Shaping the Energy Transition
Insights and Trends from Belgian Industry

BRIGHTWOLVES

November 2024

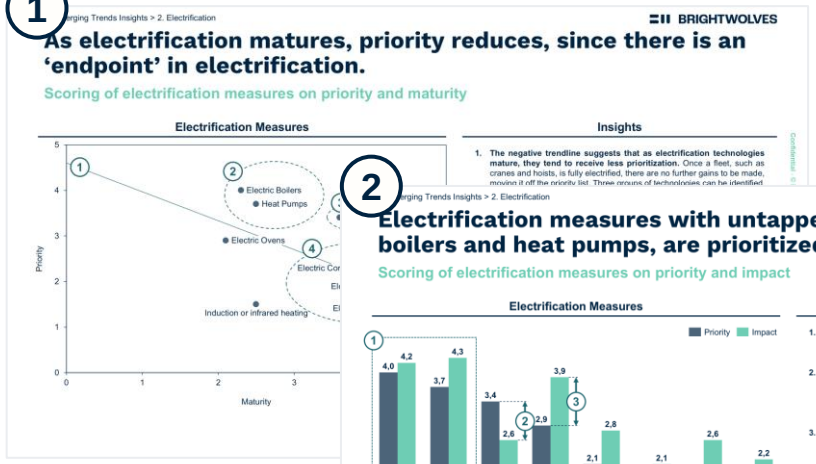
Why Read this Report?

Introduction to the report: reading methodology, audience and expected learnings

How to read the report?

To start with, an executive summary outlines the key takeaways. In the Emerging Trends Insights section each pillar of the energy transition will be explored in order of importance based on the interview findings. Trends in each pillar are explained by a scatter plot and a bar chart, see print screens below. Finally, the Approach to the Analyses explains the methodology of the research.

1



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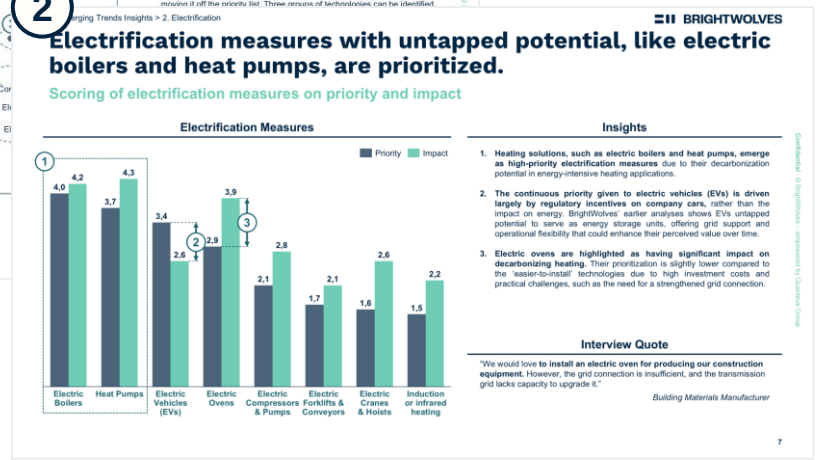

Who benefits from reading this report?

1. **Industry Leaders, Plant Managers, and Energy Managers**
   Gain insights into Belgian industry priorities, strategic investments, and impactful energy transition strategies.

2. **Energy & Utility Sector Players**
   Explore where Belgian industries focus resources and uncover B2B opportunities in electrification and demand flexibility.

3. **Sustainability Officers**
   Discover impactful technologies and gaps in Belgium's decarbonization efforts, with a roadmap for maximizing local impact.

What can you expect to learn?

1. **Trends for Strategic Alignment**
   Explore trends to refine your strategy and align with industry needs.

2. **Industry Motivations for Energy Transition**
   Understand key drivers behind industry engagement in the energy transition.

3. **Core Pillars of Decarbonization**
   Learn why electrification, renewables, and efficiency are vital for decarbonization.

4. **Growth Opportunity of Demand Flexibility**
   Discover the potential of demand flexibility as a key growth area.

Agenda

1. Key Takeaways
2. Emerging Trends Insights
3. Approach to the Analysis
4. Flex Scan Solution
5. Why BrightWolves?

Agenda

1. **Key Takeaways**
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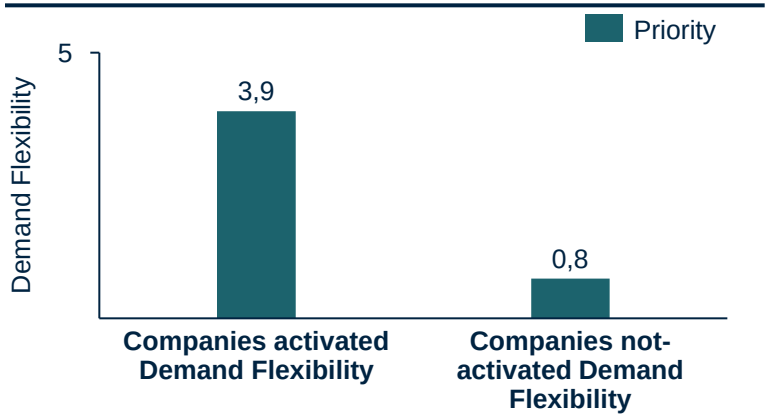
The energy transition is driven by demand flexibility, electrification of heating and solar energy

Overview of key trends based on interviewees ranking[1] of energy transition measures

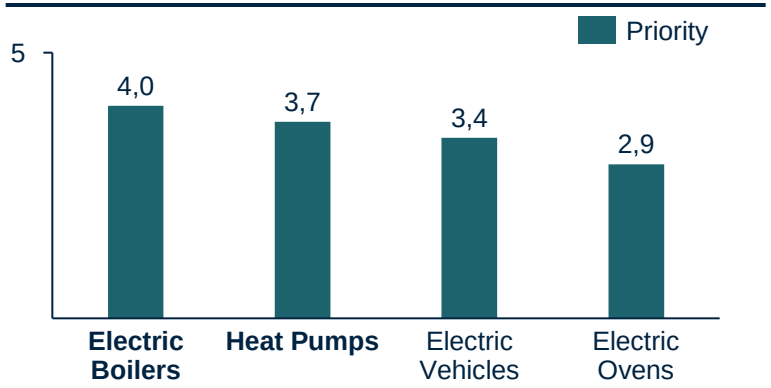
1. Demand Flexibility rises as energy prices fluctuate



Demand flexibility is essential as grid stabilization becomes critical and energy prices fluctuate.

Companies already leveraging demand flexibility value it highly, while others, uncertain of its benefits or operational potential, prioritize it less.Growing awareness of energy price fluctuations may drive broader adoption.

2. Electrification is priority to decarbonize heating



Electrification is a top priority in Belgium's industrial energy transition, followed closely by renewable energy and energy efficiency.

The emphasis within electrification is on heating solutions like electric boilers and heat pumps. Those are high-priority due to their significant decarbonization potential in energy-intensive heating applications.

3. Solar drives growth in renewable electricity production

Solar remains priority in expanding production capacity, fueled by the 'PV verplichting,' ease of implementation, and a strong business case.

The business case is increasingly challenged by a growing penetration of renewables leading to **times of overproduction and negative energy prices.** As a result, the need for demand flexibility and storage solutions increases.

Notes

1. Priority reflects a measure's importance, impact shows its cost and emission reduction potential, and maturity indicates its development and readiness

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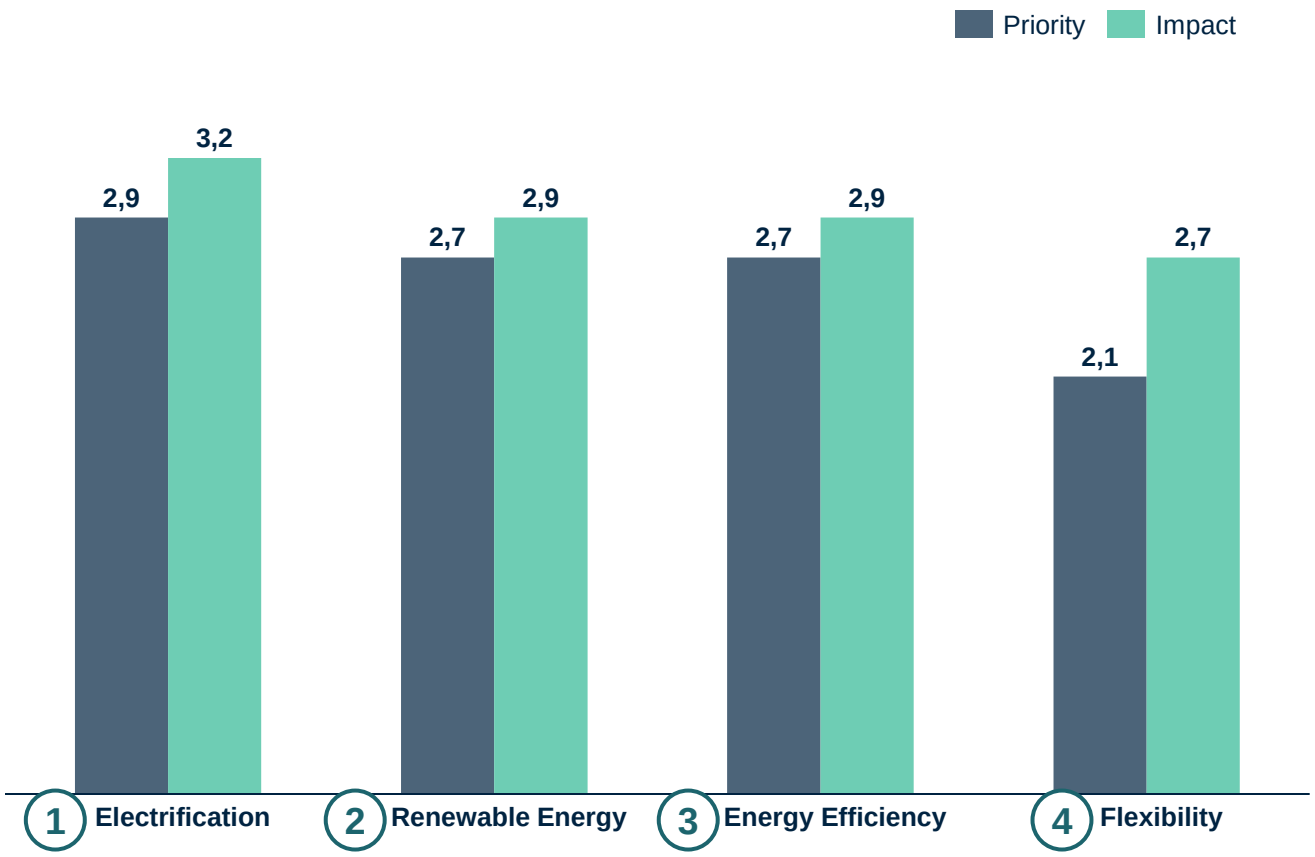
Electrification is most prioritized by industry professionals moving the needle in the energy transition

Overview of the priority and impact of the different energy transition pillars

Energy transition pillars



Insights

1. **Electrification is recognized as a key priority** for Belgium's industry, driving engagement in the energy transition and supporting decarbonization efforts, as reflected in the high emphasis placed on electrification measures.

2. **Renewable Energy is close second. Solar Energy continues to lead** the charge in expanding required capacity needed to enable industries to operate entirely on 100% renewable energy.

3. **Energy efficiency, also close second, seems to be experiencing a resurgence in interest** after years of being consistently important due to regulatory obligations and support mechanisms. This renewed focus is driven by voluntary CO_2 reporting, and continuous regulatory push.

4. **Demand flexibility**, however, receives lower overall priority. A closer examination of the responses, detailed later in the report, highlights **a polarized approach: some companies actively adopt and prioritize demand flexibility, while others disregard it entirely**.

Interview Quote

"We are currently installing a **5 MW electric boiler**. We will also use this system in the **flexibility markets**, allowing us to store and use energy at times of high demand"

Industrial Imaging & Printing Company

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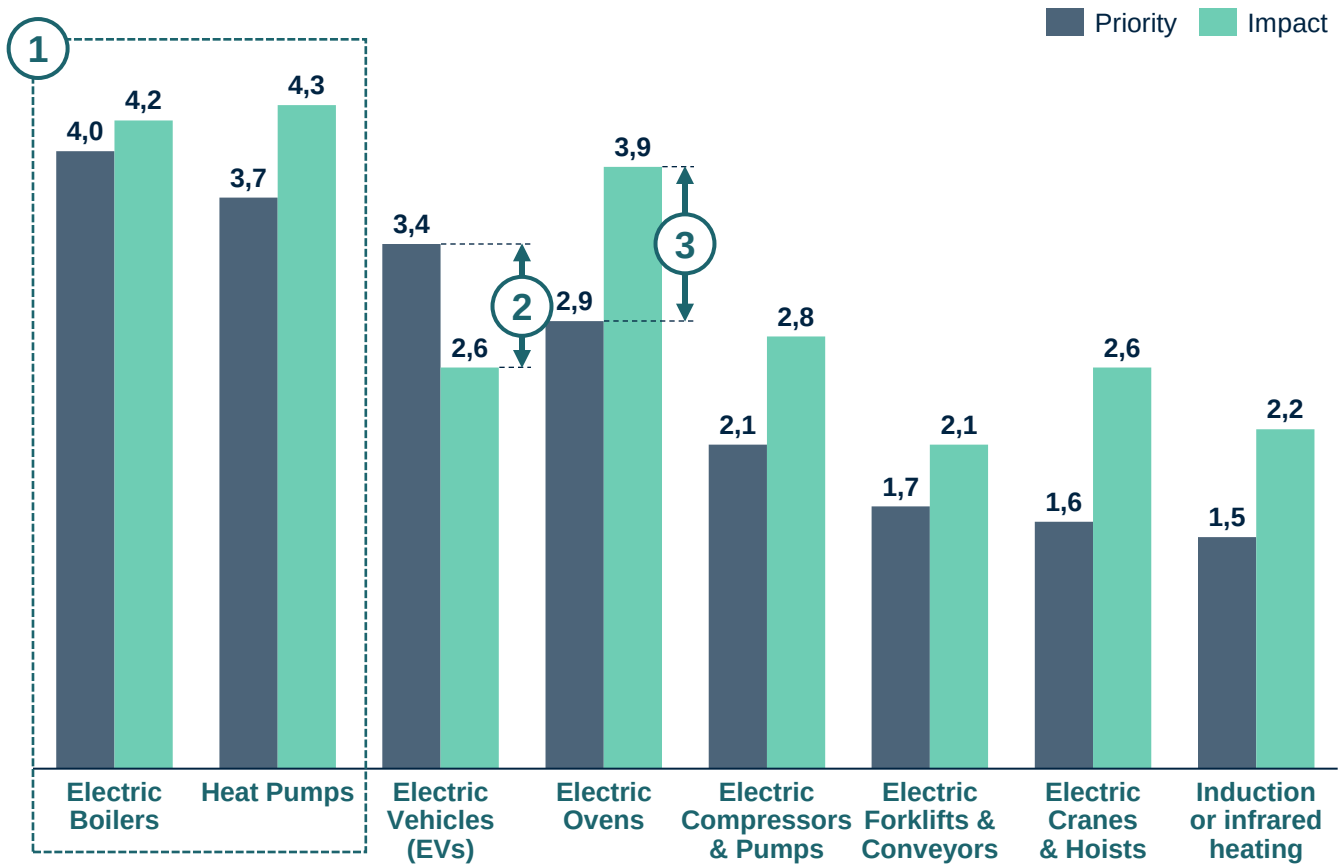
Electrification measures with untapped potential, like electric boilers and heat pumps, are prioritized.

Scoring of electrification measures on priority and impact

Electrification Measures



Insights

1. **Heating solutions, such as electric boilers and heat pumps, emerge as high-priority electrification measures** due to their decarbonization potential in energy-intensive heating applications.

2. **The continuous priority given to electric vehicles (EVs) is driven largely by regulatory incentives on company cars,** rather than the impact on energy. BrightWolves' earlier analyses shows EVs untapped potential to serve as energy storage units, offering grid support and operational flexibility that could enhance their perceived value over time.

3. **Electric ovens are highlighted as having significant impact on decarbonizing heating.** Their prioritization is slightly lower compared to the 'easier-to-install' technologies due to high investment costs and practical challenges, such as the need for a strengthened grid connection.

Interview Qluote

"We would love **to install an electric oven for producing our construction equipment.** However, the grid connection is insufficient, and the transmission grid lacks capacity to upgrade it."

Building Materials Manufacturer

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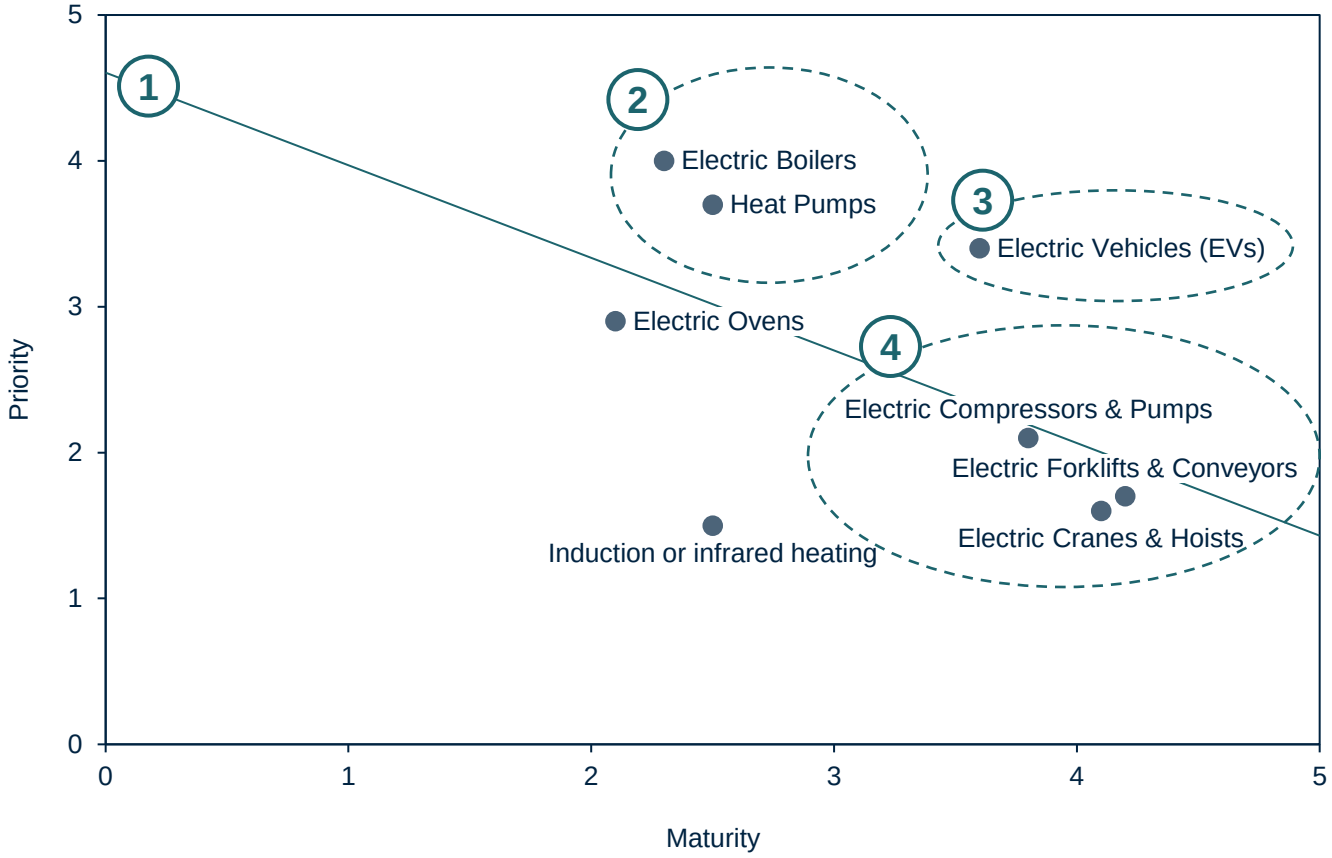
As electrification matures, priority reduces, since there is an ‘endpoint’ in electrification.

Scoring of electrification measures on priority and maturity

Electrification Measures



Insights

1. **The negative trendline suggests that as electrification technologies mature, they tend to receive less prioritization.** Once a fleet, such as cranes and hoists, is fully electrified, there are no further gains to be made, moving it off the priority list. Three groups of technologies can be identified

2. **Electric boilers and heat pumps are recognized as essential technologies for lowering greenhouse gas emissions**. Hence their high priority as they offer efficient means of converting electricity into heat. Though their high initial investment cost has limited widespread adoption so far, hence their average maturity scoring.

3. **Electric vehicles have reached a high maturity level** as they are increasingly used across fleet and logistics. The proven technology enjoys continuous priority moving forward.

4. **Electric forklifts, cranes and conveyors are seen as Best Available Technology,** not needing to further electrify. Hence their low prioritization.

Interview Quote

“As for electric vehicles: the impact is low, but the maturity is high. All forklifts are electric, and the **car policy is adjusted to electric vehicles only**.“

Specialty Chemicals Manufacturer

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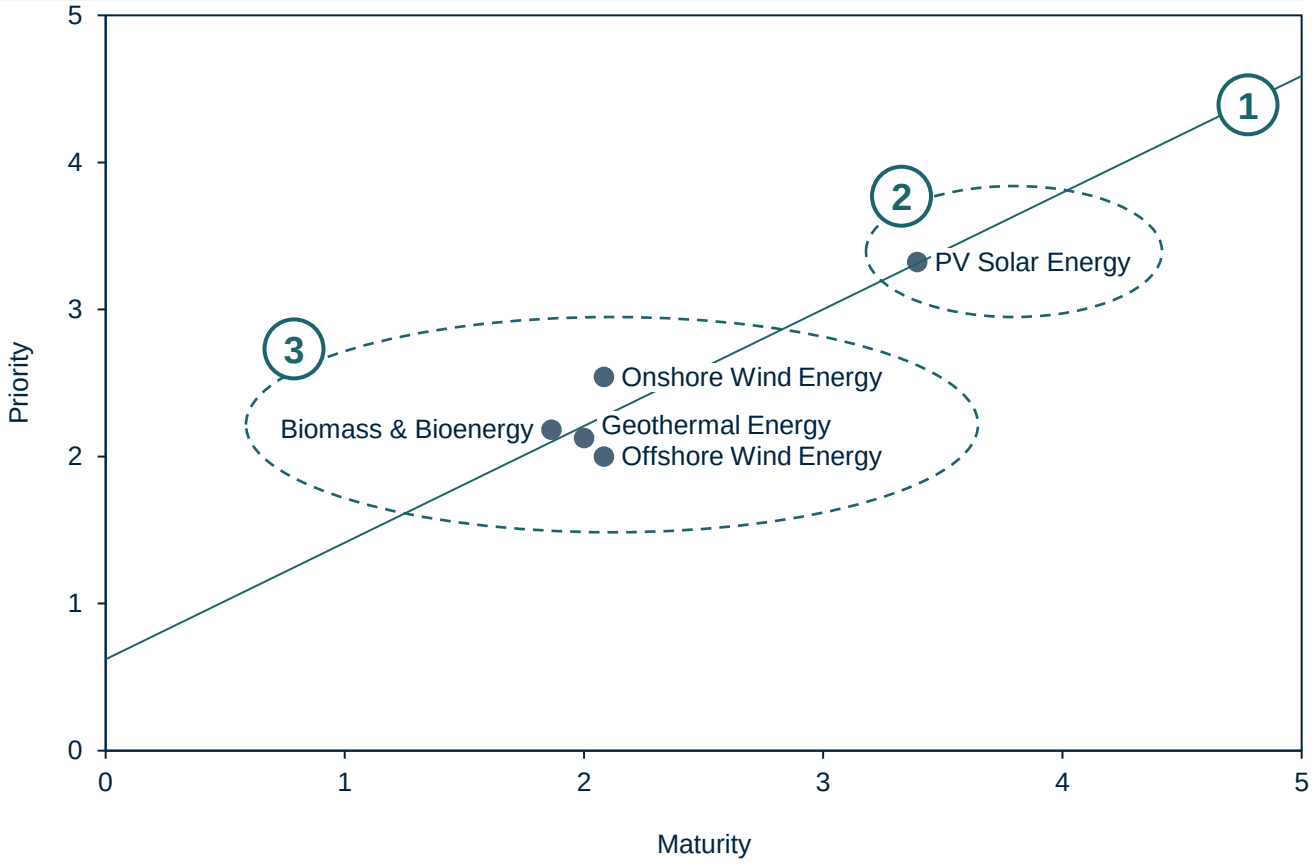
Renewable Energy investments have focused on proven, scalable and high-mature technologies, like PV Solar Energy

Scoring of renewable energy measures on priority and maturity

Renewable Energy Measures



Insights

1. The upward trend indicates that **as renewable technologies reach higher maturity, their priority increases**, making them more attractive for investment.

2. **Solar Energy drives this trend as it is the most mature renewable technology.** Due to scalability, technological readiness, and positive business case, Solar PV highly correlates with priority further accelerating the energy transition.

3. **Other renewables such as wind energy**, geothermal energy and biomass & bioenergy, have faced **development challenges (permitting for wind energy), high investment cost (geothermal) and supply chain uncertainty (bioenergy)** hindering widespread adoption and hence lowering priority moving forward.

Interview Quote

"We recently installed 300 kWp of PV solar energy. In total, **we aim for a capacity of 1,8 MWp in PV**. This will make a significant contribution to our sustainability goals."

Chemicals & Petrochemicals Company

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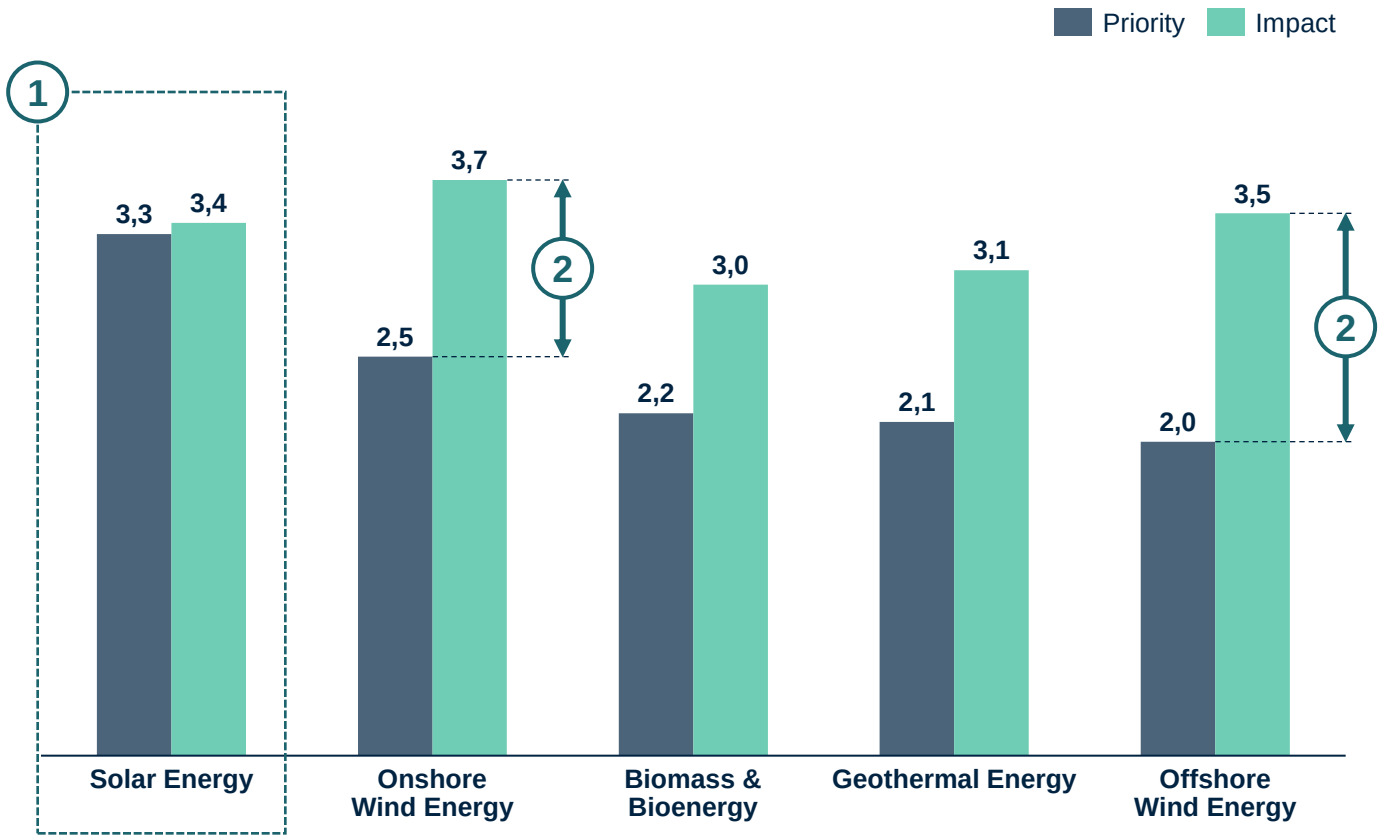
Solar continuous to lead the renewables charge, driven by regulatory push, proven business case and ease of installation

Scoring of renewable energy measures on priority and impact

Renewable Energy Measures



Insights

1. **Solar energy remains a focus** for companies accelerating in the energy transition. Its high priority is **driven by regulatory incentives, such as the 'PV verplichting' in Flanders,** ease of implementation its proven business case.

   This **positive business case is being increasingly challenged by negative energy prices**. As renewable energy penetration grows, overproduction leads to surplus electricity and periods of negative prices, reducing profitability for current and future solar operators and offtakers unable to fully valorize excess electricity.

2. **Onshore and offshore wind energy are among the most impactful renewable options**, primarily due to their low Levelized Cost of Electricity (LCOE). However, their **adoption is hindered by cumbersome permitting processes.** This drives the growing popularity of long-term power purchase agreements (PPAs). These contracts enable large consumers to secure reliable, predictable volumes of electricity at competitive prices.

Interview Quote

"We recently **signed a Power Purchase Agreement (PPA) for onshore wind** energy. The impact of this measure is very high."

Metals & Recycling Company

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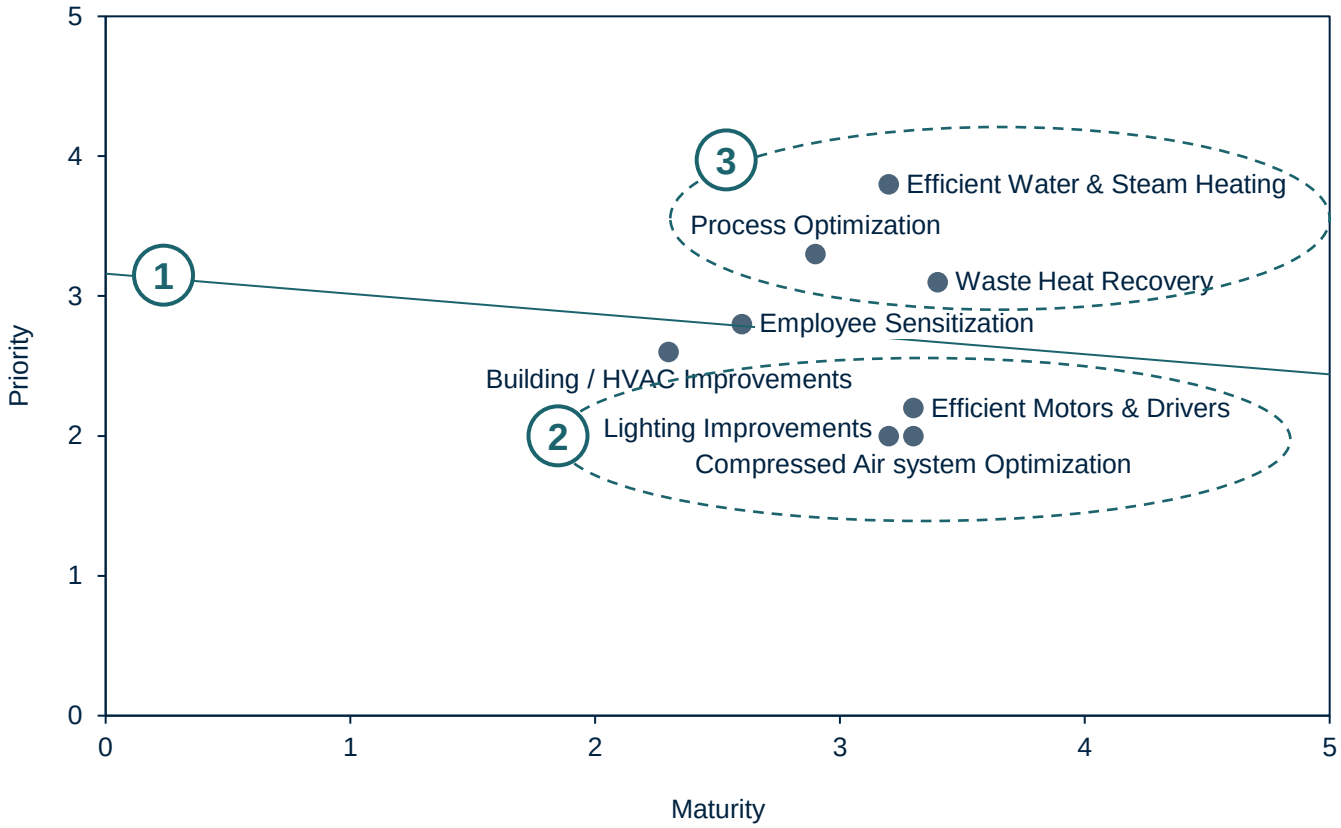
After years of compliance-driven adoption, energy efficiency has strongly matured and is now seeing renewed interest.

Scoring of energy efficiency measures on priority and maturity

Energy Efficiency Measures



Insights

1. The nearly flat trend line at **high priority levels suggests energy efficiency remains a focus** since both new and mature energy efficiency measures are valued.

2. More mature technologies may receive slightly less priority, as shown by the somewhat declining trend line, possibly because of high implementation. This **"maturity plateau" is evident in measures like Efficient Motors & Drivers and Lighting Improvements. These are considered established solutions** with less focus moving forward unless new, more efficient technology innovations emerge.

3. A notable trend is the **higher prioritization of gas efficiency measures** over electricity-focused ones, likely driven by the decarbonization potential.

Interview Quote

"Waste heat recovery is the most important measure. We are in a process industry and use a lot of steam, so **reusing heat from processes is essential** for our energy efficiency."

Chemicals & Petrochemicals Company

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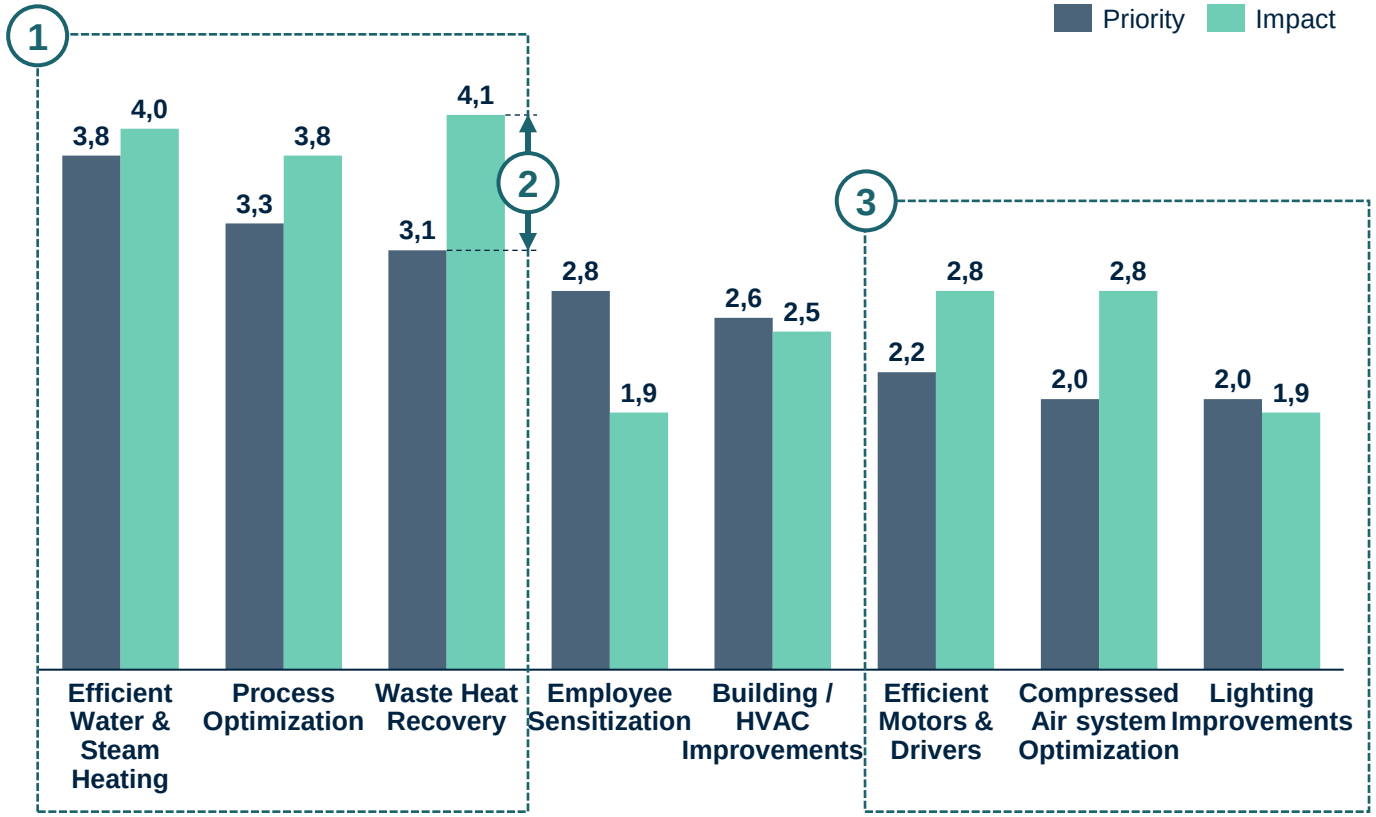
High-impact measures like heating and process optimization, and waste heat recovery are prioritized moving forward

Scoring of energy efficiency measures on priority and impact

Energy Efficiency Measures



Insights

1. **The top three priorities - Efficient Water & Steam Heating, Process Optimization, and Waste Heat Recovery** - are listed as priorities due to their high impact on energy savings and decarbonization potential, especially in energy-intensive industries where these measures directly reduce operational costs and emissions.

2. Certain **highly impactful measures, such as waste heat recovery, appear underprioritized.** This could be due to the perceived operational complexities and disruptions, as well as the higher initial costs.

3. The research confirms the well-known approach of **companies focusing first on "low-hanging fruit" measures** with a straightforward business case before moving on to more complex, but more impactful solutions.

Interview Quote

"We conducted a study on heat recovery, including capturing heat from our water treatment and upgrade it to higher temperatures via a heat pump. This project **would save us 16,000 MWh of gas**."

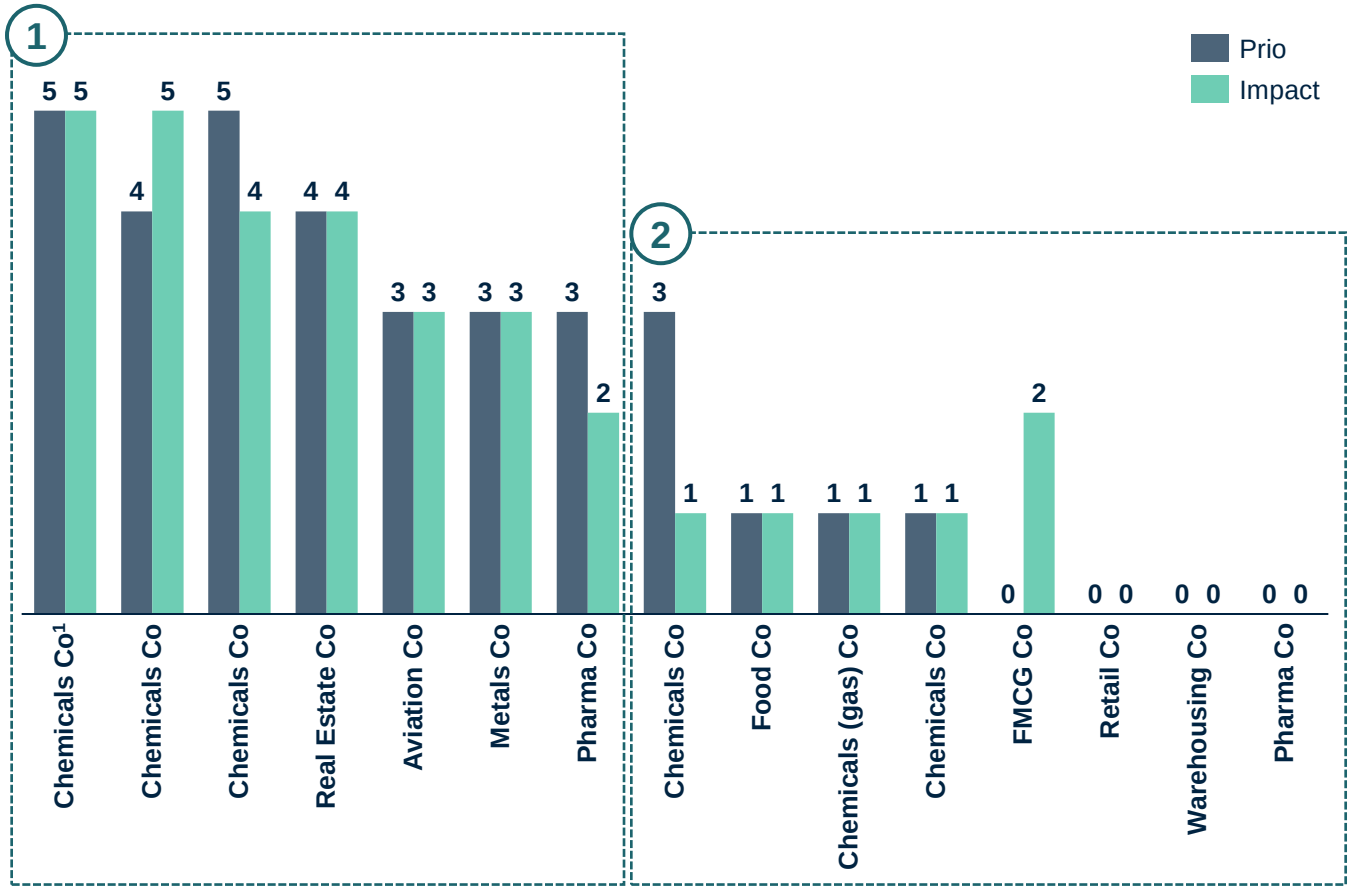
Pharmaceuticals Company

BRIGHTWOLVES

Demand flexibility is here to stay, with some companies recognizing and leveraging its value, driving the trend forward

Scoring of demand flexibility measures on priority and impact per company

Demand Flexibility Measures



Note:
1. 'Co' stands for Company

Insights

Demand flexibility is here to stay, with demand expected to surge in the short term. This growth is **driven by the urgent need for system operators to stabilize grids** and prevent disruptions. Also, many companies remain unaware of **the threat negative energy prices pose to the promised business case** of renewables. Overproduction during peak renewable periods reduces profitability, and without measures like demand-side response or energy storage, companies risk financial losses.

1. Companies that have implemented demand flexibility rate it highly, **acknowledging its strategic value** gained through direct experience.

2. In contrast, organizations that have yet to adopt demand flexibility often assign it a lower priority, driven by **uncertainty about its potential benefits.**

This difference indicates a potential growth opportunity: as awareness and evidence of successful implementations increase, more companies may be encouraged to adopt demand flexibility strategies in the future.

Interview Quote

"We **produce heat with the electric boiler when electricity prices are** low and fire up the CHP (combined heat and power) unit with gas when electricity prices are high. This has a **significant impact on our demand flexibility**."

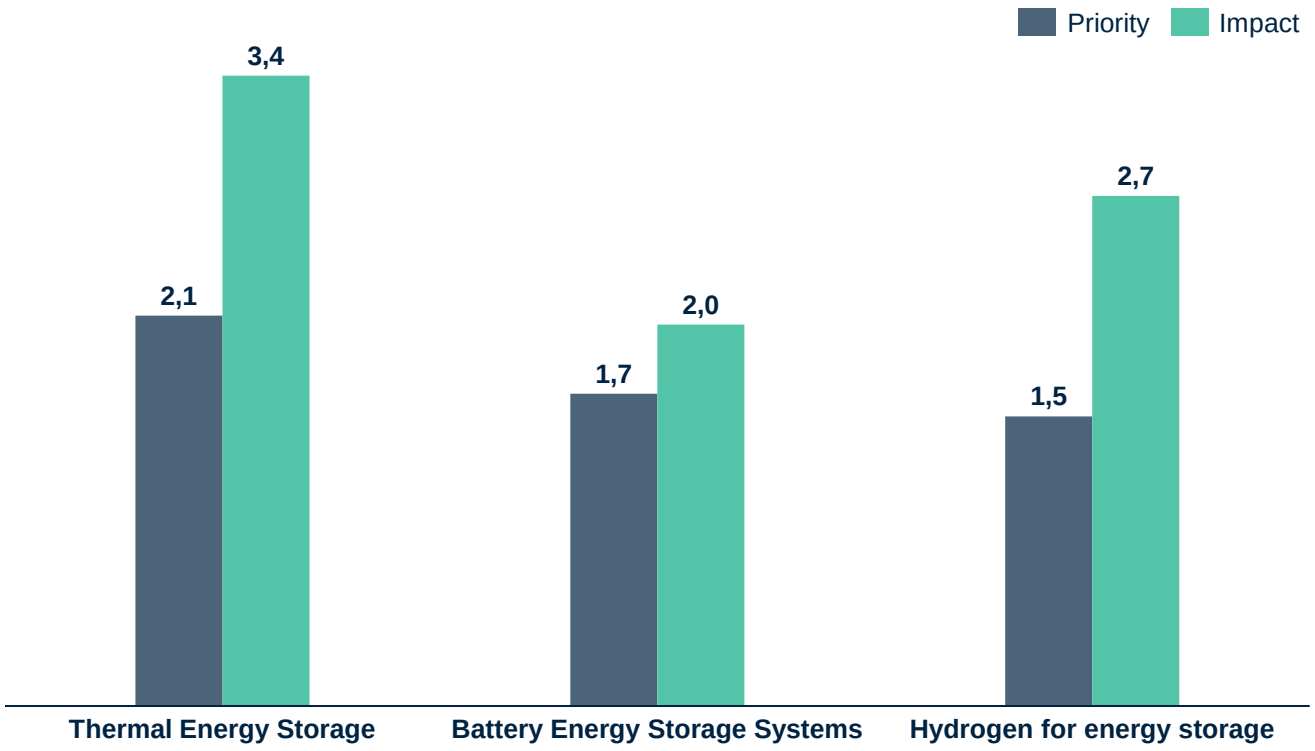
Pharmaceuticals Company

BRIGHTWOLVES

Hydrogen is losing focus as a current priority but holds future promise in decarbonizing industries, like batteries

Scoring of flexibility measures on priority and impact

Flexibility Measures



Insights

1. Battery energy storage systems (BESS) are still in their early stages, but advancements in battery technology and cost reductions are positioning them as essential components for managing energy loads and enhancing flexibility. **The demand for BESS is expected to grow significantly**, driven by the increasing need for flexibility as highlighted in the previous slide on Demand Flexibility.

2. The research also indicates that while hydrogen initially attracted significant hype, it is currently losing focus as a short-term priority for companies.

   However, BrightWolves foresees a **resurgence of hydrogen in the coming 2-5 years**, fueled by its potential as a critical feedstock technology, including applications such as green steel manufacturing or sustainable fertilizers, and for industrial decarbonization. This highlights hydrogen's enduring significance, even as its immediate adoption remains limited.

Interview Quote

"Hydrogen could theoretically be a game-changer. Maybe not now, but our goal is to **use hydrogen partially in our production processes by 2030**."

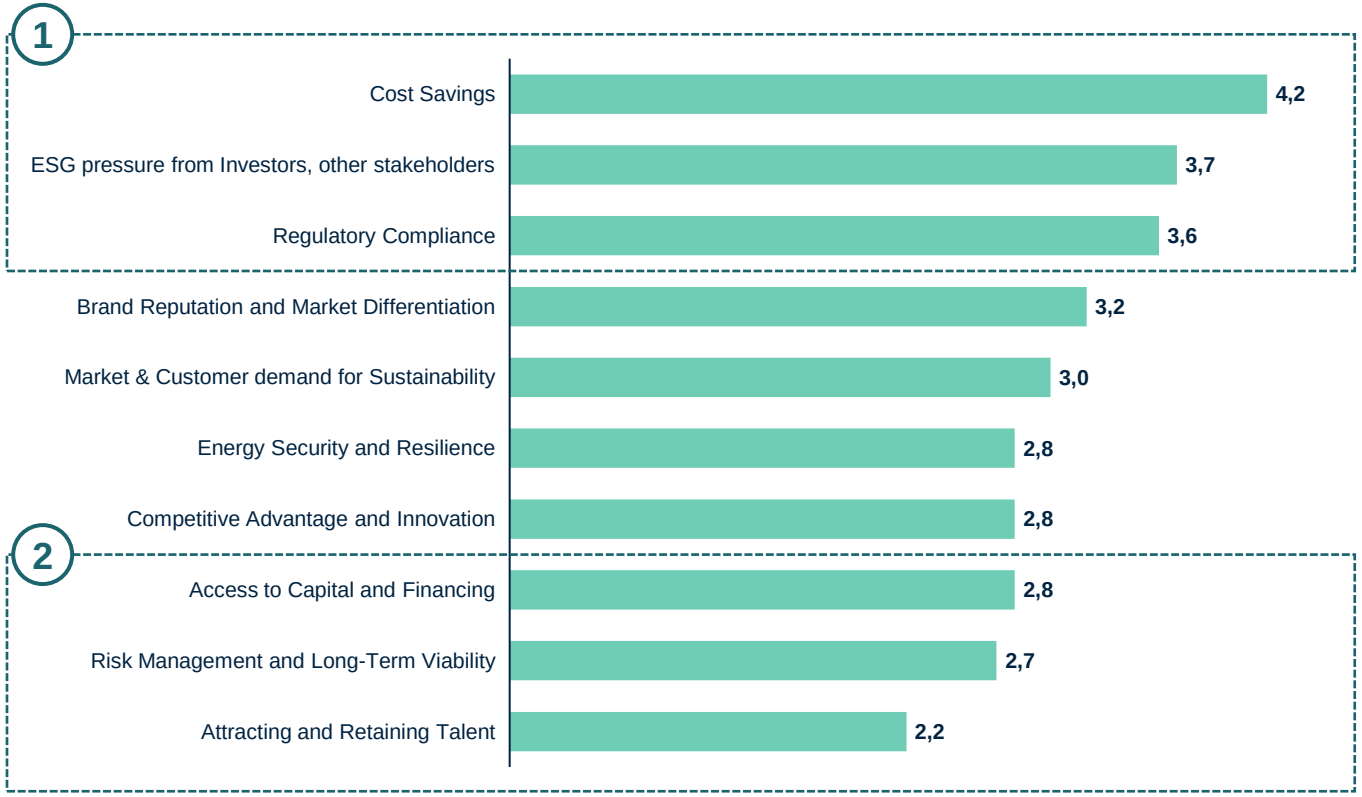
Metals & Recycling Company

BRIGHTWOLVES

Cost savings, ESG Pressure & Compliance are the leading drivers in the energy transition

Overview of motivations from interviewees to engage in the energy transition

Energy Transition Motivations



Insights

1. Companies primarily **prioritize cost savings, ESG pressures, and regulatory compliance** as key motivators for investing and engaging in the energy transition.

   These factors align with financial performance and **reflect growing stakeholder expectations to integrate sustainability into business** strategies. Consequently, they rank higher than compliance, which, while essential, often arises from necessity rather than proactive alignment with long-term goals.

2. **Access to capital, risk mitigation and talent attraction are viewed as less critical** for energy transition investments. As many companies in our research are privately owned, they face limited external investor pressure. While sustainability can aid talent retention, these considerations often take a secondary role. Risk mititgation is also rated low, suggesting that the risks posed by climate change and unsustainability have not yet been widely felt.

Interview Quote

"**It would be naïve to say cost-savings are not a leading factor**. ESG-pressure from stakeholders and general perception plays an increasing role, and we do feel extra pressure coming from our direct customers."

Chemicals Company

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3. **Approach to the Analysis**
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BRIGHTWOLVES

BrightWolves trends analysis covers 15 industrial, Belgian companies, representing 7 500 GWh of energy consumption

Methodology of the trends analysis and overview of the interviewed companies

Goal

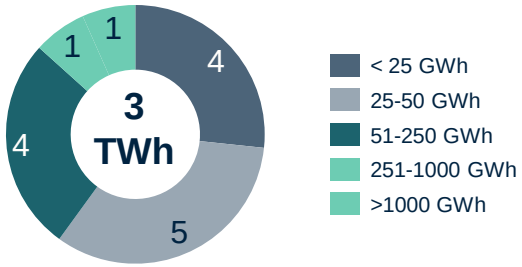
Understanding the **status** of the Energy Transition in the Belgian Industry & identify **trends** moving forward.

Analysis Methodology

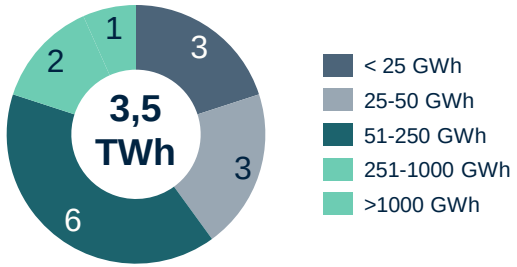
- Conducted **15 online interviews** with energy professionals in the Belgian industry
- Between **September and November 2024.**
- Asked to **rank different measures** from 1 (very low) to 5 (very high) according to expected level of **priority, impact and maturity.**
- Measures touched upon the **four pillars of the Energy Transition**: Energy Efficiency, Renewable Energy, Electrification & Demand Flexibility
- **Priority** reflects a measure's importance, **impact** shows its cost and emission reduction potential, and **maturity** indicates its development and readiness

15 Participating Belgian Companies

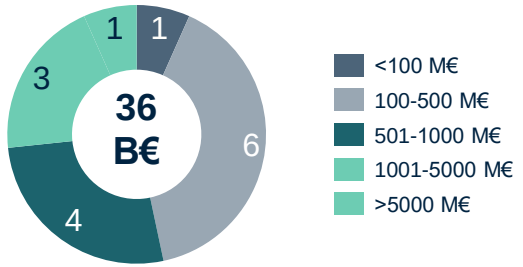
Electricity Consumption (GWh/year)



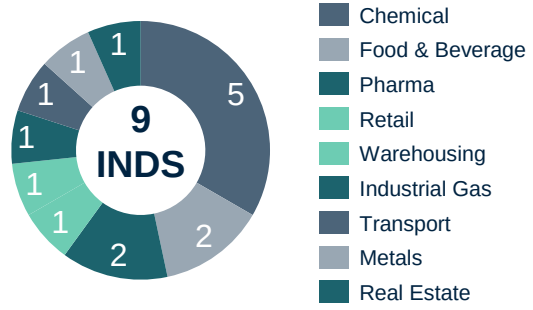
Gas Consumption (GWh/year)



Revenue (M€/year)



Industries (INDS) (# COS/industry)[1]



Note:
1. INDS stands for Industries. COS stands for Companies.

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BRIGHTWOLVES

Unlock next-level energy savings through demand flexibility with a customized Flex Scan Solution

BrightWolves offering for companies aiming to better understand the value of demand flexibility

Our Approach

1. Consumption Profile & Flex Potential

1. Conduct a detailed analysis of the **client's energy consumption and production patterns to identify assets and operational areas** where both demand and production flexibility can be effectively applied.
2. Source **energy price forecasts from energy markets and balancing markets** to understand the moments in which value can be generated by increasing or decreasing demand.

2. Modelling & Scenario Analysis

1. Simulate various **demand and production flexibility scenarios**, evaluating financial, operational, and environmental impacts.
2. Provide insights into **the value of existing assets** and explore opportunities for **integrating new technologies**, such as batteries, electric boilers, and heat pumps.

3. Business Case & Roadmap

1. Create a detailed, **actionable plan** with specific steps for adopting demand flexibility, supported by a comprehensive **cost-benefit analysis** to guide implementation.

Why Perform a Flex Scan?

1. **Identify Cost Savings**
   Uncover opportunities to reduce energy costs by strategically shifting demand based on pricing and availability.
2. **Boost Operational Flexibility**
   Gain insights to better manage energy usage in response to market fluctuations, increasing adaptability and resilience.
3. **Enhance Sustainability**
   Support decarbonization goals by aligning consumption with the availability of renewable energy, as a result lowering overall carbon footprint.

Deliverables

1. **Business Case and Data Insights**: A detailed analysis of potential savings, operational impacts, and environmental benefits, enabling data-driven decision-making.
2. **Strategic Roadmap for Cost and Emission Reduction**: A customized, actionable plan to implement demand flexibility, to optimize costs and lower emissions.

Agenda

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5. **Why BrightWolves?**

BRIGHTWOLVES

BrightWolves is a next-generation management consulting firm with +80 professionals across Benelux and South Africa

BRIGHTWOLVES

The world is changing fast – and so is your business. Our international team of consultants build a **more resilient future for your business** by helping you:

- **Grow** – expand with confidence through research & analytics
- **Optimise** – streamline your operations building critical capabilities
- **Digitalise** – tap into the power of digital, data and AI
- **Sustain** – turn sustainability into a competitive edge

We work shoulder-to-shoulder with you. From strategy to implementation.

We are proudly supported by our venture partners

DIGIT MINT

Digit Mint is our proprietary software tool designed to empower businesses to perform **life-cycle assessments**

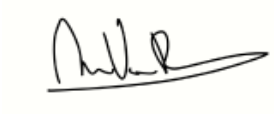
QuantIM

QuantIM is our network of +2.500 highly experienced **independent industry experts and interim managers**.

BrightWolves is empowered by Quanteus Group, currently counting +450 professionals worldwide.

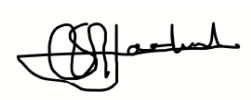
BRIGHTWOLVES

We are on a mission to build a more resilient future for our clients, talents, society and future generations



To our clients

- We commit to **own your challenges**, to go the extra mile with **passion and flexibility**
- We commit to reliable **excellence** in every BrightWolves service and solution
- We are **pragmatic** and go for tangible results
- We commit to act with the **highest level of integrity,** without ever compromising



To our talented professionals

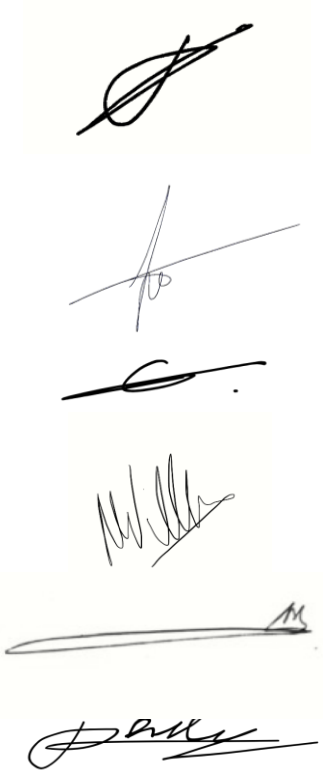
- We commit to **grow and nurture** you through permanent on-the-job learning, dedicated trainings and constant **feedback**
- We will equip you with the right **productivity tools** and train you on effectiveness, stimulating a **healthy life balance**
- We welcome proactivity and value an **entrepreneurial** attitude
- We treat everyone with **respect**. We all **speak up**. There should be **no subordination** in our firm

To our society

- We adhere to the principles of **conscious capitalism**
- We strive for **diversity and inclusion**. We offer **equal chances** based on merit and contribution
- We contribute fairly to a resilient **local economy** in the countries where we are active
- We aim to accelerate the energy transition to safeguard our **local prosperity**

To our future generations

- We commit to be an authentic **sustainability leader** in the industry, starting with our own operations
- We aim to transform our clients, partners and suppliers by **speaking up** on sustainability concerns at every suitable occasion
- We commit to **using technology responsibly and ethically**, contributing to a future where technology benefits all
- If we feel a project is **NOT** contributing to a resilient future (if it doesn't feel right), we will not do it



We collectively signed our #BeyondConsulting charter, September 2024

BRIGHTWOLVES

We do things The BrightWolves Way

Impact through *tangible* results

Wo do less PPT, more MVP.

We are driven to bring real change in your organisation. Therefore, we quickly create impact through smaller iterations and continuous learning, ensuring a pragmatic solution tailored to your business.

Flexibility in our setup

We recognise your unique needs.

Whether you prefer a team setup, expert guidance, or just having one of our consultants integrate into your team, we adapt to your needs and adjust our approach accordingly.

Experts bringing a *holistic view*

Reality is multifaceted and interdependent

Our team is made up of dynamic, highly skilled professionals, aiming to understand and fix systems in their entirety. Our wolves are trained to think business and act digital, with a heart for sustainability.

Even a single wolf works in a *team*

We always bring in industry or topic expertise.

Through our iceberg principle, each consultant is consistently supported by one of our topic experts. We further enhance this support with our international network of experts whenever necessary.

BRIGHTWOLVES

Our team of transformation experts can strengthen your business on the following *key capabilities*

Grow	Optimise	Digitalise	Sustain
M&A and Integration	Operational Excellence	Digital Transformation	Sustainability Strategy & Transformation
Market & Customer Insights	Financial Performance	Data Transformation	Impact Assessment & Reporting
	Transformation & Turnaround	Advanced Analytics	Climate Change
		Artificial Intelligence	Sustainable Operations

BRIGHTWOLVES

Our servant leadership team

Miguel Van Damme

Managing Director

Sven Van Hoorebeeck

Director

Peter-Jan Roose

Director

Joris Vanthienen

Principal

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