

# IEA April 2010

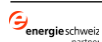
## ***Reducing CO<sub>2</sub>: The Swiss way***

Thomas Weisskopf  
thomas.weisskopf@enaw.ch  
Energie-Agentur der Wirtschaft (EnAW), Zürich



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## Energie-Agentur der Wirtschaft (EnAW)

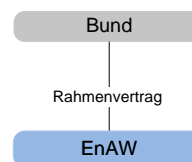
- Founding
  - 1999 by leading economic associations
- Organization
  - Institutions: Management board, executive board, division management and 35 moderators
  - Members: 1'970 companies from all sectors
- Aims
  - Reducing energy consumption and CO<sub>2</sub>-emissions by reasonable measures



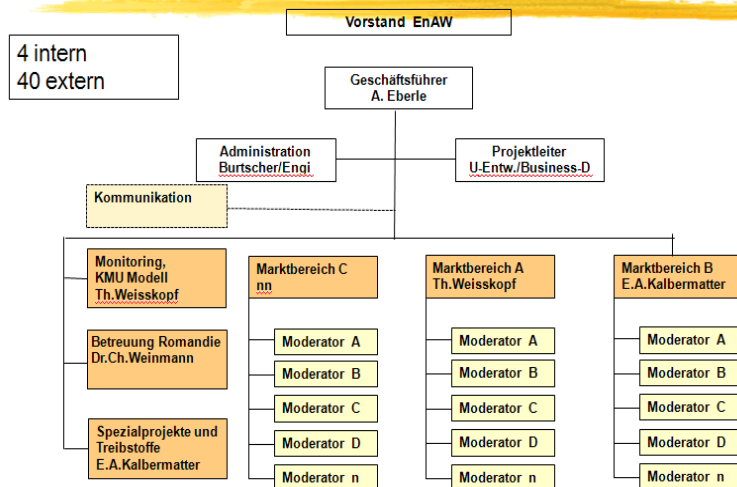
EnAW

## Settings of EnAW

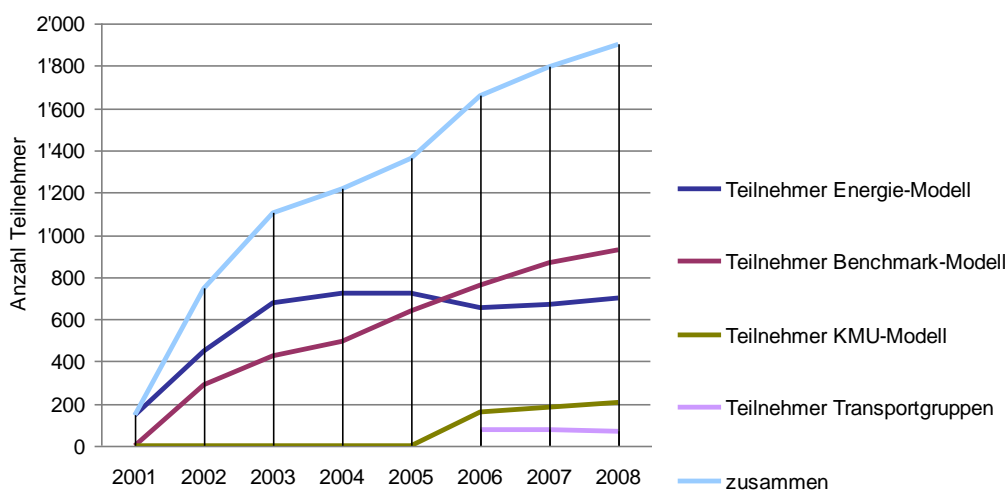
- Work of EnAW is based on the CO<sub>2</sub>-bill
- CO<sub>2</sub>-bill
  - Aim: Reduction of CO<sub>2</sub>-emissions by 10% regarding to 1990 until 2010
  - Voluntary measures are an important part of the CO<sub>2</sub>-bill
  - For implementation federal authorities can use the support of private organizations
- EnAW supports federal authorities in implementing voluntary measures



# Organization

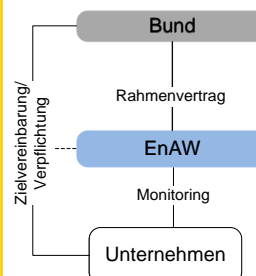


# Participating companies



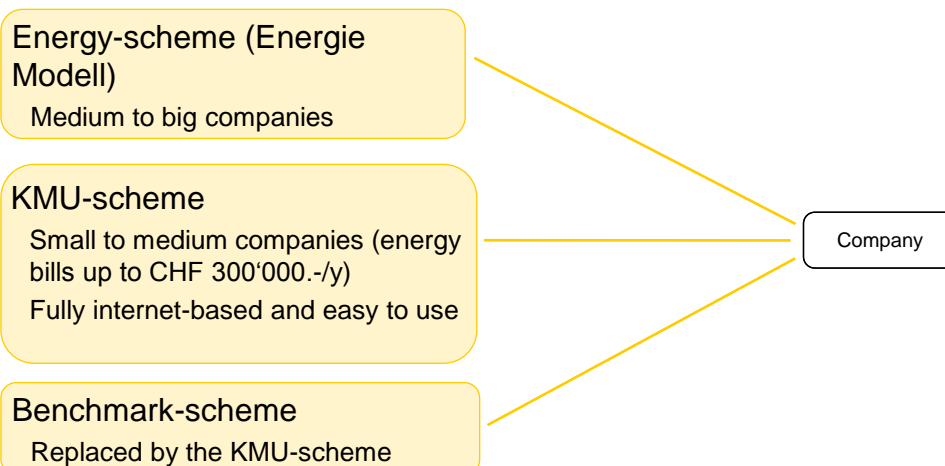
## Collaborating with companies

- Collaboration with companies is based on target agreements
  - Drawn by a moderator using a standard procedure
  - Target agreement or commitment (dispensation from CO<sub>2</sub>-tax)
  - Target agreement gets audited by federal authorities
- Monitoring of target achievement by companies and EnAW
- Quality control of monitoring by EnAW
- Monitoring gets audited by federal authorities (40 companies per year)



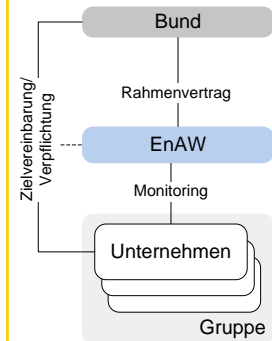
## Three schemes

Three schemes for different needs



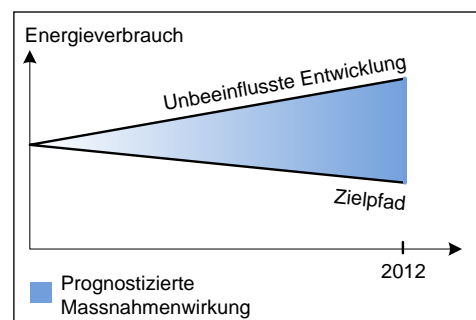
## Energy-scheme (Energie-Modell)

- Development
  - 8 to 15 companies grouped
  - One moderator as manager
  - Elaboration of company specific target agreements
- Target agreement
  - Targets depend on the measures found
  - Agreements last until 2012



## Elaborating the target agreement in the energy-scheme

- Collecting data
  - Energy consumption by source
  - Basic data e.g. building surface
  - Past energy saving activities
- Identify potential energy savings
  - What is the company's potential in saving energy and CO<sub>2</sub>-emission?
- Fixing targets
  - What energy/CO<sub>2</sub>-reduction is reached by the found measures?



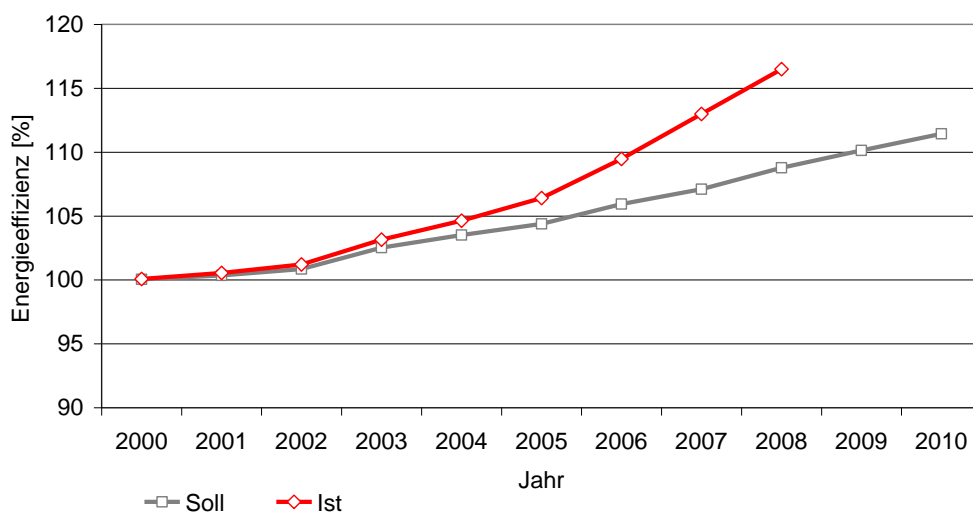
## Target-parameters in the energy-scheme

$$\text{Energy efficiency} = \frac{\text{BEC} + \text{SavedBEC}}{\text{BEC}} \cdot 100$$

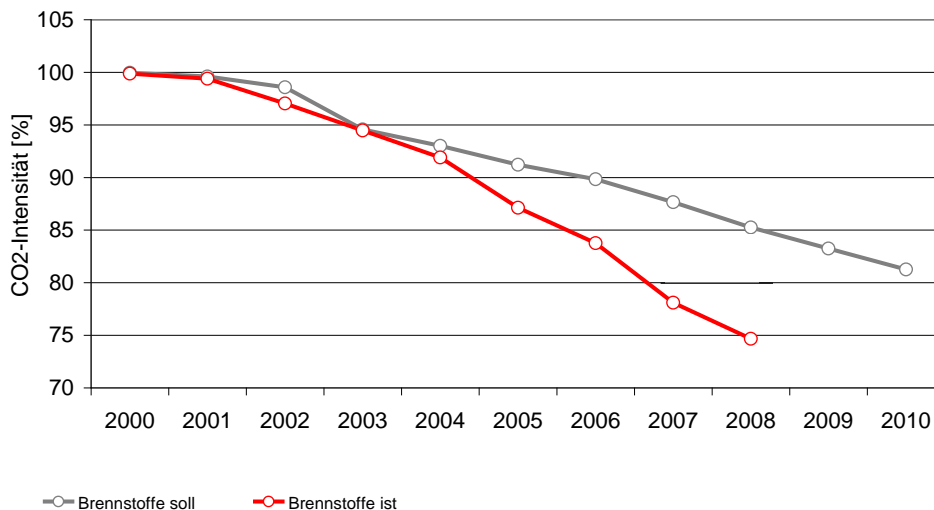
BEC                      Balanced energy consumption  
 SavedBEC              Balanced energy saving of measures

$$\text{CO}_2 \text{ Intensity} = \frac{\text{CO}_2 \text{ Emission}}{\text{CO}_2 \text{ Emission} + \text{SavedCO}_2} \cdot 100$$

## Energy efficiency



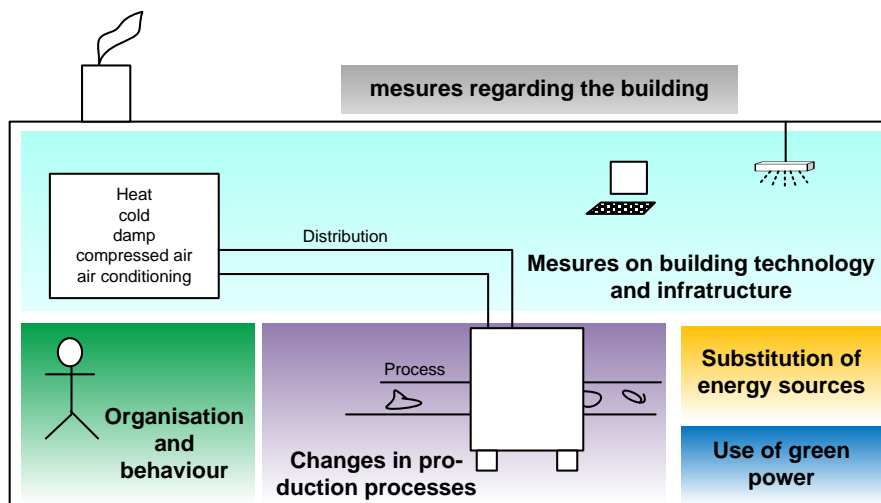
## CO<sub>2</sub>-Intensity



## What is taken as a measure?

- Improving processes
  - Product improvements to reduce energy consumption of production
  - Changing methods or technology
  - Process integration by heat recovery
- Improving infrastructure
  - Isolation, etc.
- Saving energy with non-energy driven action
  - Repairing and isolating a leaky roof
  - Replacing old monitors by flat screens
  - Building investments, etc.
- Behavior and organization
  - Driver trainings (eco drive), etc.
  - Lower room temperature, etc.

## Categories of measures



## Evaluating the impact of measures

- Normally, impact of measures is calculated
- Various calculation methods are used
  - Simple measures are easily calculated online by entering the parameters needed (e.g. isolating a building)
  - More sophisticated measures are calculated by the moderator in collaboration with the company
- Impact is entered online for monitoring

## Monitoring

- Companies enter their data online annually
  - Energy consumption
  - Measures completed
  - Company indicators

home | logout | ?

**Eingabe Gruppe**

Admin Daten

Selbstbeurteilung

Status Unternehmen



**Ausgabe Gruppe**

Auswertung

Auswertung Verpflichteter-Gruppe

### ENERGIEVERBRAUCH

Energieträger	Vorjahr		Heizungs- anteil [%]	Berichtsjahr	
	Verbrauch			Verbrauch	
Heizöl extra leicht	225'118.00 kWh		40	<input type="text" value="0.00"/> kWh	<input type="text" value="0.00"/> kWh
Erdgas Brennstoff	12'390'687.00 kWh		40	<input type="text" value="0.00"/> kWh	<input type="text" value="0.00"/> kWh
Strombezug	22'443'608.00 kWh		10	<input type="text" value="0.00"/> kWh	<input type="text" value="0.00"/> kWh

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## Monitoring

- Companies can follow their progress online

### Sample of company report

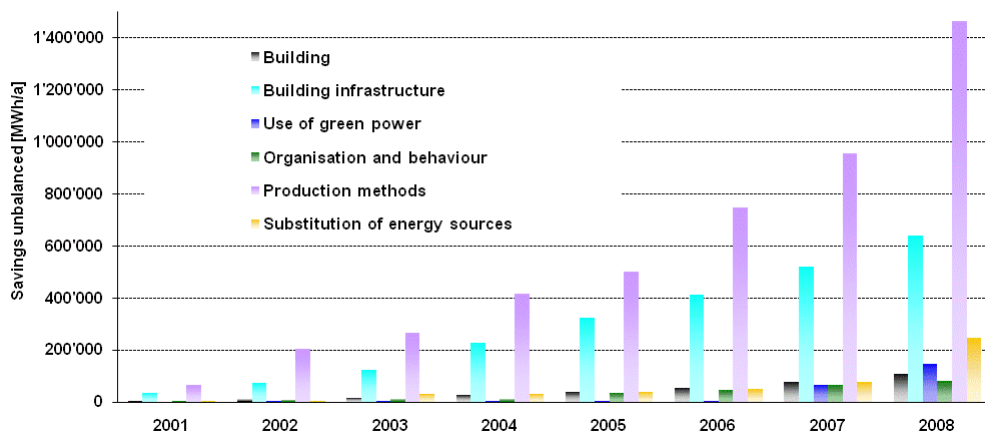
Energieverbräuche und CO <sub>2</sub> -Fracht					
Alle Angaben beziehen sich auf untere Heizwerte.					
	Energieverbrauch [MWh/a]	Brennstoffe		Treibstoffe	Total
		GEV [MWh/a]	CO <sub>2</sub> -Fracht [tCO <sub>2</sub> /a]	CO <sub>2</sub> -Fracht [tCO <sub>2</sub> /a]	CO <sub>2</sub> -Fracht [tCO <sub>2</sub> /a]
Heizöl extra leicht	0	0	0		0
Erdgas Brennstoff	164'669	164'669	32'605		32'605
Fernwärmeabgabe	0	0	0		0
Strombezug	128'929	257'858	0		0
<b>Total</b>	<b>293'598</b>	<b>422'527</b>	<b>32'605</b>	<b>0</b>	<b>32'605</b>

Wirkung aller im Betrachtungsjahr aktiven Massnahmen					
Alle Angaben beziehen sich auf untere Heizwerte.					
	Reduktion Energieverbrauch [MWh/a]	Brennstoffe		Treibstoffe	Total
		Reduktion GEV [MWh/a]	Reduktion CO <sub>2</sub> -Fracht [tCO <sub>2</sub> /a]	Reduktion CO <sub>2</sub> -Fracht [tCO <sub>2</sub> /a]	Reduktion CO <sub>2</sub> -Fracht [tCO <sub>2</sub> /a]
Heizöl extra leicht	0	0	0		0
Erdgas Brennstoff	12'387	12'387	2'453		2'453
Fernwärmeabgabe	0	0	0		0
Strombezug	-2'575	-5'150	0		0
<b>Total</b>	<b>9'812</b>	<b>7'237</b>	<b>2'453</b>	<b>0</b>	<b>2'453</b>

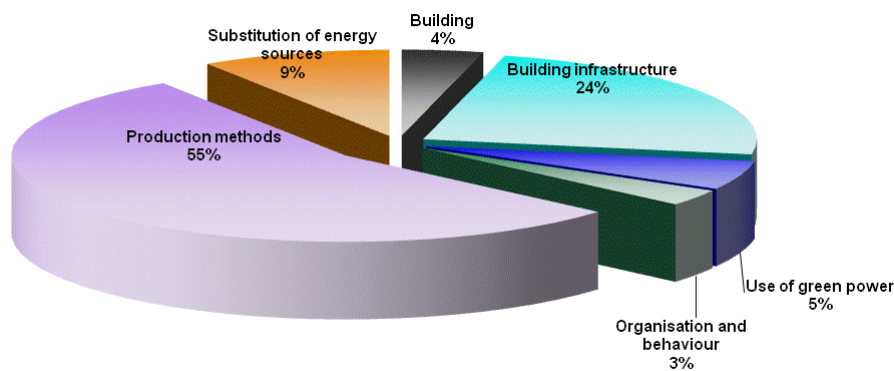
## Impact of measures in the energy-scheme

### Saved energy



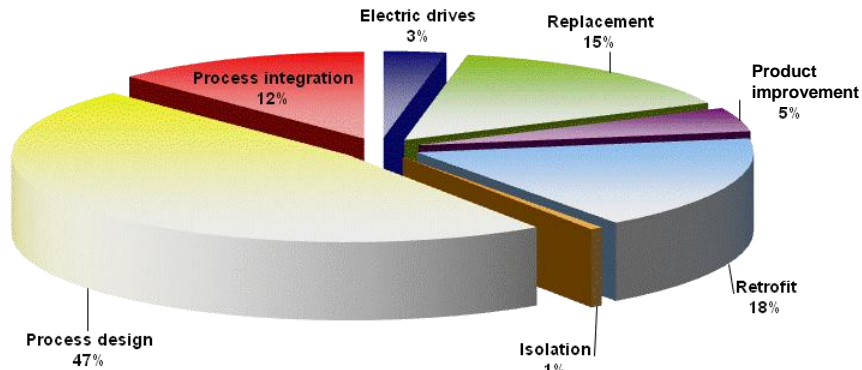
## Impact of measures in the energy-scheme

### Impact by different categories of measures



## Impact of measures in the energy-scheme

- High energy saving potential in processes



## EnAW-support for companies

- Pinch-analyses
  - Overlook on heat flows
    - Temperatures
    - Capacities
  - Shows economic energy savings by 10-40% on processes
  - Leads to the optimized heat exchanger network
  - Shows the actual and the maximum heat recovery
  - 12 EnAW-moderators are trained Pinch-experts
  - 20 analyses done
- „Top-motors“
  - Typically motors use 70% of electricity in industrial manufacturing
  - Easy to use tool to identify motors with the highest saving potential

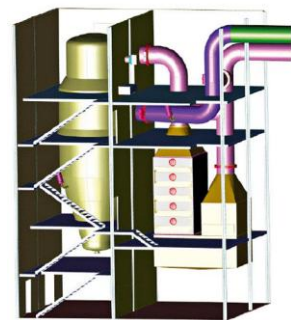
## Example of a measure

- Nestlé
  - Planning of a new production facility
  - Optimizing with pinch-analyses
- Results of pinch-analyses
  - Total energy need of new facility: 8'700 kW
  - Heat recovery potential: 4'900 kW
  - Three packages of measures:
    - Use of the spray dryer's outgoing hot air
    - Warm up milk with used cooling water
    - Use of lost heat of cooling unit in process heat exchanger



## Example of a measure

- Heat effectively recovered: 4'528 kW (92% of potentially usable heat)
- Annual savings
  - Energy: 12.5 GWh/a
  - CO<sub>2</sub>-emissions: 3'329 to/a
  - Saving on energy costs: € 766'000.-/a
- Payback: 2.6 years (3.3 years after taxes)



## Why companies participate?

- Lower energy costs
- PR
- Financial incentives
  - Reaching the target companies are disburdened of the CO<sub>2</sub>-tax
  - Additional CO<sub>2</sub>-savings can be sold (to the Schweizerische Klimastiftung)
  - Zurich power distributor: Reaching the target electricity bill is reduced by 10%
  - Other power distributors support the realization of measures and partly pay the participating fees of EnAW

## Further information (German and French only)

<b>Homepage of EnAW</b>	<a href="http://www.enaw.ch">www.enaw.ch</a>
<b>KMU-sceme of EnAW</b>	<a href="http://www.enaw-kmu.ch">www.enaw-kmu.ch</a>
<b>Programm "EnergieSchweiz"</b>	<a href="http://www.energieschweiz.ch">www.energieschweiz.ch</a>

## Many thanks for your attention



Energie-Agentur der Wirtschaft EnAW  
Member of executive board  
Thomas Weisskopf  
c/o Weisskopf Partner GmbH  
Albisriederstrasse 184 b  
8047 Zürich  
Tel. +41 44 404 80 41  
Fax +41 44 404 80 30  
[thomas.weisskopf@enaw.ch](mailto:thomas.weisskopf@enaw.ch)  
[www.enaw.ch](http://www.enaw.ch)