

# Conceptual Design of an Energy & Water Efficient Brewery

DACE meeting

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# Overview

1. Brewing a Better Future
2. Energy and water consumption targets for 2020
3. Conceptual Energy and Water Efficient Brewery
4. Best Available Techniques: approach
5. Summary of Improvements
6. Summary



# Sustainability



*Brewing a*  
**Better Future**

# Sustainability

## What does this mean for HEINEKEN?

- Part of our **DNA**; embedded in our Company values
- **Historical** commitment
- Considering **long-term** impact of our actions, not just short-term growth
- A tremendous opportunity to “**do good while doing good business**”

# Sustainability

## Why is it critical to our future?

- With **success** and **leadership** comes **responsibility**
- We must win as **one sustainable HEINEKEN** together **with all our stakeholders** and per their expectations and dialogue
  - Employees, Consumers, Customers and Retailers, Governments, NGOs, Shareholders and Investors, Media
- **Positively impact the role of beer in society**
- Our future **ability to continue to produce beer** and cider for our consumers depends on it

# Sustainability

Our journey is called .....

**Brewing  
a Better Future**

Our long-term ambition is .....

**To be the  
World's Greenest Brewer**

We have built our programme  
around three strategic imperatives .....

**Improve**  
Continuously improve  
the environmental  
impact of our brands  
and business

**Empower**  
Empower our  
people and the  
communities in  
which we operate

**Impact**  
Positively impact  
the role of beer  
in society

We have grouped our 23  
programmes into 6 core initiatives .....

Green  
Brewer

Green  
Commerce

Engaging  
Employees

HEINEKEN  
Cares

Responsible  
Consumption

Partnerships  
for Progress

**Governance, Senior management incentives,  
Reporting & transparency, Supplier code, Communication & engagement**



Measured by the SAM  
Dow Jones  
Sustainability  
Indexes



# Green Brewer

## Improving our environmental impact

### By 2020:

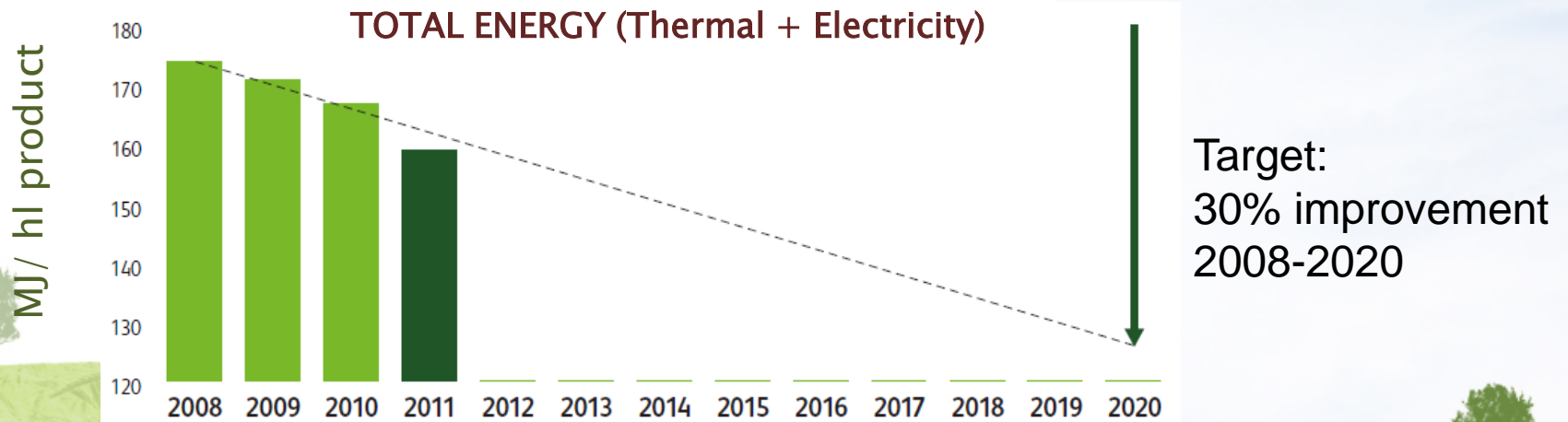
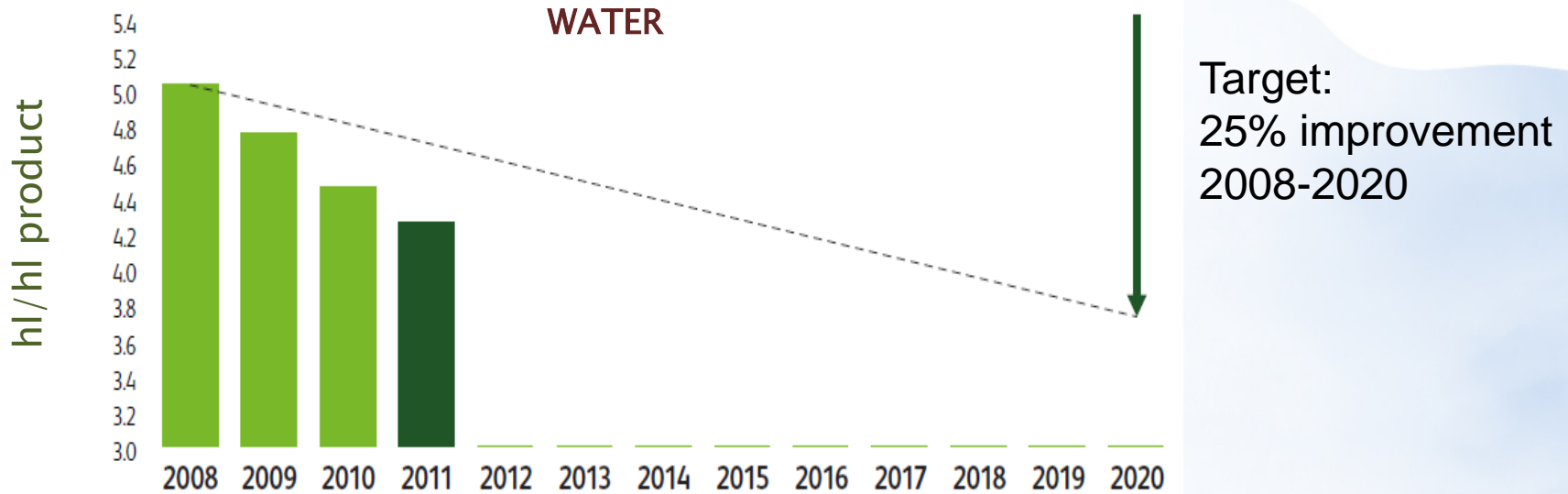
- Reduce **CO2 emissions** from fossil fuels in our breweries by 40%
- Reduce **water consumption** in our breweries by 25%
- Aim for **water neutrality** of breweries in water-stressed areas
- Develop and implement concept of **CO2 neutral brewery**
- **Energy saving** in non-brewing production sites and offices

# The total value chain and our footprint





# Energy and water consumption targets for 2020



# Conceptual design of an E&W Efficient brewery

Best Available Techniques

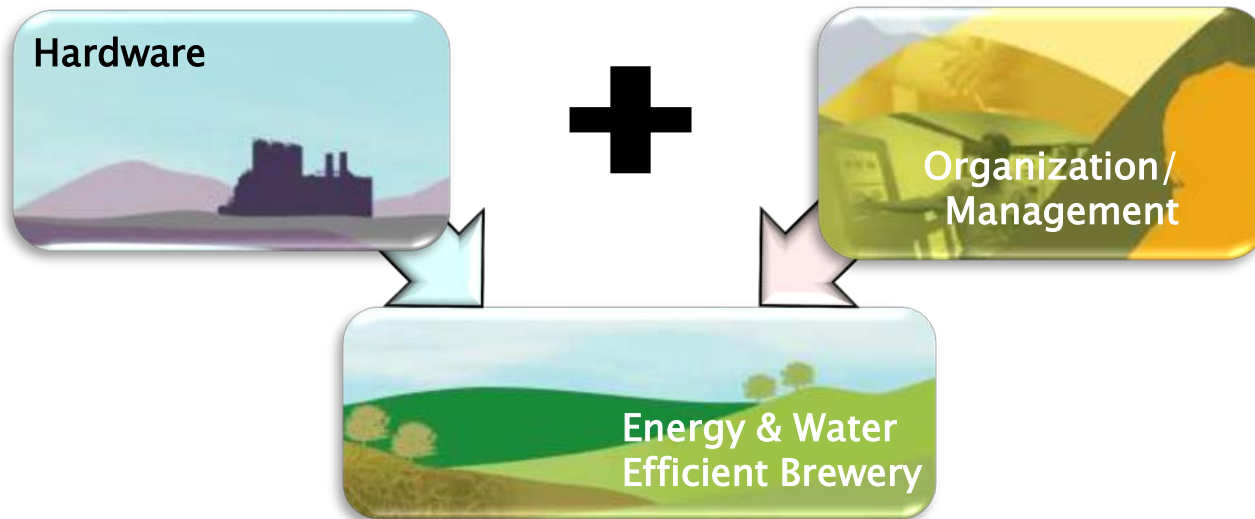
Daily E&W management

Machine & Equipment Choices

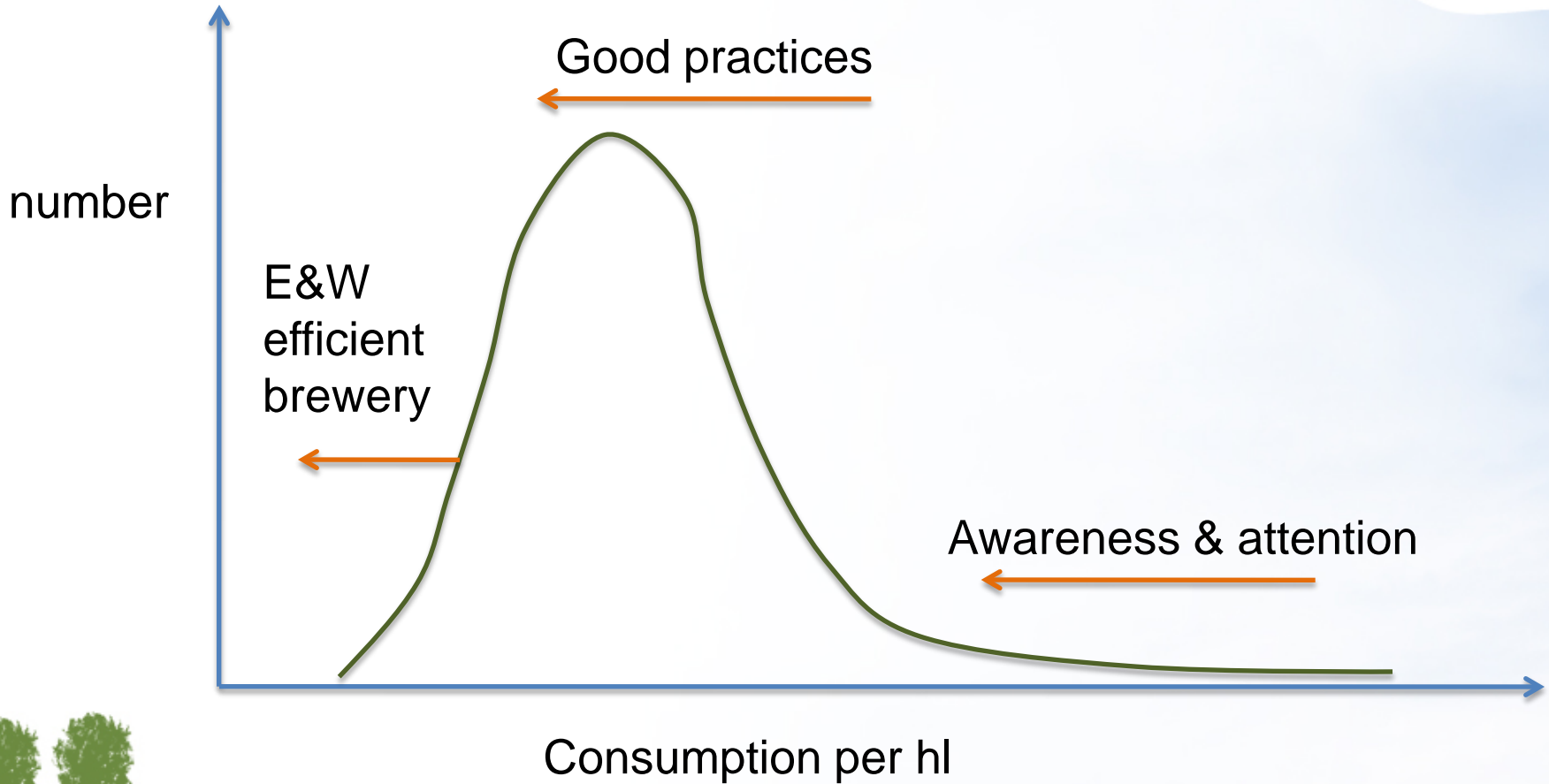
Operate within design parameters

With or without recipe changes

Sustainability mind-set change



# Improve



# Starting points and approach

1. Ideation, list of Best Available Techniques (BATs)
2. Quantification in terms of impact on KPI's & operational cost savings
3. Quantification of cost impact
4. ROI & summary



# Best Available Techniques

## Literature:

- Applied Thermal Engineering 31 (2011) 2023–2034: The green brewery concept ..... Feasibility of 37 MJ/hl for “medium sized brewery A”
- Etc..

## (Supplier) BATs

- Efficient lighting
- Energy re-use in the brew-house
- Efficient motors (efficiency classes)
- Measurement & Control
- Etc...

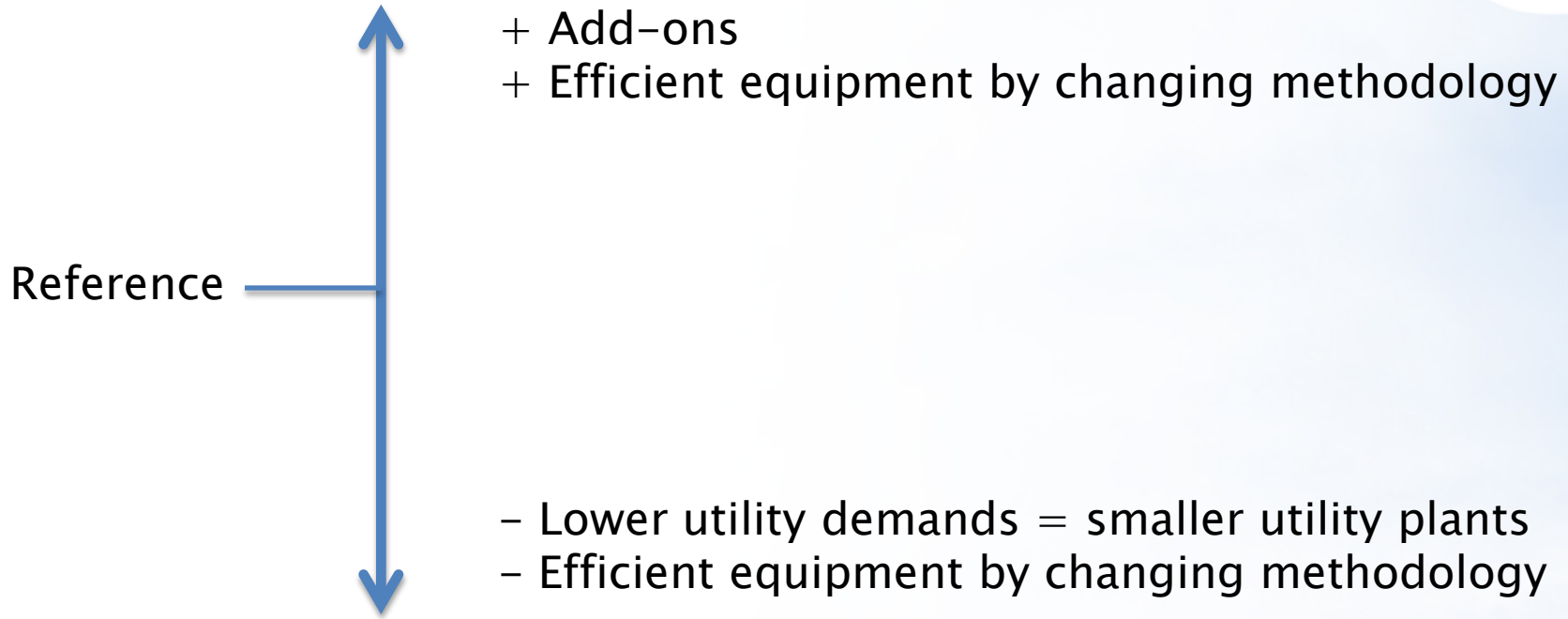


# Approach to screen BATs

Item	Electricity [kWh/hl]	Thermal [MJ/hl]	Water [hl/hl]	Capex Delta
Improvement 1	[specify]	[specify]	[specify]	[specify]
Improvement 2	[specify]	[specify]	[specify]	[specify]
Improvement 3	[specify]	[specify]	[specify]	[specify]



# Capex impact: Balance between additional and reduced investments



# Overall overview – example

Item	Electricity Delta [kWh/hl]	Thermal Delta [MJ/hl]	Water Delta [hl/hl]	Capex Delta [€/hl]
Delta Brewing	-0.12	-4.2	-0.35	+0.47
Delta Packing	-0.49	-2.3	-0.21	-0.24
Delta Cooling	-0.23		-0.03	0
Delta Air	-0.08			+0.02
Delta CO2	-0.14		-0.003	+0.02
Delta SHW	+0.1	-2.8		+0.01
Delta Electrical general	-0.25			-0.02
Delta WTP/WWTP	+0.01	-0.1	-0.12	+0.00
Delta Warehouse & Buildings	-0.32	-	-0.025	+0.04
Automation & Instrumentation & Process control	-	-	-	+0.16



# Conclusions

- 😊 Technological & technical improvement potential
- 😊 Good balance of costs

