



Learning Energy Efficiency Networks

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Saving potentials, realization and dissemination

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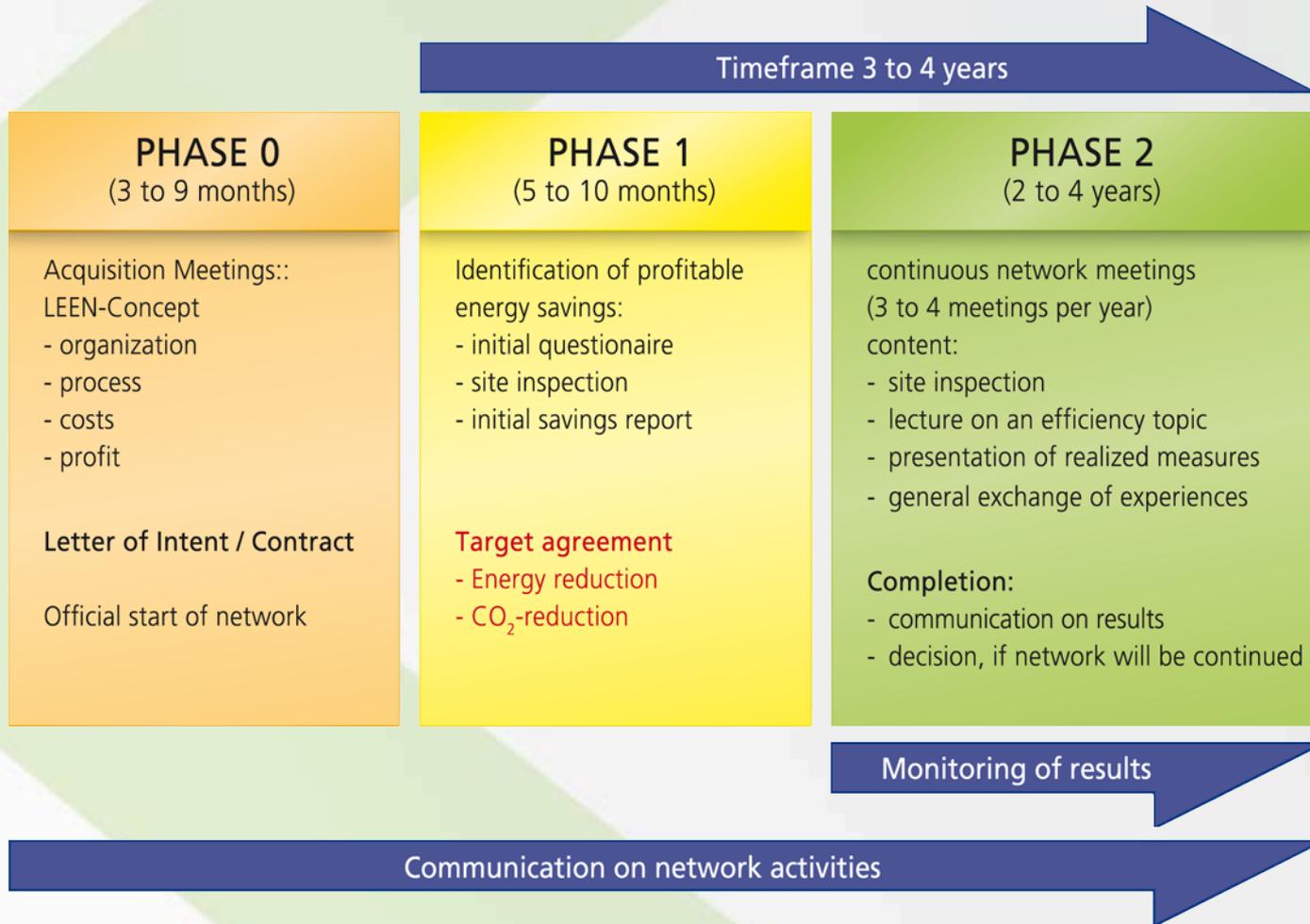
SPEEEP Workshop, June 17th 2014 Berlin, Germany



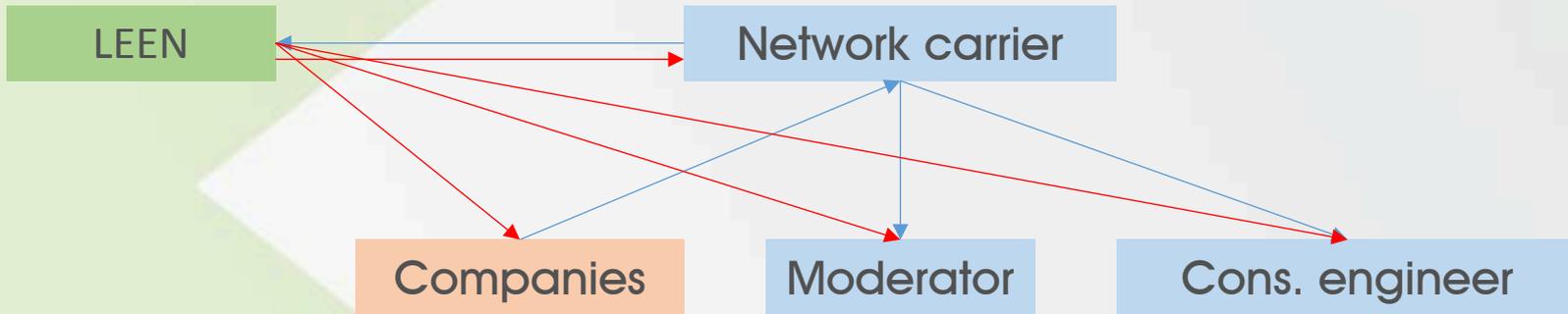
History

- 1987: First network in Switzerland (Zurich)
- 2002: First network in Germany (Hohenlohe)
- 2006 – 2009: First concept of LEEN management system (LEEN MS); promoted by DBU and the ministry of environment in Baden Wurttemberg
- 2009 – 2014: Development of the LEEN MS and establishment of 30 pilot networks in Germany (promoted by BMU within the framework of the national climate protection initiative (NKI))
- End of 2009: Foundation of LEEN GmbH to establish the LEEN MS
- 2012: DIN EN ISO 50001 conformity declaration (TÜV Rheinland)
- May 2013: Cooperation with German Chamber of commerce in Japan to establish networks in the region of Tokyo
- April 2014: First LEEN network in Austria operating (ENAMO)

How it works



Organizational structure



- > Money flow
- > Service & deliverance of LEEN MS

LEEN-compact: meetings and content

- The network meetings are organized and carried out by a LEEN certified moderator.
- During three years nine meetings are planned from which six are predefined:
 - Compressed air
 - Lighting systems
 - Heat/ waste heat
 - Heat production/ hydraulic balancing
 - Electrical drives
 - Monitoring / profitability calculations
- The content of the other three meetings are determined by the participants

General acceptance of the network idea

- 80% rated the benefits of network participation at least as “rather high” in comparison to the effort required for participation
- More than 60% indicated that contacts gained were used outside the network meetings
- 90% rated the topics discussed in the meetings and site inspections at least as good
- The measures identified during the energy review phase fully met the expectations of 80% of the companies
- More than 60% stated that the network enhanced the attention paid to energy efficiency by company management

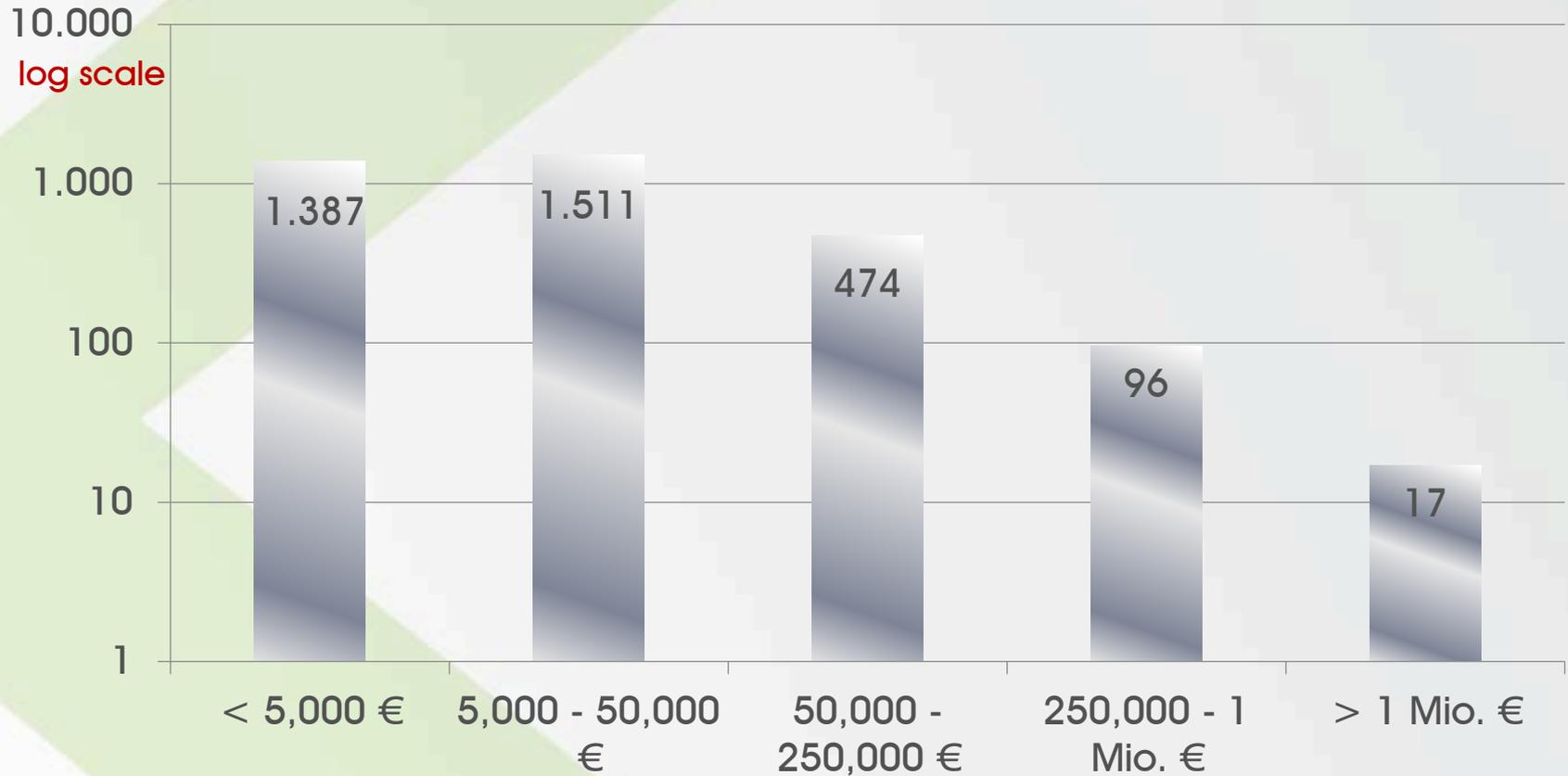
Advantages of the network approach

- A complete assessment of the saving potentials in crosscutting technologies and several process-technologies
- An economic evaluation of the saving potentials (IRR, Payback Period and Net Present Value)
- Exchange of experiences (an information network as a know-how-pool)
- Commitment of the management
- Higher acceptance of the energy manager
- Up to date information on new technologies (presented by engineering experts)
- Topics of the meetings are chosen by the participants
- Evaluation of realized measures by a yearly monitoring
- A three year energy manager training

Identified measures

Overview	
Evaluated reports	366
Total number of measures	7,030
thereof quantitatively evaluated measures	6,030
thereof profitable measures (where IRR is greater than 12%)	3,580
Ø IRR of all profitable measures	31%
Ø static payback period of all profitable measures	3.2
Ø investment per measure [EUR]	55,700
Ø values per company/site (all profitable measures realized; IRR > 12%)	
Ø energy savings [MWh/year]	2,670
Ø CO ₂ emission reduction [t/year]	940
Ø number of quantitatively evaluated measures	19
thereof classified as profitable	10
Ø total additional investment [EUR]	580,000
Ø reduction of energy costs [EUR/year]	180,000

Identified measures: investment volumes (profitable measures only)



Realized measures: reached savings

The figures on this slide are preliminary!

Evaluated monitoring reports		
Companies	No	89
Measures	No	891
Total energy saved	GWh	272
Electricity	GWh	68
Natural gas	GWh	112
Gasoline	GWh	23
District heat	GWh	6
Others	GWh	63

Extrapolation for 366 companies		
Companies	No	366
Measures	No	3.700
Total energy saved	GWh	1.120
Electricity	GWh	280
Natural gas	GWh	460
Gasoline	GWh	95
District heat	GWh	25
Others	GWh	260

Total energy consumption of 366 companies: 16,000 GWh
Average operational time of networks: 3 years
Average yearly efficiency increase: 2,3%/a

Realized measures: profitability, energy savings and CO₂ emission reductions (NW Karlsruhe)

Category	Value
number of measures	107
Ø investment [EUR]	20,700
Ø energy cost savings [EUR/year]	6,750
Ø internal rate of return (IRR)	33.0%
Ø static payback period [years]	3.0
Ø energy savings [MWh/year]	98.5
Ø reduction of CO ₂ emissions [t/year]	25.6

Measure: Fiducia IT AG

Ventilation:	Modernisation of conditioning cabinet
Investment:	157,000,- €
Energy carrier:	electricity
Annual savings:	Energy: 820 MWh CO ₂ Emissions: 379 t Energy costs: 98.400,- €
Profitability:	Amortisation: 1.6 a IRR: 63 %

Costs (3 years)

- 9 network meetings (organisation , execution): 7,500 EUR
 - 2 x monitoring (without report): 1,000 EUR
- Energy review (10 days)
- Energy review without KfW funding: 10,000 EUR*
 - Energy review with KfW funding : 5,200 EUR*
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- Price LEEN-compact (without KfW funding): 18,500 EUR
 - Price LEEN-compact (with KfW funding): 13,700 EUR

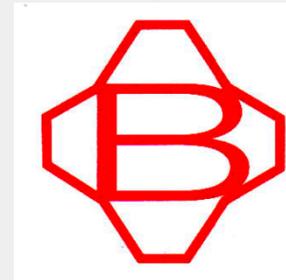
Additional: up to 10 work days

* Varies with respect to company size

Example: Profitability of participation

Annual energy costs:	400,000 €
Annual energy savings (8%):	32,000 €
Investment in efficiency measures:	100,000 €
Add. Costs of participation :	13,700 €
Add. Costs of technical staff:	10,000 €
Total costs after 4 years:	123,700 €
Pay back period (investments only):	41 (33) month
IRR, time of use	
10 years (investments only):	26% (34%)

Participants in the region of Karlsruhe (2 networks)



Questions & answers

(probably)

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