WACKER

CREATING TOMORROW'S SOLUTIONS

VINNAPAS® eco

VINNAPAS®

Building a Sustainable Tomorrow with VINNAPAS® eco

April 2022, Qiyong Cui

Sustainability Momentum Accelerates

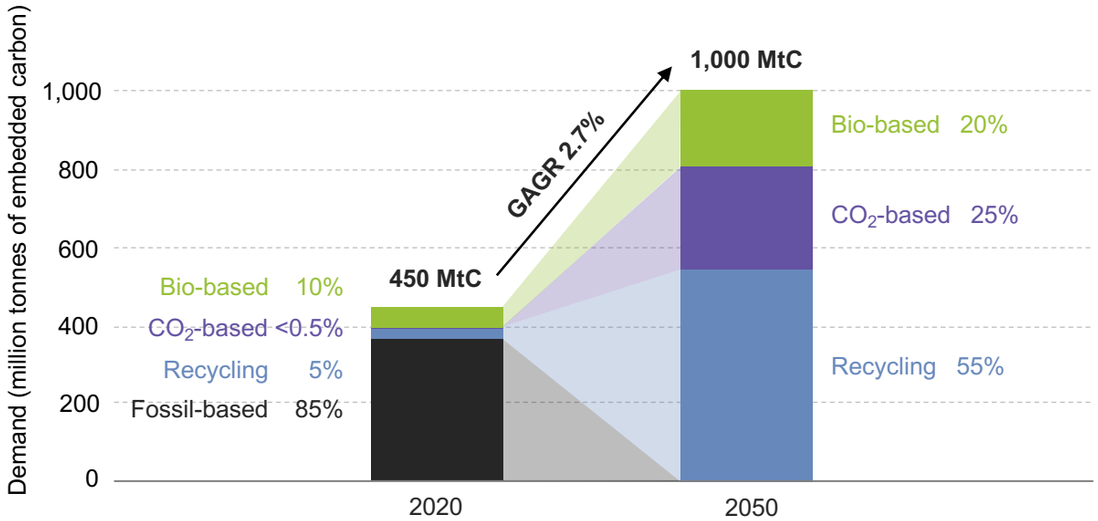
EU Regulatory Initiatives

- CO_2 tax ("*ETS Plus*"…)
- Biocide regulations
- Microplastic
- EU Directive
  Single-use-plastics / plastic-to-paper
- CLP and REACH review

European Green Deal

Market, Investors' and NGOs' Views

Global Carbon Demand for Chemicals and Derived Materials



Source: nova-Institute.eu, 2021

"**Decarbonizing** the world requires a **whole portfolio of mitigation; renewable resources** represent one of the solutions."

Source: CITI Financing a greener planet

"**Mass balance approach** to **accelerate** the **use** of **renewable feedstocks** in chemical processes"

Source: PositionPaper Plastics Europe

Climate Neutrality Is One of the Most Challenging Tasks in the Coming Decades

PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

The Paris Agreement's long-term temperature goal is to keep the rise in global average temperature to well below 2 °C above pre-industrial levels, and to pursue efforts to limit the increase to 1.5 °C, recognizing that this would substantially reduce the impacts of climate change.

ESG and climate funds fall short of Paris Agreement goals, report warns

71% of broad ESG funds studied scored negatively on Paris Alignment

DNV says electrification alone won't reach Paris Agreement climate targets

OSLO - A new forecast of the energy transition from DNV has warned that even if all electricity was 'green' from this day forward, the world will still fall a long way short of achieving the 2050 net zero emissions ambitions of the COP21 Paris Agreement.

India among a few G20 nations on track to meet Paris Agreement goals

Paris Agreement goals won't be met without Chinese emissions curbs - Lord Duncan

House of Lords deputy speaker claims geopolitics is getting in the way of environmental action

Source: Mint, Aug. 2021; ETF Stream, Sep. 2021; insider-co-uk, Sept. 2021; World Oil, Sep. 20221

Because We Care

*“Sustainability in all its facets is a matter really close to my heart.
Protecting the climate and reducing global warming are vital for the future of humankind and, at the same time, a mammoth task. If possible, we want to achieve our sustainability goals even faster than originally planned.”*

Dr. Christian Hartel
CEO WACKER

WACKER SustainaBalance®
Two Main Perspectives along Our Value Chain

Enable customers to establish future technologies

- Enabling Products
- Supporting Products

Improve our own products and processes

- Renewable raw materials
- Efficient resources use
- Waste Reduction
- Safe ingredients

Value UP

Footprint DOWN

Collaboration BEYOND

Clear Pathway to Net Zero While Capitalizing on Growth Opportunities

New and More Ambitious Targets for 2030

- **100%** products meet sustainability criteria
- **50%** reduction in absolute GHG[1] emissions (vs. 2020)
- **15%** reduction in specific water withdrawal (vs. 2020)
- **0** accidents[2]
- **100%** key suppliers meet sustainability standards[3]
- **25%** reduction in absolute upstream GHG emissions[4] (vs. 2020)
- **Extend** world-class "Verbund" sites and circular economy

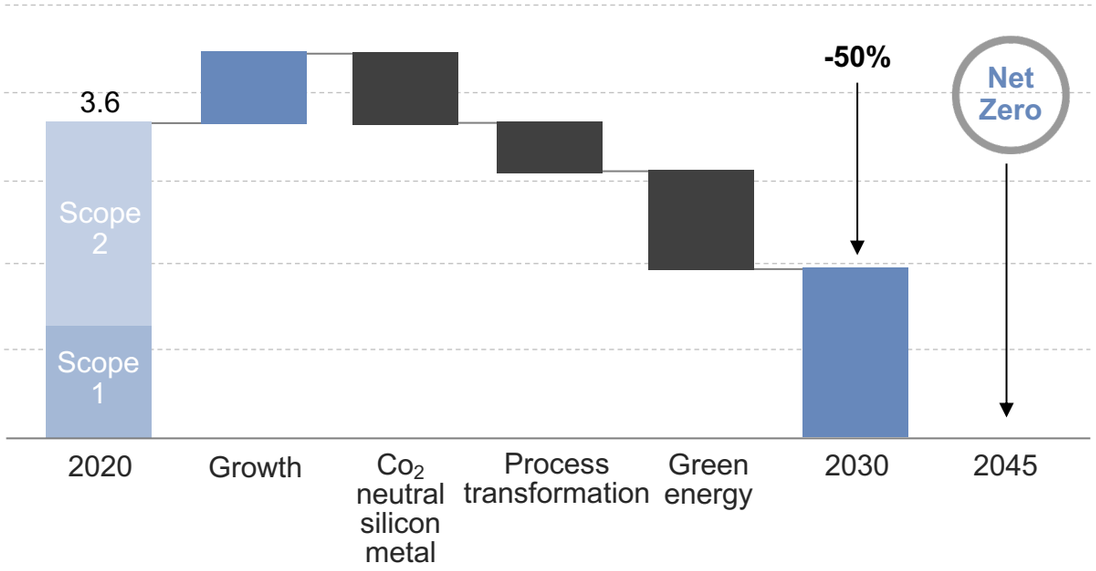
Value UP

Footprint DOWN

Colaboration BEYOND

Aim to Reach Carbon Neutrality in 2045

Growing with Lower Absolute Emissions (m t CO_2e)



SCIENCE BASED TARGETS

RACE TO ZERO

Clear commitment to 1.5°C Paris Agreement → Net Zero

[1] according to Scope 1 and 2 GHG emissions; [2] according to WACKER Process Safety Incidents; [3] covering 90% of total procurement spend; [4] according to Scope 3 GHG emissions from purchased good and services (cat. 1) and fuel and energy related activities (cat. 3)

WACKER Products and Technologies Enable Customers to Reduce CO_2 and Save Resources

Primary sources CO_2	% of global emissions[1]
Buildings	18%
Transport	16%
Energy	24%
Industry	5%
Agriculture	18%

WACKER products for CO_2 abatement technologies

Enabling Products

Products that enable new technologies

Supporting Products

Products that support new technologies and make them even better

1) Source: https://ourworldindata.org/emissions-by-sector

We Enable You to Abate Your Product Carbon Footprint

100% of the fossil-based raw materials required for manufacturing VINNAPAS® eco were replaced by certified sustainable biomass.

REDcert² certification scheme audited by TÜV Nord.

VINNAPAS®

VINNAPAS® eco
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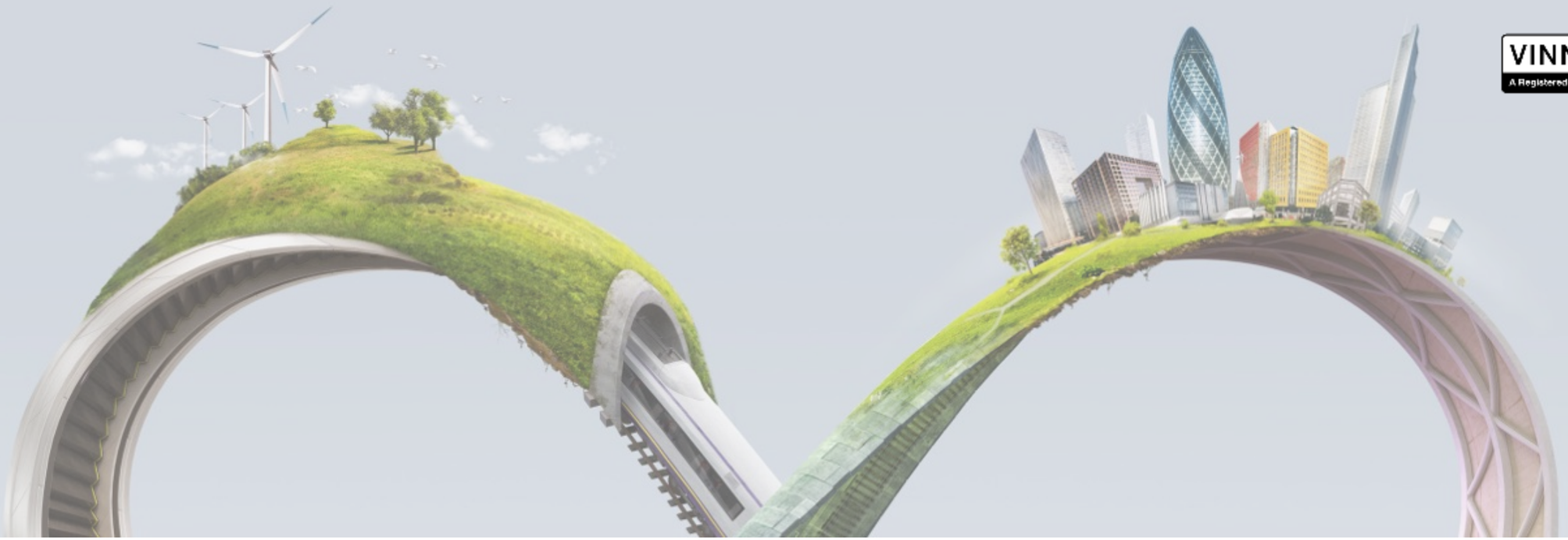
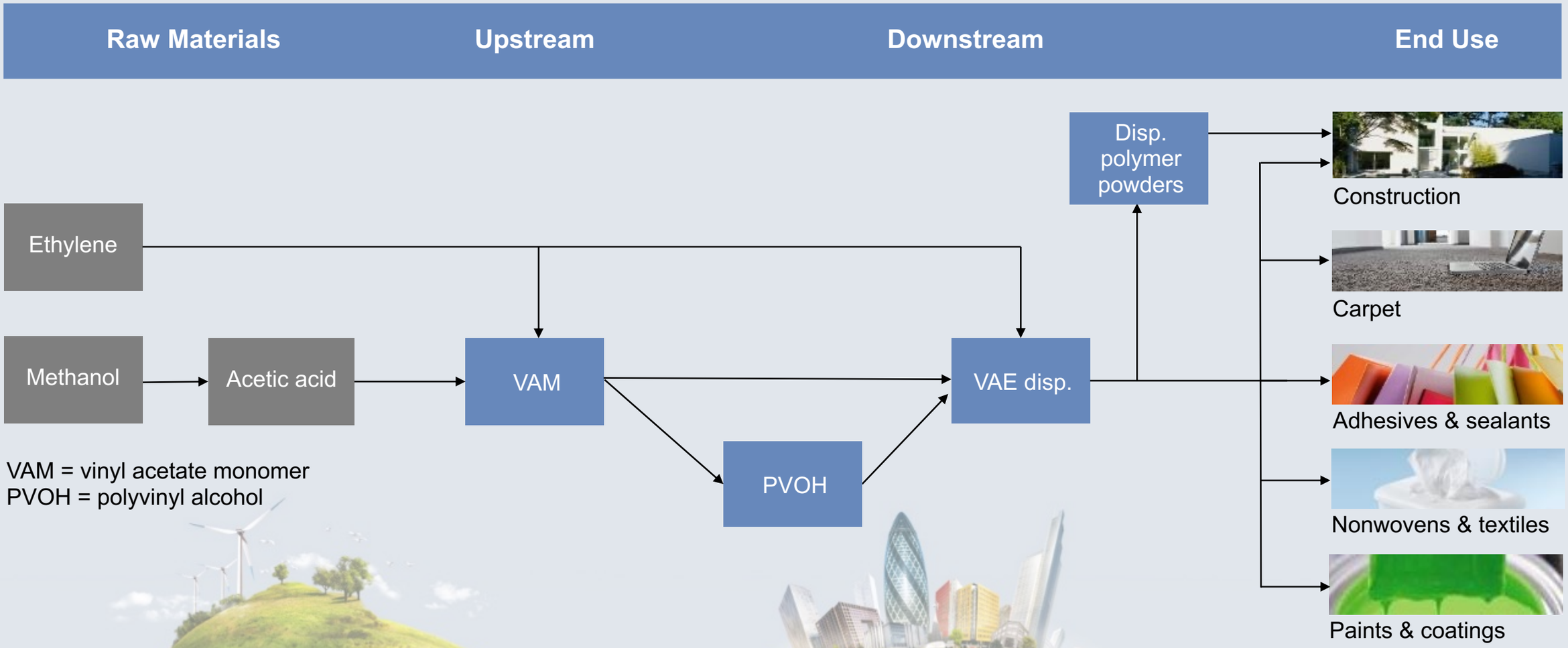


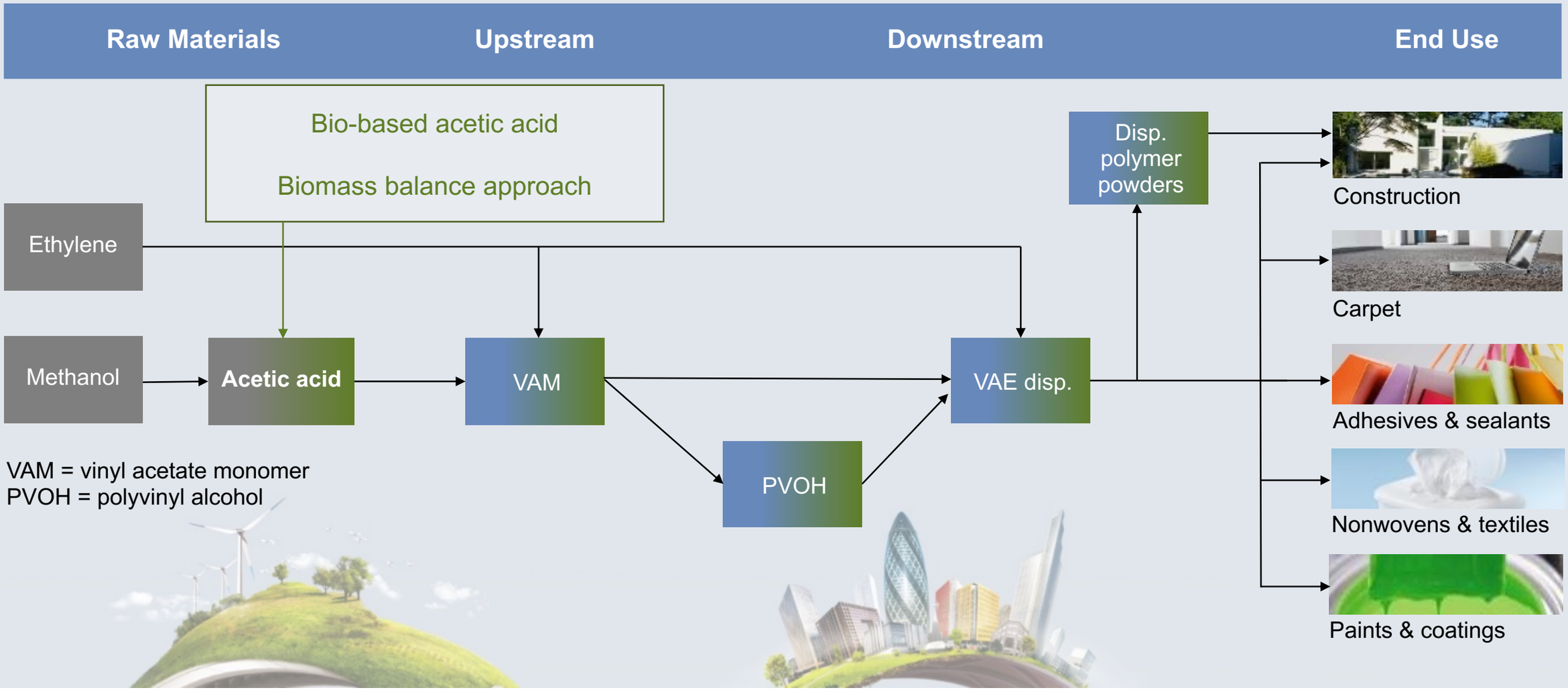
VAE Dispersion and Dispersible Polymer Powders Production Value Chain



VAM = vinyl acetate monomer
PVOH = polyvinyl alcohol

It Is Possible to Introduce New Raw Materials from Renewable Feedstock in VAE Production

Value UP



VAM = vinyl acetate monomer
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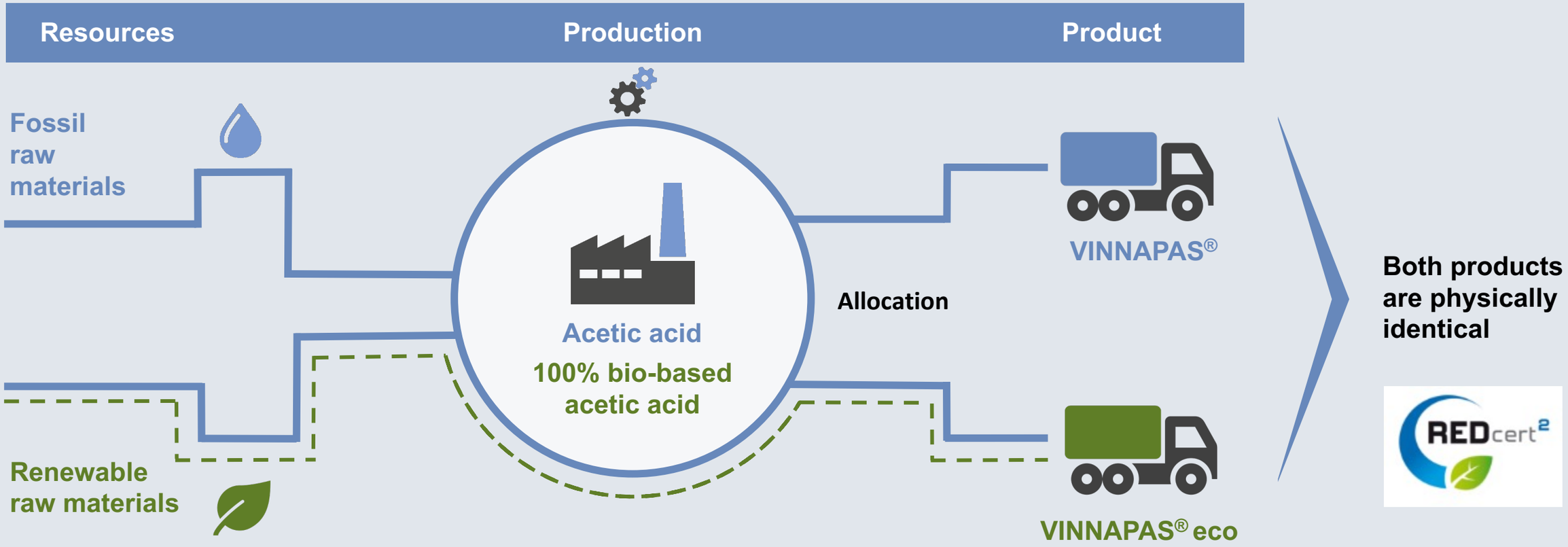
The Biomass Balance Method for VAE-Based Polymer Binders

Value UP



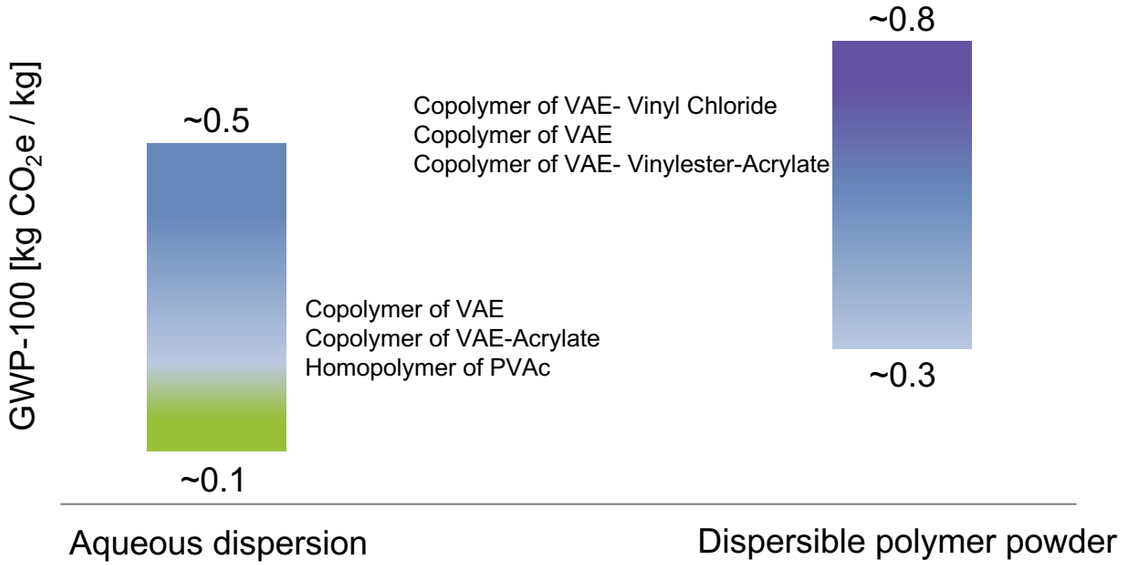
Bio-based acetic acid is fed into the VAE supply chain and then assigned to specific products
100% replacement of fossil materials is possible through compensation with bio-based acetic acid

The Carbon Footprint of VINNAPAS® eco Products Is Significantly Lower

Footprint Down

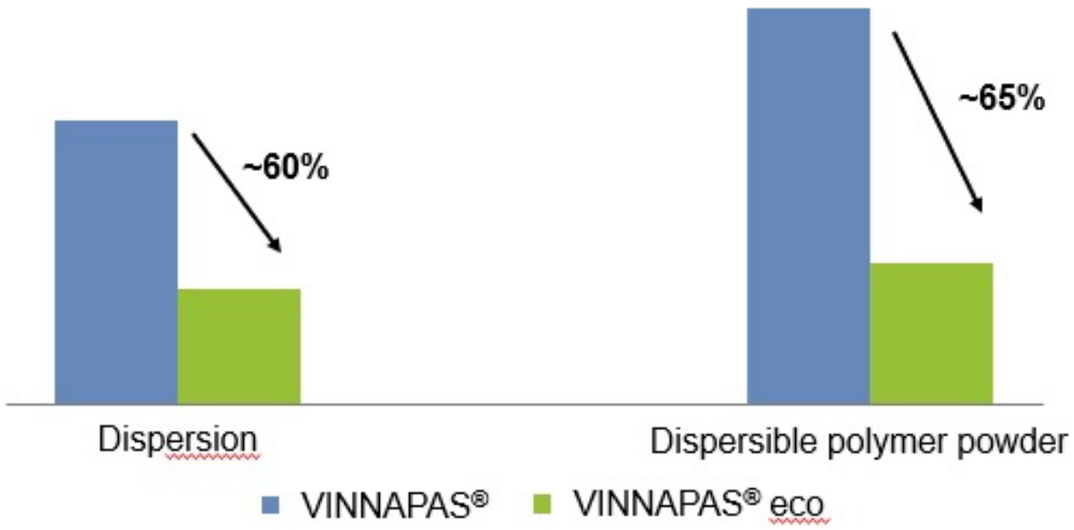
Ranges for VINNAPAS® eco Dispersions and Dispersible Polymer Powders

Global Warming Potential WACKER Polymer Binder



Comparison between VINNAPAS® eco VAE and Standard VINNAPAS® VAE

Relative CO_2 Reduction (Based on Cradle-to-Gate, incl. Compensation)



Carbon footprint calculation is compliant with ISO 14040/44 standard

* Biomass balance approach applied for replacing 100% of fossil materials with renewables

VINNAPAS® eco Helps Customers Introduce More Eco-Friendly Solutions

Contribution to Sustainability

- Reduced dependence on fossil resources and lower CO_2 footprint
- 100% certified bio-based acetic acid
- Biomass balance approach certified and audited by third party

Production and Storage Efficiency

- Existing large-scale or integrated plants can be used
- Separation only on paper, no extra storage capacity for the raw material necessary

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Cost Efficiency

- No investment needed in new plant or in R&D
- No additional operating costs

Performance

- Product performance remains the same: “drop-in solution”
- Producers can use supplier’s certificate as proof for their own certification

VINNAPAS® eco Can Be Applied to All VINNAPAS® VAE or PVAc Grades

Construction

VINNAPAS® eco 4023 N

VINNAPAS® eco 5010 N

…

Engineering Fabrics

VINNAPAS® eco EN 1024

VINNAPAS® eco EN 1092

...

Adhesives

VINNAPAS® eco EP 400

VINNAPAS® eco DPN 15

…

Carpet

VINNAPAS® eco CA 55

VINNAPAS® eco CA 5680

…

Coatings

VINNAPAS® eco EP 3360

VINNAPAS® eco EP 3777

…

Thank You for Your Attention

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