



Federal Ministry
for Economic Affairs
and Climate Action



HỖ KHÓA HỌC VÀ CÔNG NGHỆ SỬ DỤNG NĂNG LƯỢNG
TIẾT KIỆM VÀ HIỆU QUẢ VIỆT NAM

Energy Efficiency and Climate Networks and the ISO 50005

Philipp Poferi
Arqum GmbH
29.11.2022

Agenda

Programme on 29.11.2022

Introduction Arqum

Company networks for a green economy – a German perspective

International case studies

ISO 50005

1. Introduction Arqum

Arqum GmbH – company profile

Our expertise.



environment

Consultation according to ISO 14001, EMAS, ÖKOPROFIT & KLIMAFit



climate

Establishment of:
Climate management system;
strategies; climate balances; Product
Carbon Footprint



energy

Support with energy management (ISO 50001/ ISO50005) + energy audits (DIN EN 16247-1)



OHS

Implementation of occupational health and safety (ISO 45001)



quality

Your partner in quality management according to ISO 9001 & EFQM criteria



international

Global cooperation to implement your climate and sustainability goals



CSR sustainability

Sustainability management according to ESG criteria + development of credible and implementable CSR strategies



compliance

Targeted services to achieve the corporate goal of legal certainty

Arqum GmbH – company profile

key data



Our Start

Since 1998, Arqum has stood for occupational safety, quality and environmental management.



Our Sites

In addition to its headquarters in Munich, Arqum has offices in Stuttgart, Frankfurt, Hanover and Berlin.



58

Employees



3.000

Supervised companies



300

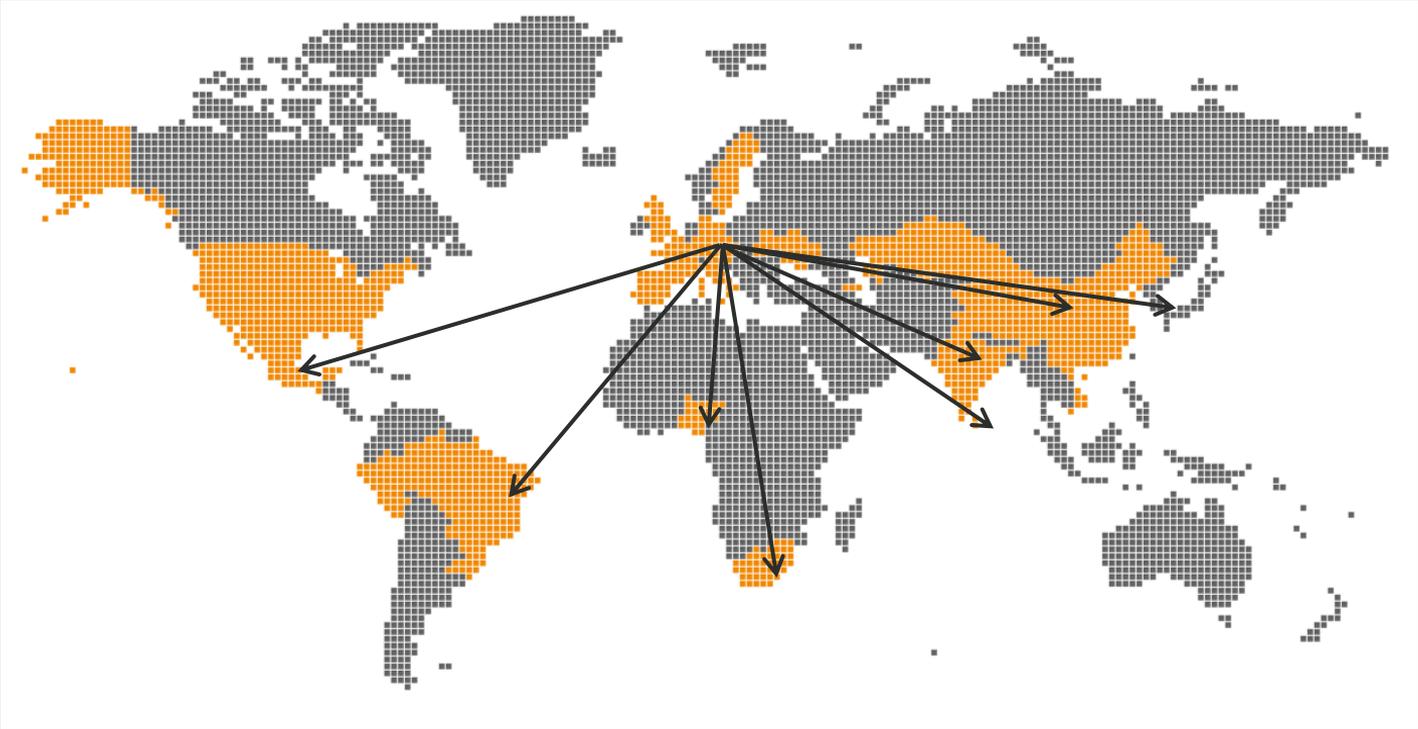
Environmental management certifications prepared (ISO 14001 & EMAS)



200

Seminars, workshops and trainings per year

Activities worldwide



International projects

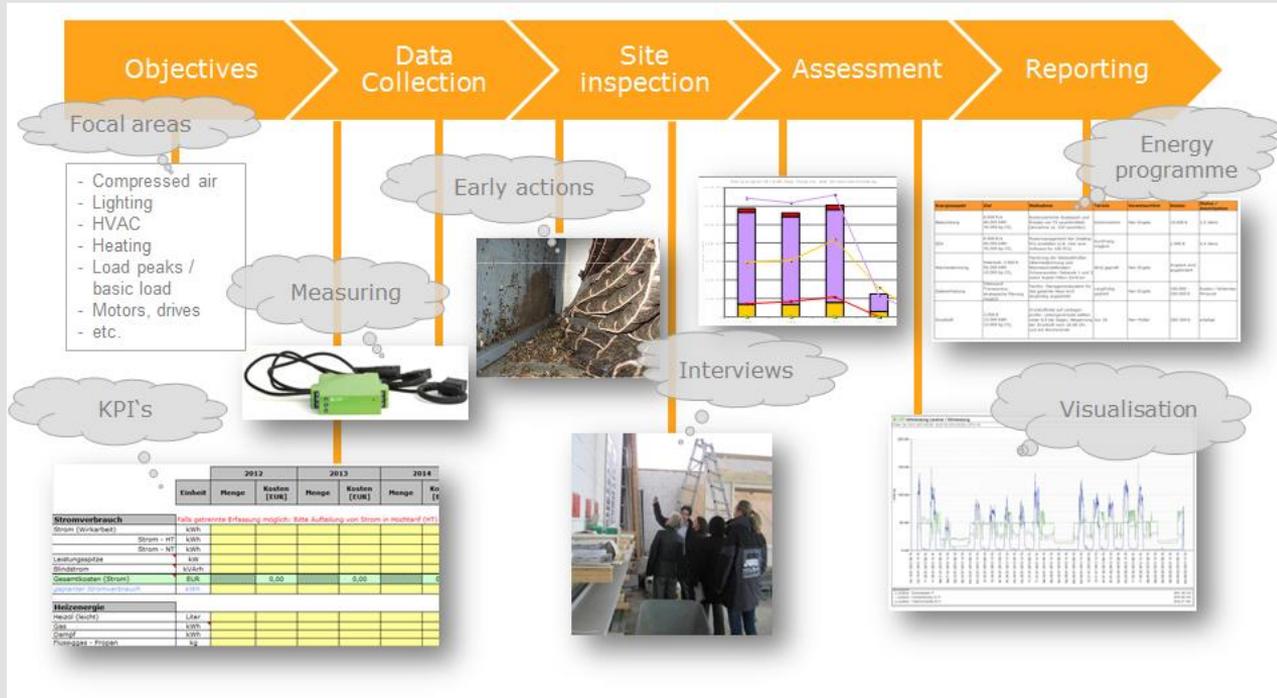


2. Company networks for a green economy – a German perspective

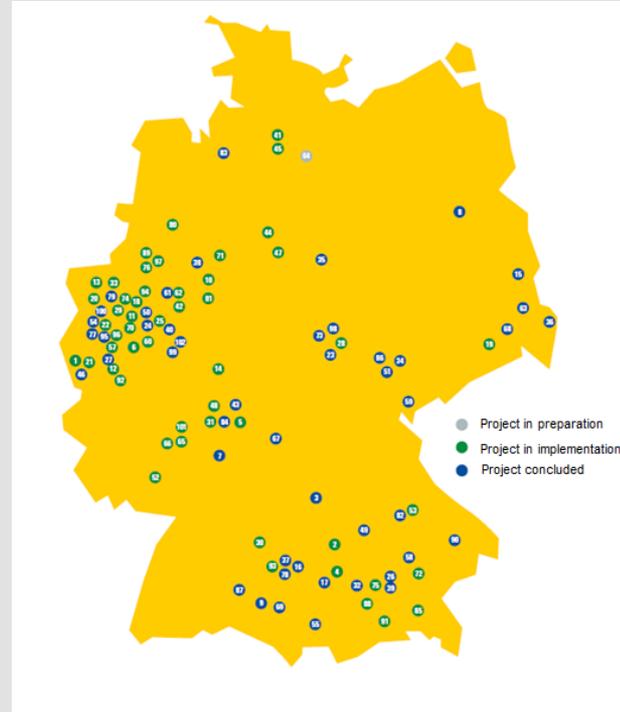
Individual Consultancy: Management Systems



Individual Energy Consultancy: Energy Audit DIN EN 16247 / ISO 50002



ECOPROFIT in Germany¹



¹ ECOlogical PROject for Integrated Environmental Technology
Source: 20 Jahre ÖKOPROFIT München Jubiläumsbroschüre

ECOPROFIT in Germany

Selected topics relevant to all participating companies

Usually 6-10 workshops within 12-24 months

Workshops	Onsite Consultancy
Project introduction and organisation	Initial Assessment
Waste	Legal Compliance Check
Energy (electricity, heat)	Action Program
Hazardous Chemical, Water	Organisation
Legal compliance, Renewables	Audit through external commission
Purchasing, Controlling	
Environmental Management	
Work Safety, HVAC	
CSR, Green-IT, finalisation	
Awarded ECOPROFIT Company	

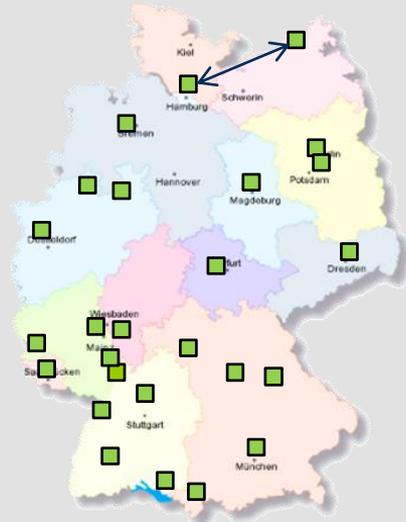
Typically 3-6 on-site meetings at each participating company



Awarding through local authorities on the basis of standardised criteria



30 Pilot Networks



- Total energy costs around 1 billion €/a
- Energy consumption > 15 TWh/a
- CO₂ emission > 5 million t/a

Climate and Energy Efficiency Networks Initiative



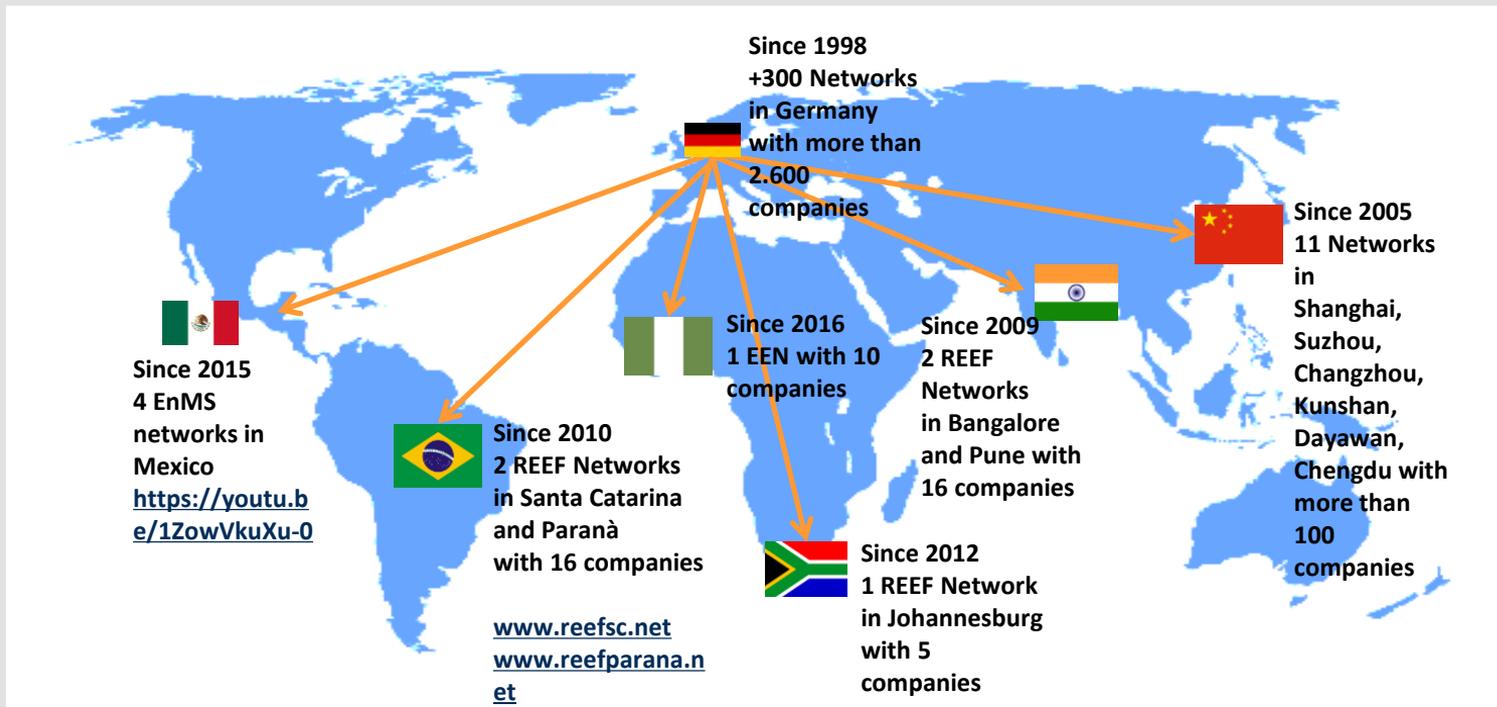
- Lead by BMWH and BMU and 21 German associations
- 500 networks until 2020
- Currently: 346 networks in Germany

Objectives of EEN

- Overcoming barriers to energy efficiency (EE) in the industry (e.g. lack of information and awareness, difficult access to technology, absence of incentives, funding and finance)
- Reduction of transaction costs (e.g. acquisition of EE information and knowledge)
- Raising awareness and priority towards EE measures (e.g. of top management)
- Facilitating the application of EE technology and best-practices in the industry
- Establishing the foundations of Energy Management Systems (EnMS)
- Initializing a continuous process for EE improvements
- Reducing energy costs of the companies
- Strengthening the competitiveness of the companies

3. International case studies

Transfer of the network concept



* Source: Arqum GmbH



Resource and Energy Efficiency Network **Santa Catarina**



Case 1: Resource and Energy Efficiency Networks (REEF) in Brazil



Case 1:

Resource and Energy Efficiency Networks (REEF) in Brazil

Workshop Topic	Onsite Consultancy
1 Kick-off and project organisation; Optimisation of industrial waste water facilities	Resource and energy efficiency assessment
2 Optimisation of Lighting Efficient generation of compressed air	
3 Heat recovery / Experience exchange	Resources and energy efficiency program development (objectives and measures)
4 Industrial waste water technology	
5 HVAC / Energy Efficiency of electric drives	Programme implementation
6 Cogeneration / Financing solutions	
7 Waste management / Preparation of Brochure	Programme review
8 Closing Event / Project Review	

- Inter-organisational approach
- Focus on full environmental spectrum, including energy efficiency
- 24 months duration
- Series of 8 collaborative resource and energy efficiency workshops
- Onsite resource and energy consultancy
- Awarding of companies through German and Brazilian network carriers

Case 1:

Resource and Energy Efficiency Networks (REEF) in Brazil

- 2 REEF Networks in Santa Catarina and Parana State (2010-2014)
- 16 companies (textile, agriculture and other industries)
- Joint network carriage through German and Brazilian associations
- 26,000 MWh energy savings p.a.
- 2,800 tons less CO₂ emission p.a.
- 4,300,000 Euros initial investment in total
- 9,500,000 Euros less resource and energy cost

Source: Arqum GmbH, 2014



Cooperation Partners



Project sponsor
Sharing best-practices
and know-how with suppliers
Contracting Arqum for
project facilitation

KfW DEG

The logo for KfW DEG, consisting of the letters "KfW" in a bold blue font followed by "DEG" in a smaller blue font.

Co-funding
within [develoPPP.de](https://www.developpp.de)



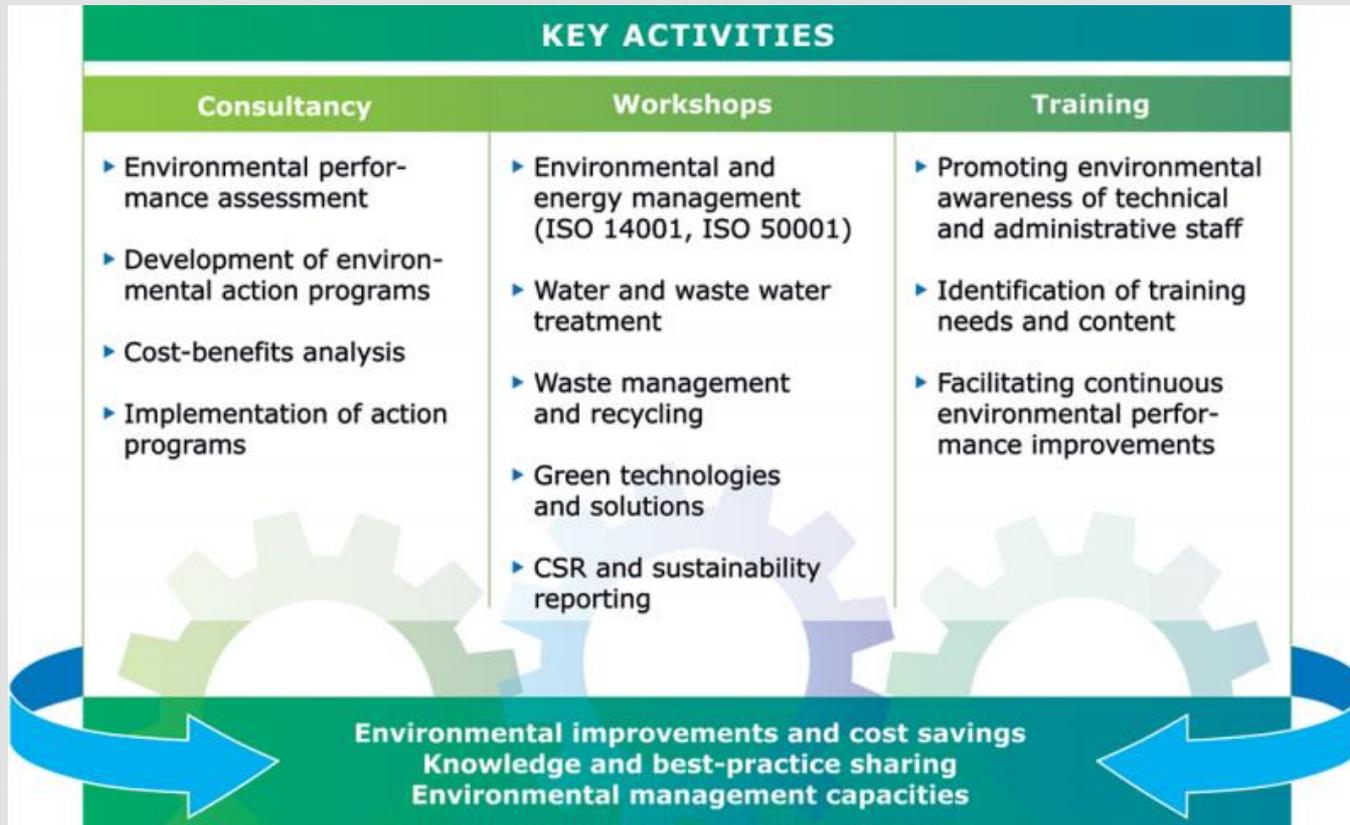
Providing all core activities to suppliers
on behalf of Continental
as project facilitator



Salzburger Aluminium Group

SAG
Progress in Aluminium





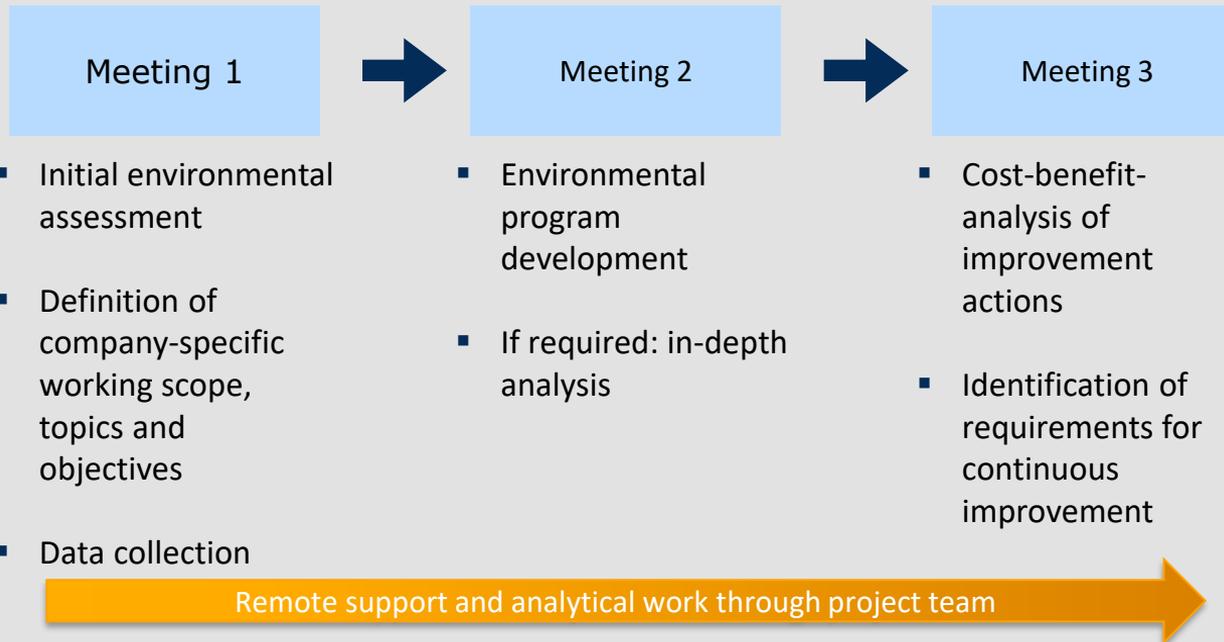
Collaborative workshops

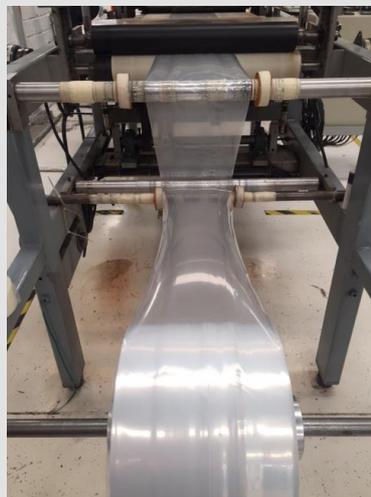
- Six collaborative workshops for all participating companies
- Energy and resource efficiency
- Water and waste water treatment
- Waste management and recycling
- Renewable energies
- Green technologies and solutions
- Monitoring, KPIs and management systems



Individual environmental consultancy

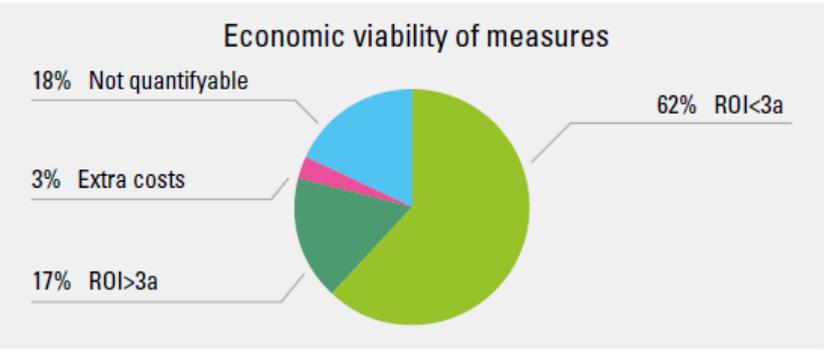
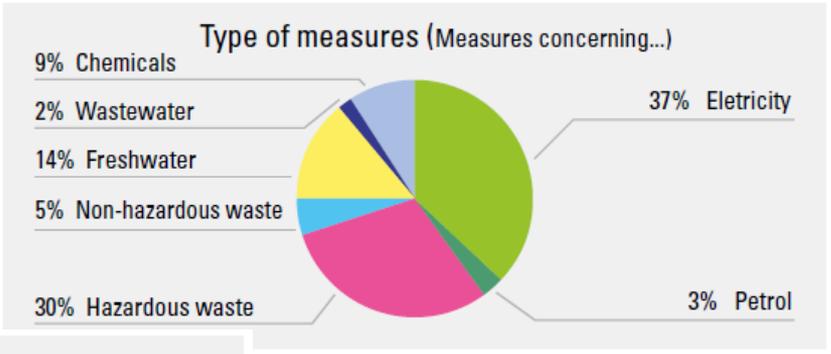
3 onsite consultancy sessions at each participating company





Achieved results

Measures



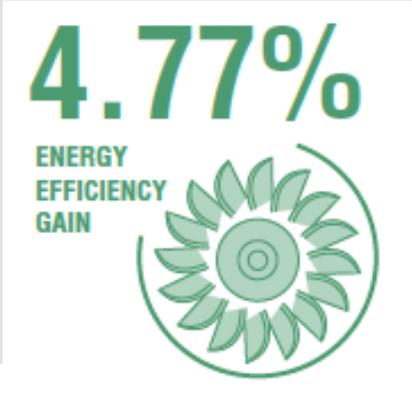
Achieved results

Measures

Overall investment: 13,814,788 MXN (664,276 EUR)

Yearly saving: 16,357,280 MXN (786,531 EUR)

→ Average return on invest is 0.84 years



Energy Efficiency and Climate Network Taicang, China

Network Report 2022

Winners of the Sino-German Energy Efficiency Cooperation Projects Award

SND

Suzhou SND Resources and Energy Efficiency Network



Taicang Energy Efficiency and Low Carbon Network

- Ending energy saving by enterprises on their own and serving as a bridge for enterprises in the park

Participating companies:

Mubea Automotive Components (Taicang) Co., Ltd.

VAST China Co., Ltd.

Haering Precision (Taicang) Co., Ltd.

BOS Automotive Systems Co., Ltd.

Suzhou Sanhe Pipe & Pile Co.

E.G.O. Elektro-Gerätebau GmbH

Foehl China Co., Ltd.

TIGER Coatings GmbH & Co. KG

Brose Taicang Automotive Systems Co., Ltd.

KERN-LIEBERS (TAICANG) Co., Ltd.



Supporting units:



Cooperation field - "Energy efficiency networks"

Support for the Taicang Energy and Climate Network

Model EEN: Support in organizing Taicang energy-climate network and involving German technology suppliers ; Summarize and disseminate Taicang experience; Provide selective support to EEN through DEU experience (especially through GIZ and dena).

Activities:

Kick-off event for the "DEU-CHN Energy Efficiency and Climate Change Network" in Taicang (25.06.2021)

Selective support for the collection of energy- and climate-relevant data in participating companies, Derivation of initial recommendations for action, capacity building (August-September 2021)

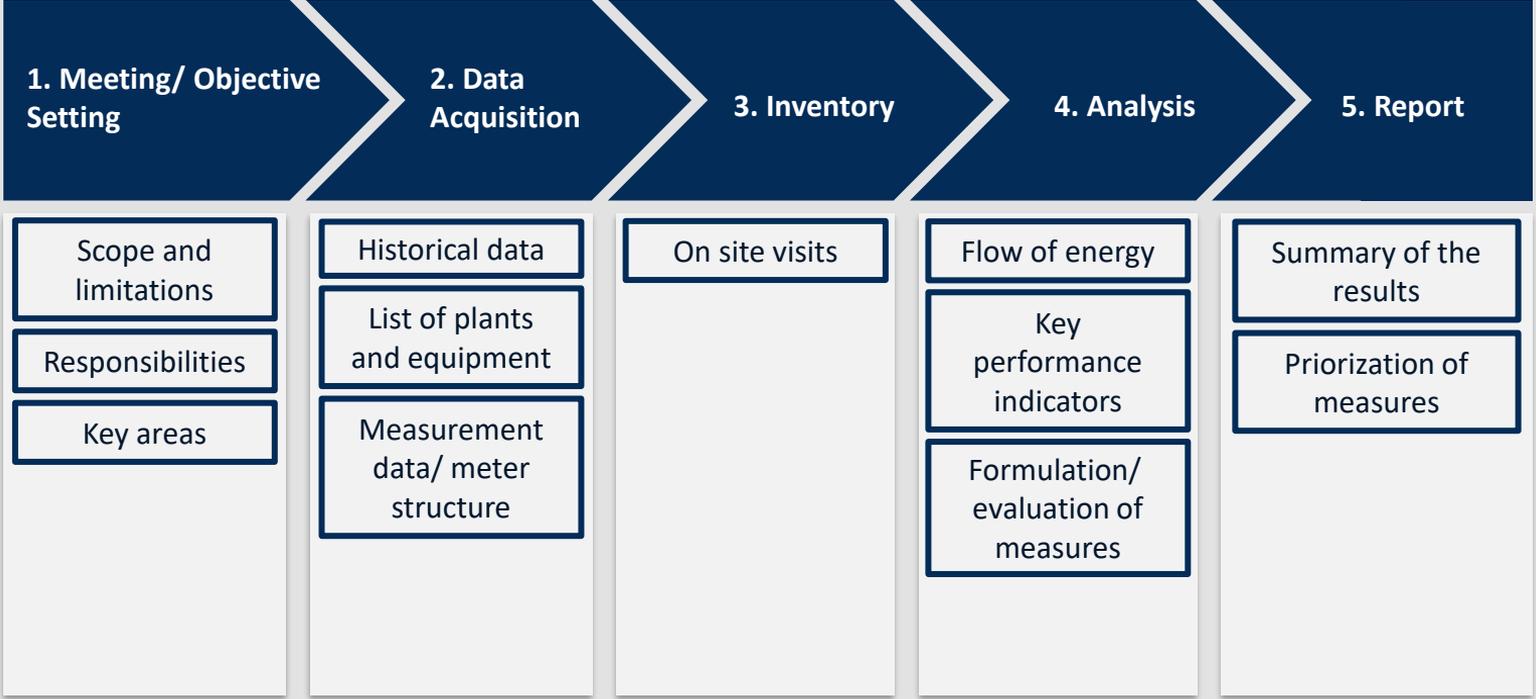
Monitoring of implementation plans by external experts

EEN Workshops on Climate Management, GHG Reduction, Green Factory Planning

GHG calculation and overview for participating companies



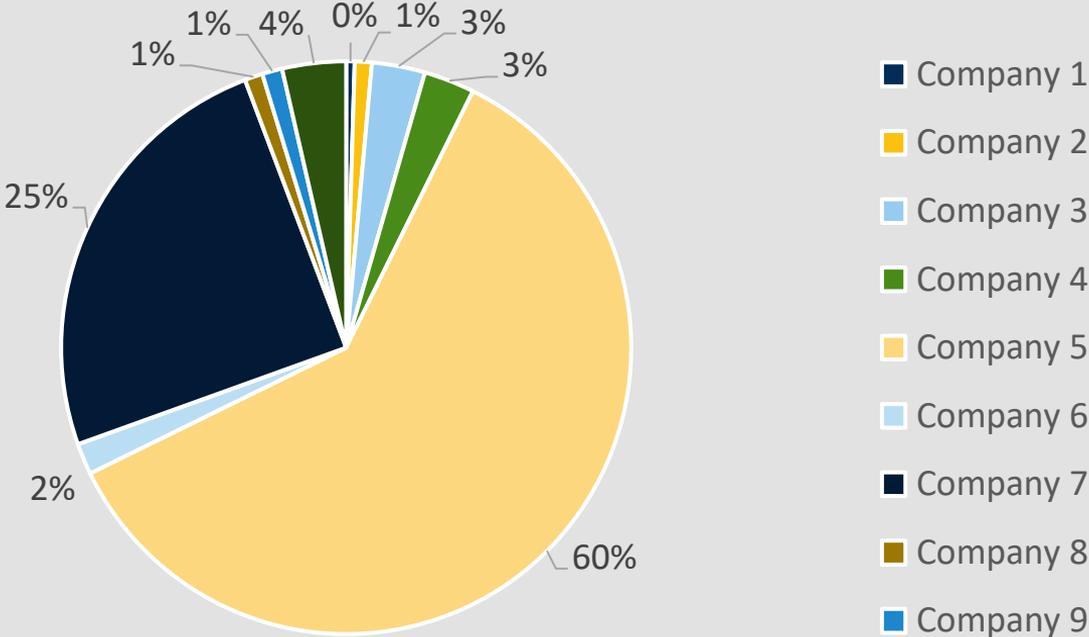
General Audit Process for each company



Analysis of Energy Data

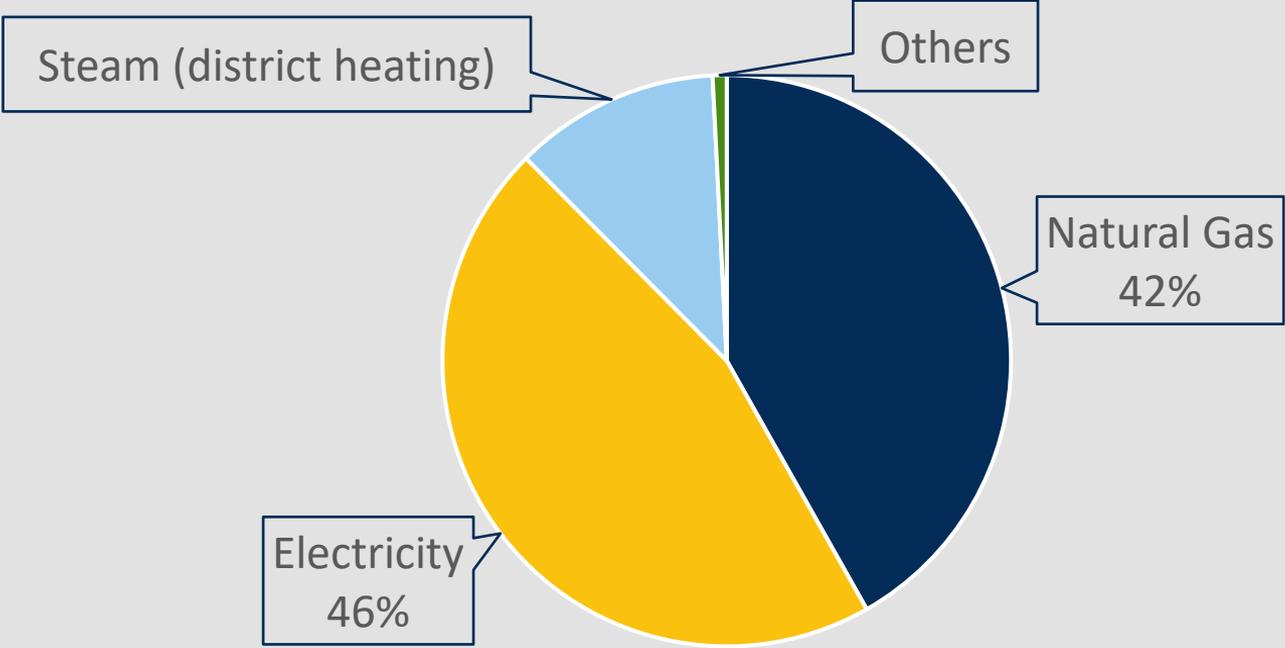
Network Report Taicang, China

Shares of Total Energy Consumption in 2020 in the network



➔ The total energy consumption of the network in 2020 was 745,332 MWh

Total emission of 2020 per Source in the network

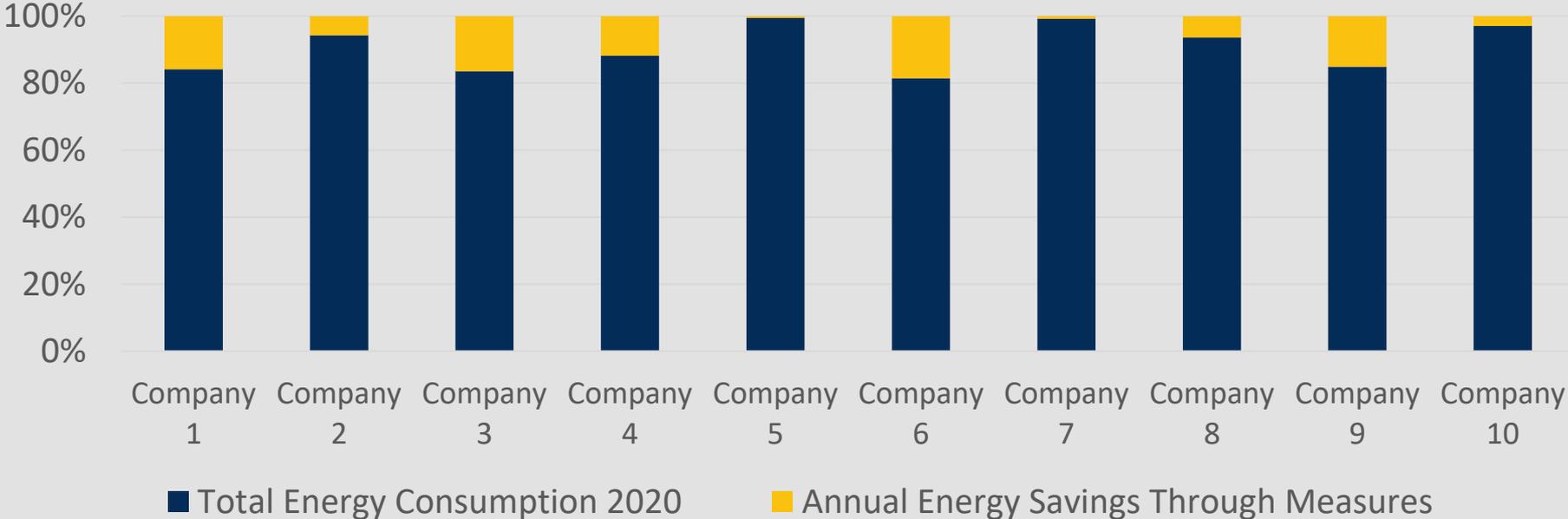


Network Report Taicang, China

Summary of Efficiency Measures

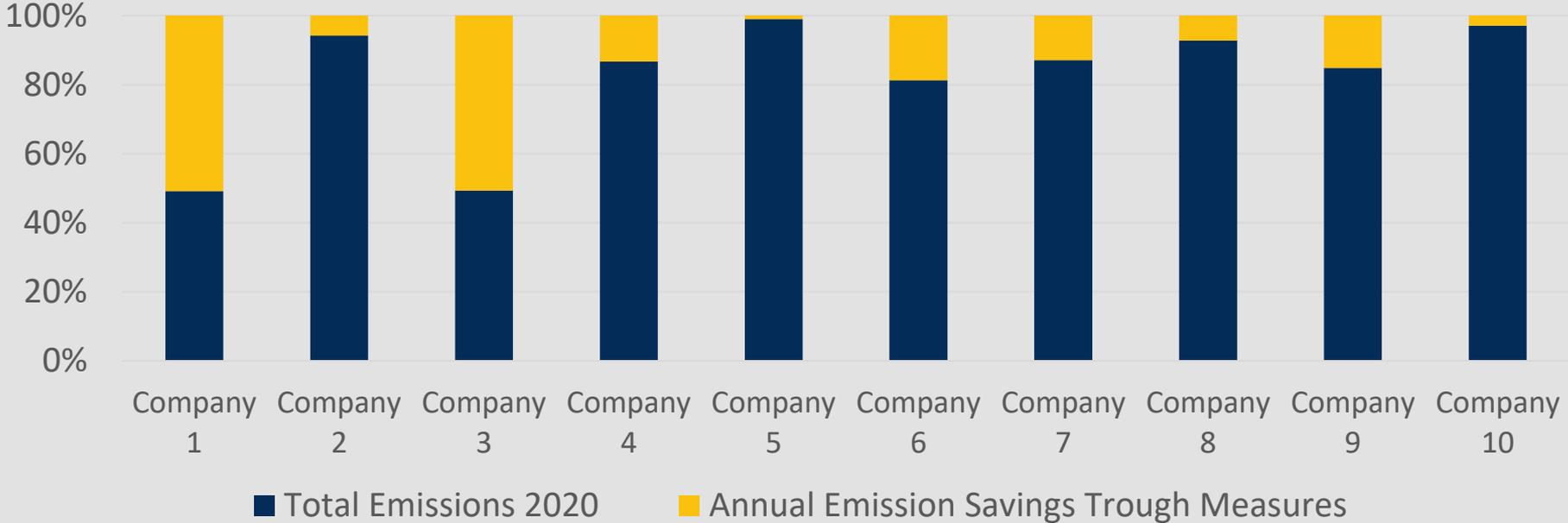
Energy Consumption in Comparison to Potential Energy Savings

➔ If all proposed measures are implemented a total of 18,072 MWh can be saved annually



Emission Outout in Comparison to Potential Emissions Savings

➔ If all proposed measures are implemented a total of 36,048 t CO₂-eq. can be saved anually



4. ISO 50005

ISO 50005:2021 Energy management systems Guidelines for a phased implementation



ISO 50005

ISO 50005 : What is it and for whom?

- Guideline for establishing a step-by-step/phased approach to implementing energy management systems (EnMS).
- The aim is to support and simplify the introduction and implementation [...] **especially for small and medium-sized organisations.**
- Use twelve core elements with four levels of maturity to establish, implement, maintain and improve an EnMS that leads to an improvement in energy-related performance.
- Strong foundation for the expansion to an EnMS according to ISO 50001:2018.

Four levels



Level 1

Enable energy management:

- Initial management support
- Some awareness and understanding of energy consumption and ways to save energy
- Collection of some energy data
- No systematic energy management practices

Level 2

Improving energy management

- Energy policy in place
- Formal energy management team
- Basic analysis of energy consumption and energy costs
- Assessment of energy saving opportunities
- Some systematic energy management practices

Level 3

Emerging energy management system

- Systematic energy management practices
- Energy management becomes strategic
- Monitoring and verification improved
- Compliance with laws is part of the EnMS
- Continuous improvement

Level 4

Established energy management system

- Continuous improvement of the EnMS and energy-related performance
- Core elements of ISO 50001 implemented
- System is ready for gap analysis compared to ISO 50001, if desired

Structure of ISO 50005

ISO 50005 describes how organizations can achieve a full energy management system step by step with

- **Twelve central elements** with several topics – similarly to ISO 50001 –
- Each with **four levels** / degrees of maturity

Table 5 — Energy performance indicators and energy baselines

Topics	Criteria			
	Level 1	Level 2	Level 3	Level 4
Relevant variables	— Brainstorm possible variables based on practical knowledge.	— Quantify potentially relevant variables. — Conduct a preliminary analysis of energy consumption based on a single variable.	— Conduct a more thorough review of variables that significantly impact energy consumption using simple regression analysis.	— Determine all relevant variables for each SEU.
EnPIs	—	— Determine EnPIs at the facility Level.	— Create EnPIs that are aligned with energy targets. — Determine EnPIs at the SEU Level. — Review EnPIs periodically to ensure that they	— Ensure that EnPIs are appropriate for measuring and monitoring energy performance and for demonstrating energy performance improvement.

Aufbau der ISO 50005

Element 1 Organization's context

Element 2 Governance

Element 3 Resources

Element 4 Energy evaluation

Element 5 Energy Performance Indicators and energetic bases

Element 6 Goals, energy goals and action plans

Element 7 Monitoring, measuring and analysis

Element 8 Competence and awareness

Element 9 Operation and maintenance

Element 10 Procurement

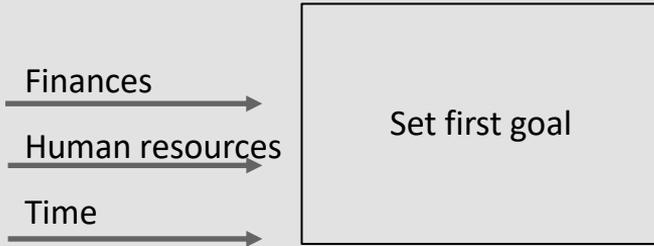
Element 11 Communication and control of documented information

Element 12 Management review

Maturity model – Implementing an EnMS

✓ Level achieved
X Goal set

Needed resources:



Topic	No data	Criteria			
		Level 1	Level 2	Level 3	Level 4
1	✓		X		
2		✓		X	
..					

- Graphic can be used to capture status quo
- Goals are set and their success controlled
- Needs and capacities are organized in phases
- How is the Maturity model used:
 - 1) Assignment of topics to levels
 - 2) Define approach
 - Individual approach
 - Level based approach

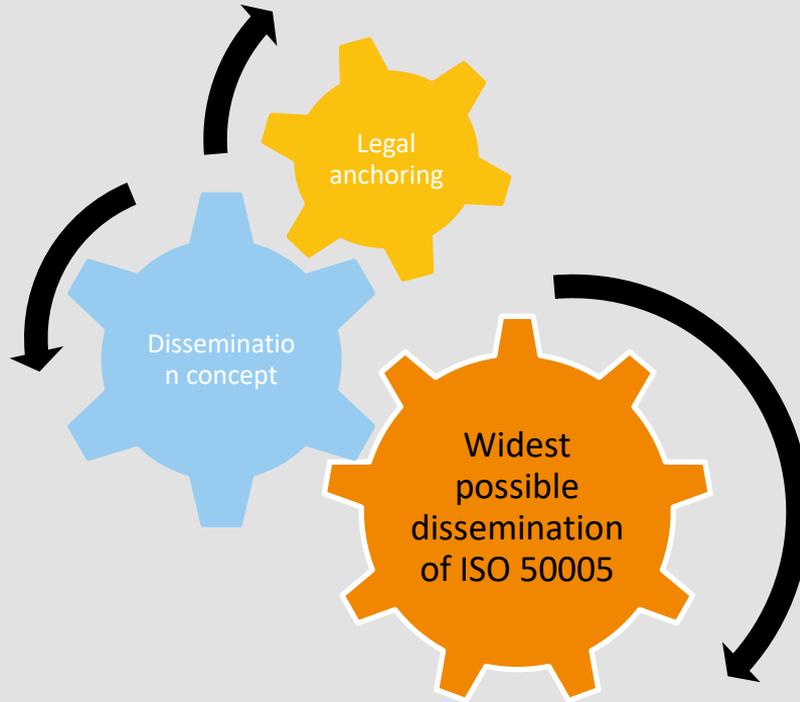
Why another ISO standard?

Phased implementation provides flexibility and allows an organisation to:

- Determine the scope and pace of EnMS implementation according to available resources and organisational requirements;
- Promote a positive culture of energy management;
- establish simple and/or cost-effective energy efficiency improvements and associated energy cost savings, emission reductions and other benefits;
- achieve initial successes and thus secure commitment and support for the further development of the EnMS.

Ultimately, a low-threshold entry into an EnMS should be enabled.

Opportunities and obstacles of legal anchoring



Voluntariness as a starting point

Integration in legal framework

- Mandatory component
- Avoidance of economic disadvantages is in the foreground (e.g. in connection with relief statuses)

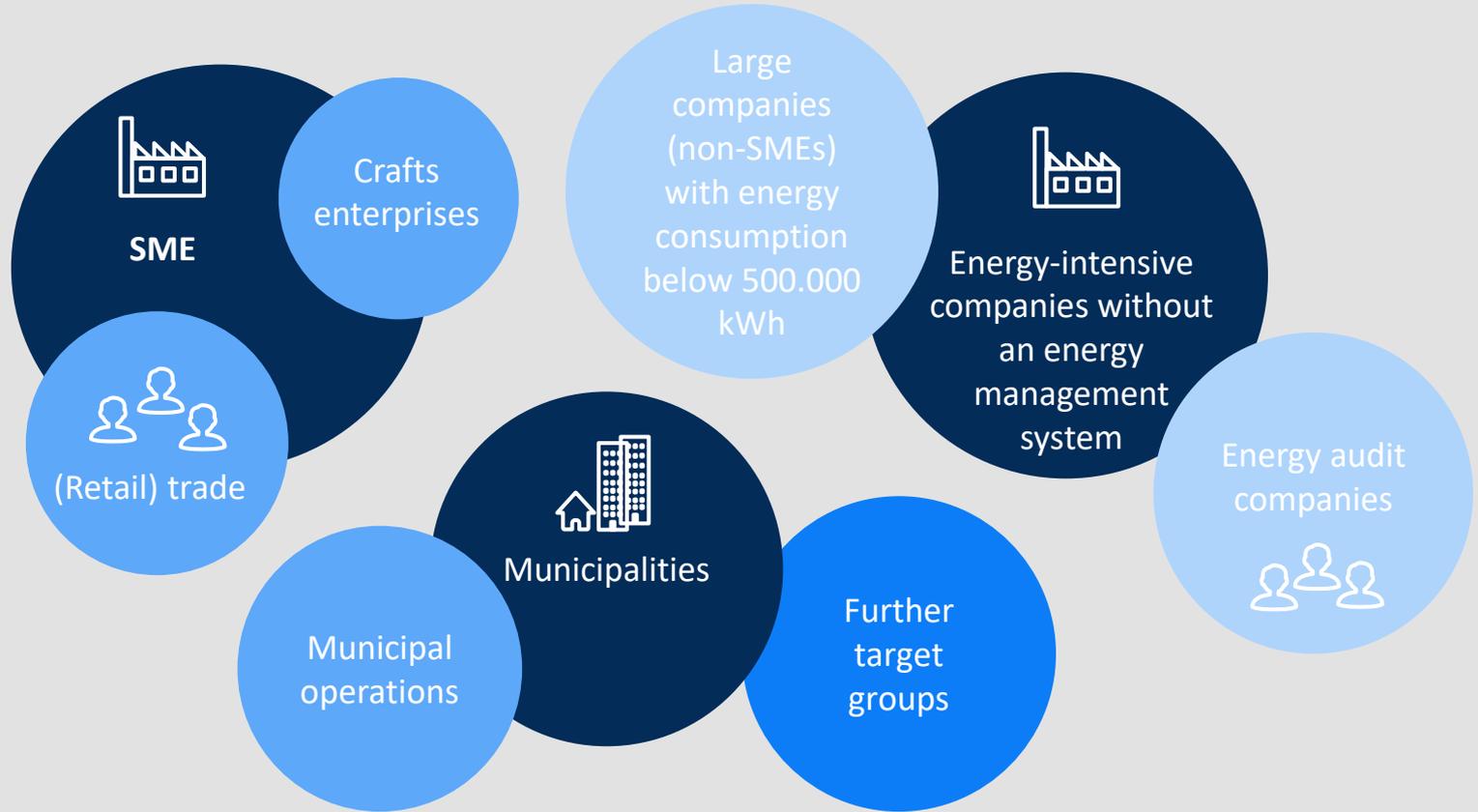
Voluntary implementation

- Focus on voluntary action maxims without threat of economic impairment
- E.g. energy efficiency networks or funding guidelines
- Advantage of funding guidelines, e.g. clear application framework of state aid law

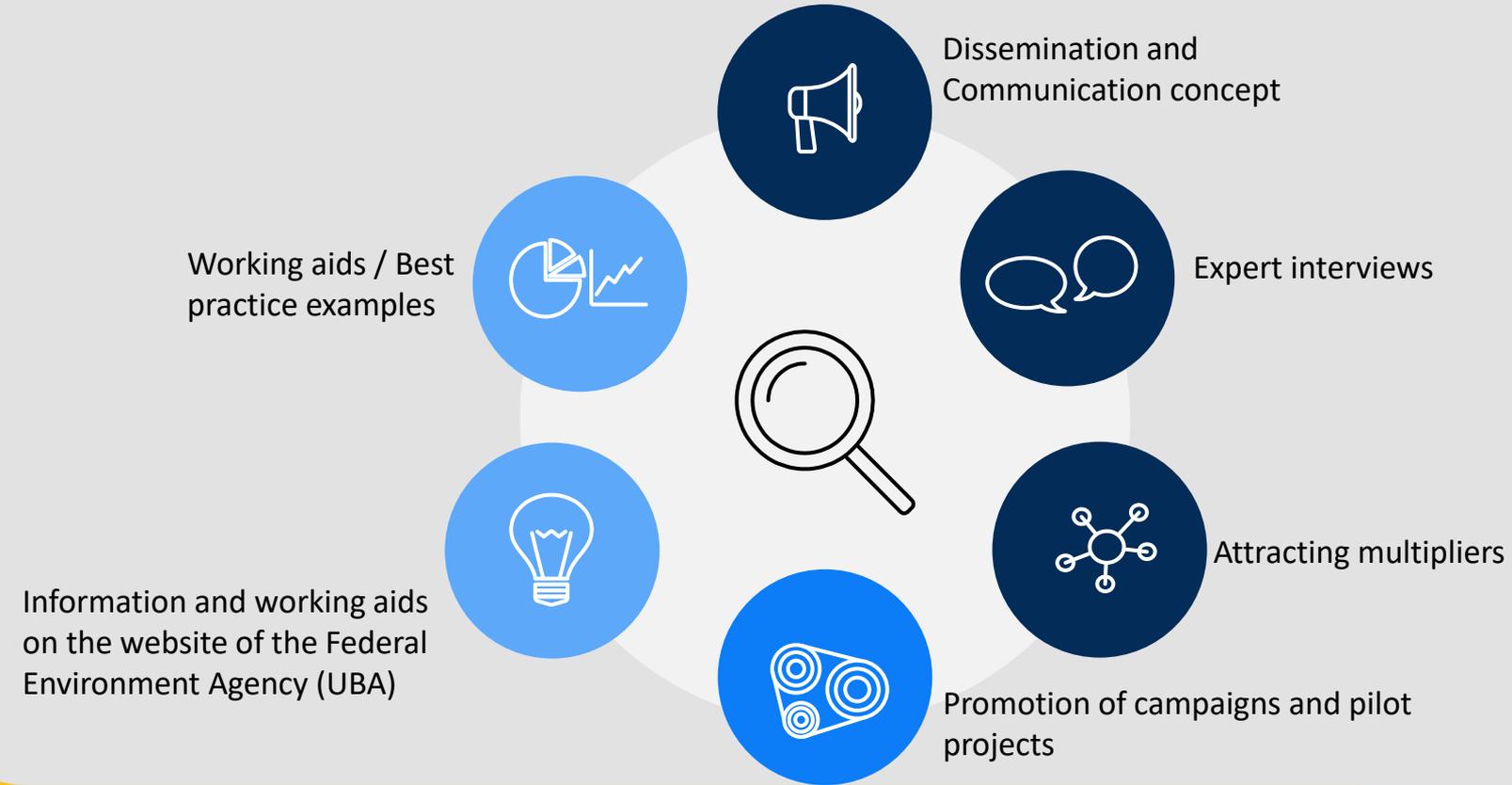


Goal: Away from the energy audit, towards a continuous energy management system

Dissemination of the standard - target groups and challenges



Dissemination of the standard - target groups and challenges





ISO 50005



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