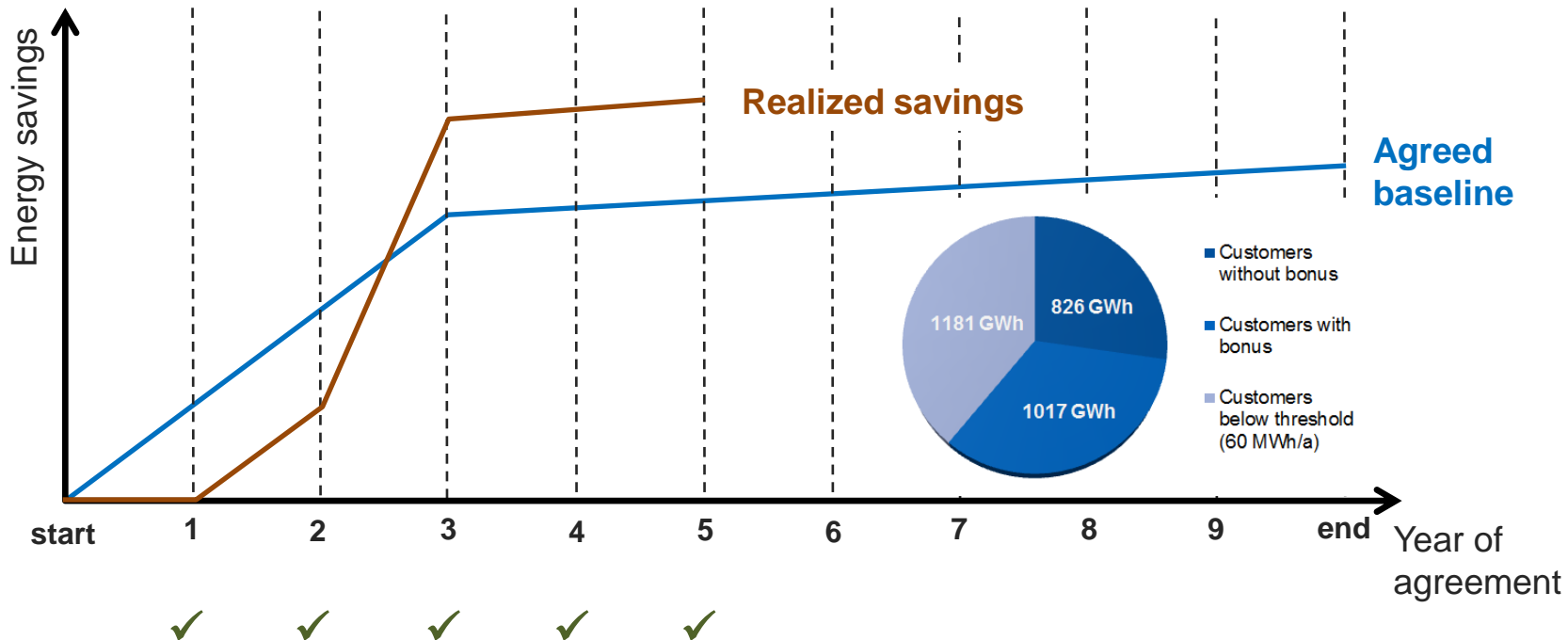


Observation: Transaction costs include mainly consulting services.

Excursus: Efficiency Bonus in the City of Zurich.

Energy efficiency program in the City of Zurich

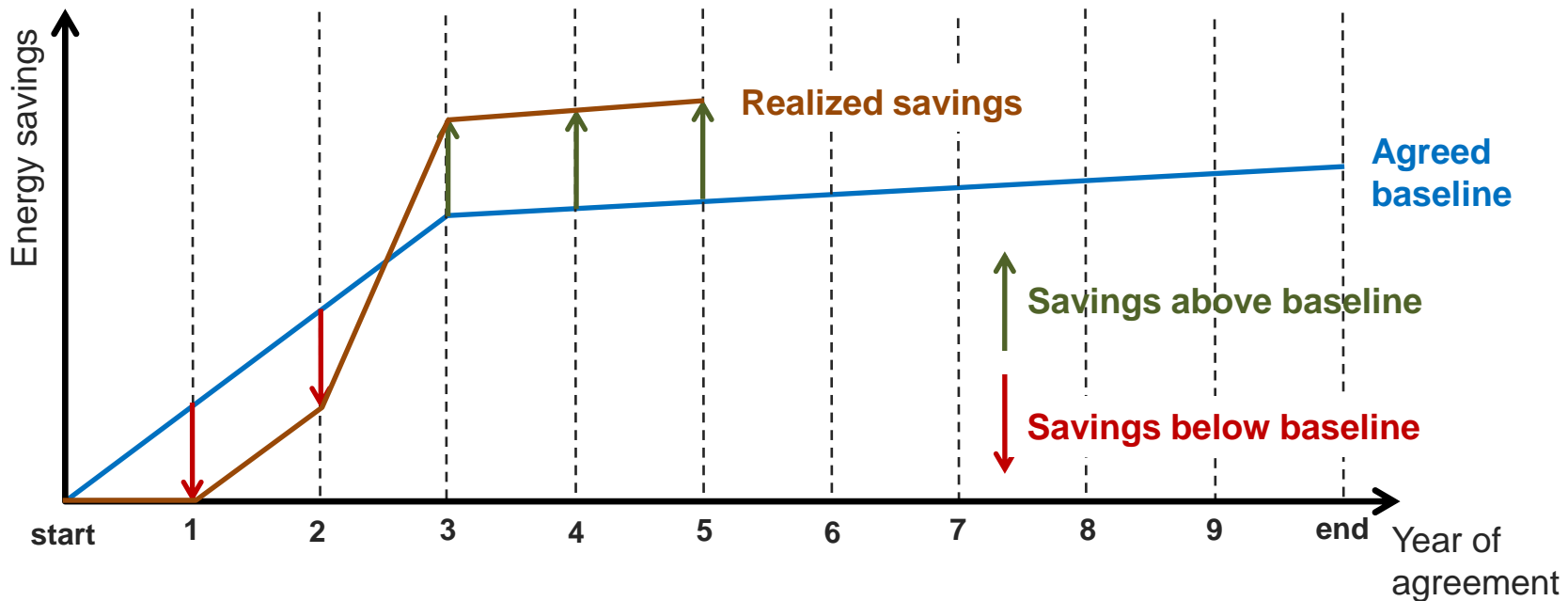
Companies with a valid energy efficiency agreement get a 10 % reduction on the electricity bill (threshold: 60 MWh p.a. electricity demand at minimum).



Finding: Strong incentive to sign an agreement, but not to over perform the baseline.

Energy Efficiency Certificate. Definition.

Energy efficiency certificates are based on the over-compliance with the agreed baseline.



Certificates

x x x x ✓

Savings below baseline have first to be compensated for.

Energy Efficiency Certificate. Measure.

Problem

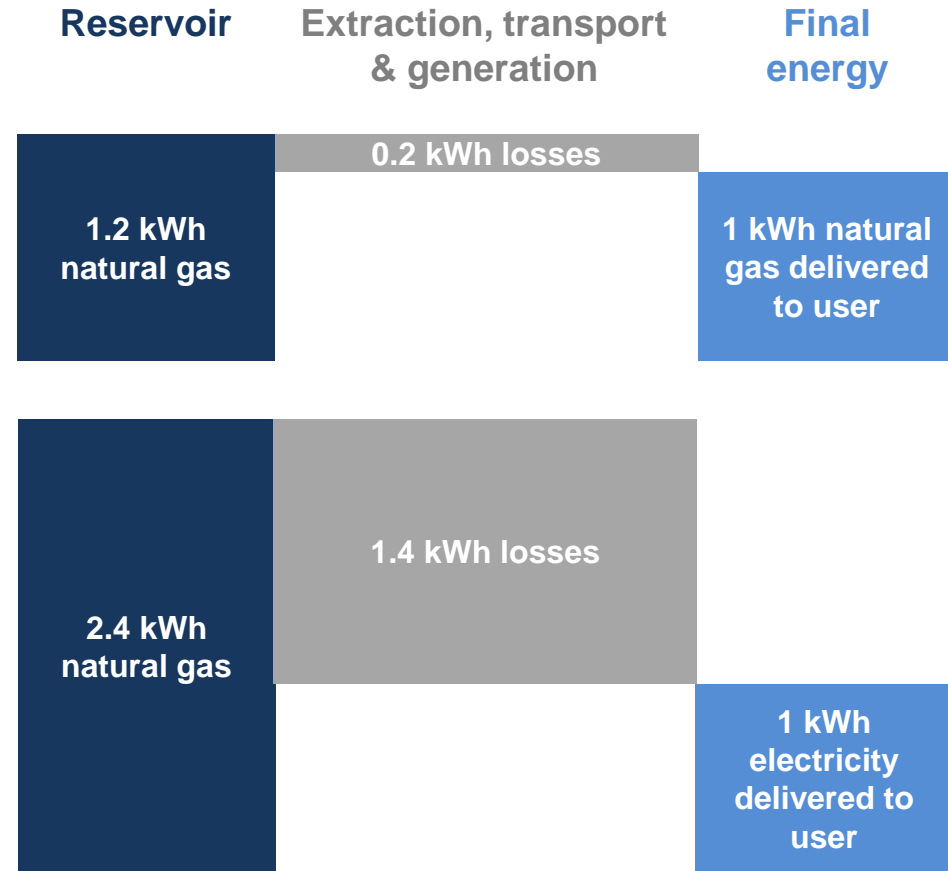
How to sum up final energy use/savings (electricity, heating oil, natural gas, biomass)?

Solution

Different forms of final energy are weighted by their primary energy factor, i.e. the primary energy required to generate one unit of final energy.

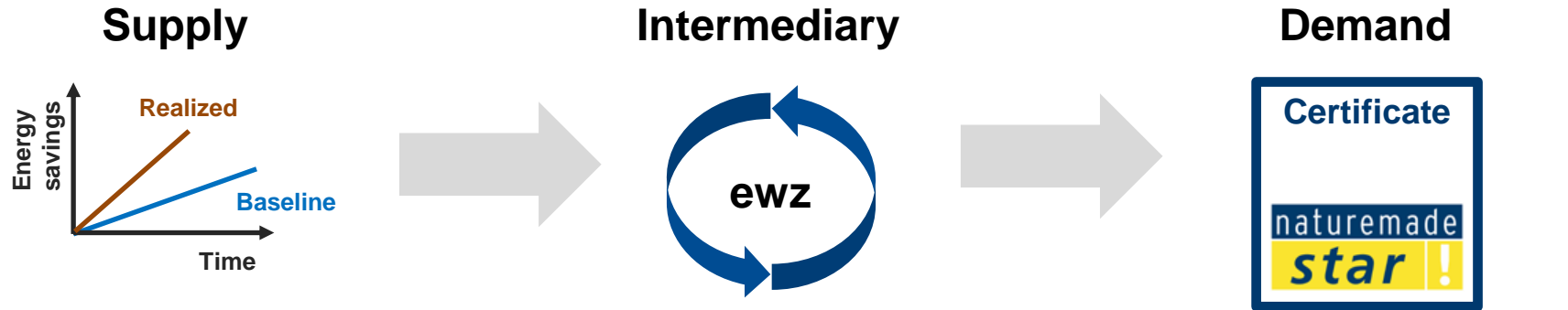
Result

Savings in weighted energy use is a measure for the efficient use of energy resources (primary energy).



The weighting factor of electricity is twice as much as the weighting factor of natural gas (for end use).

Efficiency Market. Market for Energy Efficiency Certificates.



Companies with an energy efficiency agreement can sell the savings above their baseline.

Qualified intermediaries (e.g. ewz) buy the savings and sell these savings as certificates to customers.

Customers can compensate for their own energy use.

ENERGIE-AGENTUR
DER WIRTSCHAFT EnAW
Preparation and monitoring of agreements

Definition and audit of agreements
SFOE

Definition of guidelines for the emission, transaction, use and invalidation of certificates & audit of qualified intermediaries
naturemade !

Efficiency Market.

Project Status and Next Steps.

Status

- Guidelines for pilot are defined
- Process for emission of certificates is defined
- 500 MWh bought
- 1 GWh/a sold for three years
- Negotiation with several potential customers

Next steps

- Finalizing market design
- Setup of organizational bodies
- Defining final guidelines
- Implementation of guidelines

Efficiency Market.

Comparison with Proposed Obligation Scheme.

	Proposed obligation scheme	Efficiency market based on certificates
Mechanism	<ul style="list-style-type: none">▪ Electricity suppliers are obliged to implement efficiency programs/projects (i.e. incentive schemes for end users)	<ul style="list-style-type: none">▪ End user become a direct incentive to implement energy efficiency measures.▪ Additionally, obligation could be implemented directly on end users
Level of efficiency improvement	<ul style="list-style-type: none">▪ Defined for each program/project by regulator	<ul style="list-style-type: none">▪ Agreement: Individual baseline to exploit economic potential▪ If realized improvement is above baseline, certificates can be emitted
Resource efficiency	<ul style="list-style-type: none">▪ Only electricity is addressed	<ul style="list-style-type: none">▪ Weighted final energy use is addressed (primary energy)
Integration in existing system	<ul style="list-style-type: none">▪ New instrument, conflicting with existing instruments (e.g. existing Cantonal obligation schemes for industry, auction for efficiency programs/projects)	<ul style="list-style-type: none">▪ Based on existing instruments (energy efficiency agreements)
Compatibility with Pigouvian tax system	<ul style="list-style-type: none">▪ Low, should become obsolete	<ul style="list-style-type: none">▪ High, could be developed to a hybrid system with Pigouvian tax and permit trading*

*Krysiak, F. C. and I. M. Oberauner, 2010, Environmental Policy à la Carte: Letting Firms Choose their Regulation, Journal of Environmental Economics and Management, 60, pp. 221–232.

Recommendations for Energy Strategy 2050 - Phase 1.

- *Reduce the number of instruments*
Instead of introducing new instruments existing instruments shall be used and specifically extended
- *Increase resource efficiency*
Focusing on the efficiency of specific forms of final energy (e.g. electricity) could result in lower resource efficiency and hinders the development of an efficiency market (not consistent with the customer's perspective).
- *Prefer instruments that could be used in Phase 2*
The implementation of instruments that could not be used in Phase 2 should be avoided. Use Phase 1 to prepare an easy transition to Phase 2.

The establishment of an efficiency market based on certificates could be promoted by:

- Implementation of a national register (to facilitate the emission, transaction, use and invalidation of certificates)
- Secure market risks

Conclusions.

- An efficiency market with tradable energy efficiency certificates can be implemented by adapting existing instruments.
- Positive market experience could be gained on the supply as on the demand side – there exists a positive demand for compensating its own energy use.
- Energy efficiency certificates enable the development of new product and services.
- Energy efficiency certificates could be an instrument for the Energy Strategy 2050 Phase 2.
- Currently, policy measures could be implemented to establish an efficiency market based on energy efficiency certificates.

Contacts for «Efficiency Market».

Project coordinator

Peter Wieland, ECG

peter.wieland@the-ecgroup.com

Tel.: +41 43 299 6664

Responsible for concept

Marcel Wickart, ewz

marcel.wickart@ewz.ch

Tel.: +41 58 319 2130