



NF Wire Forum

Development of modern drawing lubricants
within sustainability aspects



Sustainability aspects on drawing media

Agenda

- 1) Carl Bechem GmbH – founded 1834
- 2) Sustainability at Bechem – a review
- 3) What means sustainability at Bechem ?
- 4) Judging methods for the PCF on Lubricants
- 5) Exemplary assessment of some drawing media


Sustainability aspects on drawing media

Agenda

- 1) **Carl Bechem GmbH – founded 1834**
- 2) Sustainability at Bechem – a review
- 3) What means sustainability at Bechem ?
- 4) Judging methods for the PCF on Lubricants
- 5) Exemplary assessment of some drawing media

BECHEM – The Brand for Special Lubricants.



A black and white portrait of Carl Bechem, a man with dark hair and a serious expression, wearing a dark coat with a white collar. The portrait is positioned on the right side of the slide, partially overlapping the text.

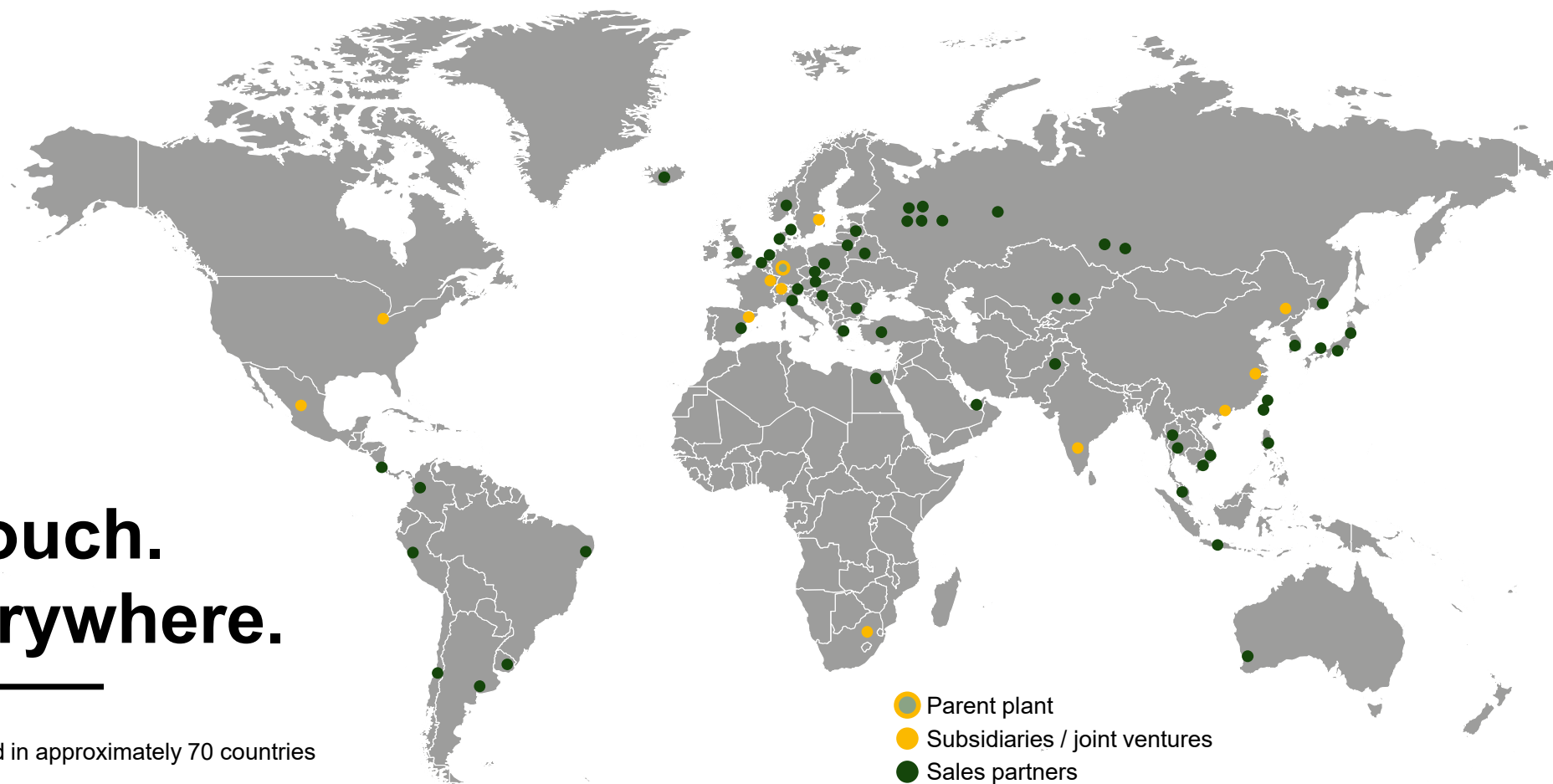
Over 180 years of lubricant history

In 1834, In Hagen, Carl Bechem founded the first German oil factory. In doing so he became the first German manufacturer of industrial lubricants.

In touch. Everywhere.

Represented in approximately 70 countries
worldwide.

Close to customers, and to their needs.



BECHEM – an overview.

Approximately 500 employees worldwide, of which 300 are in Germany.
Certified in accordance with IATF 16949, and DIN EN ISO 9001

Plants in Germany:
Hagen | Gardelegen-Mieste | Kierspe

Plants worldwide:
China | India | USA



900 heroes.

900 products offer convincing performances in the most demanding industrial applications.

Lubricating greases and oils

Metal removal and forming lubricants

Anti-friction coatings

Corrosion protection and cleaners



Specialist.

BECHEM is lubrication specialists for the most demanding industry applications.

Automotive | Railway | Mining | Chemical industry |
Electrical engineering/electronics | Conveyor technology |
Wood processing and wood working |
Plastics | Food products | Mechanical engineering |
Metal production and metal processing |
Pharmaceutical industry | HVAC | Industrial fittings |
Shipbuilding | Textile industry | Environmental technology | Cement



Hidden Champions.

Reduced friction and wear, plus sustainable improvement of functionality.
Invisible in thousands of consumer goods and industrial goods.

Not just in the 125,000 electric toothbrushes produced daily.

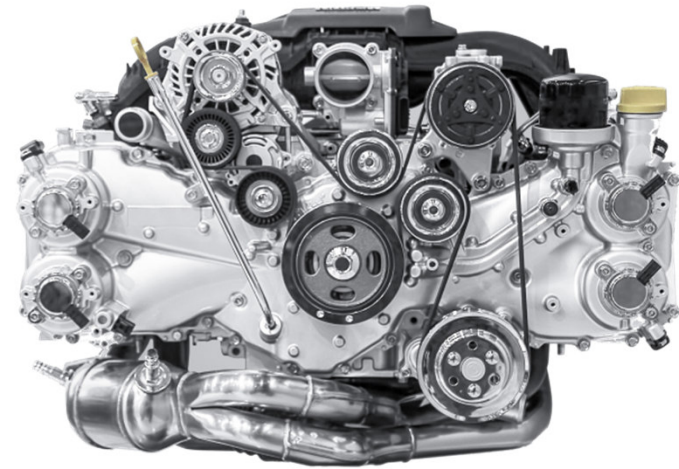
Premium with **BECHEM.**

More than 200 lubricant solutions for every vehicle class. From chassis, to brake systems, to the entire interior with electronics, mechatronics and seat, seatbelt, and locking systems.



Cool types.

A complete product line of high-performance cooling lubricants and forming products for the most demanding metal processing operations, from the processing of important engine components for sports cars to assemblies for the aerospace industry.



Potential.

Modern process fluids and special lubricants can make a major contribution to the sustainability and efficiency of products and processes.

Awarded lubricants.

Award-winning performance, energy-efficiency and sustainability of products and processes.



German Raw-Material Efficiency Prize

Awarded for Berufluid – a joint project with the Fraunhofer IVV and IWF Braunschweig institutes.



Johnson Controls

BECHEM was honored with the award for customized solutions in the premium vehicles sector.



NRWirtschaft im Wandel (The changing economy of North-Rhine Westphalia) competition

BECHEM is selected as one of the 20 most innovative companies in North Rhine-Westphalia.



Brose

BECHEM received the award for innovative lifetime lubrication of various vehicle components.



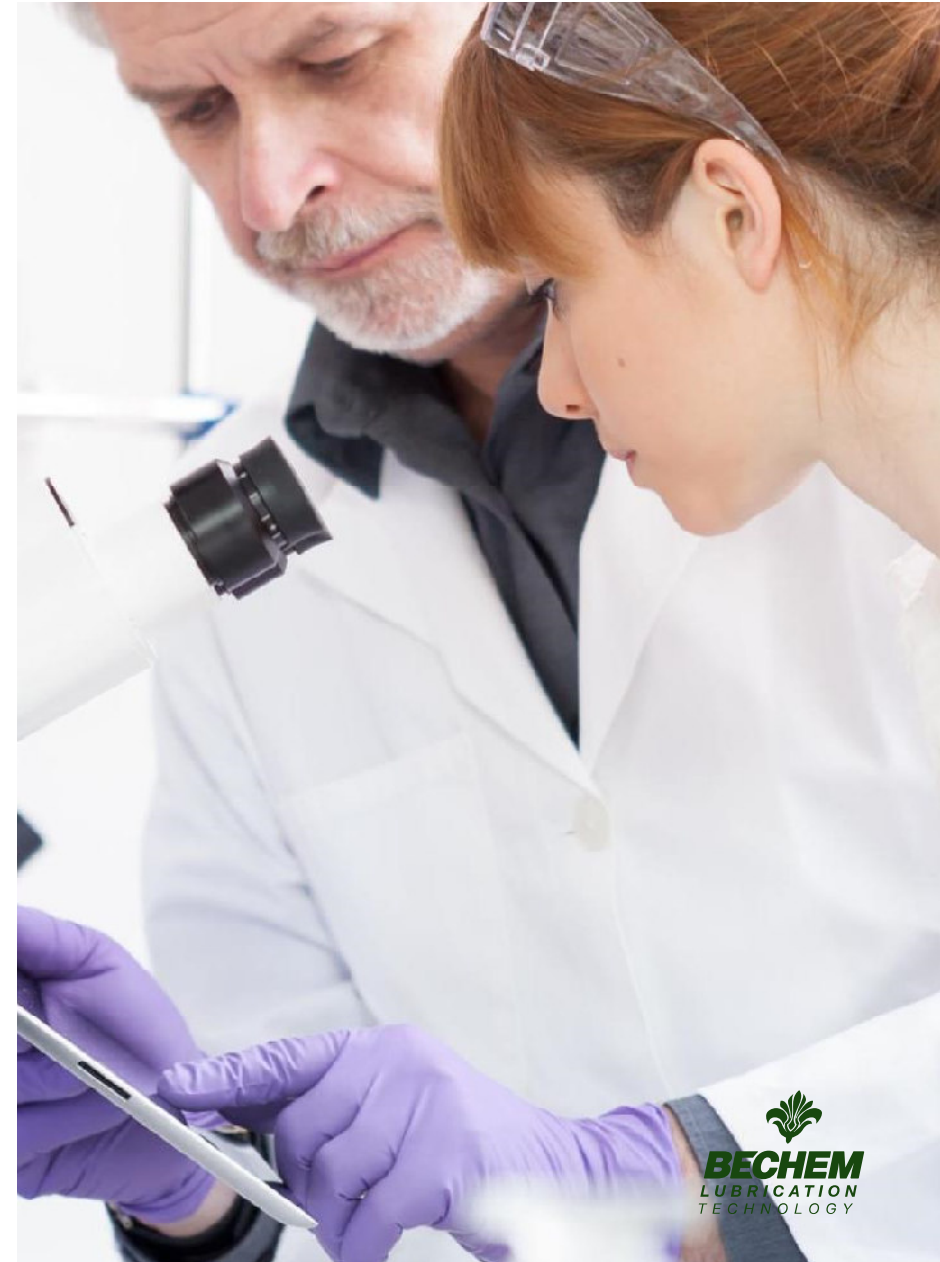
NRW efficiency prize

BECHEM won this award for an innovative and resource-saving coating in cold mass forming.

Development.

Development partner for industry.

- 100 engineers and scientists worldwide
 - More than 1200 R&D projects
 - Laboratories in Germany, India, and China
 - Large test facility for analytics, application tests, and R&D
-



Sustainability aspects on drawing media

Agenda

- 1) Carl Bechem GmbH – founded 1834
- 2) Sustainability at Bechem – a review**
- 3) What means sustainability at Bechem ?
- 4) Judging methods for the PCF on Lubricants
- 5) Exemplary assessment of some drawing media

Pioneering.

With water-based lubricant systems, phosphate-free coating systems, and microcapsule-based products, BECHEM is the innovator for future lubricant technologies.

Clean.

Emulsion technology for higher quality end products.

In the area of aluminum wire drawing BECHEM also enables use of emulsion technology for preliminary drawing. Higher quality end products and a cleaner work environment are convincing arguments for the product. BECHEM Unopol AL

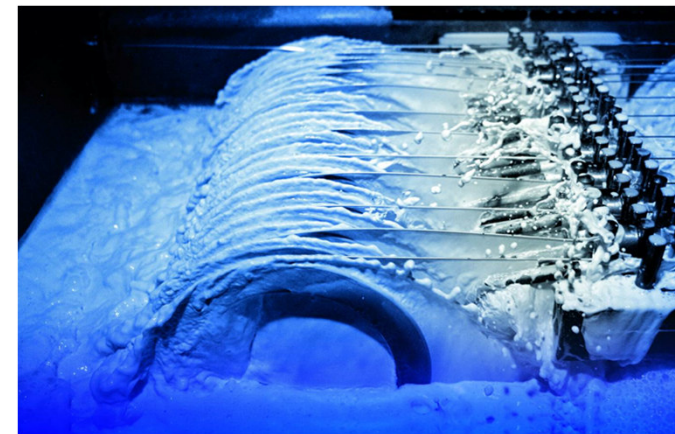
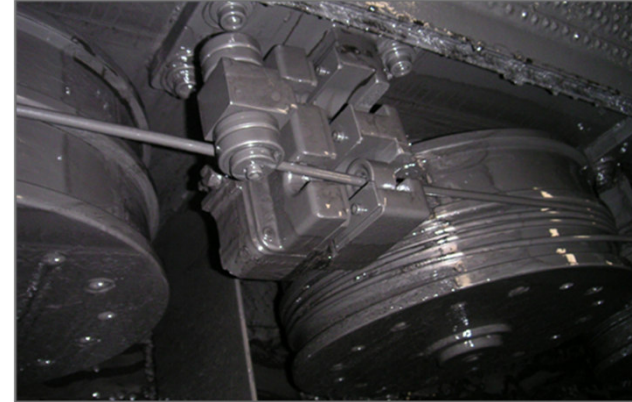


Way back – somewhere in 2005....

Aluminium Wire Drawing Lubricants - watermiscible

Advantages of the Unopol AL-range:

- perfect cooling
- higher productivity
- lower costs
- clean environment
- clean machine
- clean wire
- no risk of an explosion
- perfect filtration
- easy recycling of Aluminium dust
- and a lower carbon footprint of the blend in use.....



NF Wire Forum

Water replaces oil.

Viscous water replaces oil as lubricant.

With a water-based, mineral oil free cooling lubricant, BECHEM has produced a completely new, high-performance category of cooling lubricants. Berufluid



Customer demands in 2011:

Optimization (increase in efficiency) and cost reduction!



NF Wire Forum

Economy

- ▶ Increase in tool life
- ▶ Reduction of workpiece cleaning costs
- ▶ Reduction of indirect costs (fire protection measures)

Ecology

- ▶ Occupational health (prevention of oil mist)
- ▶ Occupational hygiene
- ▶ Free of mineral oils

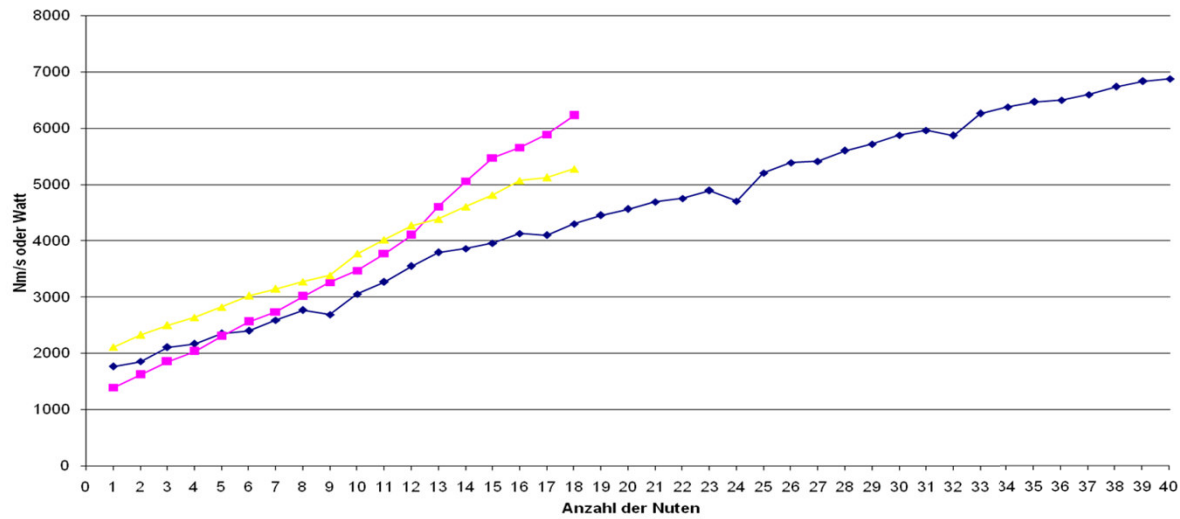
Technology

- ▶ Process stability
- ▶ Increase in productivity
- ▶ Peripheral equipment

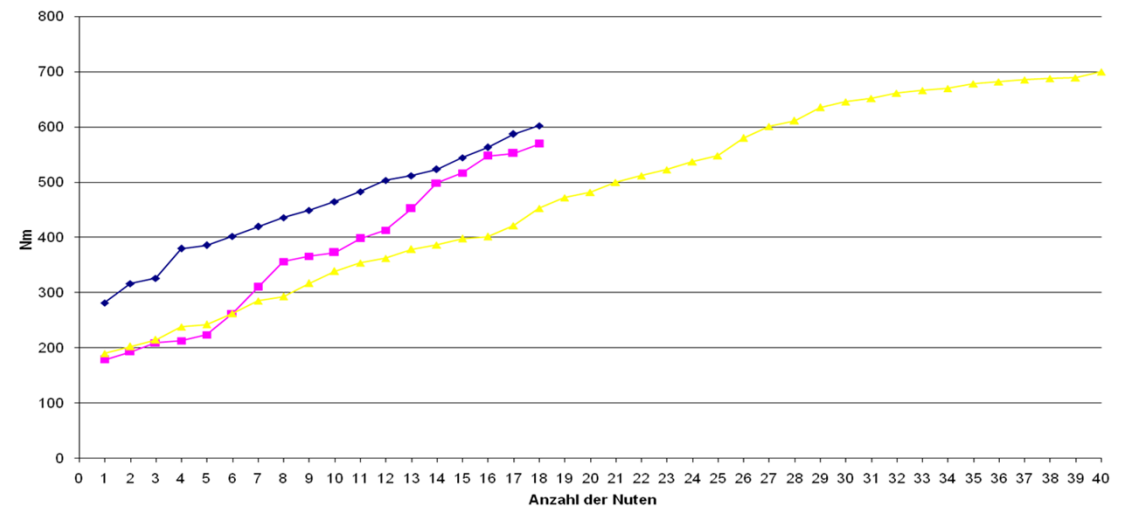


NF Wire Forum

Power consumption



Cutting force



In 2011 BERUFLUID was honored with the first
„German Resources Efficiency Award“.



NF Wire Forum



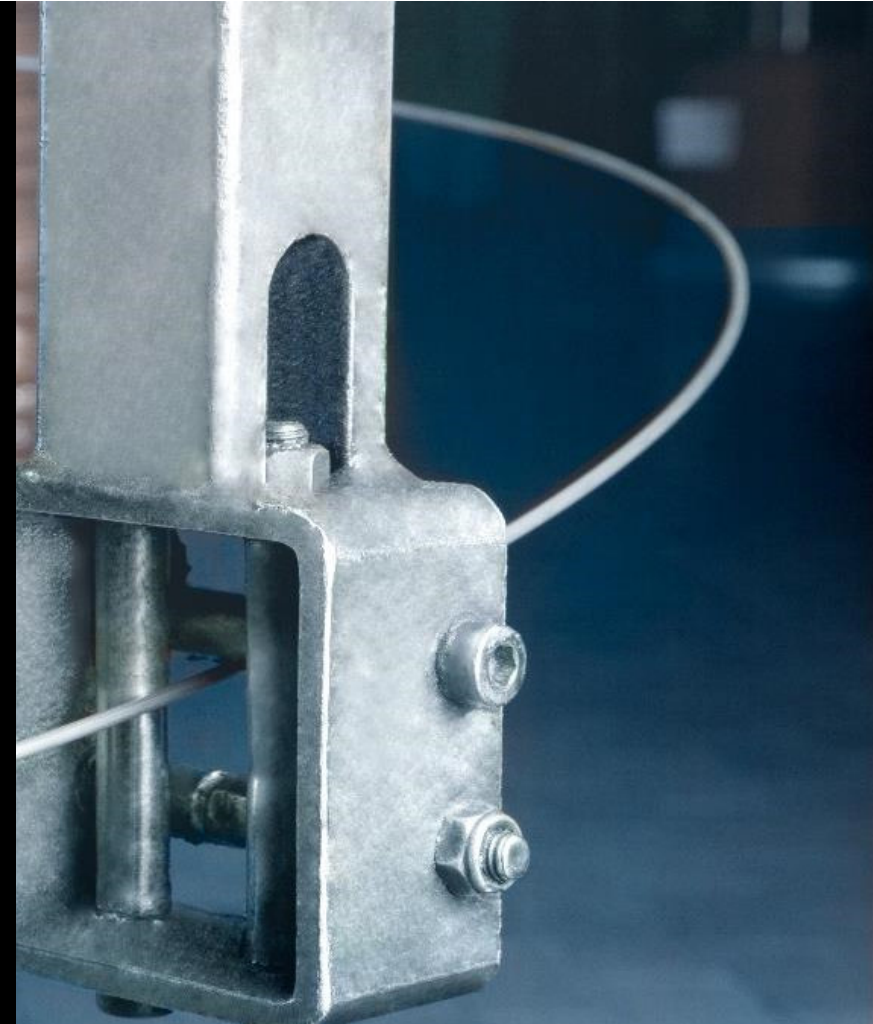
Bundesministerium
für Wirtschaft
und Technologie

Dr. Philipp Rösler (Bundesminister für Wirtschaft und Technologie), Prof. Dr. Horst-Christian Langowski (Fraunhofer-Institut IVV, Freising), apl. Prof. Dr.-Ing. Christoph Herrmann (TU Braunschweig), Dr. Heinz Dwuletzi (Carl Bechem GmbH), Prof. Dr. Hans-Joachim Kümpe (Bundesanstalt für Geowissenschaften und Rohstoffe)

Environmentally-friendly.

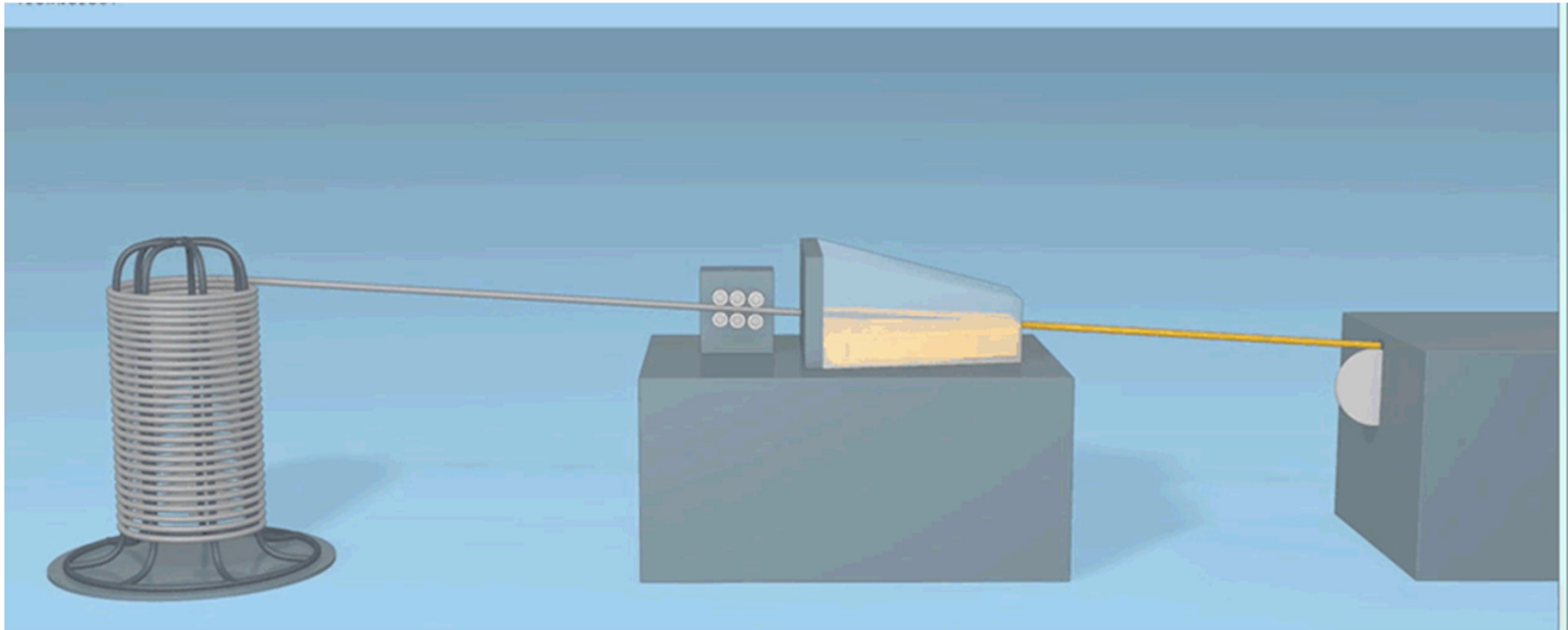
Environmentally-friendly and energy-efficient.

With a new coating medium BECHEM presents a genuine alternative to the phosphating of semi-finished metal products. Beruforge 150



2013 – The Beruforge 150 series of products

a new coating medium BECHEM a genuine alternative to the phosphating of semi-finished metal products.



.... and the story continues



NF Wire Forum

Der Deutsche Rohstoffeffizienz-Preis 2022



Bundesministerium
für Wirtschaft
und Klimaschutz

DEUTSCHER
ROHSTOFF
Effizienz
Preis

- Fachhochschule Südwestfalen gemeinsam mit einem Konsortium (Gesamtverband der Deutschen Buntmetallindustrie e.V., Möhling GmbH & Co. KG, Müller Engineering GmbH & Co. KG, Grillo-Werke AG, Metallpresswerk Hohenlimburg GmbH, Carl Bechem GmbH):
Energieeinsparung durch die Anwendung von Zinkknetlegierungen:
Untersuchungen zur Massivumformung und Entwicklung eines technologischen Leitfadens zur Verarbeitung dieser Werkstoffe

Sustainability aspects on drawing media

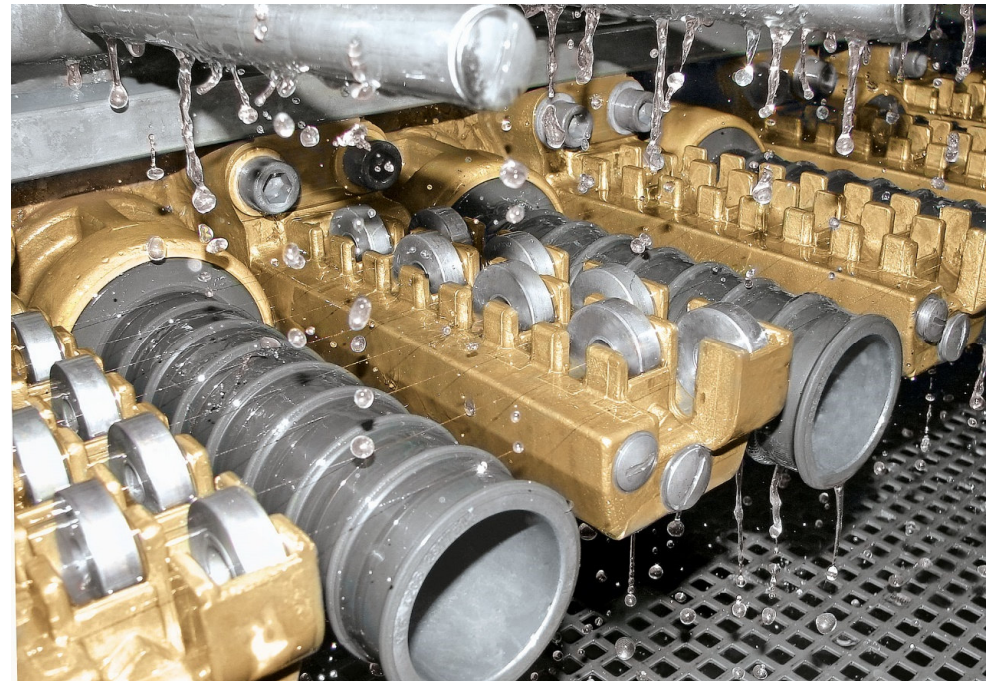
Agenda

- 1) Carl Bechem GmbH – founded 1834
- 2) Sustainability at Bechem – a review
- 3) What means sustainability at Bechem ?**
- 4) Judging methods for the PCF on Lubricants
- 5) Exemplary assessment of some drawing media

Sustainability aspects on drawing media

What means sustainability for lubricants?

- Usage of renewable raw materials
- Increasing of tool lifetime
- Reduction of power consumption
- User friendly
- Long lifespan of the lubricant – increasing working time



Sustainability aspects on drawing media

sustainability at Bechem



Sustainability aspects on drawing media

Sustainability at Bechem „3-Pillar-Model“



Energy saving

Resource conservation

Ökologie

Environmental protection

Responsible entrepreneurship

Increased efficiency/innovation

Wirtschaft

Health management

„just – fair – ethic“

Soziales

Sustainability aspects on drawing media

Sustainability at Bechem

Status Quo:

- The current focus is on fully determining the current state in order to then initiate optimizations.
- First steps:
 - Photovoltaic systems for production in Hagen and Gardelegen
 - Tree planting in Gardelegen
 - ISO 14001 (target 2023)



Sustainability aspects on drawing media

Sustainability at Bechem

Customer Responsibility:

- Focus on recycling containers:
 - Currently IBC, steel drums, plastic drums
 - New containers with an increased recycled content up to fully recycled material:
 - Pails
 - Hobbocks
 - In testing cardboard phobes

Gebinde	CO ₂ -Einsparung gesamt (kg)	CO ₂ -Einsparung pro Gebinde (kg)
IBC Lohnreinigung	303.360	82
IBC mit neuer Blase und Retourticket	39.585	8
Stahlspundfässer Reko	102.499	11
Stahldeckelfässer Reko	29.589	11

Sustainability aspects on drawing media

Sustainability at Bechem

Customer responsibility and energy consumption optimization:

- Creating redundancy when heating boilers with oil and gas
- Energy consumption optimization by modernizing the burners



Sustainability aspects on drawing media

Sustainability at Bechem



2021 first evaluation by Ecovadis

2022 Reaching Bronze Status

Target 2024 Reaching Silver with the 2023 Evaluation



Sustainability aspects on drawing media

Agenda

- 1) Carl Bechem GmbH – founded 1834
- 2) Sustainability at Bechem – a review
- 3) What means sustainability at Bechem ?
- 4) Judging methods for the PCF on Lubricants**
- 5) Exemplary assessment of some drawing media

Sustainability aspects on drawing media

Evaluation methods for the PCF

**calculation procedure
for the
Product Carbon
Footprint (PCF)**



Basis for our approach

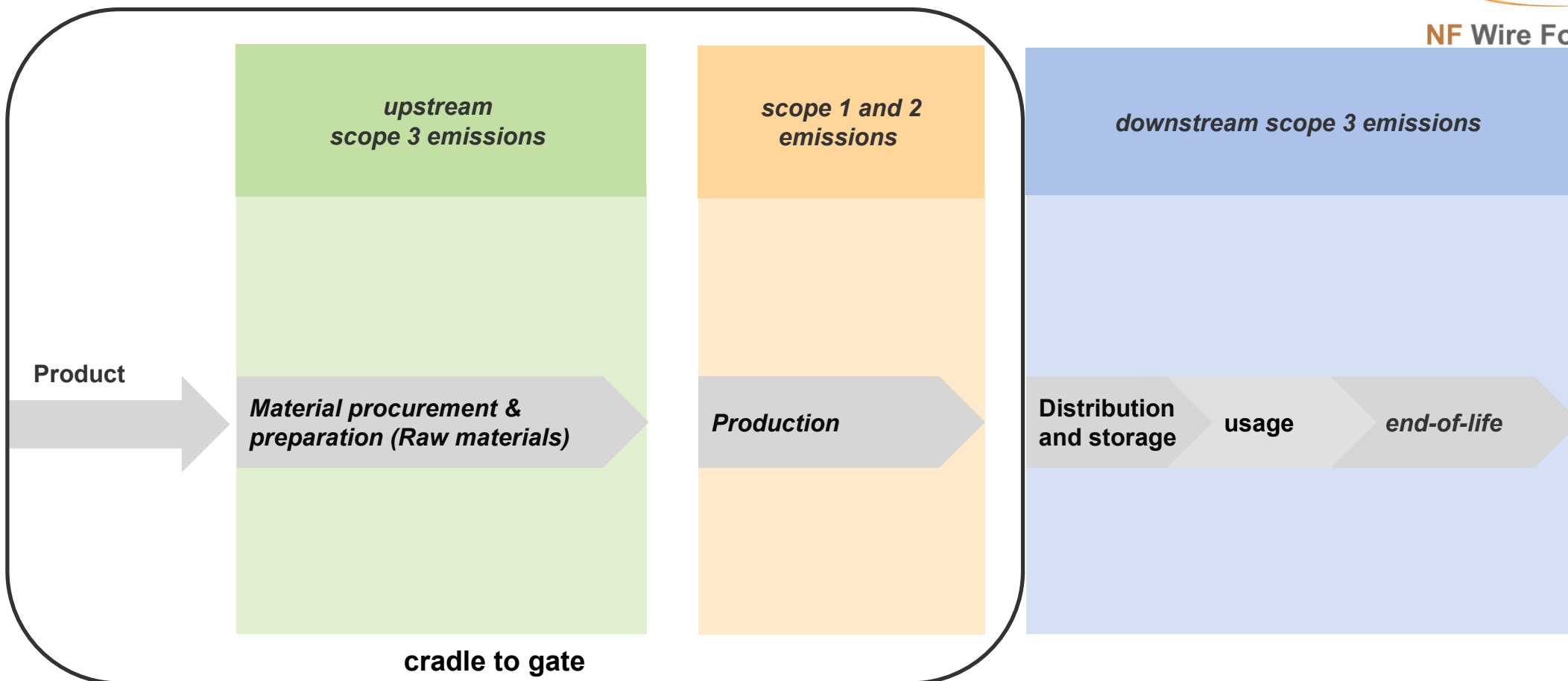


ISO 14067

Life cycle analysis

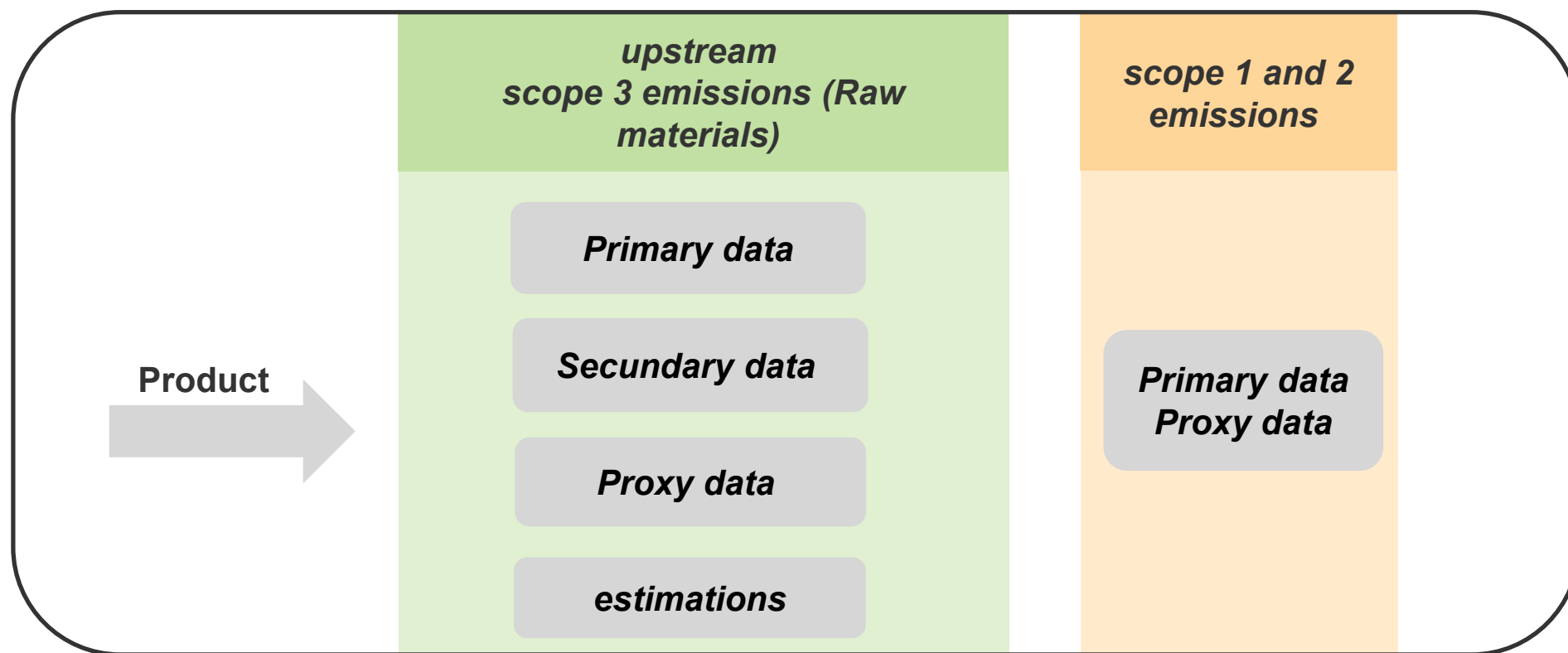


NF Wire Forum



Bechem LCA Prozedure

Cradle to Gate

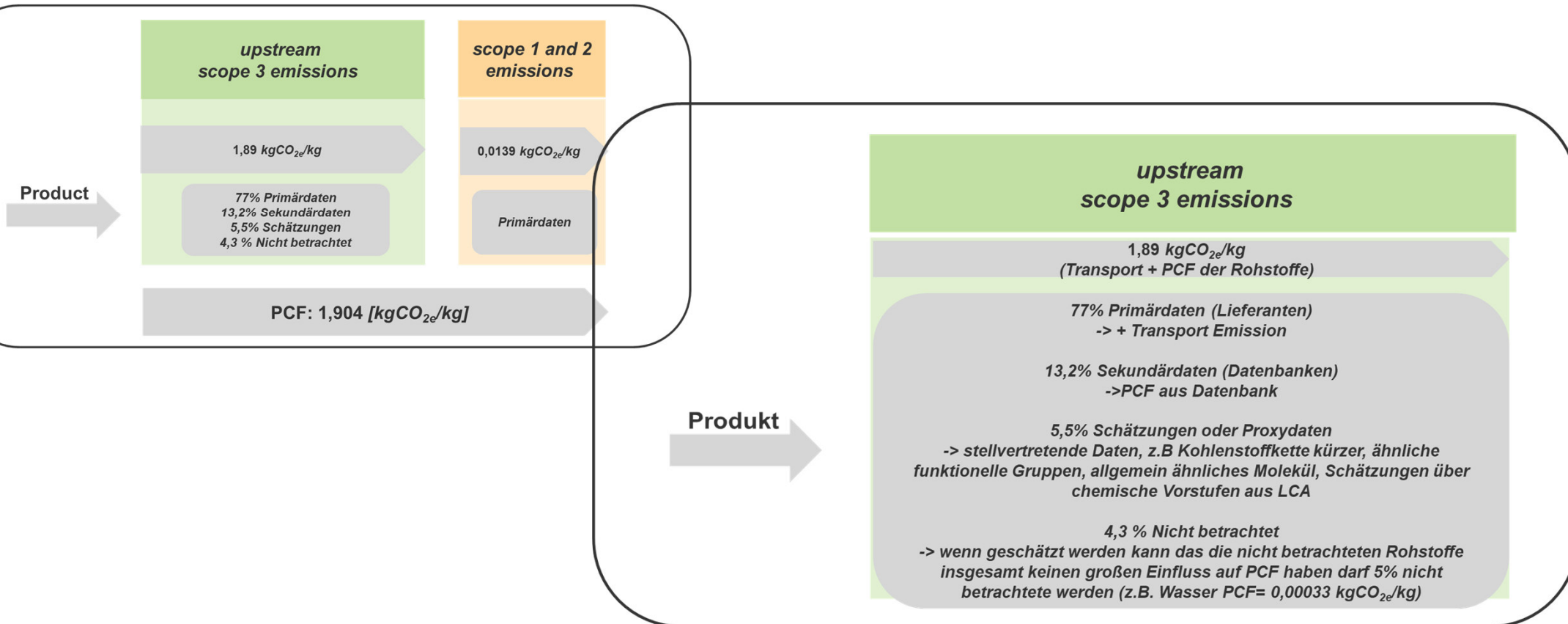


LCA Beispielprodukt

Cradle to Gate



NF Wire Forum



Sustainability aspects on drawing media

Agenda

- 1) Carl Bechem GmbH – founded 1834
- 2) Sustainability at Bechem – a review
- 3) What means sustainability at Bechem ?
- 4) Judging methods for the PCF on Lubricants
- 5) **Exemplary assessment of some drawing media**

Sustainability aspects on drawing media

Exemplary assessment of Bechem drawing agents

A first evaluation was done on two exemplary products

Unopol G 560

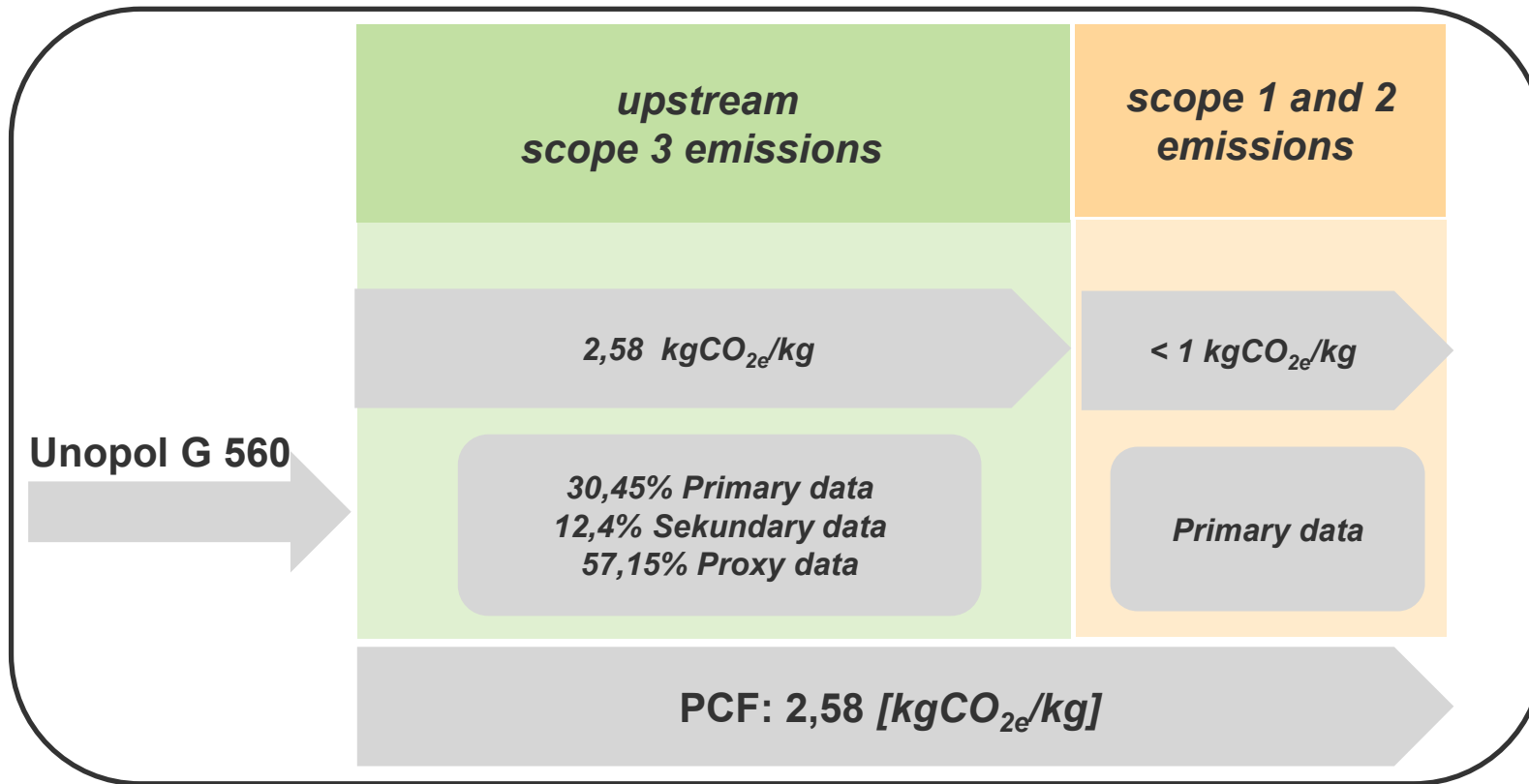
&

Unopol S 643



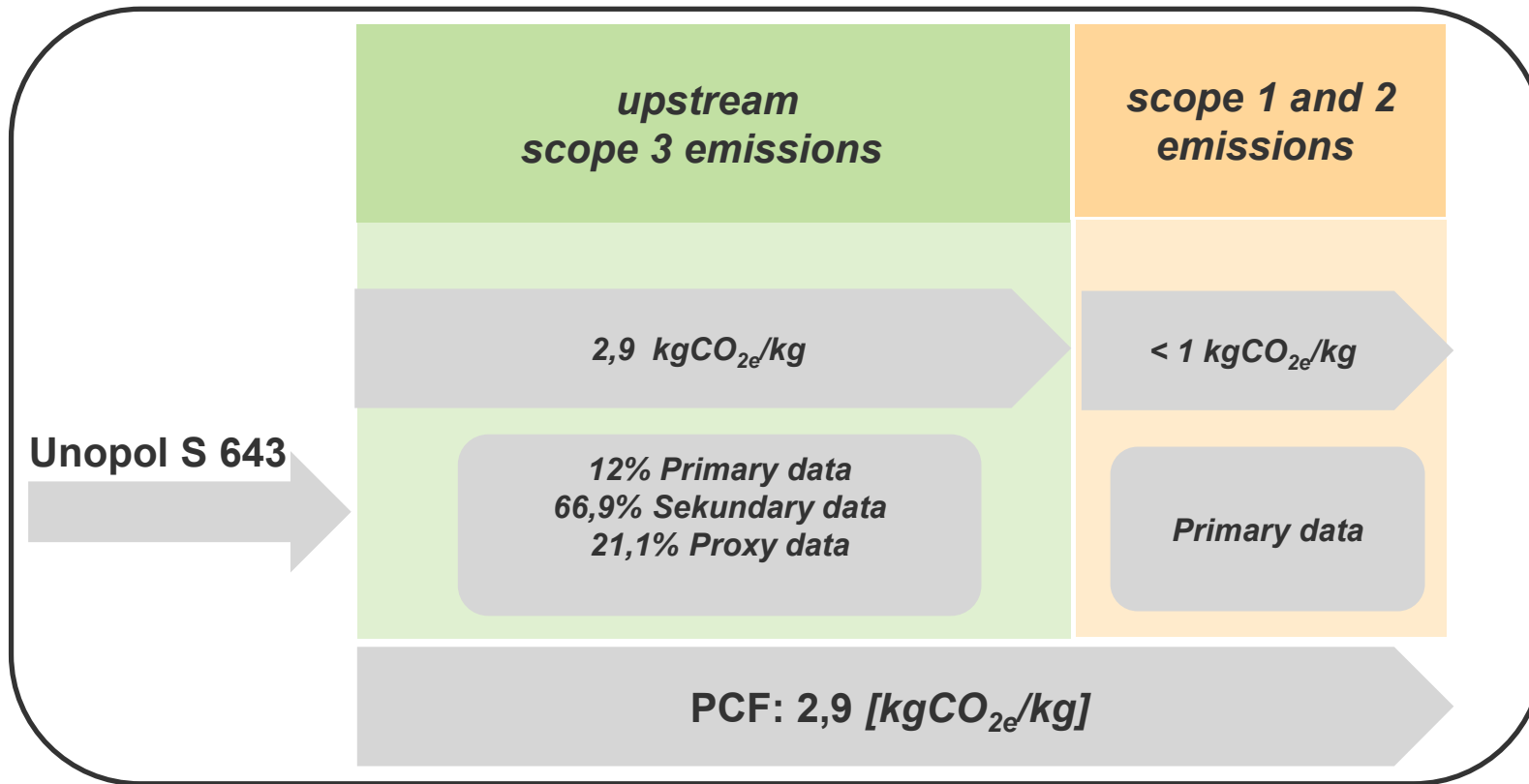
Sustainability aspects on drawing media

Exemplary assesment for Unopol G 560



Sustainability aspects on drawing media

Exemplary assesment for Unopol S 643



Sustainability aspects on drawing media

Exemplary assessment of Bechem drawing agents

Recap PCF Unopol G 560 and Unopol S 643

- Primary database is very thin
- Primary data from our suppliers are given with big uncertainty levels
- Sekundary data are partly available
- In many cases we have to rely on Proxy data
- Against all the uncertainties, we have started and are improving the data when ever we can!

Assessment of the data situation:

- G 560 has due to a high concentration of renewable raw materials a good

Further thoughts:

- Cradle to Grave LCA/PCF for S 643 is getting much better, as the top up levels are pretty small and by that the Lubricant amount per meter wire is reduced.
- The assessment becomes more reliable as the data situation for the primary data increases

Sustainability aspects on drawing media

Regardless of the PCF, the following points were not considered:

- lifespan of the product
- Top up amounts
- Needed lubricant per meter wire
- Disposal: vacuum evaporation vs. Conventional disposal

