



BILFINGER'S NET ZERO APPROACH

A LEADING SOLUTION FOR SUSTAINABLE TRANSFORMATION



Multiple Challenges Are the New Normal



Where to start?



Net Zero Approach

The Challenge

The industrial sector must rapidly **reduce its carbon emissions**. Manufacturers around the world are intensively addressing the question of **how to enable their plants for net zero operation**. Solutions around energy efficiency, electrification, heat optimization, waste heat utilization and innovative ideas for renewable fuels are attracting a great deal of interest.

However, most of the **corporate decarbonization strategies** have not yet been translated into executable roadmaps at site level.



Mentimeter

WHAT ARE THE CHALLENGES?



Net Zero approach

THE WAY TO START

We start with Net Zero Approach – a lifecycle approach





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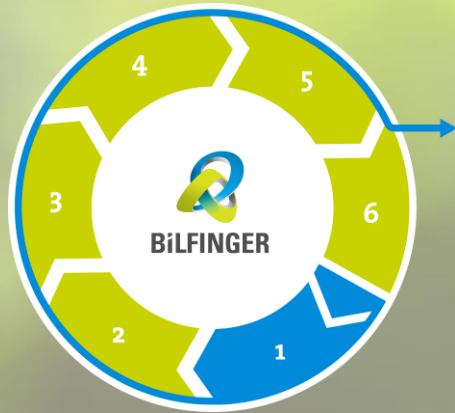
Net Zero Approach

INITIATION, ASSESSMENT & PLANNING

The first step of the Net Zero Approach is used to identify critical process parameters and collect required data

Initiation, assessment, and planning

In the process analysis, the first step is **initiated** in which **critical process parameters** and **required data** is collected.



- 1** Process Analysis
- Process flow diagram
 - Critical process parameters
 - Best Available Techniques
 - Alternatives and Variants



Identify stakeholders



Material balance



Energy balance



Site characteristics



Asset management processes



Organisation



Required time for this step is approximately 4 weeks

Customizable toolbox → focused on sustainable improvements

In the second step of the Net Zero Approach starting points are identified and verified

Net Zero Approach

Initiation, assessment, and planning



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Base case analysis

- Energy scan
- Plan Site visit & interviews
- Emission registration
- Expert judgement

In this step, the **starting points** for the roadmap will be formulated. Moreover a **site visit** will be planned in which the starting points can be **verified and confirmed**.



Kick off presentation



Identifying scope 1, 2 & 3 emissions



Starting points & call for action



interviews



Required time for this step
Approximately 1 week

Customizable toolbox → focused on sustainable improvements

The environmental analysis identifies potential opportunities in the surrounding area of the site, with taken into account regional/national plans and legislation

Net Zero Approach

Initiation, assessment, and planning



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Environmental analysis

- Context outline
- Stakeholders
- Regional vision / initiatives / potential
- Laws and regulation

In the environmental analysis, **potential for collaborations** and **opportunities** in the surrounding area of the site are identified. Moreover, **legislation and regional / national development plans** are taken into account in order to come with a site specific strategy. The analysis can be used as a **strategic tool** that identifies which **internal and external factors** can impact the performance of the company.



Stakeholder analysis



Regional / National development plans



Market trend analysis



Overview plot plan with explanation



Site visit (1 week)



Required time for this step
Approximately 2 weeks

Customizable toolbox → focused on sustainable improvements

The potential analysis identifies the measures that have potential to be implemented in the final roadmap

Net Zero Approach

Initiation, assessment, and planning



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Potential analysis

- Process optimization
- Renewable energy
- New energy technologies
- Ecodesign – circularity

In the potential analysis, **potential measures** that can be implemented in the roadmap can be identified. These measures regard **energy saving, reduction, or transition measures** on scope 1+2 or measures to promote a **circular approach** regarding scope 3 emissions.



Process optimization



Circular design



Renewables and green energy sources



To be Asset Management system



Define list of CO₂ reduction measures (long list)



Required time for this step
Approximately 2 weeks

Customizable toolbox → focused on sustainable improvements

The potential analysis identifies the measures that have potential to be implemented in the final roadmap

Net Zero Approach

Initiation, assessment, and planning

The fifth step identifies **potential risks, opportunities, and costs** that come with implementation of the proposed measures of step 4. These assets depend on the **availability, market developments and location**.



5 Risks, opportunities and costs

- Lock-in
- Availability / continuity
- Market developments (CO₂ price / Grants)
- CAPEX / OPEX



Availability



Market developments



Decide on final CO₂ reduction measures (short list)



CAPEX / OPEX indication (+/- 50%)



Value based portfolio management



Required time for this step
Approximately 1 weeks

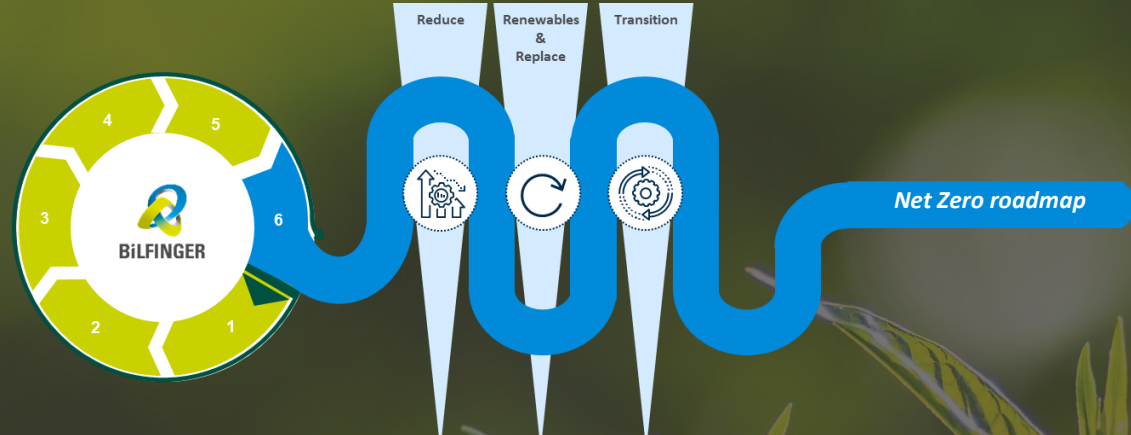
Customizable toolbox → focused on sustainable improvements

Our Solution Net Zero Approach

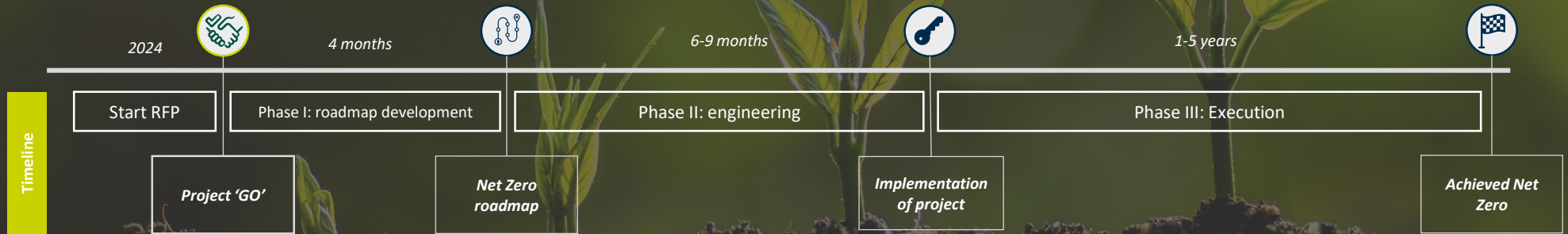
Initiation, assessment and planning

+

Optimization & Modification



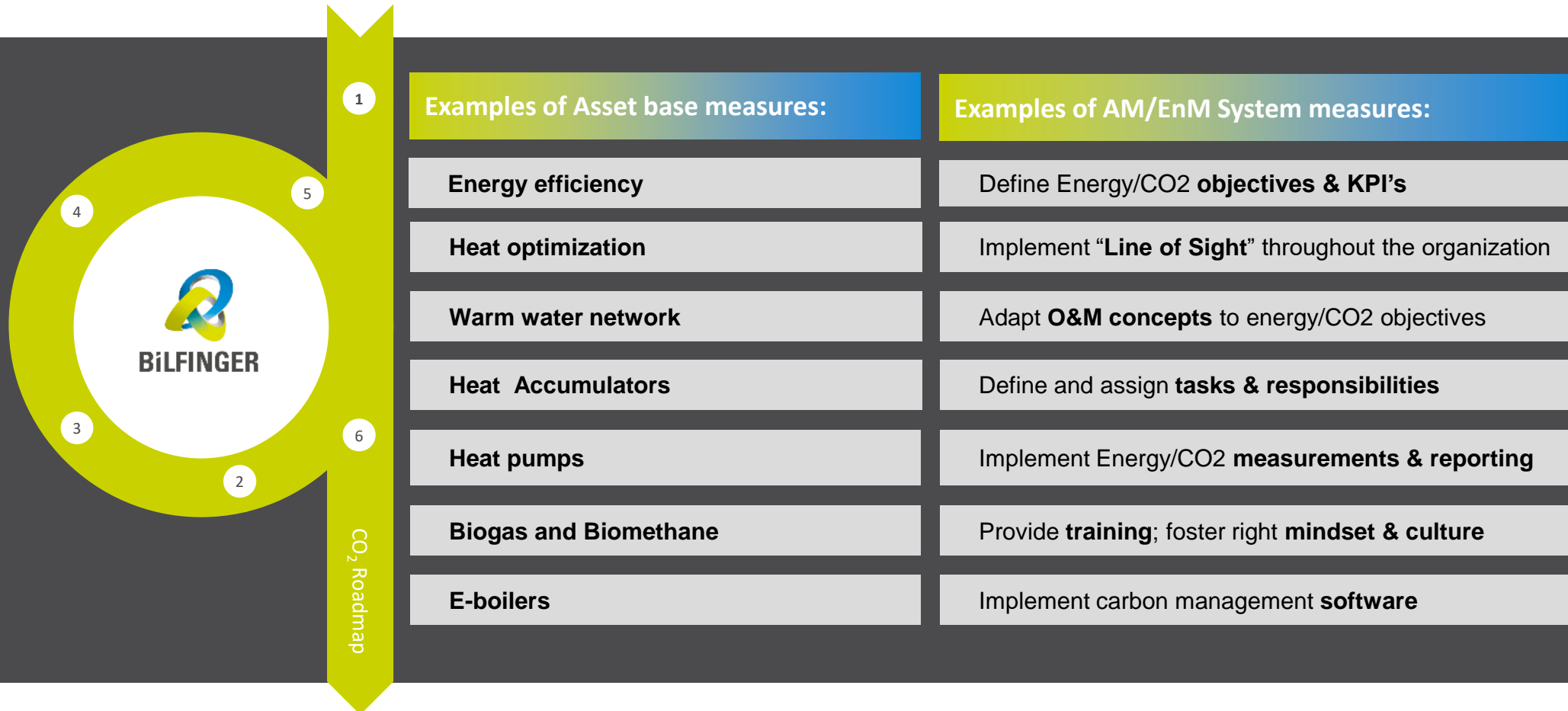
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Net Zero Approach timeline

Net Zero Approach in practice

Example of measures



Net Zero Approach in practice

Roadmap timeline & example measures to implement

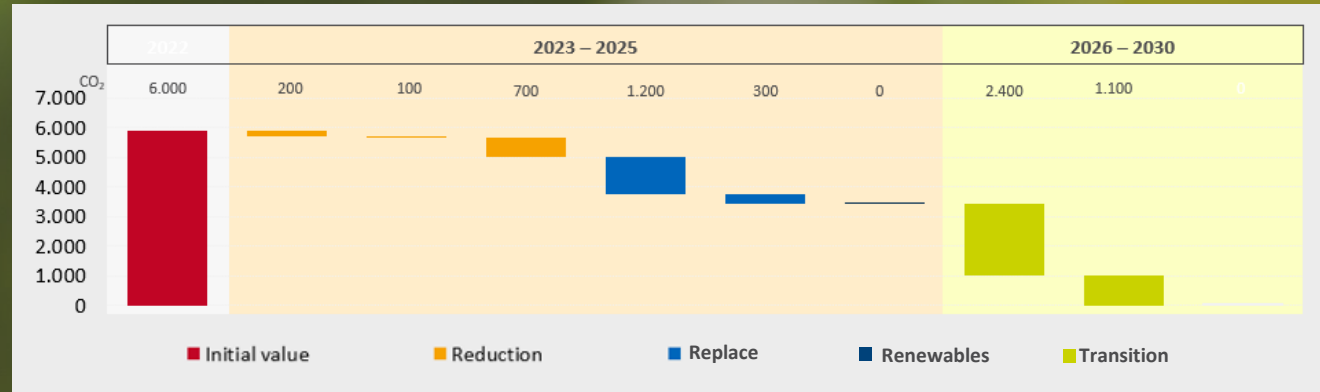
The NetZero roadmap includes four themes which will lead to Net Zero in production: measures based on 'reduce', 'replace', 'renewables' and 'transition'.

Reduce includes all saving measures like flash steam reduction, temperature reduction, insulation, resulting into **3-10% emission reduction** and a **negative cost per ton CO₂ reduction**.

Replace includes heat optimization measures optimizing heat exchange, heat storage and implementing heat pumps for waste heat utilization resulting into **up to 60% emission reduction**.

Renewables include own biomethane or biomass utilization and renewable power production **increasing plant self sufficiency**. Emission reduction potential is site dependent but can amount up to **more than 50%**.

Transition measures include energy/fuel switch solutions like an e-boiler or biomethane purchase agreements required to **close the gap for remaining emissions**.



Measure number	Measure title	CAPEX in € (accuracy -40%/+40%)	Cost per ton CO ₂ reduction [euros/ton]	Simplicity	Implementation period	
1	Reduction 1	50.000-100.000	-150	+	2023-2025	+ Easy to implement
2	Reduction 2	low (<50 000)	-100	+	2023-2025	
3	Reduction 3	1 000 000	-50	+/-	2023-2025	+/- Medium hard to implement
4	Replace 1	1 000 000 - 1 500 000	-20	+/-	2023-2025	+/- Hard to implement
5	Replace 2	500 000	-10	+	2023-2025	
6	Renewables 1	300 000 - 400 000	0	+	2023-2025	- Difficult to implement
7	Transition 1	800 000 - 1 000 000	100	+	2026-2030	
8	Transition 2	2 500 000 - 3 500 000	250	+/-	2026-2030	

Net Zero Approach in practice

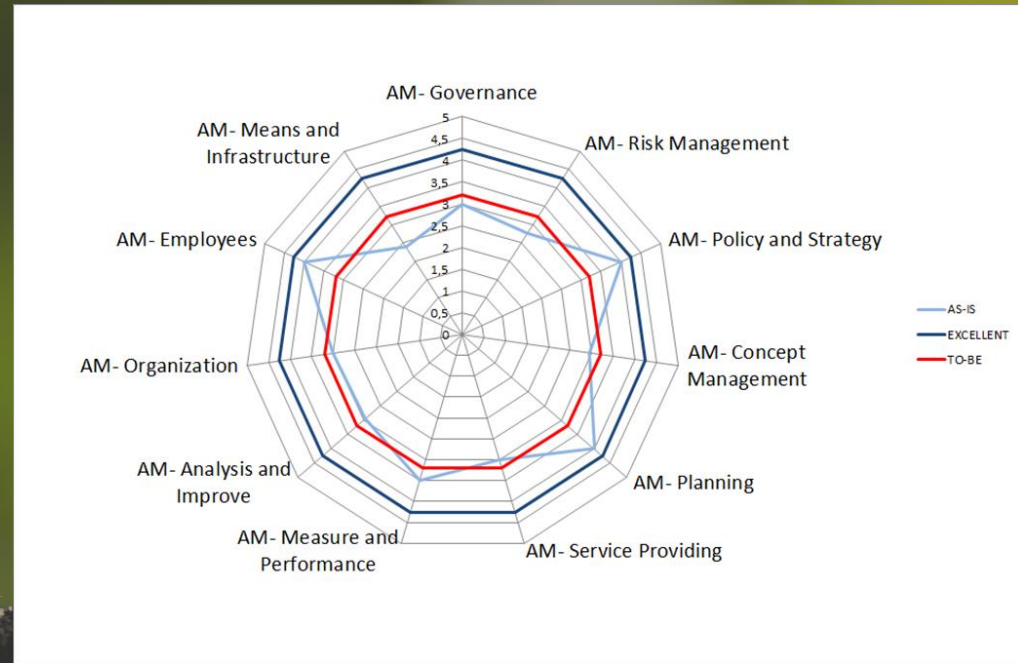
Assessment and improvement of AM/EnM processes and organisation

The **Bilfinger Asset Management and Energy Management assessment** evaluates the **business process, organization, people and infrastructure** aspects that are relevant to realizing your Net Zero ambitions. It results in a clear and structured picture of the as-is, the to-be and **the gaps to be closed**.

Based on this assessment, Bilfinger drafts the **road map** to make your Asset Management and Energy Management Systems **fit for realizing your Net Zero ambitions**.

After that we guide you through the **implementation** of the proposed road map. We support you with defining the required **changes to business processes and organization**, with the **training** of your people, and with selection and implementation of **IT applications**.

Our capabilities with regard to implementation projects cover **Project Management, Change Management** and provision of required **Expert Knowledge**.



Wrap Up Net Zero Approach

A partnership with Bilfinger will give you:

- Experience in a wide range of industries
- Integrated collaboration with clear deliverables
- Global coverage
- Tailormade solutions
- Highly efficient supplier management

Start now and create an open discussion!



We're Happy to Answer Your Questions



Bart Desmet
Principal Consultant Asset Management
Bart.desmet@bilfinger.com



Michiel Geurds
Consultant Industrial Sustainability
michiel.geurds@bilfinger.com

