

# Energy Efficiency Network in the Greater Accra Region

Official Launch Event

Accra, Ghana

Sustainable Energy for Climate | September 28<sup>th</sup>, 2023



german  
cooperation

DEUTSCHE ZUSAMMENARBEIT

Implemented by:

**giz** Deutsche Gesellschaft  
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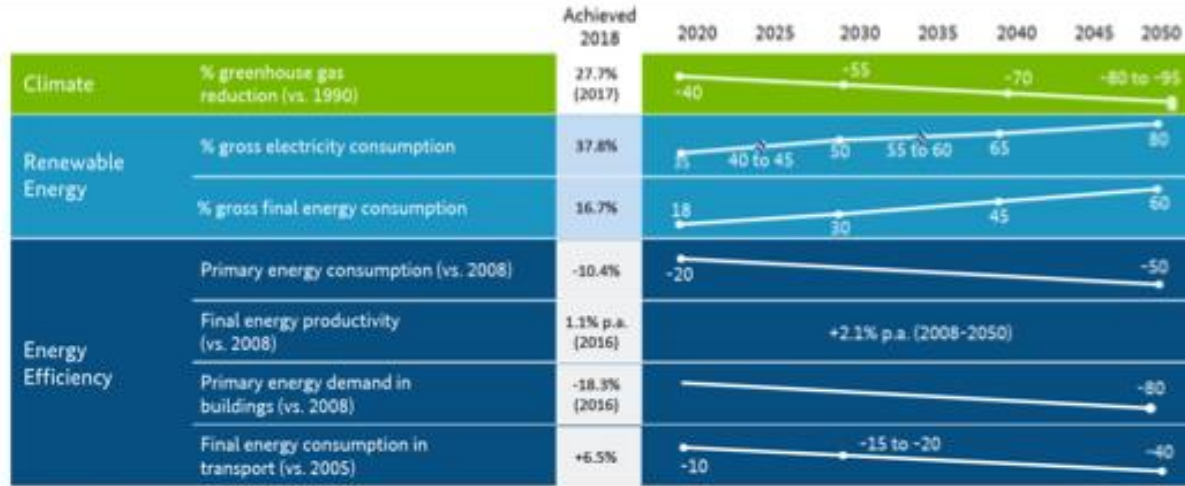


INTEGRATION  
environment & energy



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# Long-term energy and climate strategy of Germany



Source: Ecofys 2018 based on BMWi 2018, UBA 2016, 2019, AGEB 2018, 2019



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# A sound mix of energy efficiency instruments for industry in Germany

Instrument from the federal government

Energy consulting for medium-sized businesses  
 Competitive tendering program – STEP up  
 Program for energy efficiency projects for electricity and thermal energy savings  
 Pilot program for energy savings meters  
 ...

EDL-G: Energy audit obligation for non SME  
 SpaEfV: peak balancing directive  
 EEG: Renewable Energy Sources Act  
 EU Ecodesign Directive: Requirements for Energy-Using-Products  
 ...

Comprehensive communication measures

**Initiative Energy Efficiency Networks**

DEUTSCHLAND  
 MACH'S  
 EFFIZIENT.



INITIATIVE  
 ENERGIEEFFIZIENZ  
 NETZWERKE

EU emission trading  
 Voluntary agreements  
 IPPC

Energy charge  
 Electricity tax ..

Broad-based and well networked energy research ...



Source: BMWi, dena



# Partners of the Initiative

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# Partners of the Initiative



Bundesministerium  
für Wirtschaft  
und Energie

Bundesministerium  
für Umwelt, Naturschutz  
und nukleare Sicherheit



**bbs** die baustoffindustrie  
Bundesverband Baustoffe - Steine und Erden e.V.  
German Building Materials Association

**bdew**  
Bundesverband der Energie- und  
Wasserwirtschaft e.V.

**BDI**  
Bundesverband der  
Deutschen Industrie e.V.

**BVE**  
Bundesvereinigung  
der Deutschen  
Ernährungsindustrie

**DIHK**  
Deutscher Industrie- und  
Handelskammertag

**HDE**  
Handelsverband  
Deutschland

**GKV**  
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**MWW**

**Stahl**

**BY GLAS**



**VDMA**

**vdp**  
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**VEA**  
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**ZDH**  
ZENTRALVERBAND DES  
DEUTSCHEN HANDWERKS

**ZIA**

**ZVEI:**  
Die Elektroindustrie

## Cooperation Partners

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**BEEN-i**

**EnergieAgentur.NRW**

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Energie Technologie Initiative

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**AGEEN**  
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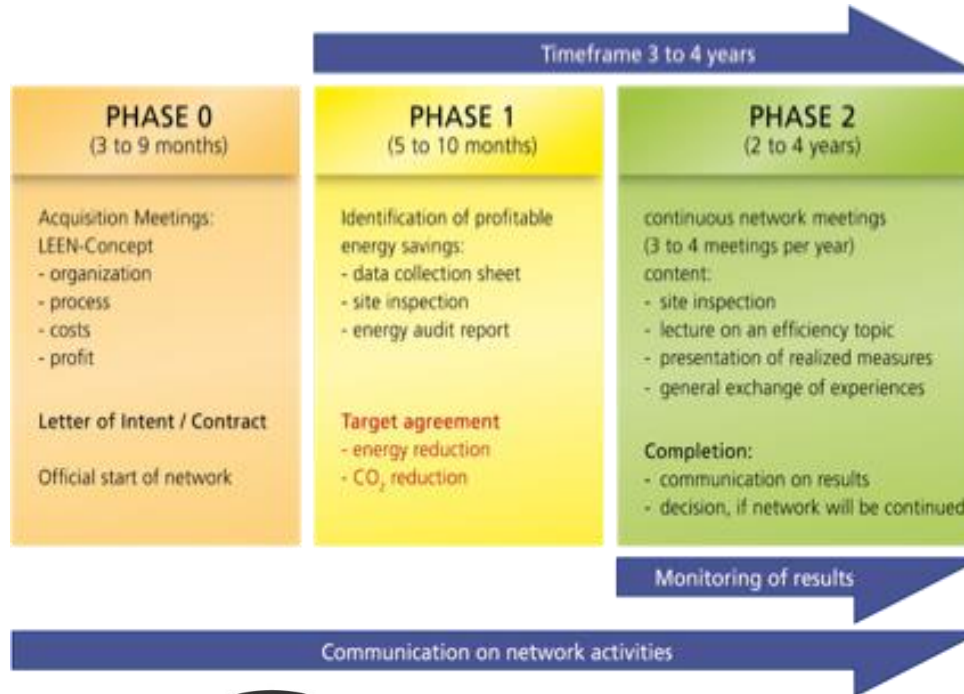
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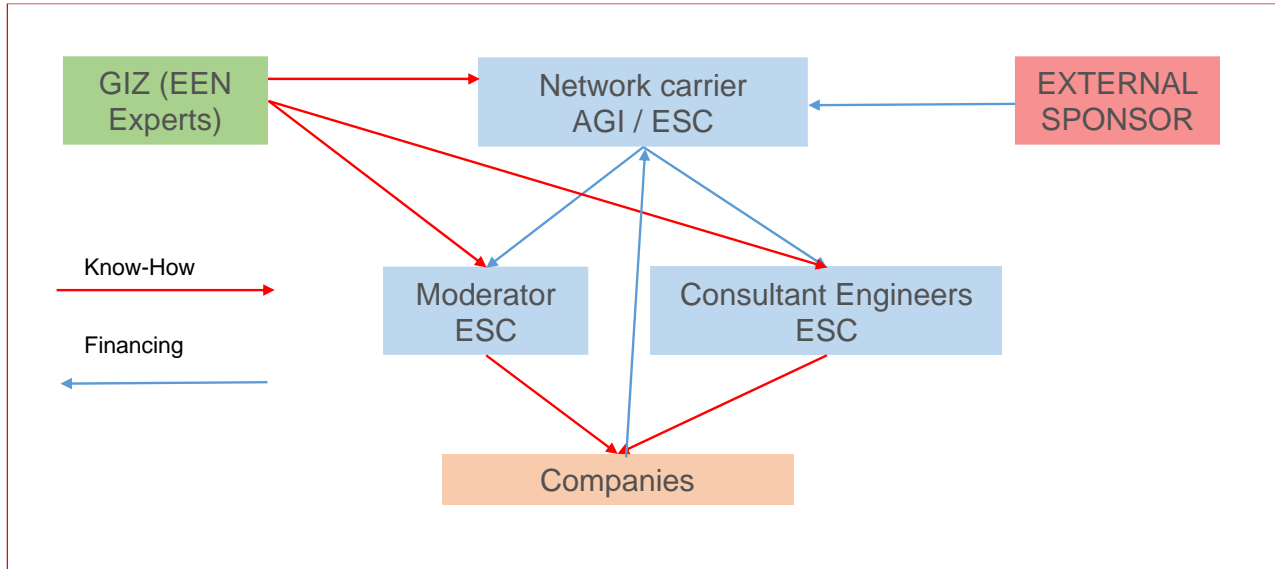
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# Network Process



# Network Structure



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# Expected outcomes (I/III) – Measures Overview

Short description of suggested measures	Purchased electricity	Natural gas	Operating life	Total investment for efficient measure	Additional investment for efficiency	Annual costs	Other annual earnings	Net present value (10%)	Internal rate of return	Static payback period	Dynamic payback period (10%)	Energy efficiency gain	CO <sub>2</sub> reduction
	MWh/a	MWh/a	a	EUR	EUR	EUR/a	EUR/a	EUR	%	a	a	%	%
Number of profitable measures	107	47.944		8.783.100	7.898.100	121.000	15.200	13.940.546	27,8%	4,2	5,1	16,8%	14
Replacement of all heat exchanger		1.215,0	5	23.000	23.000			183.762	220,8%	0,5	0,5	0,4%	0
Replacement of heat exchanger at exchanger replacement		12.250,0	15	1.050.000	300.000	45.000		4.403.542	157,9%	0,7	0,7	3,8%	3
Reduction of condensate water loss due leaks in HOS		1.814,0	15	100.000	100.000	3.000	15.000	738.466	90,7%	1,2	1,3	0,5%	0
Replacement of valves, fittings of steam distributing system		90,0	5	5.000	5.000			10.316	72,7%	1,4	1,5	0,0%	0
Reduction of steam leaks in distribution system		675,0	15	50.000	50.000			228.035	60,3%	1,8	2,0	0,2%	0
Installation of modulating burner and control		2.000,0	15	150.000	150.000	5.000		635.776	56,5%	1,9	2,2	0,6%	0
Installation of Water Boiler Economizer		-200,0	15	570.000	570.000	18.000		2.240.962	53,4%	2,1	2,3	2,2%	2
Replacement of lighting system with LED		7,0	15	2.600	2.600		200	2.789	24,6%	4,4	5,6	0,0%	0
Replacement of valves, fittings and pumps at DHS		475,0	5	62.500	62.500			18.333	20,5%	3,2	3,8	0,1%	0
Installation of solar collectors for DHW preparing		22.000,0	25	6.500.000	6.500.000	50.000		5.447.800	17,5%	7,6	10,2	7,1%	6
Replacement of circulation pumps with frequency regulation		300,0	15	270.000	135.000			30.766	13,3%	8,2	11,3	0,1%	0



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## Expected outcomes (II/III) – Example measures

Overview	
Reports evaluated	366
Number of measures	7,030
Of that quantitatively evaluated measures	6,030
Of that profitable measures (int. rate of return $i^* > 12\%$ )	3,580
$\emptyset$ $i^*$ of all profitable measures	31%
$\emptyset$ Static amortization of all profitable measures	3.2
$\emptyset$ Investment per measure [EUR]	55,700
$\emptyset$ Values per company/site if all profitable measures are implemented ( $i^* > 12\%$ )	
$\emptyset$ Energy savings [MWh/a]	2,670
$\emptyset$ Reduction of CO <sub>2</sub> emissions [t/a]	940
$\emptyset$ Number of quantitatively evaluated measures	19
Of that profitable measures (int. rate of return $i^* > 12\%$ )	10
$\emptyset$ Total additional investment sum [EUR]	580,000
$\emptyset$ Reduction of energy costs [EUR/a]	180,000



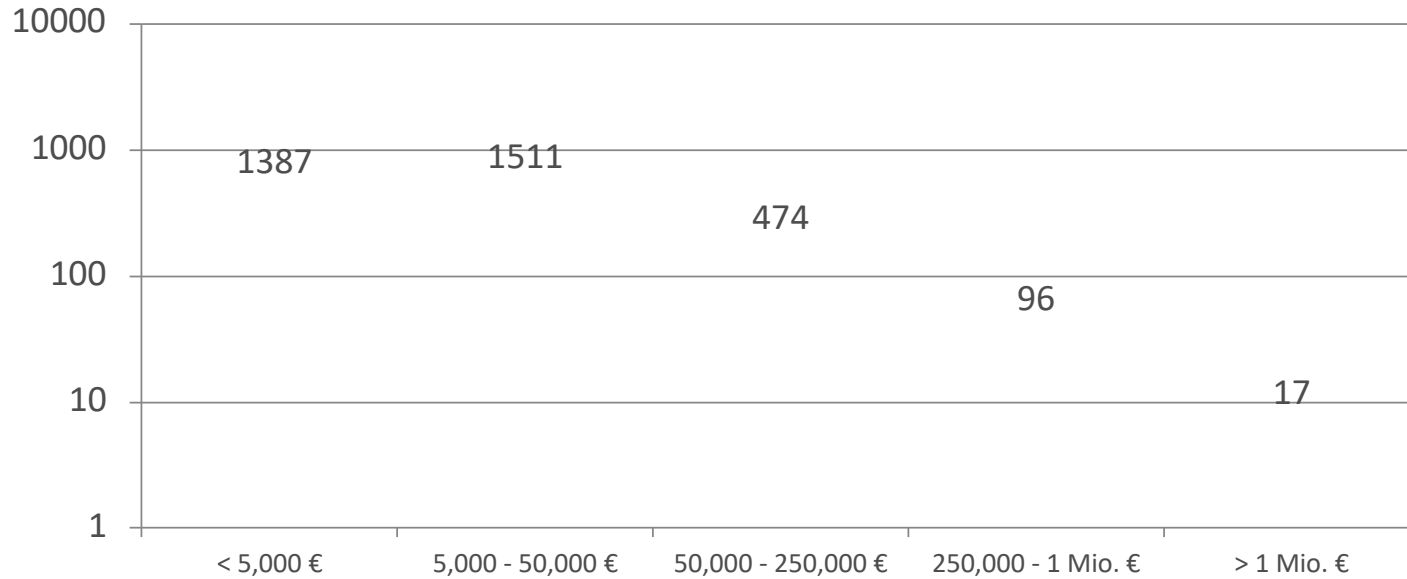
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# Expected outcomes (III/III) – Example measures



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# Companies will get a clear understanding of their...

- Consumption per energy carrier
- Price per energy carrier
- Cross-cutting technologies in place
- Saving potentials per cross cutting technologies
- Savings potentials per energy carrier
- Investment required
- Rate of Return per measure



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# What will it take?

- An experience and certified engineer (ISO 50001 or 50006)
- A tool set for data-collection and the calculation of savings (cross-cutting and process technologies)
- An economic assessment of the saving potentials
- A monitoring process on implemented measures (energy, CO2, profitability)
- An established communication between management, procurement and technical & maintenance head
- A general support structure



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**Deutsche Gesellschaft für  
Internationale Zusammenarbeit (GIZ) GmbH**

Registered offices  
Bonn and Eschborn

GIZ Office Accra  
P.O.BOX KA 9698  
7 Volta Street Airport Residential Area  
Accra-Ghana  
T +233 302 780 448  
F +233 302 777 375

E [info@giz.de](mailto:info@giz.de)  
I [www.giz.de](http://www.giz.de)