

OK renewable carbon

Philippe Dewolfs | TÜV AUSTRIA | Sustainable Industry Week | 13 & 14 Nov 2024 | Cologne

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1

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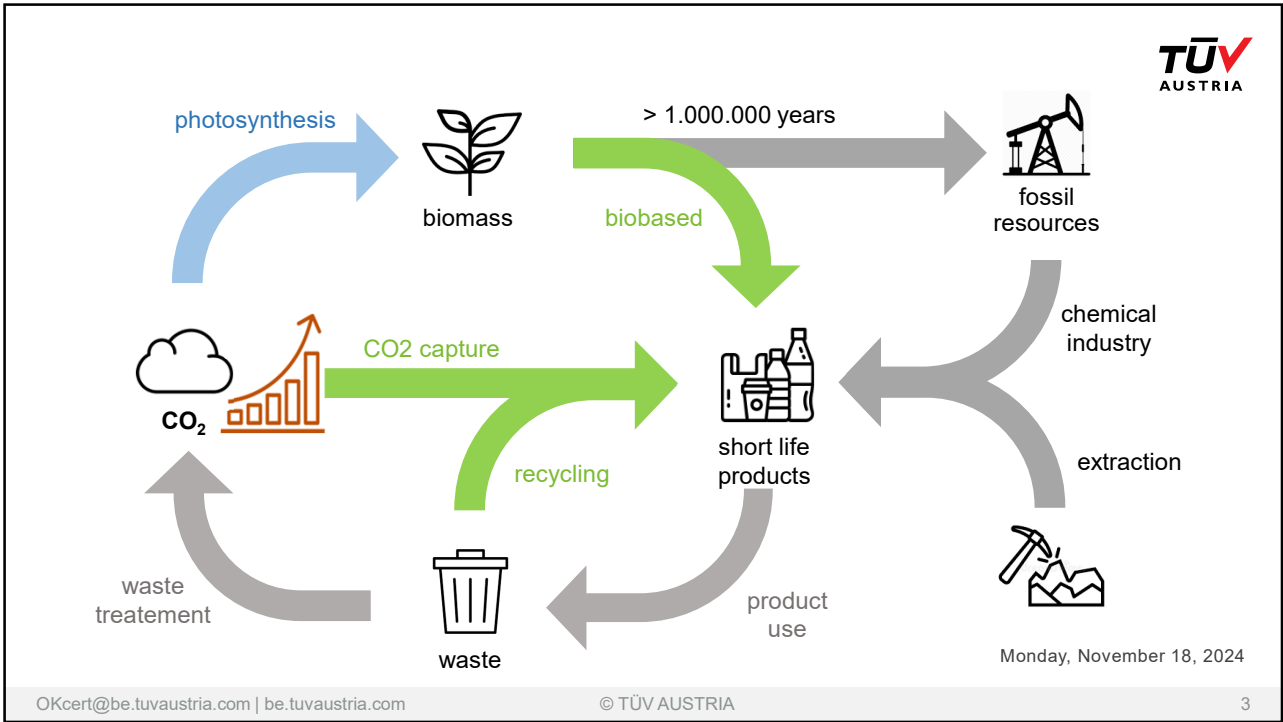
+ 340 Mio €

+ 3.400 employees

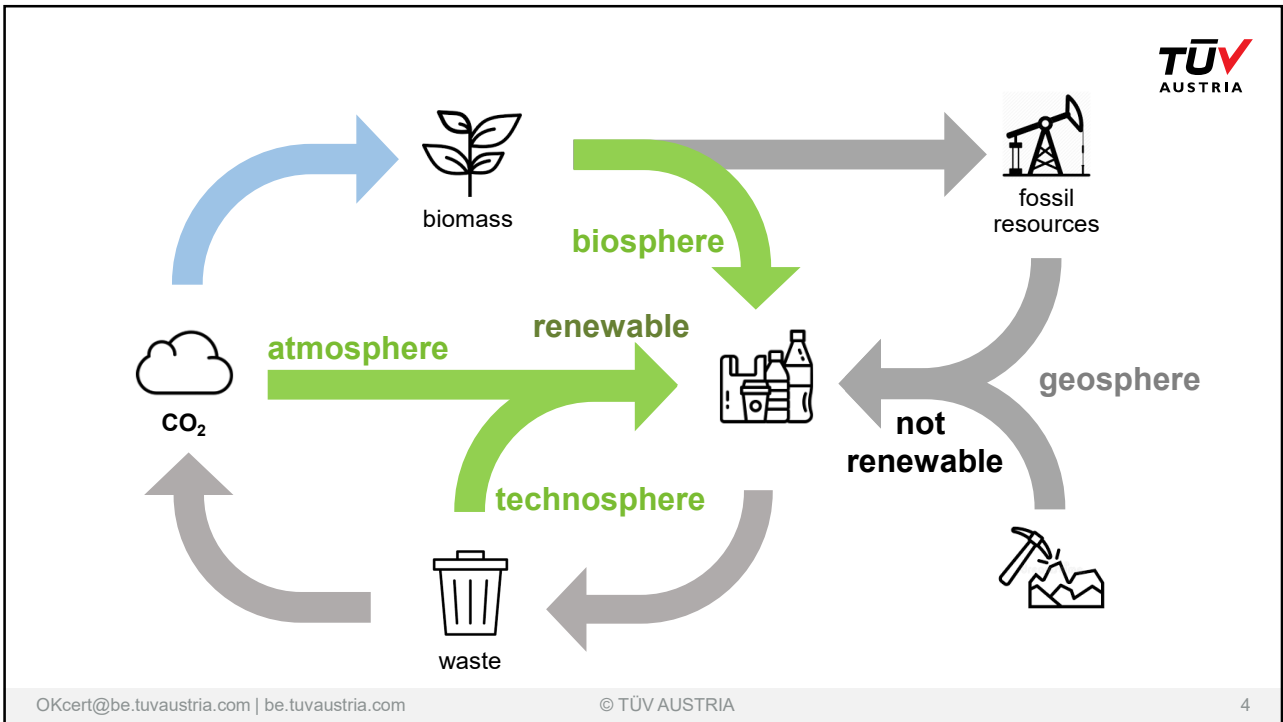
+ 30 countries

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2



3



4

Renewable Carbon Initiative (RCI) - 2020



Renewable carbon entails all carbon sources that **avoid or substitute the use of any additional fossil carbon** from the **geosphere**.



- Renewable carbon**
- can come from the **biosphere, atmosphere** or **technosphere** but not from the **geosphere**.
 - circulates between biosphere, atmosphere or technosphere, creating a **carbon circular economy**.



carbon from biomass



captured carbon



recycled carbon

Renewable Carbon Initiative (RCI) - 2020



MEMBERS OF THE INITIATIVE

LARGE SUPPLIERS



SME



BRANDS



START-UPS



RESEARCH INSTITUTES



PARTNERS OF THE INITIATIVE



How to claim when mixing several sources ?



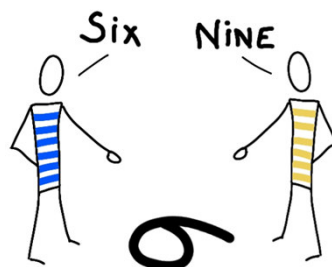
Why 90% ?

- uncertified component ?
- component << 100% ?
- other reason ?
- how to calculate ?

Determination of the **renewable carbon share** of the **product**

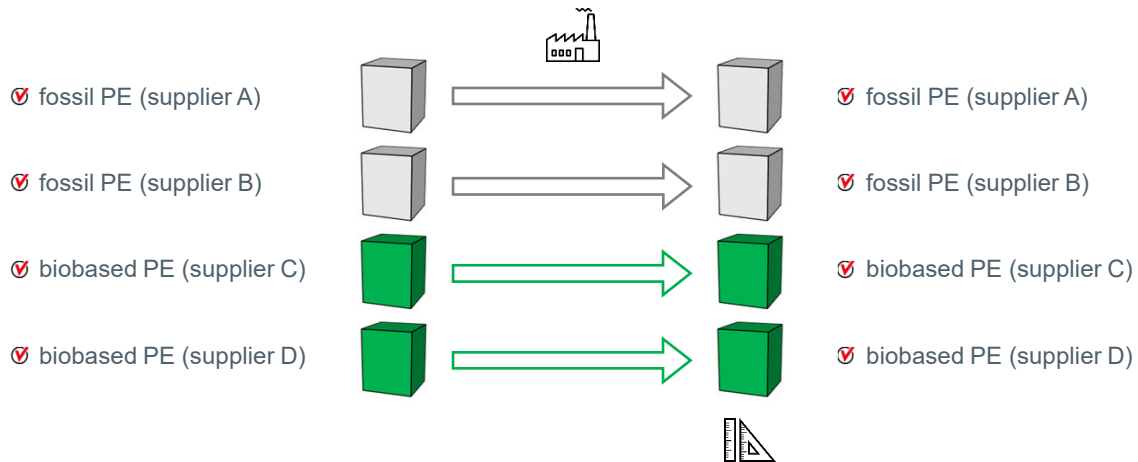
7

Chain of custody (CoC) - Terminology & models ISO 22095



8

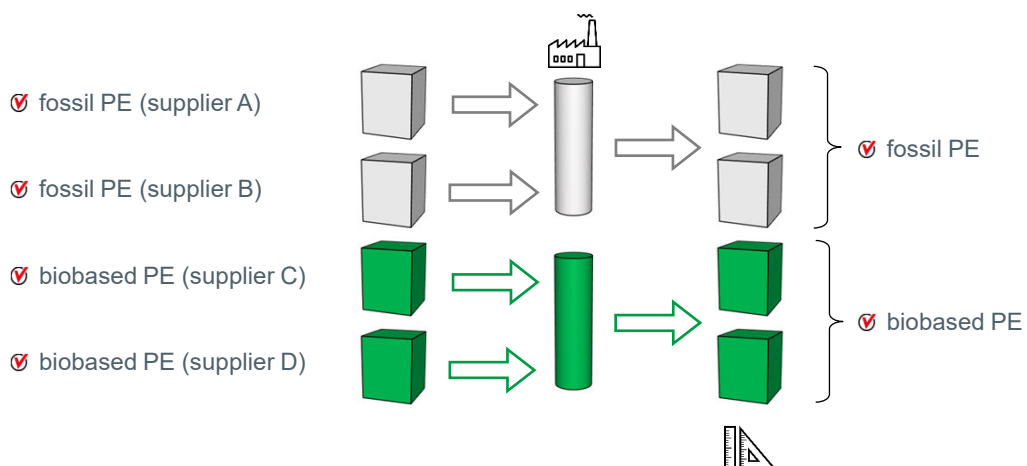
CoC - Without mixing - Identity preserved model



- ✓ The specified characteristics are clearly identifiable as originating from a **single source**.
- ✓ Each output contains a verifiable amount

9

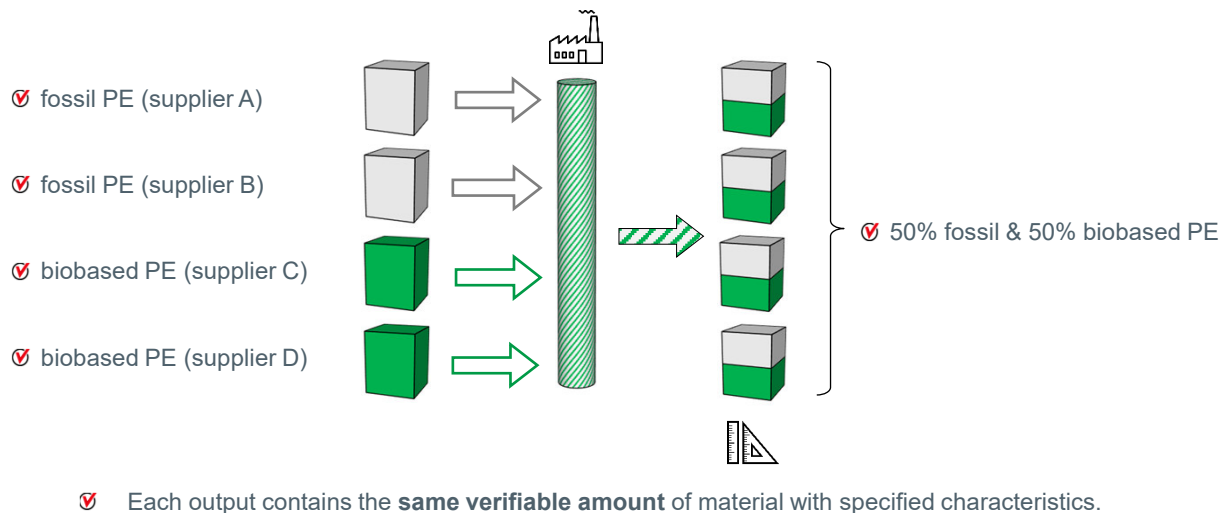
CoC - Without mixing - Segregated model



- ✓ The outputs can contain inputs from **different sources** with identical specified characteristics
- ✓ Each output contains a verifiable amount.

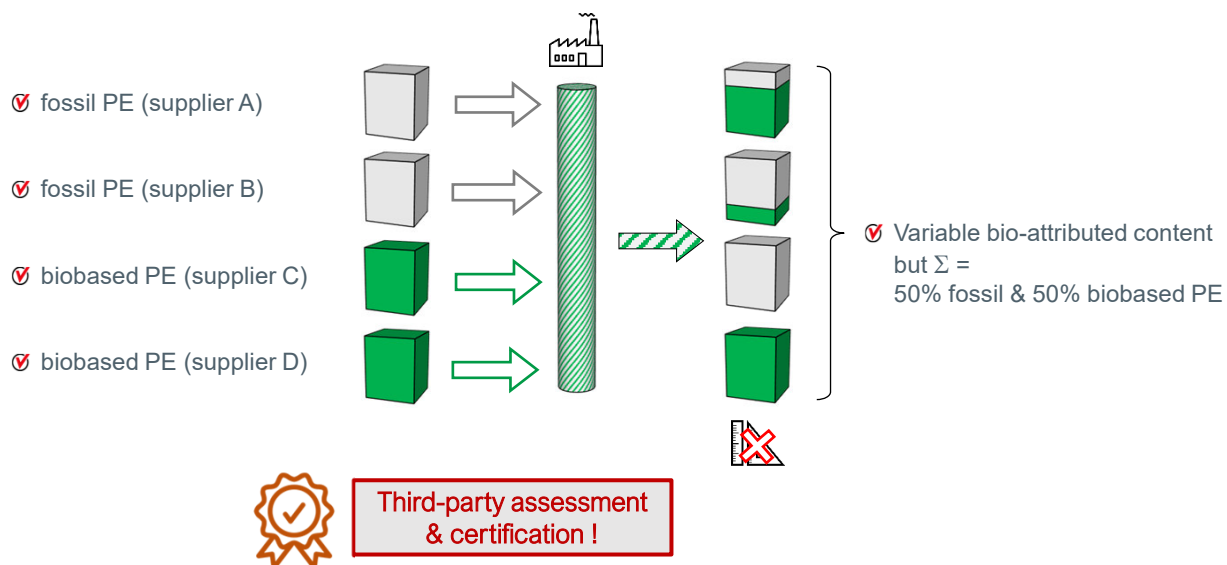
10

CoC - With mixing - Controlled blending model



11

CoC - With mixing – Mass balance model



12

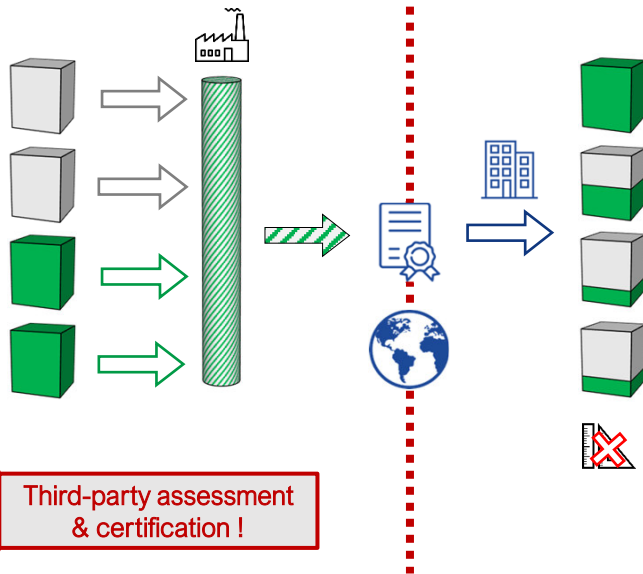
CoC – Book and claim model

✓ fossil PE (supplier A)

✓ fossil PE (supplier B)

✓ biobased PE (supplier C)

✓ biobased PE (supplier D)



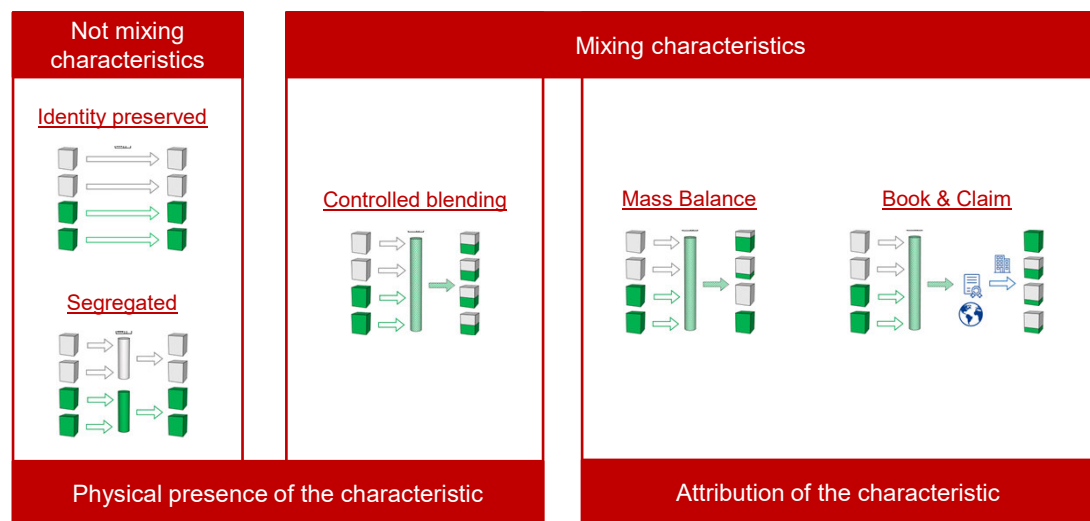
✓ Decoupling material and characteristics



Third-party assessment & certification !

13

Chain of custody – 5 models



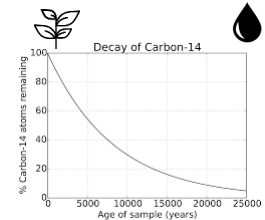
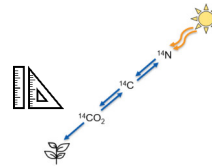
14

“-based “ vs “ –attributed “



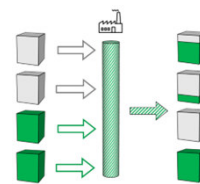
-based

Measurement :
quantification of attributes of an object, which can be used to compare with other objects.



-attributed

Mass balance with free attribution :
chain of custody accounting methodology controlled by a **third-party certifier** which makes it possible to attribute the mass of raw materials with a specific characteristic (biobased, recycled) to one or more products.



Definitions

Renewable carbon

Renewable carbon entails all carbon sources that avoid or substitute the use of any additional fossil carbon from the geosphere. Renewable carbon can come from the

- biosphere
- atmosphere
- technosphere

but not from the geosphere.

Renewable carbon

- is carbon from above the ground in contrast to carbon from below the ground (oil, natural gas, coal).
- circulates between biosphere, atmosphere or technosphere, creating a carbon circular economy.

Underlying schemes

RecyClass



biobased %

9 underlying schemes

17

RCS formula

share in
composition (%)

% of certified
renewable carbon

$$\begin{aligned}
 \text{RCS} &= \text{SIC}_{\text{BB}} * \text{BB} \\
 &+ \text{SIC}_{\text{BA}} * \text{BA} \\
 &+ \text{SIC}_{\text{BCB}} * \text{BCB} \\
 &+ \text{SIC}_{\text{FCB}} * \text{FCB} \\
 &+ \text{SIC}_{\text{CA}} * \text{CA} \\
 &+ \text{SIC}_{\text{RB}} * \text{RB} \\
 &+ \text{SIC}_{\text{RA}} * \text{RA} \\
 &+ \text{SIC}_{\text{NR}} * 0 \\
 &+ \text{SIC}_{\text{NC}} * 0
 \end{aligned}$$

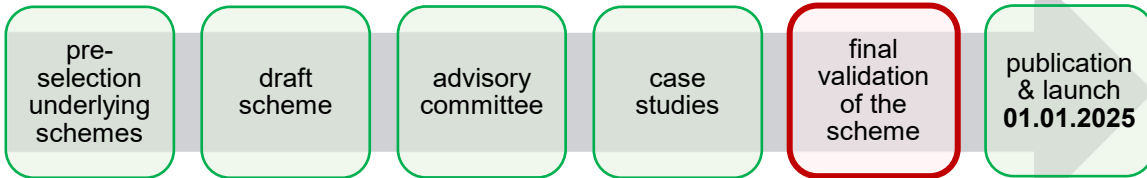
- bio-based
- bio-attributed
- bio-CO2-based
- captured fossil-carbon-based
- CO2-attributed
- recycling-based
- recycling-attributed
- not renewable
- not certified

Where $\sum \text{SIC}_{xx} = 100\%$

This method considers solely the renewable carbon share, regardless of the type of material, its origin (biomass, CCU or recycling) or the assessment methods, and does not give any judgement about the other sustainability aspects such as energy use, end-of-life treatment, water use, hazardous substances content, or any other green claims

18

Timeline



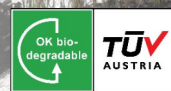
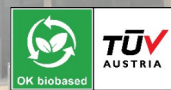
thank you

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NEW ADDRESS

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biobased %