

Incentive program for motor systems efficiency in industry

First experiences from Easy in Switzerland

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Swiss Agency for Efficient Energy Use

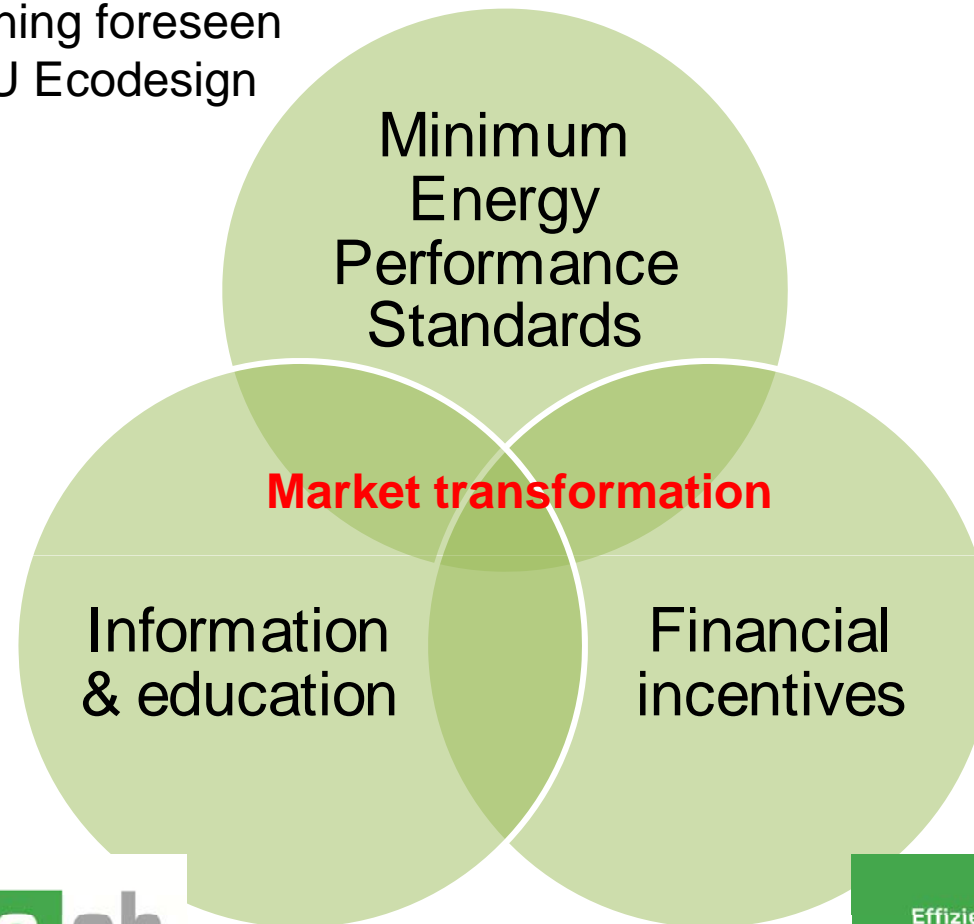


Contents

- Motor policy in Switzerland
- The Easy program
- Method
- First results

Swiss motor policy

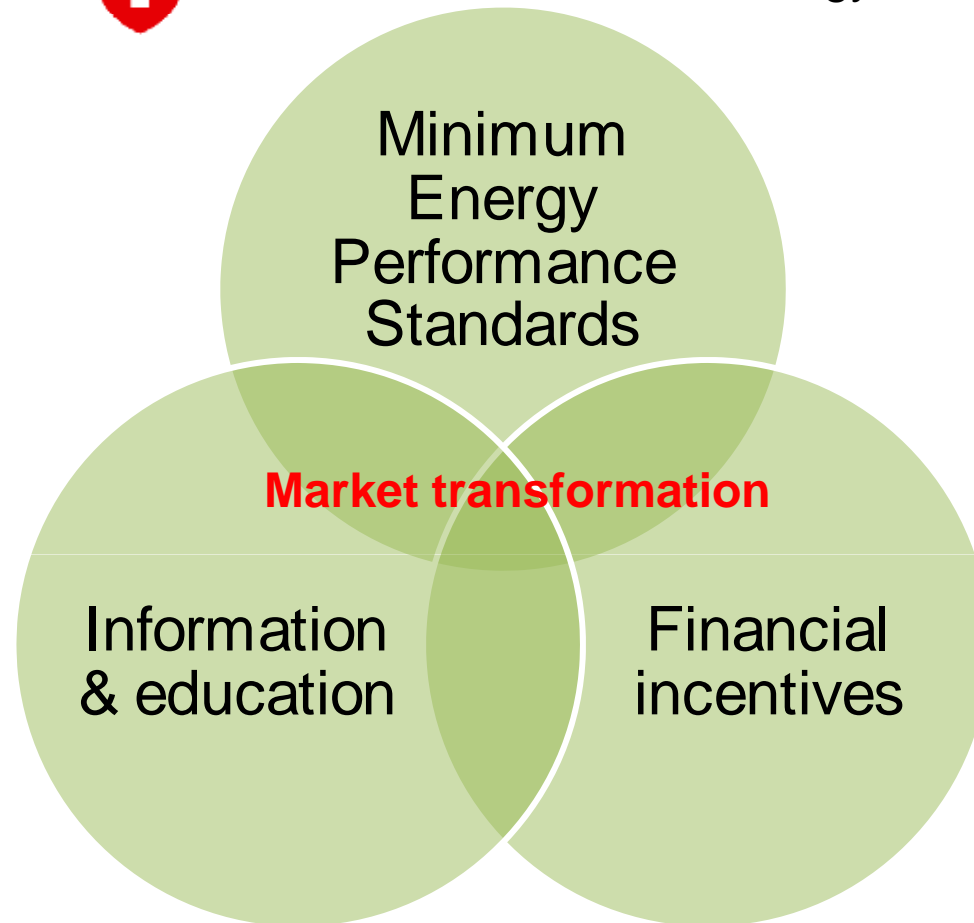
- Since 1 July 2011: IE2
- Further tightening foreseen in line with EU Ecodesign



Swiss motor policy



Swiss Federal Office of Energy



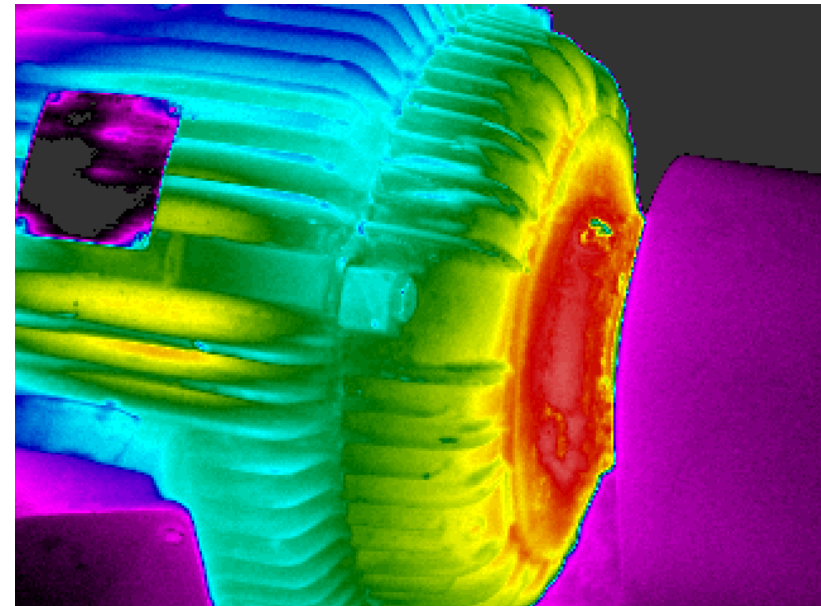
Swiss Agency for Efficient Energy Use



What is Easy?

Efficiency for motor systems

- Swiss financial incentive program
- Optimisation of existing motor systems in:
 - Industrial plants
 - Infrastructure facilities
 - Large buildings
- 3 years: until 2013
- CHF 1 million



Financing

Stiftung KEV 

 **Swiss Federal Office
of Energy**

- Funds from Swiss electricity grid charge
- National tender for electric energy efficiency

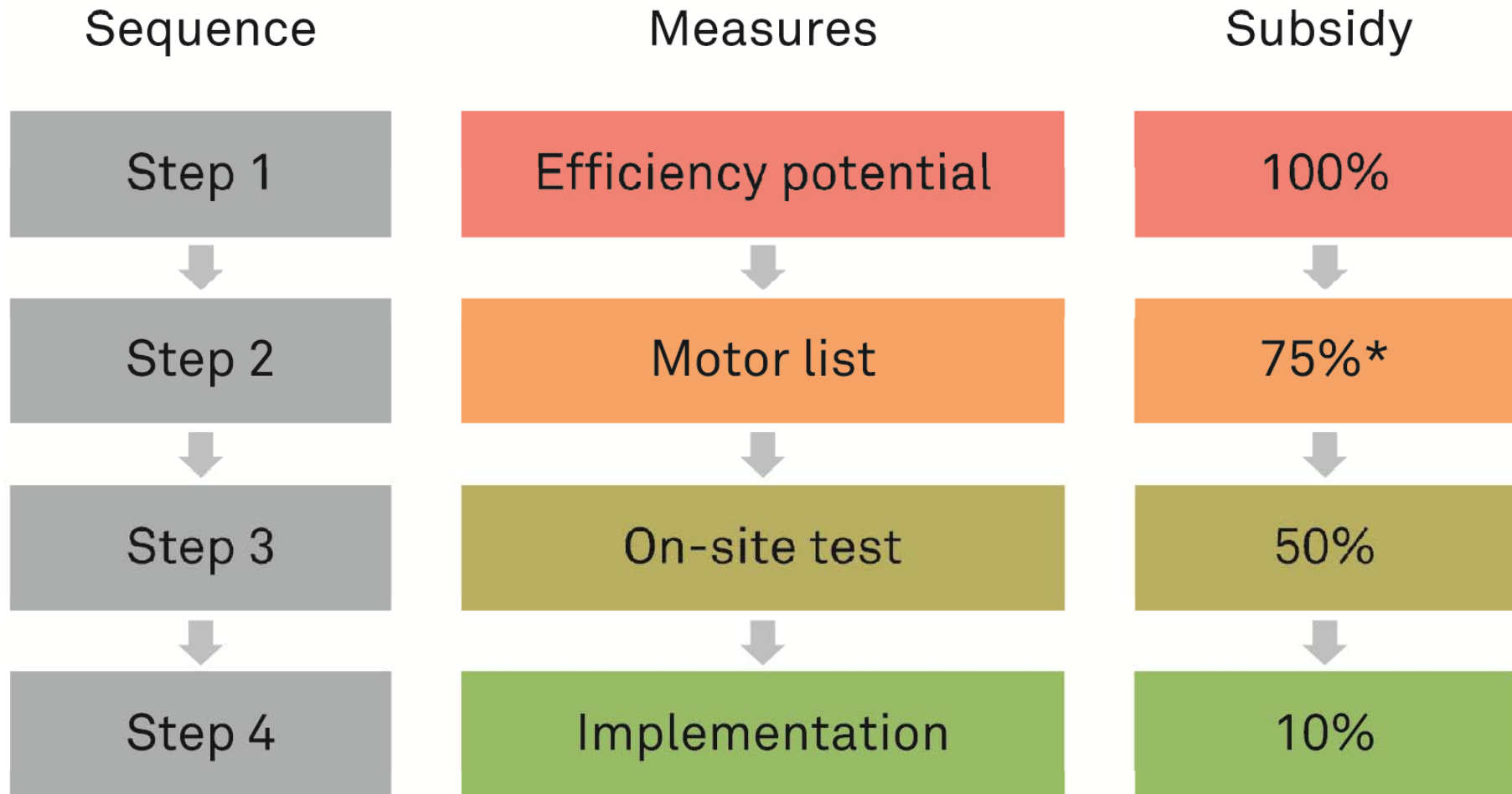
Program goal

- Preliminary assessments
 - Time & costs are barriers
 - Subsidy for preliminary assessments
- 5 participating industrial plants
 - Electricity consumption: 10 – 40 GWh/a each
- Total projected savings: 6.3 GWh/a



Method

4 Steps



* min. 25 %, max. 75 %.

Step 1 with SOTEA: top - down

SOTEA Software Tool for the estimate of energy efficiency
topmotors.ch Effizienz im Antrieb

General

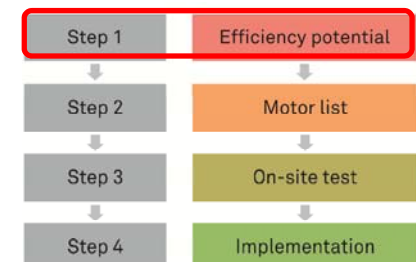
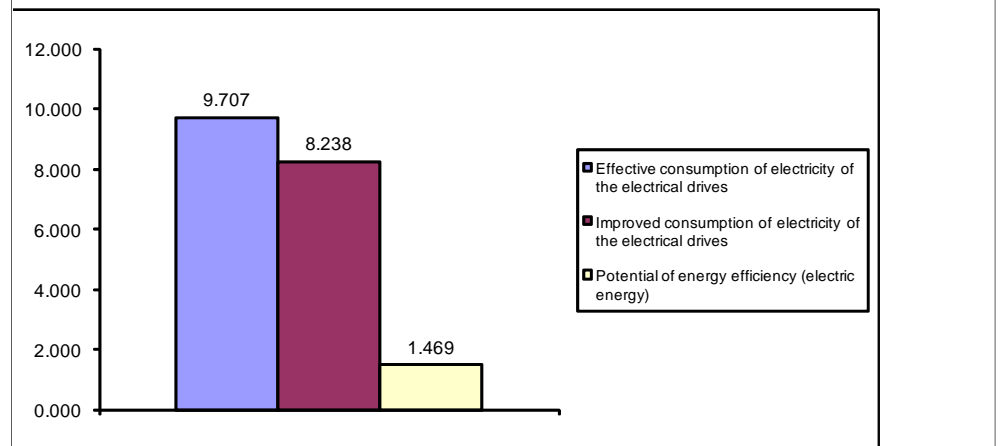
deutsch/français/english english
Date 15.12.2010
Company name Muster AG
Object Hauptanlage
Supplying electricity company BKW
ZIP code and city 3457 Wasen i.E.
Contact person in company Heinz Marti
Energy consultant Topmotors
Turnover 50 000 000 [CHF/a]
Total number of workplaces 220
Factor of office workplaces 10 [%]
Industry branch, type of plant Manufacture of chocolate

Electricity

Annual costs of electricity 1 500 000 [CHF/a]
Use of electricity 14 000 000 [kwh/a]
Average price of electricity (present) 0.107 [CHF/kwh]
Peak electric load 2 200 [kw]
Additional own electricity production (not included in electricity bill)
Electric energy 0 [kwh/a]
Electric power 0 [kw]
Special energy users
Electric water heating
Process heat
Electric steam production
Large computer center
Restaurant/cafeteria/canteen
When was the last major renewal of electric machinery? 1990 [Year]
When is the next general renewal planned? [Years]
Production changes in future Enlargement
Annual budget for maintenance or renewal of motor systems 70 000 [CHF/a]

Calculations

Effective consumption of electricity of the electrical drives	9.707	[GWh/a]
Fraction of effective consumption of electricity of electrical	69.3	[%]
Percentage of motors to be replaced	64.0	[%]
Numbers of motors with VFD	40.0	[%]
Improved consumption of electricity of the electrical drives	8.238	[GWh/a]
Potential of energy efficiency (electric energy)	1.469	[GWh/a]
Potential of energy efficiency (in currency)	0.157	[Mio CHF/a]
Potential of energy efficiency (in percentage)	15.1	[%]
Additional investments for realisation of the potential of energy efficiency	0.205	[Mio CHF]
Payback-time for realisation of efficiency potential	1.3	[a]

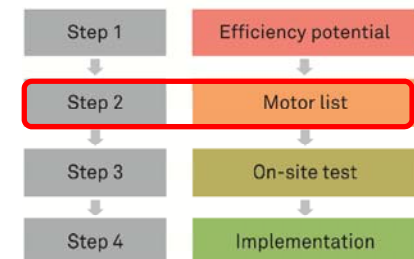


Step 2 with ILI⁺: bottom – up

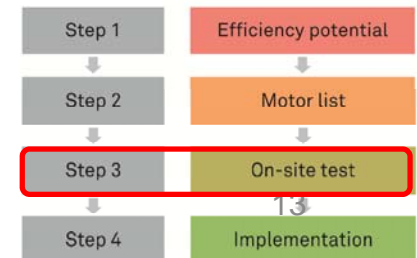
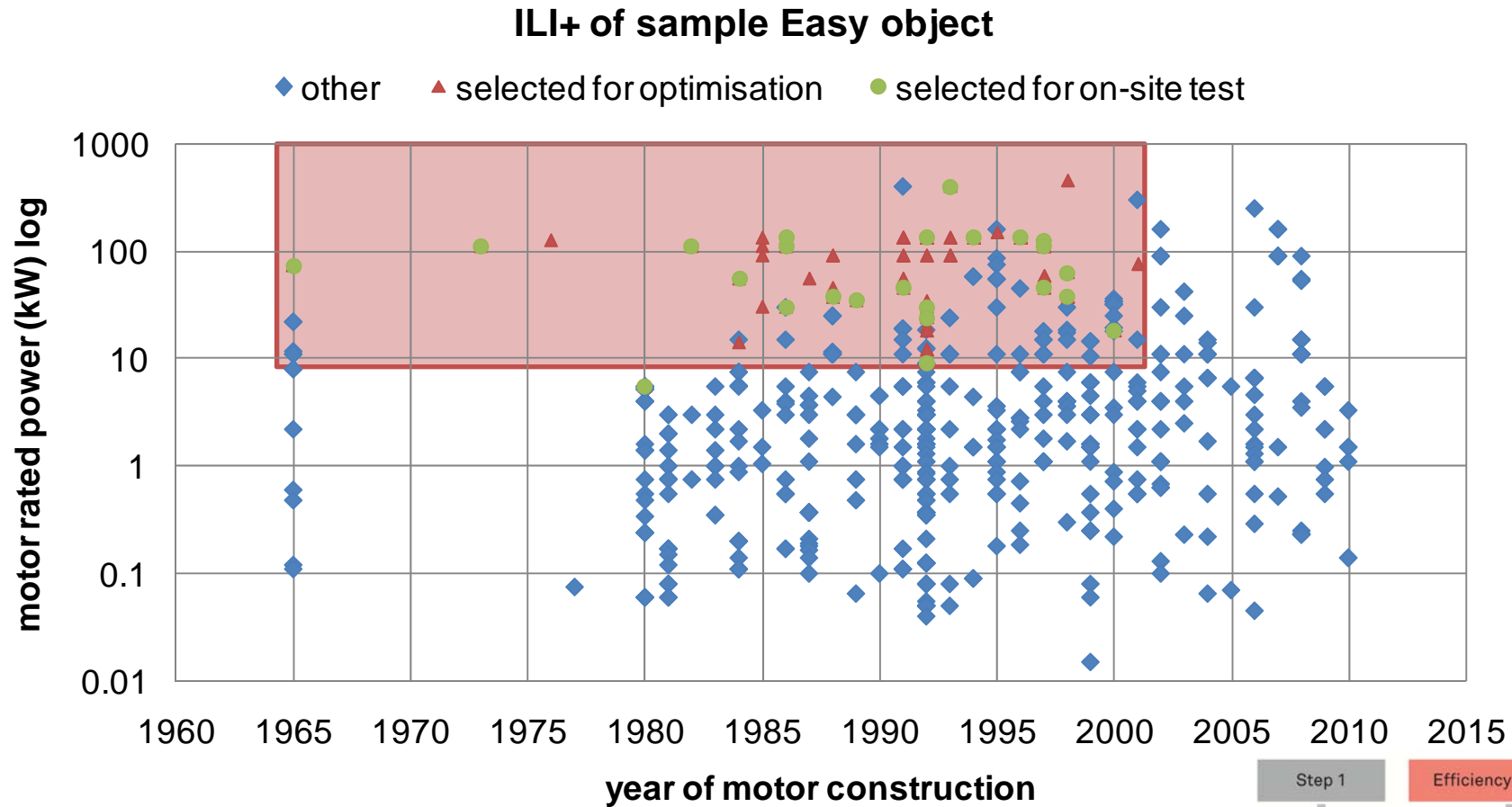
Decision Maker

Potential of reduction according to criteria									
Criteria	Default values	My values	Number of motors		Potential of reduction of energy		Potential of reduction of costs		
			absolute	in %	[kWh/a]	[kWh/LC]	[CHF/a]	[CHF/LC]	
(1) Rate of realisation of the maximal saving potential in %	50	80	81	21%	168 341	2 484 977	15 151	223 648	
(2) Age, older than x years	15	9	164	43%	139 085	1 861 780	12 518	167 560	
(3) Operating hours per year > x Stunden	3000	3000	167	44%	181 325	2 462 210	16 319	221 599	
(4) Dimension of motors > x kW	10	4	186	49%	181 425	2 653 271	16 328	238 794	
(5) Motors without FC (frequency converter)	yes	yes	326	86%	152 916	1 856 225	13 762	167 060	
(6) Application	Pump	yes	yes	112	29%	47 729	620 177	4 296	55 816
	Ventilator	yes	yes	103	27%	31 148	316 363	2 803	28 473
	Compressor air compr.	yes	yes	3	1%	493	5 105	44	459
	Compressor cold	yes	yes	18	5%	23 196	374 815	2 088	33 733
	Mechanical conveyer	yes	yes	4	1%	705	8 566	63	771
	Others	yes	yes	141	37%	121 947	1 771 288	10 975	159 416

- Goal: choose motors for optimization



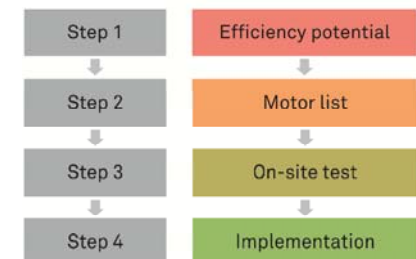
Step 3: On-site test



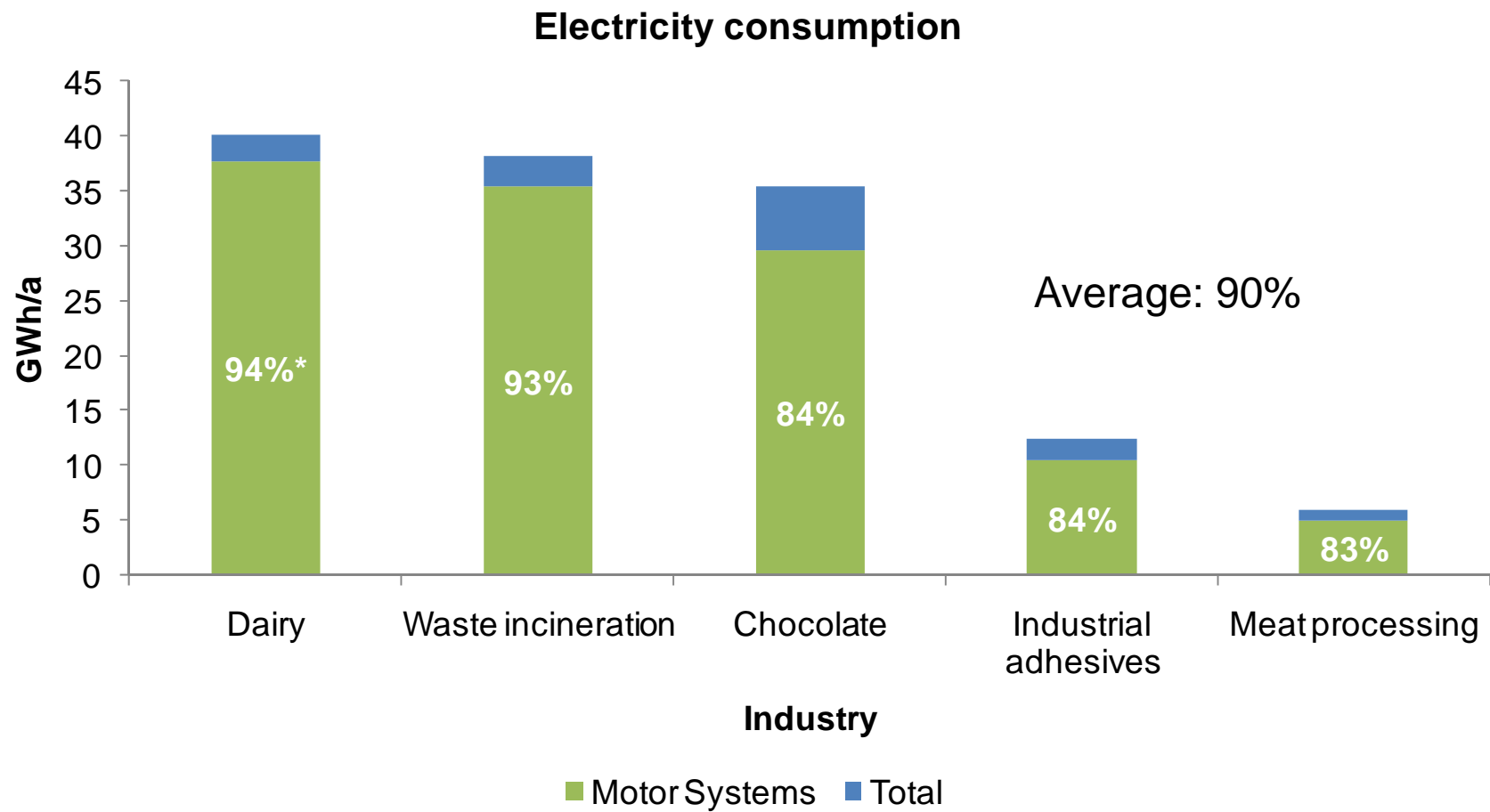
First results

Schedule

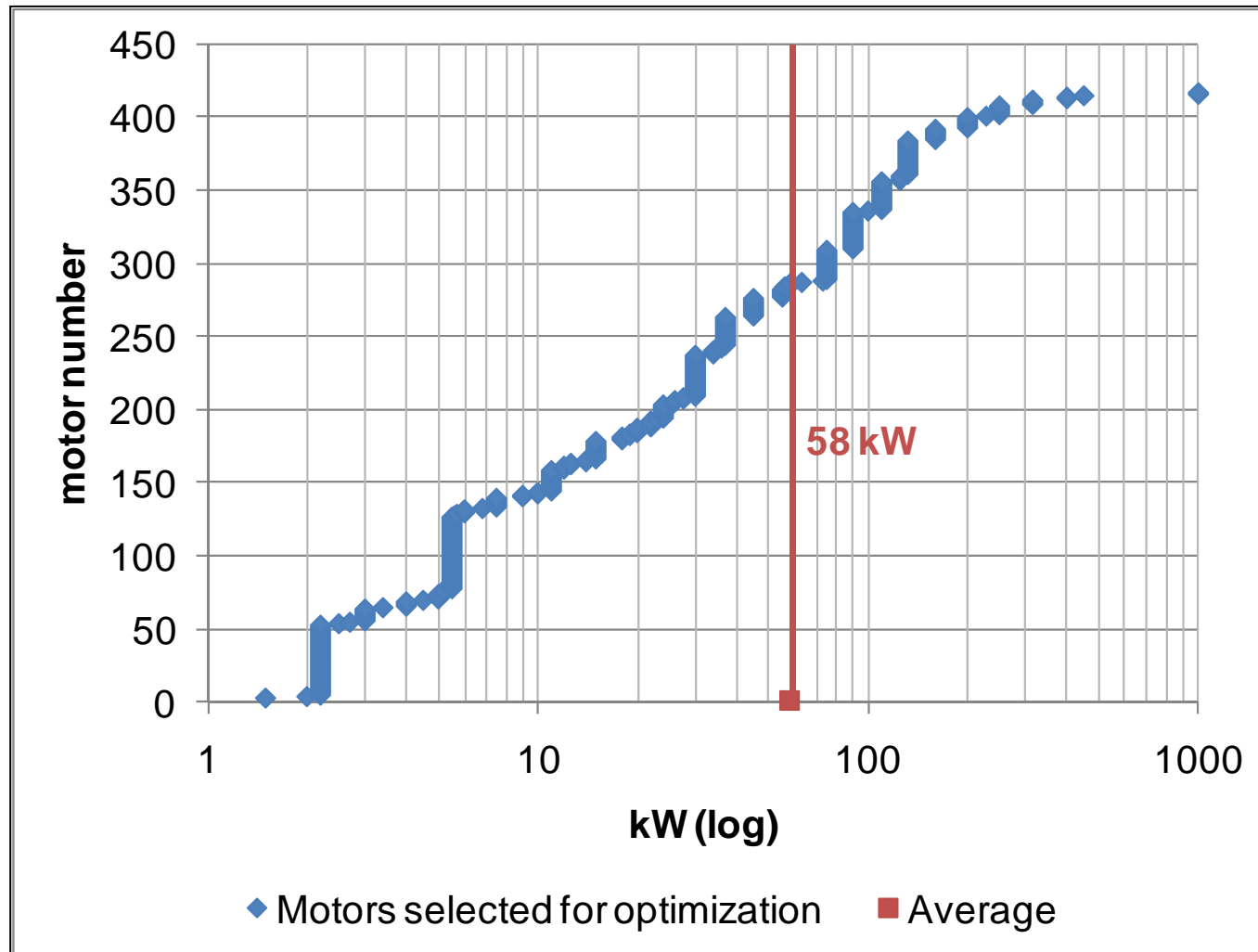
2010	Nov		Contract
	Dec		Orientation workshop
2011	Feb	9 objects	Efficiency potential
	Aug	5 objects	Motor list
	Oct	4 – 5 objects	On-site test
2012	Mar	3 – 5 objects	Investment plan
	Apr		Implementation
2013	Oct		Implementation
	Nov		Evaluation & verification



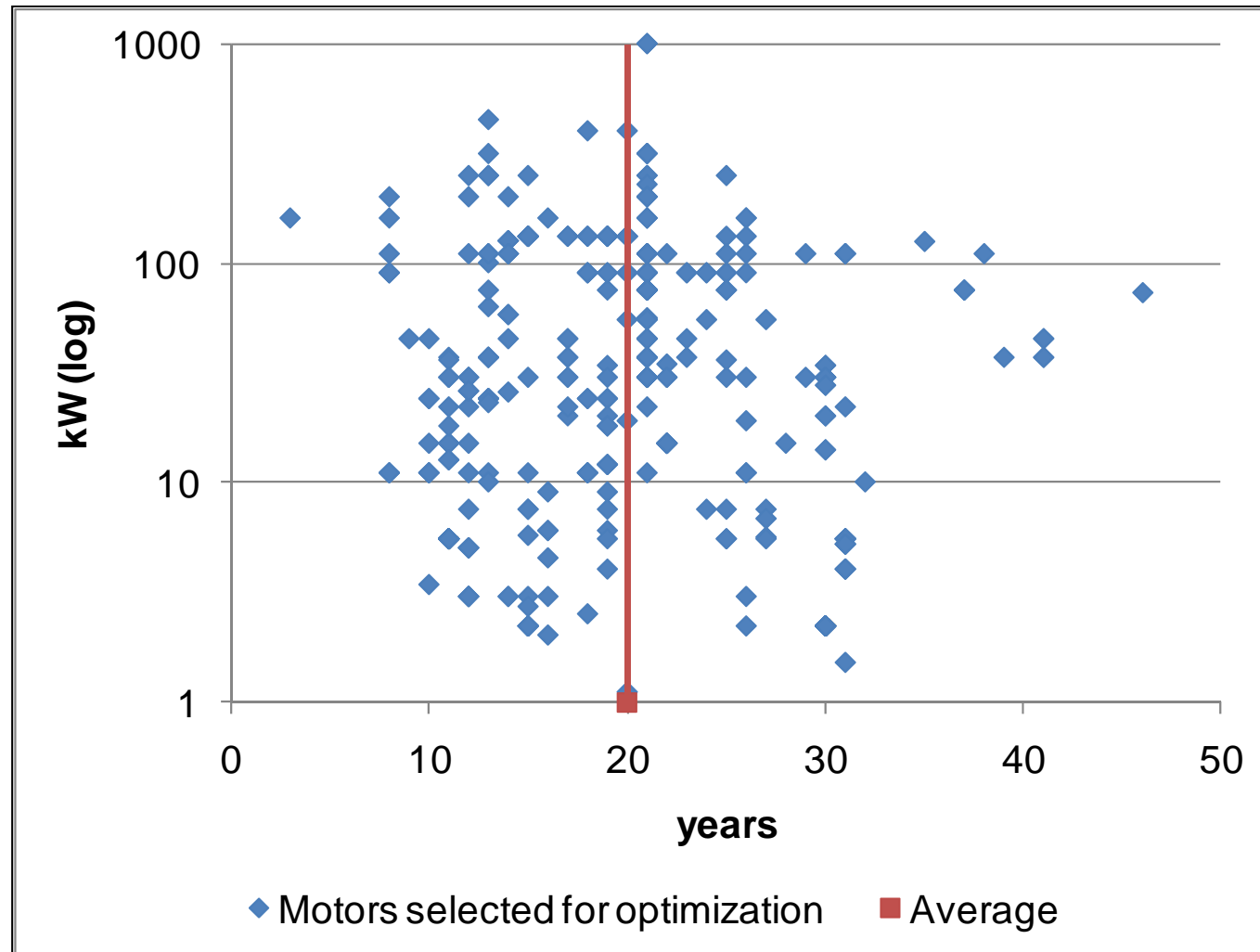
Easy objects



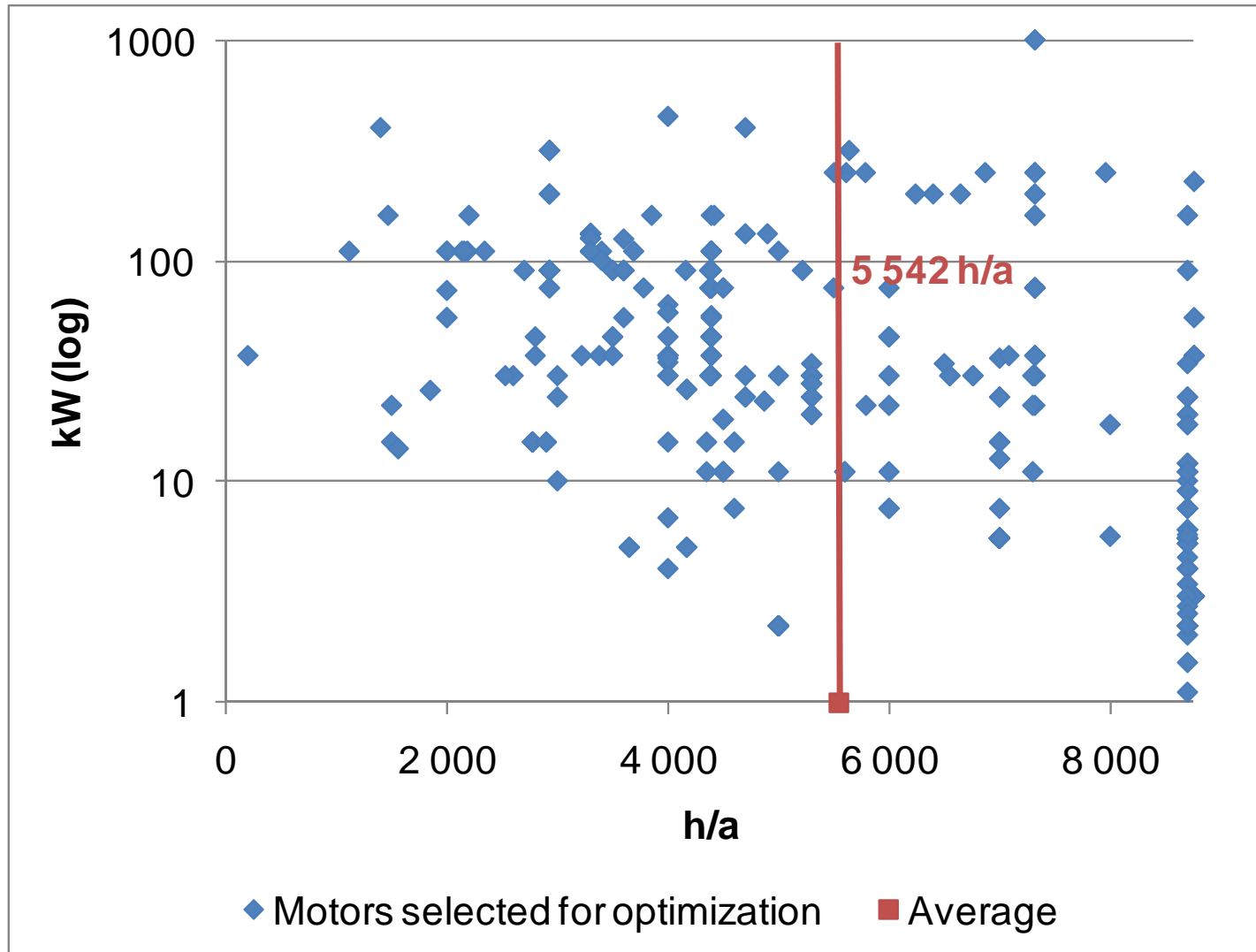
Motor size



Motor age



Operating hours



Conclusions

- Average share of motor electricity consumption 90%
- Selection of 420 motors from 1518 28%
- Average
 - size 58 kW
 - age 20 years
 - operating hours 5 542 h/a
- Estimated savings on motor replacement 2.5 GWh/a

- More results on Motor Summit 2012

Thank you for your attention!

Questions?

www.topmotors.ch/easy

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Effizienz im Antrieb

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Easy - Effizienz für Antriebssysteme

Was ist Easy?
Easy ist das Förderprogramm von S.A.F.E. für effizientere elektrische Antriebe in der Industrie. Easy wird mit 1 Million CHF aus den Wettbewerblichen Ausschreibungen des Bundesamtes für Energie gefördert. Mehr Informationen zum Ablauf, Teilnahme und dem Förderbeitrag sind unter den entsprechenden Menüpunkten zu finden. Falls Sie interessiert sind, am Förderprogramm Easy gemäss Zeitplan teilzunehmen, nehmen Sie mit uns Kontakt auf.

News
Am 29. März 2011 fand in Zürich ein Workshop für messtechnische Fachleute statt. Ziel des Workshops war, ein Standardmessprotokoll zu entwickeln, das für den Motor-Check und bei Easy eingesetzt werden kann.
Am 15. Dezember 2010 fand ein Orientierungs-Workshop für alle, an Easy Interessierten statt. Informationen und Diskussionsthemen sind in den Workshop-Folien enthalten.

Easy Downloads
Alle verfügbaren Unterlagen zu Easy sind hier zum Download bereit.

Easy Merkblätter

Nr. 1: Überblick | Nr. 2: Ablauf | Nr. 3: Teilnahme | Alle: Nr. 1+2+3

Easy Standardvereinbarungen
S.A.F.E. schliesst mit jedem Teilnehmer eine vertragliche Vereinbarung basierend auf den Easy Standardvereinbarungen ab.

provisorische Fassung (Juni 2011)

energie schweiz
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