Universität Stuttgart
Institut für Energieeffizienz
in der Produktion EEP

Are we ready?

Creating resilience through energy efficiency and decarbonisation

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Societal expectations are rising

Why become carbon neutral now?

CLIMATE HOME NEWS

EU €750 billion Covid recovery fund comes with green conditions

Published on 27/05/2020, 2:37pm

A quarter of spending has been earmarked for climate action and a 'do no harm' clause rules out environmentally damaging investments

edie

Disclose climate risks or face divestment, investors warn Europe's largest companies

17 November 2020, source edie newsroom

A coalition of investors representing more than $9trn of assets has asked some of Europe's largest and highest-emitting companies, like Shell and Maersk, to prove they are aligning with the Paris Agreement and to improve climate risk disclosure.

The New York Times

Big Business Says It Will Tackle Climate Change, but Not How or When

In Davos, business leaders were newly vocal about the danger, though they gave few details about how they would reform their practices.

The Guardian

Bloomberg Green

Finance

Long-Term Investors Now Hold Sway Over ESG

Investors are having more success on climate change, and increasingly are pushing companies on human rights, diversity and pay equity.

Green

U.S.'s Kerry Calls for a Global Carbon Market: Energy Update

Bloomberg News

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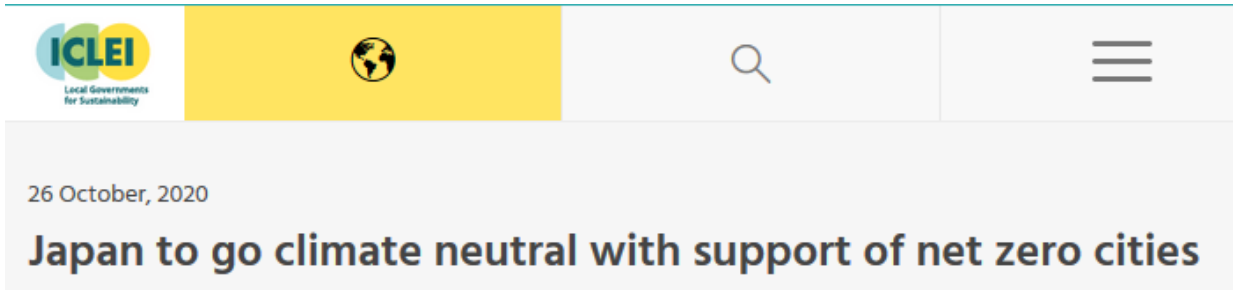
Understanding the terminologies is crucial

Carbon- vs climate neutrality?

The New York Times

Japan's New Leader Sets Ambitious Goal of Carbon Neutrality by 2050

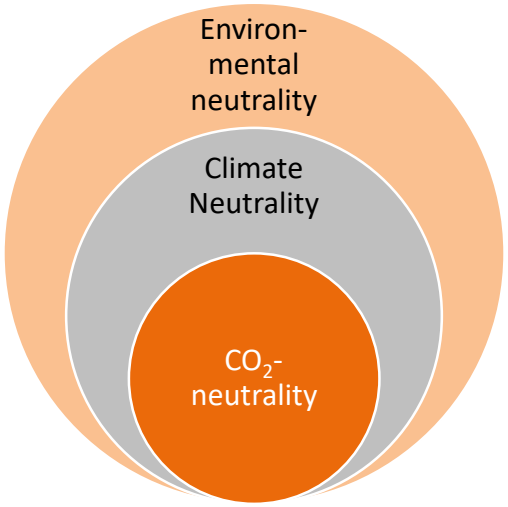
The announcement, coming weeks after a similar pledge by China, will require a major overhaul of the infrastructure in Japan, which remains heavily dependent on fossil fuels.



Sources: The New York Times, ICLEI

Create clarity about the terminology

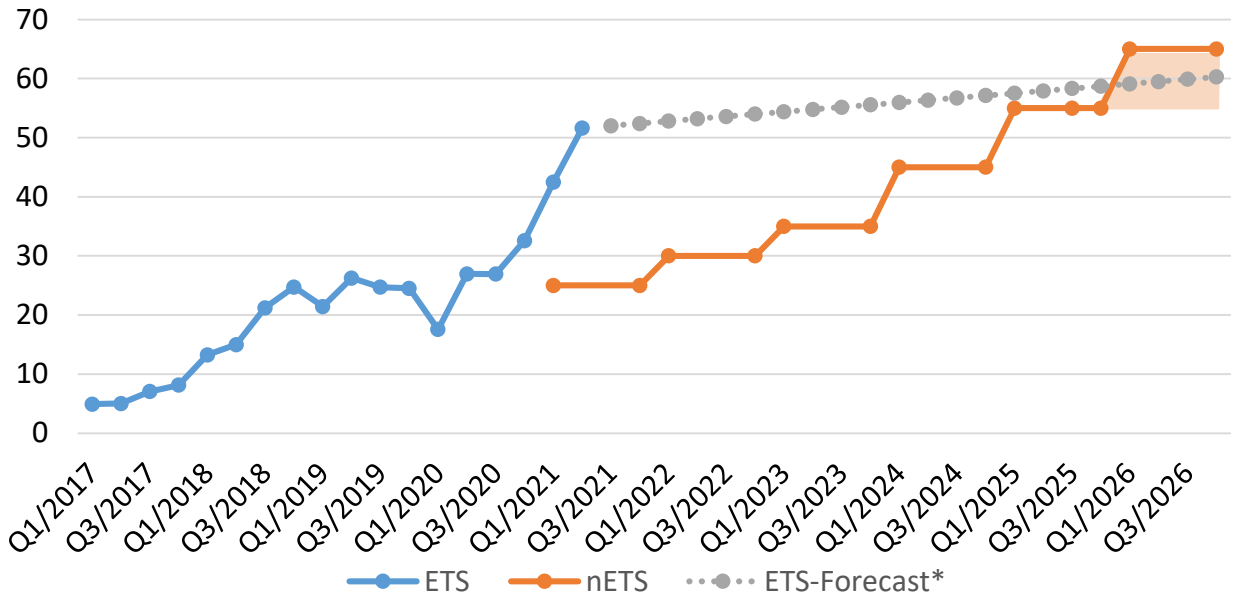
Measures to achieve various neutralities



- **CO2 neutrality**
  - Reduction of CO2 emissions
  - CO2 compensation measures
- **Climate neutrality**
  - Reduction & compensation of other greenhouse gases with global warming potential such as:
    - *Non-fluorinated GHGs: methane (CH4), nitrous oxide (N2O).*
    - *Fluorinated GHGs: hydrofluorocarbons (HFC), perfluorocarbons (PFC), sulfur hexafluoride (SF6), nitrogen trifluoride (NF3)*
- **Environmental neutrality**
  - Avoidance & compensation of all othersubstances that have a negative impact on the environment and health such as
  - Particulate matter, soot, pesticidesnitrogen oxides (NOx), sulfur dioxide (SO2)

Source: https://ee-ip.org/article/defining-carbon-neutrality-not-as-simple-as-it-might-seem-1811

How does escalating carbon tax affects my company?



European ETS price

- Rising rapidly with tightening of EU 2030 emissions targets
- Expansion to additional sectors in clarification (currently electricity + selected industrial sectors)
- Projected €60 for 2030 likely to be exceeded
- Little planning certainty

National Emissions Trading Scheme Germany (nETS)

- On energy-related emissions (excluding electricity)
- Planning certainty until 2025/6

*EU Commission ALLBNK Scenario (-58%CO_2~65€ in 2030), ETS last updated on 01/06/2021
Source: EU Commision, TradingView

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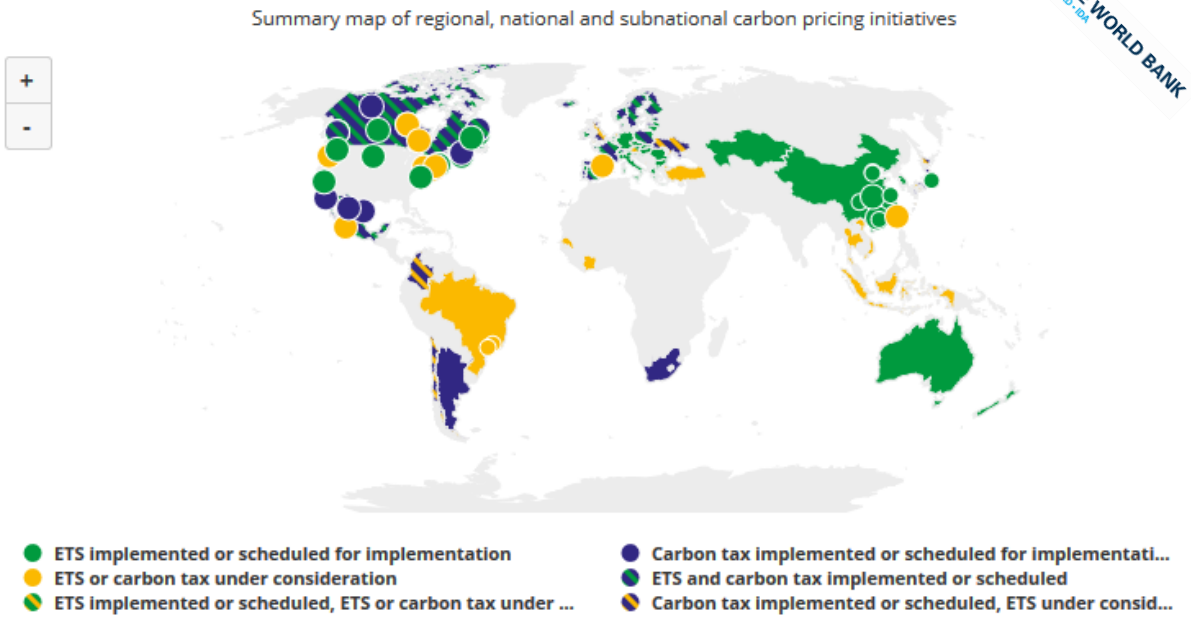
Racing towards a global carbon tax scheme

Uzbekistan eyes carbon pricing mechanism as part of net zero quest

Published 12:48 on February 2, 2021 / Last updated at 22:46 on February 2, 2021 / Asia Pacific, Carbon Taxes, Other APAC / No Comments

Uzbekistan's energy ministry plans to carry out subsidy reforms in its gas-dominated electricity generation sector, to be followed by the introduction of a carbon pricing mechanism in a bid to cut energy-related carbon output to net zero by 2050.



Source: Worldbank, Carbon Pulse

What follows from this?

Looking behind decarbonisation - what pressure points trigger action?

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Publication coming soon

Abstract

Already more than 75 countries pledged to become climate neutral by 2050 and the share of global emissions falling into an emission pricing scheme has steeply increased over the past two years. Even where there are no direct implications to industry (yet), there is a series of subtle pressure points driving an increasing number of companies across the globe to work towards climate neutrality and pledging ambitious carbon reduction goals.

This article sheds light on what the pressure points are, what the subtle triggers and what the underlying considerations, as well as hoped-for benefits of industrial companies to achieve decarbonisation. The observations and ideas presented in this paper are derived from quantitative and qualitative data. The quantitative data were collected within the framework of Energy Efficiency Index of German Industry (EEI). The qualitative data have been collected from interviews in industrial organisations and media documents as well as from professional practice.

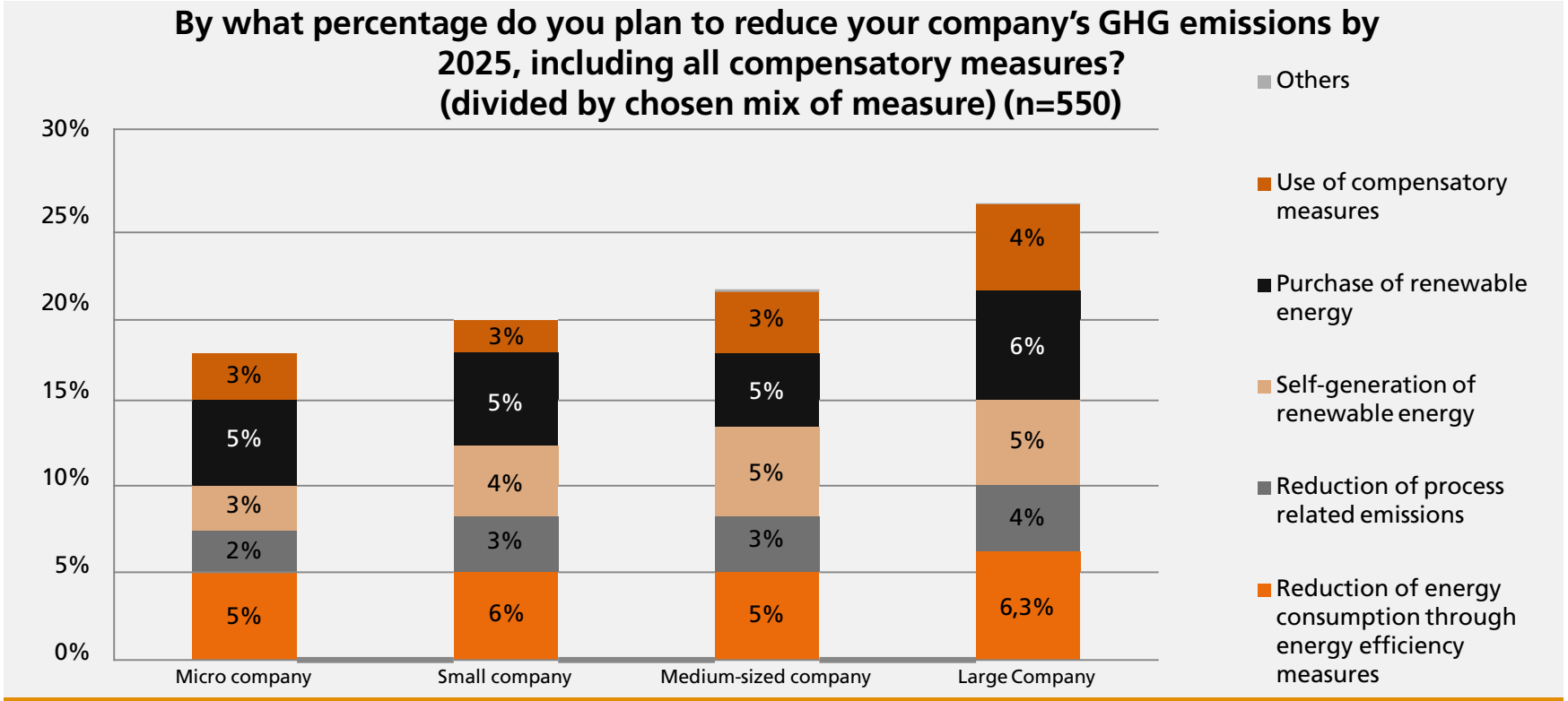
Not only societal, work force, supply chain and investor expectation play a large role, but also many strategic considerations which have the potential to make the business more resilient and profitable. Those companies that do not move towards decarbonisation on the other hand may face a costly late mover disadvantage.

This piece uncovers subtle interconnections helping stakeholders from industry and beyond to grasp opportunities & challenges ahead. It further illustrates how this development calls for rethinking economic viability calculations leading to investment decisions taken differently and why, consequently, it makes even more sense to prioritise on-site measures to decarbonise.

Keywords: Decarb-Efficiency, decarbonisation, industrial energy saving, cost effectiveness, strategic decision-making

Target GHG-Reduction by 2025, Base: 2019

Companies intend to reduce emissions by ca. 23% by 2025



approx. 60% of the planned measures by 2025 are of a local nature (efficiency improvement, process change, self-generation)

© Energy Efficiency Index of German Industry 2020/1 | Data gathered during COVID-19 in May 2020 | Arithmetic mean of all answers

Being conscious of your emissions assists you in shaping your decarbonisation strategies

Industry GHG emissions

2019 in CO2 equivalents	188 Mio. t
Process-related	63 Mio. t
Energy-related	125 Mio. t

Share of the emission reduction targets by 2025:

Measures	in %	in mil. tCO_2e	in TWh
Energy efficiency	5,6	10,8	~ 64
Reduction of process emissions	3,0	5,6	
Own production of renewable energies	4,25	8	~47
Purchase of renewable energy sources (RES)	5,25	9,9	~58
Compensation	4,25	8	
Estimated total GHG savings Industry	**22,3**	**42**	**105/64**

To help you visualise:

8 mil tCO_2e ~ 6,150 km^2 — 861344 x size of football pitches; 3 x size from Monaco

105 TWh ~ 11,600 or 282 km^2

Source: Umweltbundesamt, Nationale Treibhausgas-Inventare, UBA press release

What do these goals mean in context?

Corporate target (base 2019) already almost at the level of the European reduction targets (base 1990)

CO_2e	1990	2019	2025	2030
Absolute (tCO_2e)	284	188	146	137
%-Change compared to 2019	51%	0%	-22%	-27%
%-Change compared to 1990	0%	-34%	-49%	-52%

- Great urge to change something
- Large savings since 1990
- Target by 2030: Almost achievable with existing measures

Why should local measures be prioritised?

Economic factors could help with sequence: How do the measures have a lasting effect on running costs?

Mix of measures for the planned greenhouse gas reduction

- **Reduction:**
  - **Reduction of energy demand reduces emissions**
    → organizational optimizations/one-time investment required
    → running *costs (energy) decrease*
  - **Process adaptation reduces emissions**
    → one-time investment required
    → running *costs (energy) unchanged*

- **Substitution:**
  - **Own production of renewable energies** reduces emissions
    → but one-time investment required
    → running *costs (energy) decrease*
  - **Change of energy source** reduces emissions
    → Energy unit may cost more per unit, !availability!
    → running *costs* (energy) increase slightly

- **Compensation (or do nothing): Emissions still exist**
    → their **compensation** (or CO_2-price were applicable) costs permanently per unit
    → running *costs (emissions) increase*

Further developed according to ACEEE-EEP Industrial Decarbonisation Considerations (2020)

Boosting Resilience in Manufacturing

On-Site optimization, using local generation & integration, followed by off-site generation and lastly compensation

On-site - direct reduction of the footprint

- *Increased energy and material efficiency and productivity*
  - *Electricity*
  - *Heat*
  - *Cold*
  - *Compressed Air*
- *Decentralized generation of renewable energies*
- *Energy flexibility and storage*

„On-Site action is key to increase resilience against external shocks.“ *SMB*

„Energy Efficiency is not in competition with Green House Gas reduction – to the contrary, Energy Efficiency is an integral part of reducing the environmental footprint.“

SMB

Off-site - indirect reduction of the footprint

- *Purchase of renewable energies*
- *Compensation measures*

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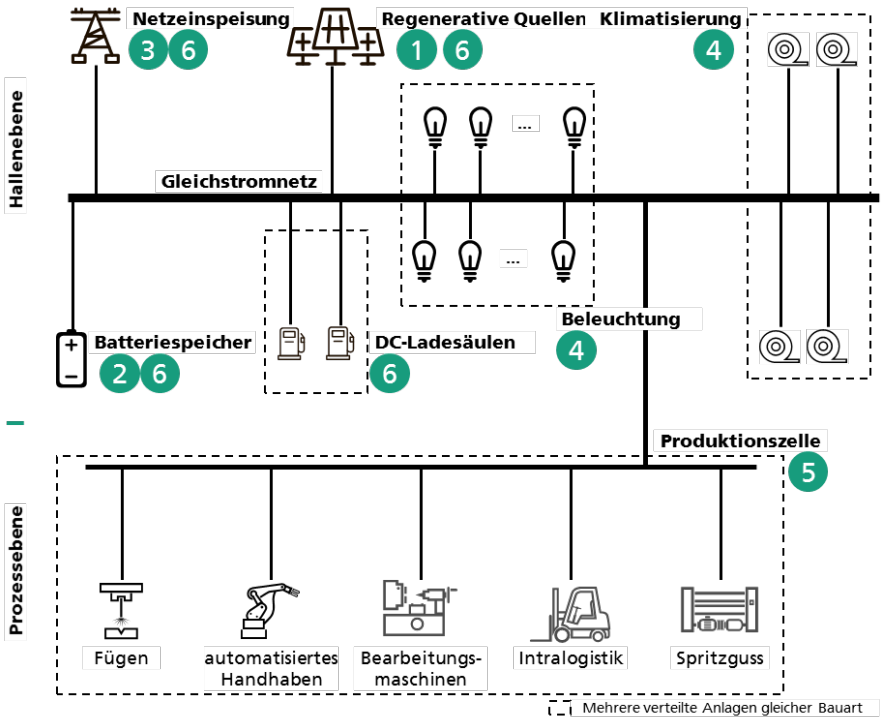
Industrial Microgrids and Energy Storage

Making your electricity supply futureproof



1. Integration of CO_2-neutral producers
2. Securing production by “stockpiling” energy
3. Conditioning the main connection (Peak-Shaving, Energy flexibility)
4. Saving conversion losses in large-scale consumers
5. Saving of conversion losses in production processes
6. Modular adaptability to environmental change

Intelligent control of energy flows in the factory!

Source: Fraunhofer IPA

Mapping out the path to climate neutrality

We need to know where we are to establish a realistic & effective roadmap

- How effective are **current policies** considered to facilitate an increase in energy efficiency in industry?
- What measures, if any, are being taken by companies to reduce their **carbon footprint**?
- Are energy, resource and carbon footprint being considered during **product development**?
- What **GHG reduction** do companies aim for within the next 5 years?
- **Impact of Covid-19** on level of ambition and planned decarbonisation action

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Giving **manufacturing companies** around the world the opportunity to make their views on energy efficiency and decarbonisation heard - **#EEBarometer**

The Energy Efficiency Barometer of Industry

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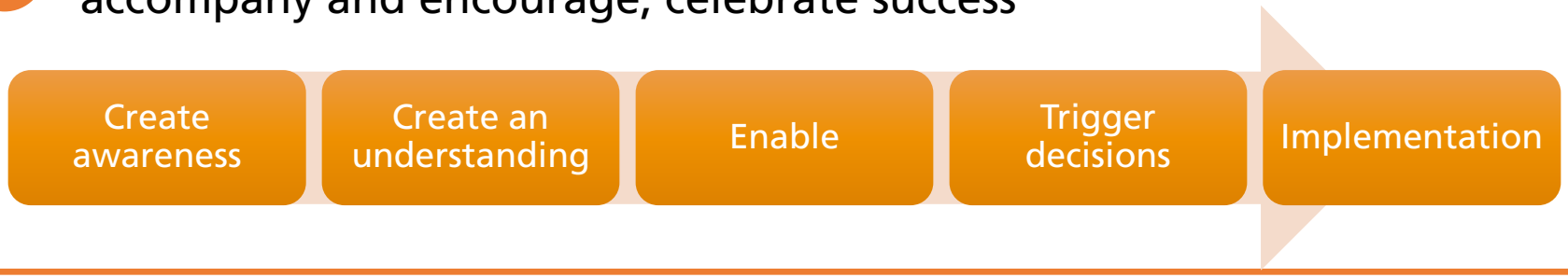
ITALCOGEN
OOENERGIESPARVERBAND
University of Ljubljana Faculty of Economics
ecci Edinburgh Centre for Carbon Innovation
COMILLAS Universidad Pontificia ICAI ICADE CIHS
LINKÖPING UNIVERSITY
LABEEF
dena German Energy Agency
BDI
TÜVRheinland Precisely Right.
KEA-BW Die Landesenergieagentur
ALLIANCE TO SAVE ENERGY using less. doing more.
THE-CO FIRM
REZ Dezentrale Energiesysteme und Energieeffizienz
K-EFF Regionale Kompetenzstellen Netzwerk Energieeffizienz

Five steps to succeed

The sequence matters: each step leverages the next one

1. **Intrinsic awareness** that ‘something’ is not in order and needs to be done (e.g., towards sustainability, decarbonisation, energy efficiency)
2. **Intrinsic understanding** that each stakeholder (each one of us) is able to make a difference no matter how ‘big’ the action’
3. **Enable stakeholders** to know what one could do, how one could do this, who can help, who has done it before, how to fund it
4. **Encourage/trigger** their **decision** to dare going for it
5. **Implement** what one decided upon – team-up, learn from each other, accompany and encourage, celebrate success



Thank You!

Dipl.-Volksw.

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