European Commission

Discussion on the CFF

Part 2 – How to deal with specific modelling aspects

TAB meeting – 25th of June 2025

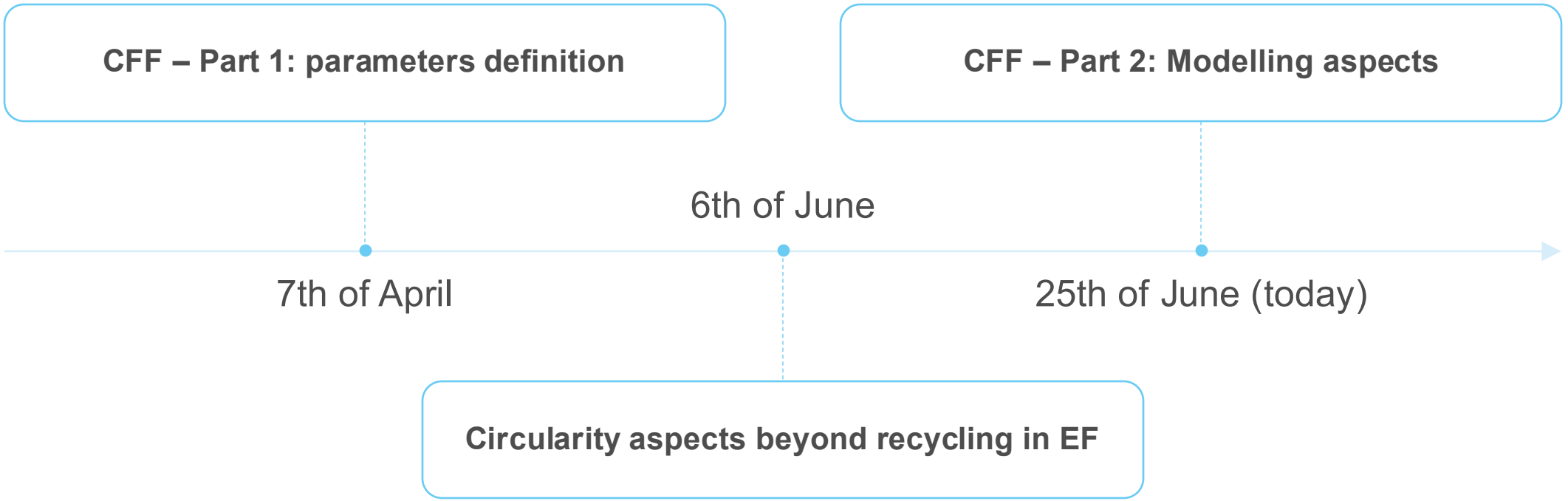
Joint Research Centre

Today topics

- TAB meeting – CFF part 2: review **of specific modelling aspects** (based on the agreed interpretation of the formula)

- A JRC Report – divided in two parts – is going to be developed:
  - Part 1 – Definition of the formula and parameters
  - Part 2 – **Modelling aspects**, circularity aspects, datasets development and comparison with other standards
- The draft reports will be shared in due time

Timeline of discussion



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Outline

- Comments from the previous TAB meeting (CFF-Part 1)

1. **Definition of the Point of substitution (PoS)**
2. **Modelling of the recycled content – R1**
3. **E*v different from Ev**
4. **Biowaste** valorisation: Compost, anaerobic digestion, fuels and manure
5. Modelling of **composite and complex products** and **'energy' part of the formula**

Comments from the previous TAB meeting (7/04/2025)

Topics discussed and commented

17 members provided their feedback

3 research centers, 2 private consultants, 1 companies, 6 national and international organizations, 3 National environmental institutes, 2 European associations

- **Factor A**: 2 members are totally against to the introduction of Ain and Aout. All agree that clear guidelines are needed (how to apply Ain and Aout). The definition of A is fine (examples requested).
- **Erec/ErecEoL**: a better explanation of the system boundaries is needed.
- **Ev**: Fine when R1<1. However, the same definition is suggested for R1=1 (or clarification needed about the definition of R1=1).
- **Factor B**: Suggestion welcomed as starting point. More explanations needed on how and when it is applicable.
- **Annex C part II:** Procedure fine, as well as the possibility to expand the granularity of A. However, "quality factors" need to be included in the list (application specific to be better defined).
- **General**: Good to divide the formula to clarify how to use it for modelling purposes.

Comments on the definition of Qin (and Qout)

- Good to introduce a general discussion on the quality factors: **agreement is still missing**
- **Clarity on how to define the parameters** is still needed: the JRC report may be helpful, moving towards general Qin and Qout instead of ratio

- Quality factors are suggested to be considered "**substitution factors**": **renaming the parameters** has been suggested (together with a better guideline for its calculation based on physical substitution)
- **Misleading point linked to the "brake" of the mass flow due to Qin: Is Qin a physical factor? Or should it be considered a methodological and policy factor?**
- **R1=f(Qin): in some cases, R1 can already "contain" the effect of secondary material quality**

Can you provide any evidence or example of the use of the quality factor in input?

Proposal for updating the configuration of the CFF

Material Input

$$E_v(1-R_1)+R_1(E_{rec}\ A_{in}+(1-A_{in})E_v\ Q_{in})$$

Material Output

$$R_2(1-A_{out})(E_{rec_{EoL}}-E_v^*\ Q_{out})$$

Modular approach

Cut-off approach

$$E_v(1-R_1)+R_1\ E_{Rec}$$

CFF material input

Burdens and benefits related to the secondary material input

$$-(1-A_{in})\ R_1(E_{rec}\ -E_v\ Q_{in})$$

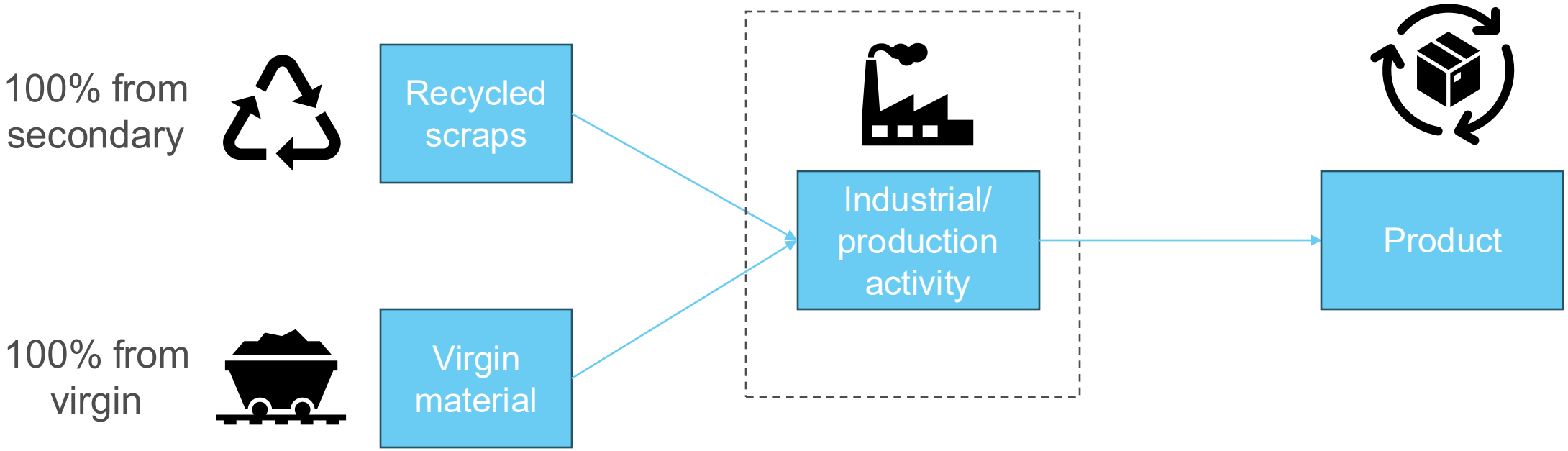
Burdens and benefits related to the secondary material output

$$R_2(1-A_{out})(E_{rec_{EoL}}-E_v^*\ Q_{out})$$

1. Definition of the PoS

Proposal of Point of substitution (PoS) for material recycling

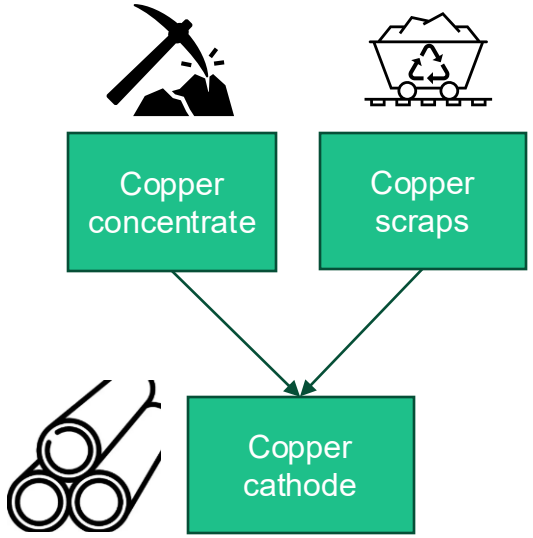
[to be identified in case of R1 and R2]

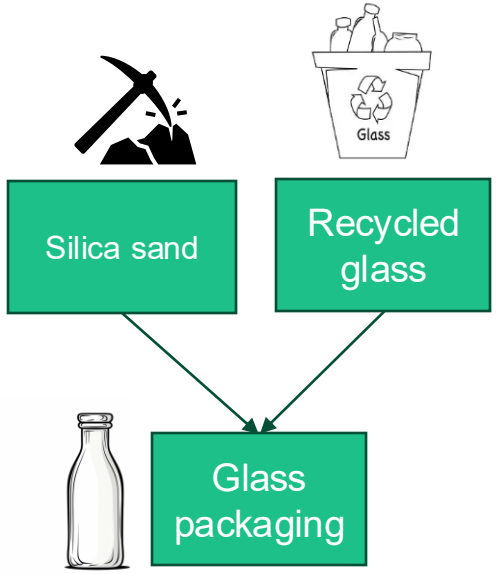


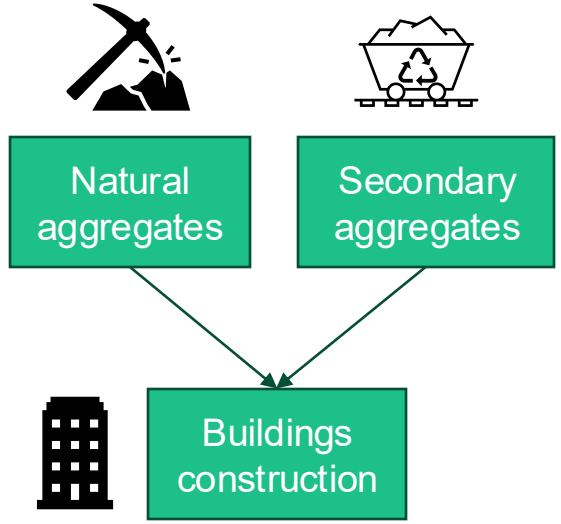
Point of substitution

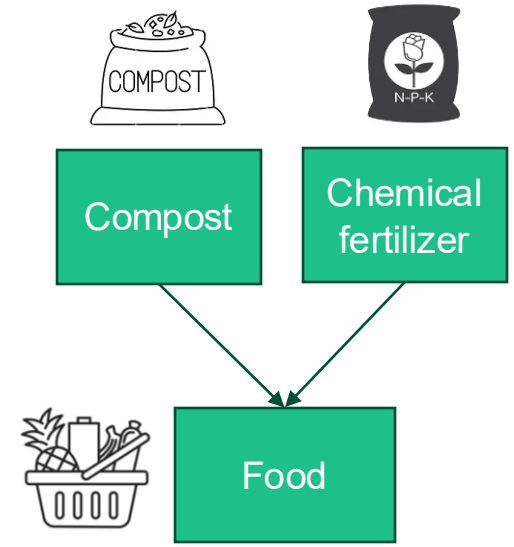
The point where the secondary material can be used to replace the primary material - 100% from virgin
PoS happens in the process where 100% secondary and 100% primary materials are mixed in industrial or production activities.

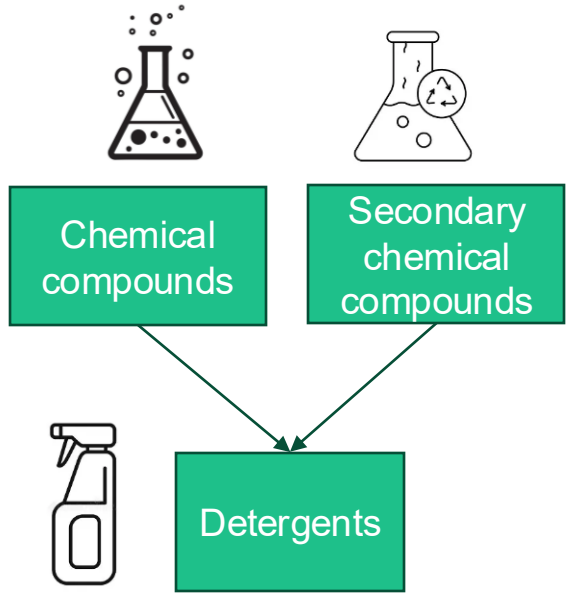
Examples of substitution

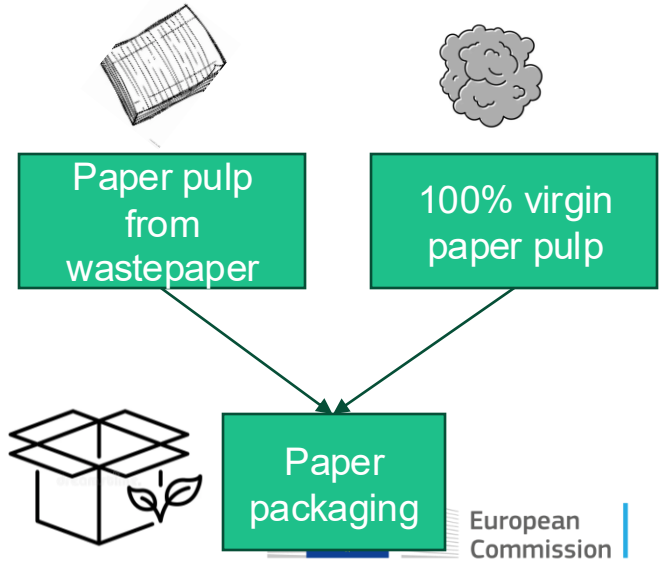






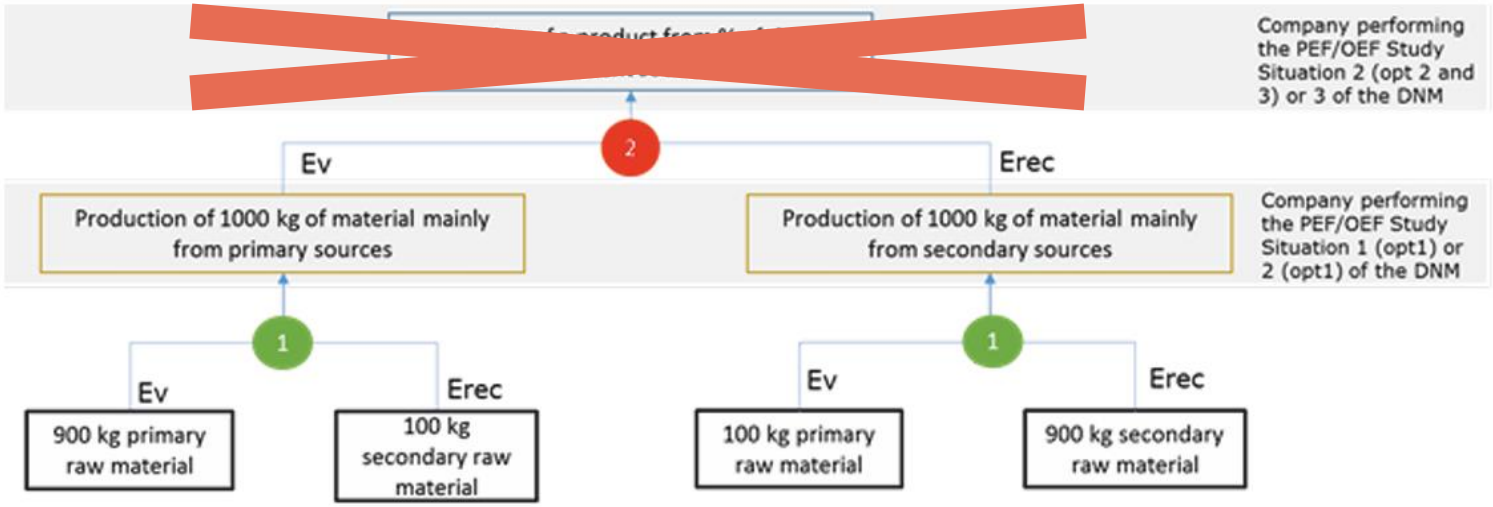


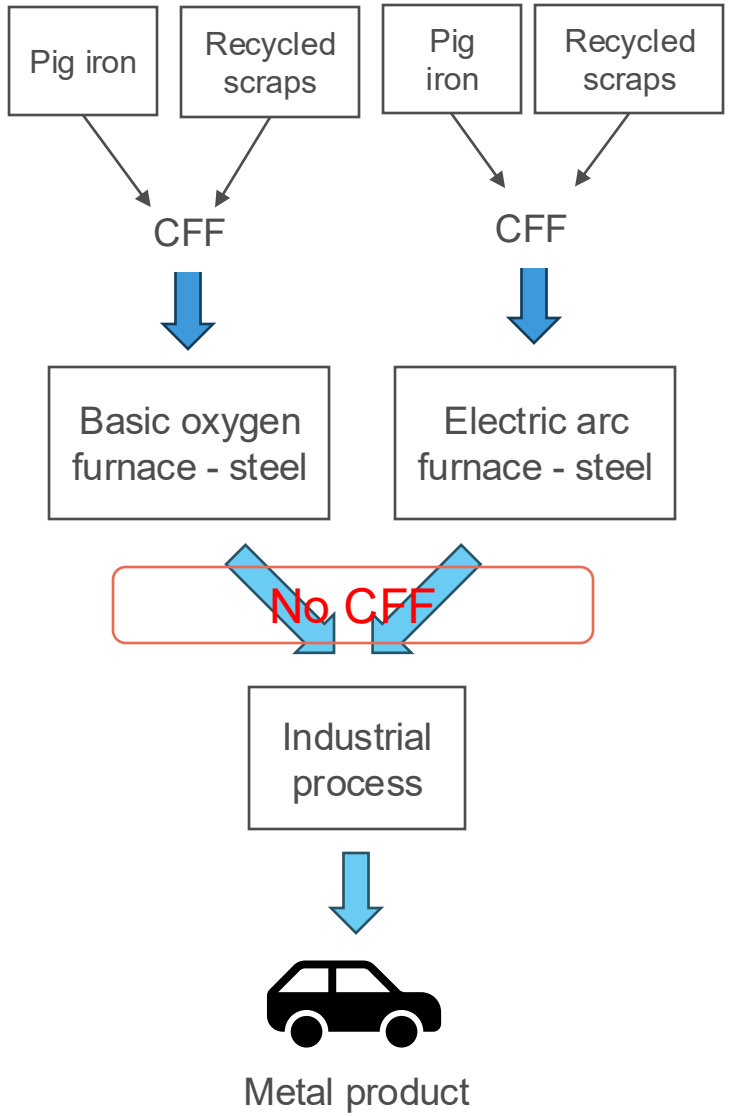




Secondary materials mixed with primary materials with a recycled content

- To apply the CFF, **the PoS shall be identified in correspondence to the process where input flows come from 100% primary sources (level 1 substitution).**





- **Ev and Ev* cannot be a market mix or a material already with scraps** (e.g., steel from BOF with a recycled content, steel from EAF with a recycled content).
  - CFF to be applied only once in the material system, avoiding double/several allocation issues. PoS identified at the production stage of the intermediate product

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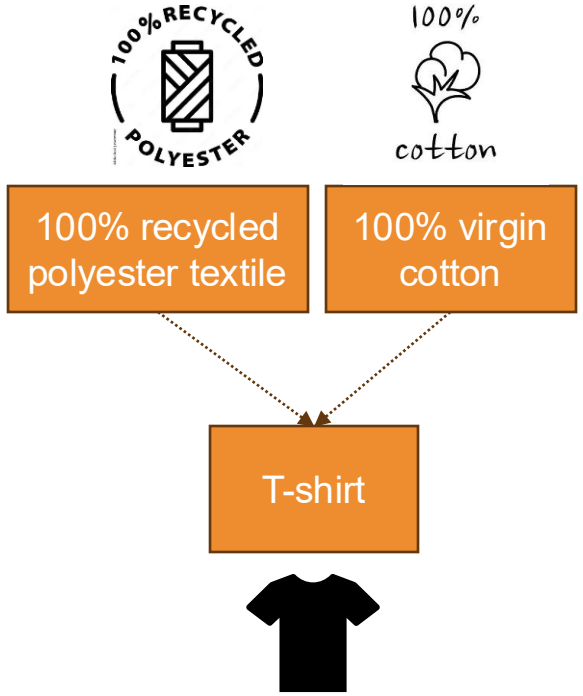
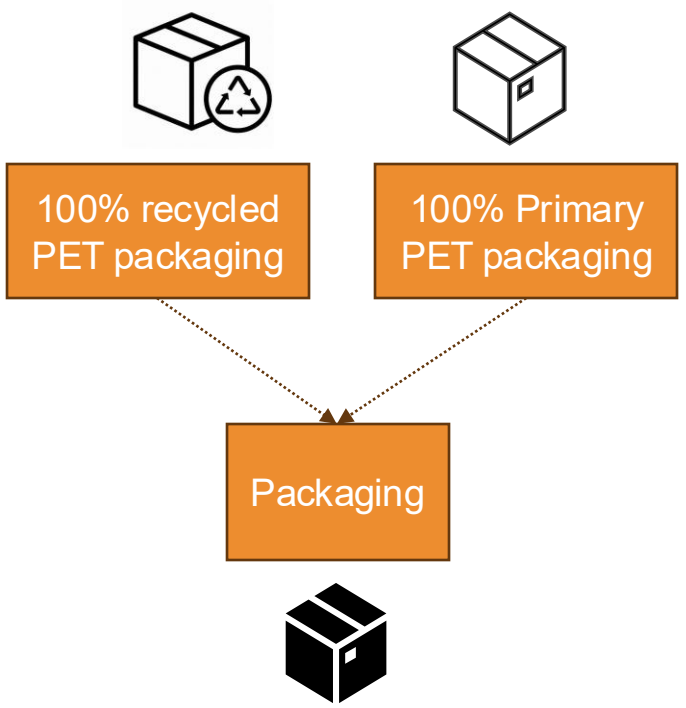
Examples

This is not considered a substitution for the application of the CFF*

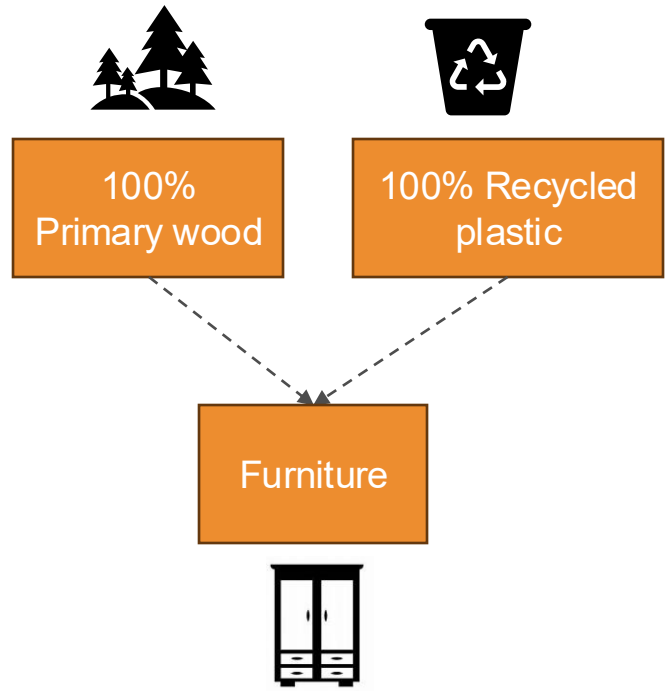
The PoS shall be identified (i) in the industrial process where the recycled materials are used and only (ii) when secondary materials have no strong different properties, structures, and behaviour under various environmental, mechanical and chemical conditions compared to the primary one.



- PoS to be identified when the fiber is produced
- Polyester changes the characteristics of the T shirt compared to the one made of cotton



- PoS to be identified when the packaging is produced



- Polyester changes the characters of the furniture. PoS to be identified at the industrial process

*Different in case of consequential modelling where a market analysis of demand/supply is needed.

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Discussion 1 – PoS

- Is the definition of the PoS clear and coherent with the objects of the CFF?
- Are further details needed to define the PoS?

[15 min]

2. Modelling of the recycled content R1

a. Multiple input secondary materials

b. Multiple input primary material

c. Pre-consumer scraps/manufacturing scraps vs home-scraps/run-around scraps

d. Intermediate products

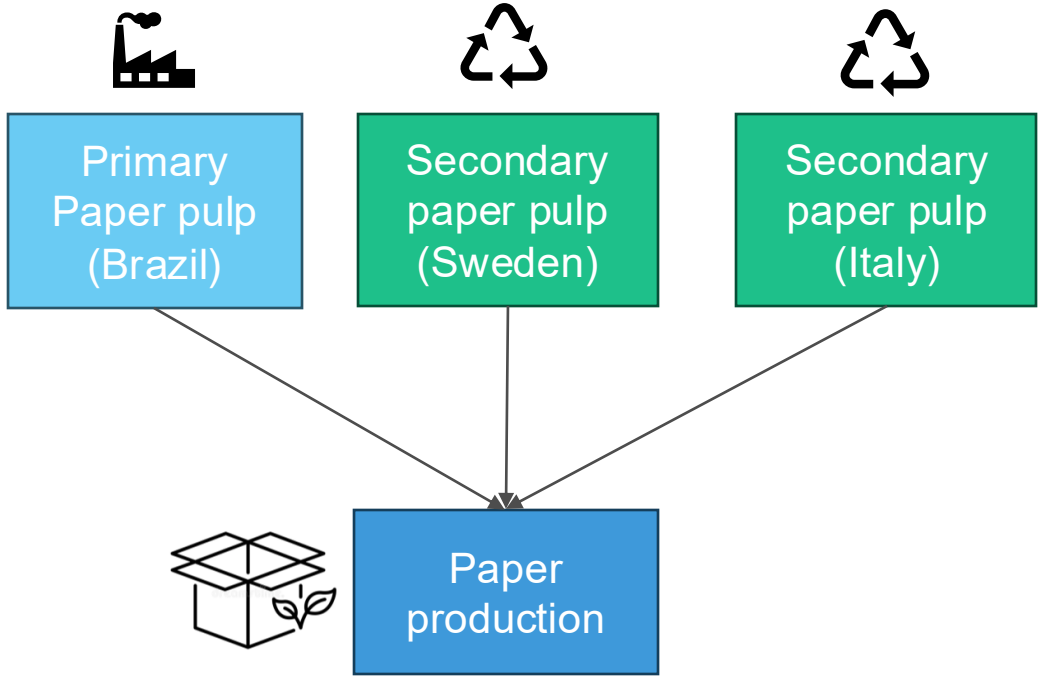
a. More than one recycled input that substitute the same primary material (**equal physical characteristics)**

- **An expansion of the CFF might be needed:** The CFF considers the different secondary materials (with their own ER1, Ered, Qin) having the same PoS.

$$E_v \cdot (1 - \boldsymbol{R_{1,1}} - \boldsymbol{R_{1,2}}) +$$

$$R_{1,1} \left(\boldsymbol{E_{rec_1}} \cdot A_{in} - (1 - A_{in}) \cdot \boldsymbol{Q_{in_1}} \cdot E_v \right) +$$

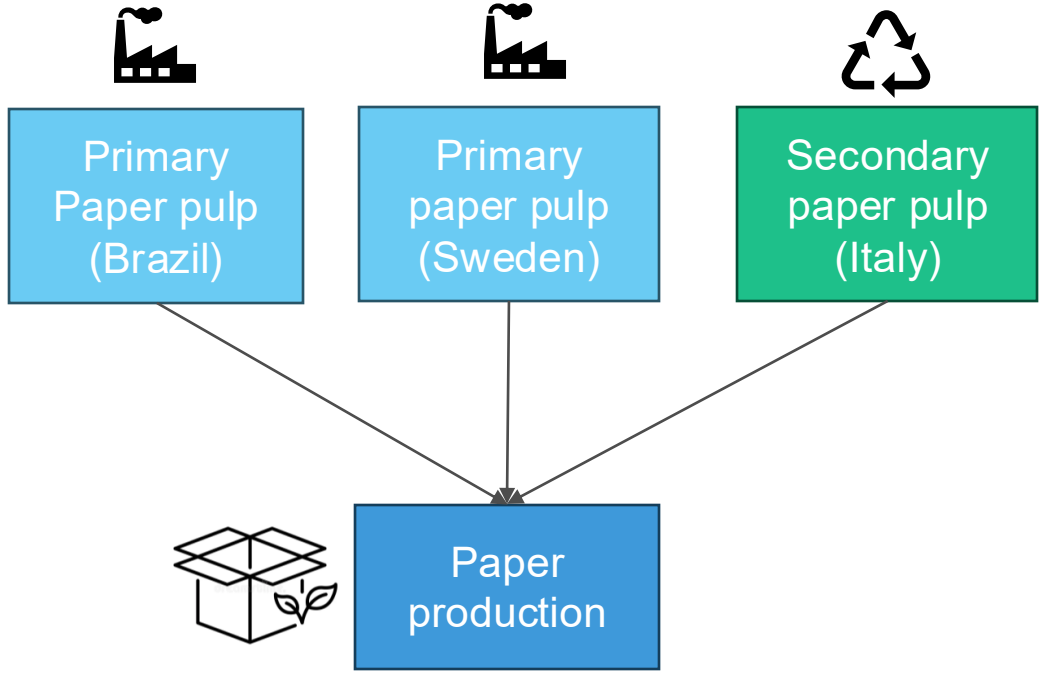
$$R_{1,2} \left(\boldsymbol{E_{rec_2}} \cdot A_{in} - (1 - A_{in}) \cdot \boldsymbol{Q_{in_2}} \cdot E_v \right)$$



b. More than one primary material substituted by a single secondary material (**equal physical characteristics**)

- When primary materials from virgin sources **are substituted by a secondary material at the same PoS and with equal physical characteristics**, the suggested approach is to **use the weighted average (e.g., per mass)** of the impacts associated to the primary material used in the model (Ev).

- This is applicable when e.g., same materials come **from different regions or countries**, or when same materials (with the same properties) are produced with **different technologies**.

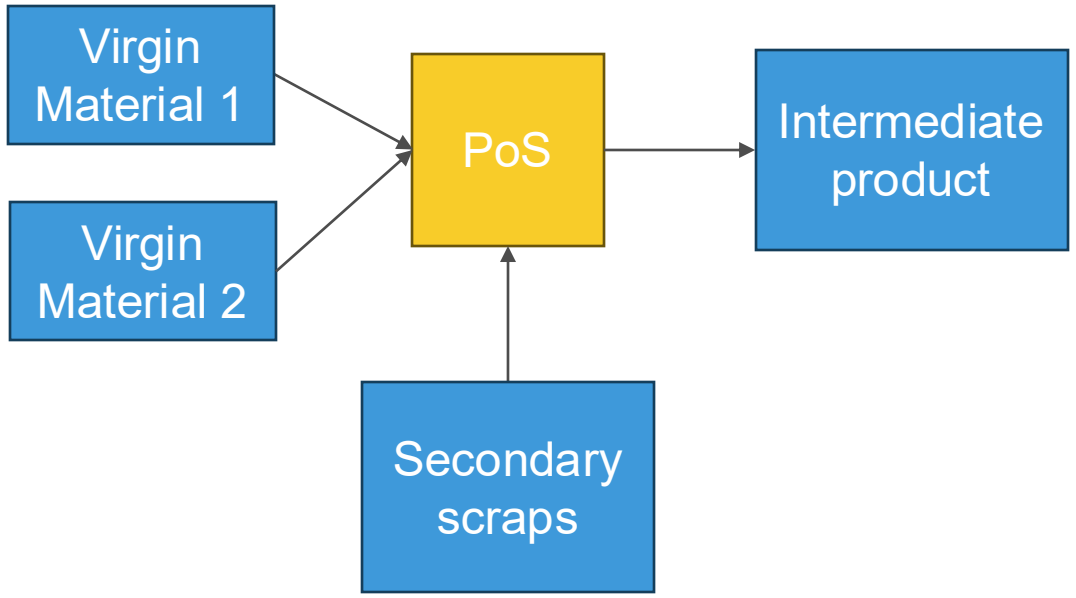


$$E_{v_{average}} = \cdots\% \cdot E_{v_1} + \cdots\% \cdot E_{v_2}$$

$$E_{v_{average}} \cdot (1 - \mathrm{R}_1) + \mathrm{R}_1 \cdot \left(A_{in} \cdot E_{rec} + (1 - A_{in}) \cdot \mathrm{Q_{in}} \cdot \mathrm{E_{v_{average}}} \right)$$

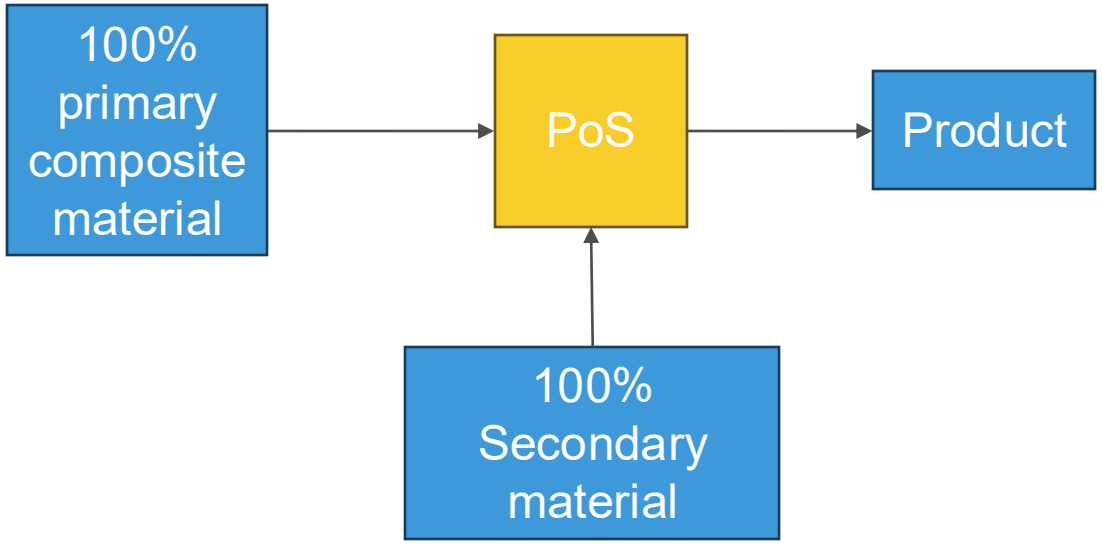
b. Identification of the PoS

Case 1



Material 1 and Material 2 are different but can be substituted by the same secondary material (clean scraps, e.g., alloys)

Case 2



Whether it is not technically possible to have a 100% primary input, the substitution should be identified as in Case 1

b. More than one primary material substituted by a single secondary material **(different physical characteristics)**

- When composite primary materials from virgin sources **are substituted by a composite secondary material**, if applicable, the suggested approach is to **solve the problem as a 'multimaterial product'**, subdividing the mass flow.

- This is applicable when different materials are included in the same one e.g., alloys, **when the composition of the secondary material is known (e.g., pre consumer waste)**. This is applicable for e.g., intermediate products modelling:

1 kg Alloy
e.g., brass

%wt. Zinc

$$E_v \cdot (1 - \mathrm{R}_1) + \mathrm{R}_1 \cdot (A_{in} \cdot E_{rec} + (1 - A_{in}) \cdot \mathrm{Q_{in}} \cdot \mathrm{E}_v)$$

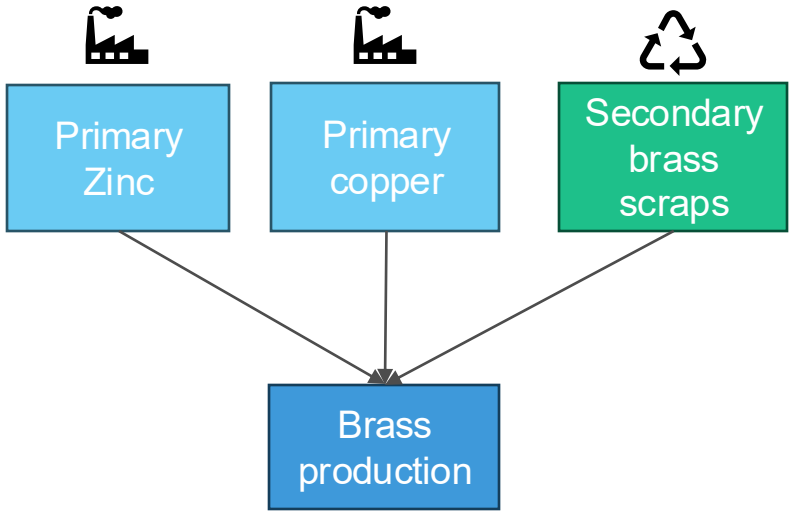
Alloy - Clean scraps production

%wt. Copper

$$E_v \cdot (1 - \mathrm{R}_1) + \mathrm{R}_1 \cdot (A_{in} \cdot E_{rec} + (1 - A_{in}) \cdot \mathrm{Q_{in}} \cdot \mathrm{E}_v)$$

Primary copper

Copper

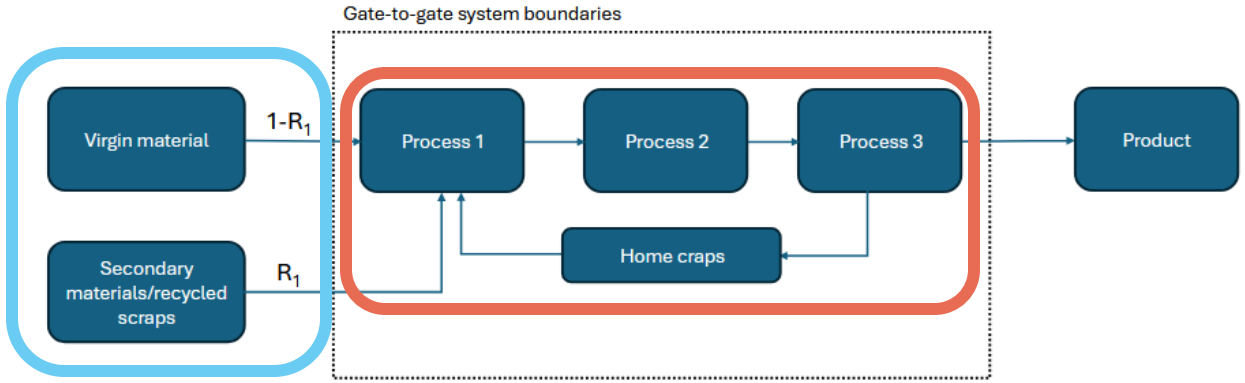


- Otherwise, the secondary material is considered to substitute the 100% primary material input (e.g., primary alloy 100% from virgin substituted by 100% secondary alloy billet).

c. Pre-consumer waste modelling and “home scraps” definition

- **Pre-consumer waste*** are discarded materials coming from different manufacturing and product systems, which are recycled by other operators.
- They can be included in the model in R1
- When applicable, processes for the pre-treatment of **pre- and post-consumer** waste shall be **differentiated for Erec**.
  - When Erec is different, the **R1 shall be also differentiated.**

- “**Home scraps**" are discarded materials directly recycled within the plant where they are originated.
- **The recycled input shall not be modelled within the CFF through the R1 factor**, but it should be considered while defining the life cycle model.



* From battery regulation: ‘battery manufacturing waste’ means the materials or objects rejected during the battery manufacturing process, which cannot be re-used as an integral part in the same process and need to be recycled;"

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d. Intermediate product modelling

Distinction needed also per component?
(see also Section 5)

- "the EoL of the product in scope shall be excluded" (EF 2279/2021)
- Modelling of recycled content: definition of factor A.
  - Setting Ain = 1: to be used as the default in calculating the PEF profile to enable the hotspot analysis and communication purposes.
  - Setting Ain = the application- or material-specific default values **when producing EF results** (including compliant EF datasets of primary data from the supply chain) **to be used for modelling final products.**

Impacts of intermediate products

- When a secondary material is included:
  - **Ain shall refer to the material under scope** (e.g., Ain=0.2 for metals) **(Erec** refers to the pre-treatment of waste to obtain secondary materials e.g., clean scraps)
  - **It can be possible to have intermediate products made by materials 100% from secondary sources: R1=1.**
  - In case of results for intermediate products that already include the recycled content, **they shall not be used as secondary datasets to develop the CFF.**

Discussion 2 – Modelling of the recycled content

- Is the expansion of the CFF useful and straightforward to model the recycled content?
- Is the modelling of intermediate products clear? Any other specification needed (e.g., for components)?

[15 min]

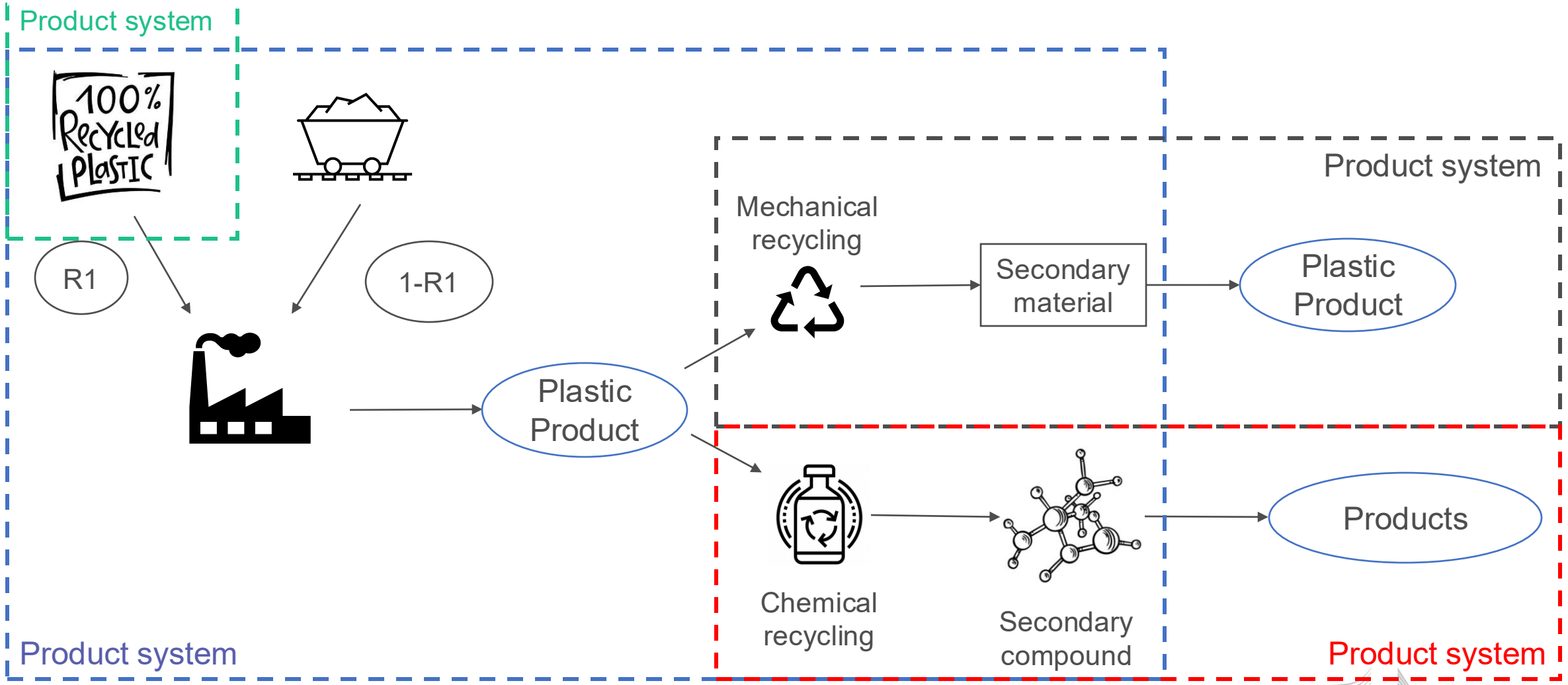
3. E*v different from Ev

a. Wasted materials that are **treated to obtain a different material** or compound (e.g., chemical recycling, composting…)

b. Primary material that would be substituted by secondary materials with different physical characteristics (e.g., wood and plastic, plastic and aggregates…)

a. Waste recycling to produce and substitute a different material (or compound): Example of plastic chemical recycling

A wasted material can be treated in processes where it is transformed into another material.



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a. Example: plastic production - input

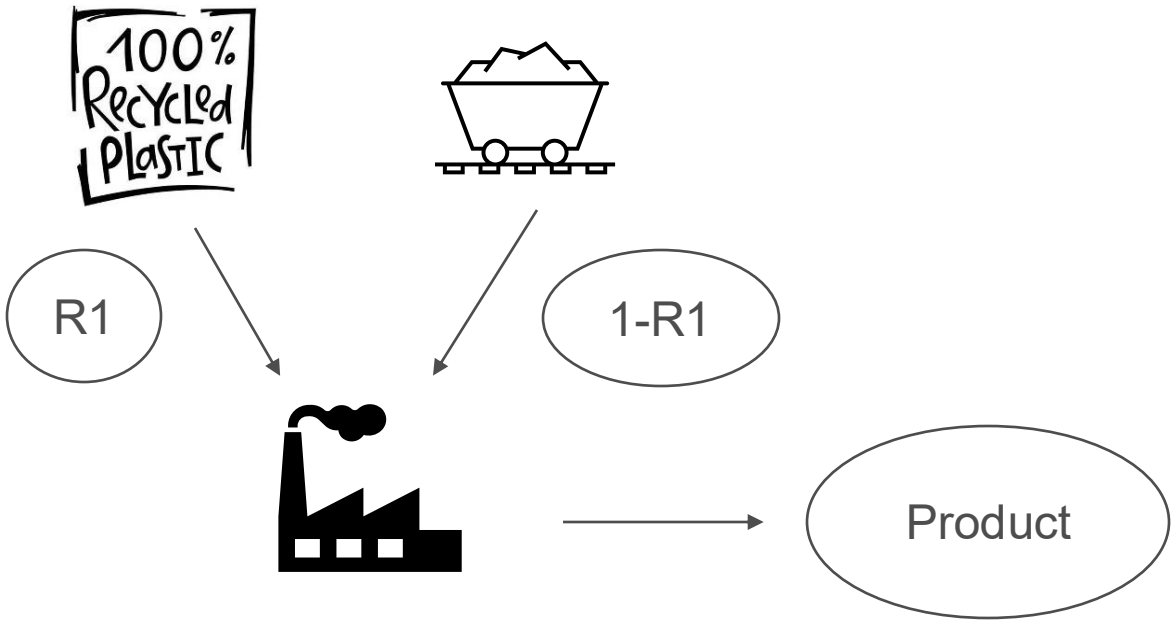
Input

Mass of plastics inflow into the process to make the product (LCI)

Primary plastic production

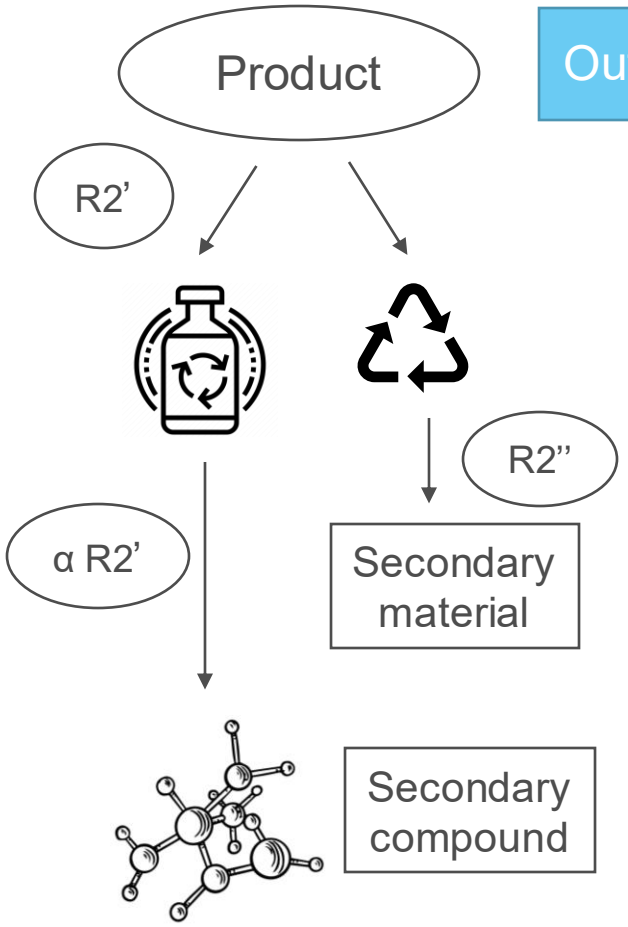
Linked to the secondary material used to substitute the primary

$$\mathbf{M_{plastics}} \cdot [\, E_v\,(1 - R_1) + R_1(A_{in}\ \cdot E_{rec} + (1 - A_{in})\ E_v \cdot Q_{in})]$$



- Mass of plastic input (LCI data) multiplied by the material input part of the formula
- The same mass of plastic input shall be modelled in output through the material output part of the formula.

a. Example: chemical recycling – R2 and ErecEoL



Percentage of secondary chemicals/plastics obtained per mass of waste

Chemical recycling process [per kg of chemicals]

$$\mathbf{M_{plastics}} \left\{ \begin{array}{l} [\, \boldsymbol{R_2'}(\alpha)(1 - A_{out})(E_{recEoL} - E_V^* \cdot Q_{out})\,] \\ [\, \boldsymbol{R_2''}\,(1 - A_{out})(E_{recEoL} - E_V^* \cdot Q_{out})\,] \end{array} \right.$$

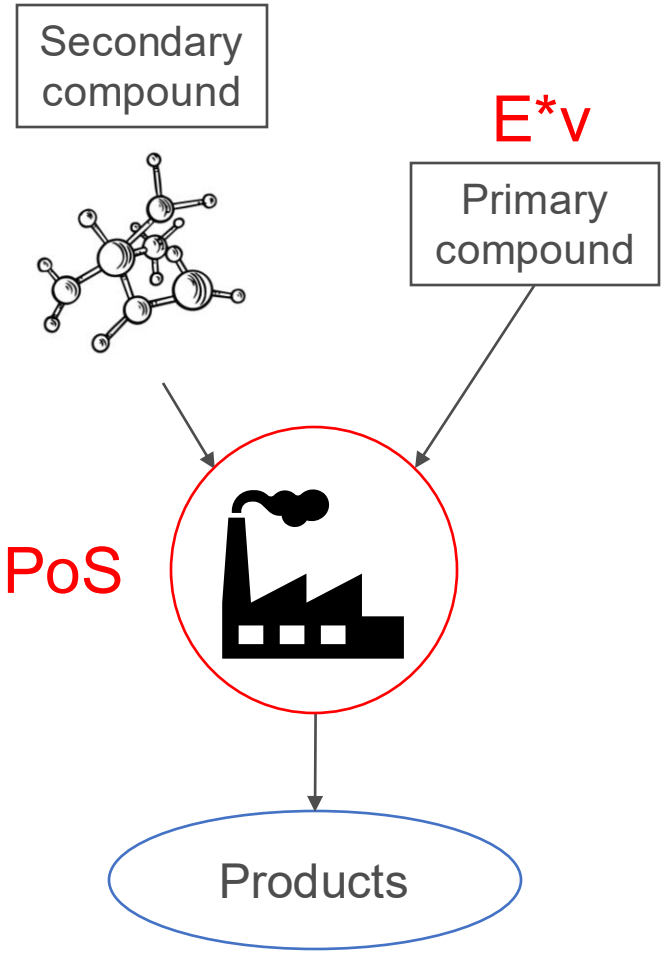
Share of plastic sent to chemical recycling

Share of recycled plastic from mechanical recycling

$$[\, \boldsymbol{R_2} = \boldsymbol{R_2'} + \boldsymbol{R_2''}\,]$$

- Part of the plastic is collected for mechanical recycling; another fraction is chemically recycled. The CFF should be expanded to model both scenario
- The plastic chemically recycled shall be modelled considering that:
  - Secondary datasets are modelled per mass of material output (e.g., chemical compound)
  - R2 should refer to recycled plastic and it is used to model disposal (1-R2-R3)

a. Example: chemical recycling – PoS and Ev*



Quality of monomer/chemicals/plastics from secondary materials

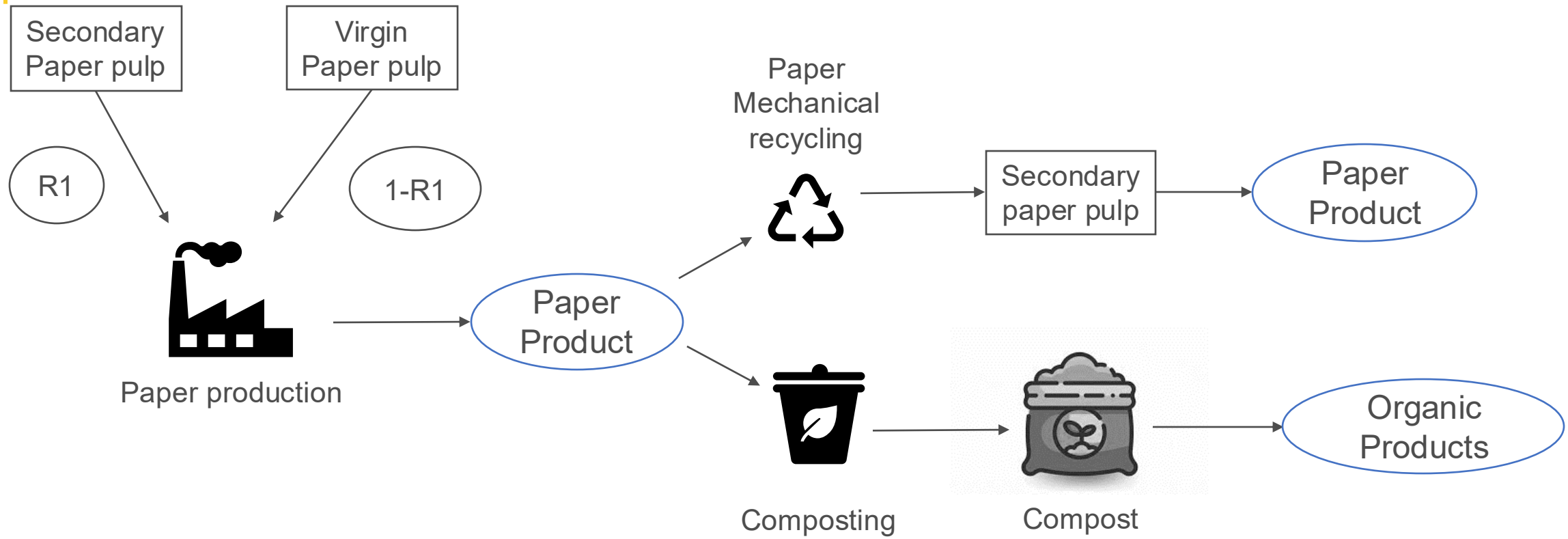
$$[\, R_2'(\alpha)(1 - A_{out})(E_{recEoL} - E_V^* \cdot Q_{out}) \,]$$

Primary monomer/chemical/plastic production

- The PoS shall be identified based on the industrial process that can use the product of the chemical recycling process. Its identification might be challenging and should be based on expert judgment
- The definition of E*v follows the identification of the PoS and can be related to a specific monomer, a chemical compound or plastics. The definition of the system boundaries of ErecEoL provide indication about the definition of E*v.

a. Example of paper waste composting

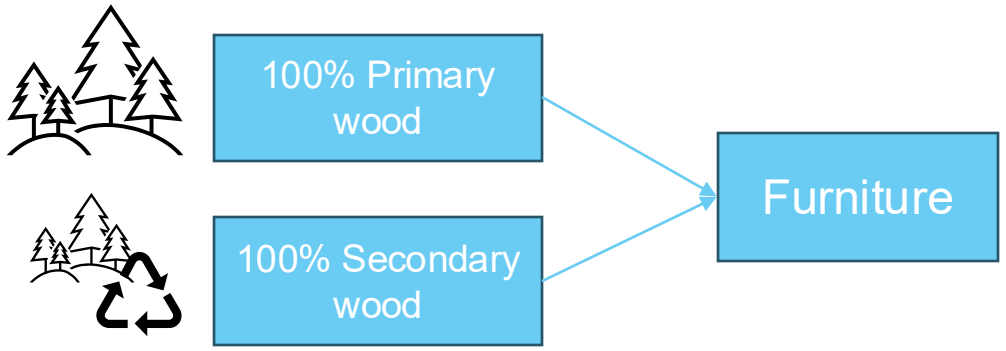
A wasted material can be treated in processes where it is transformed into another material.

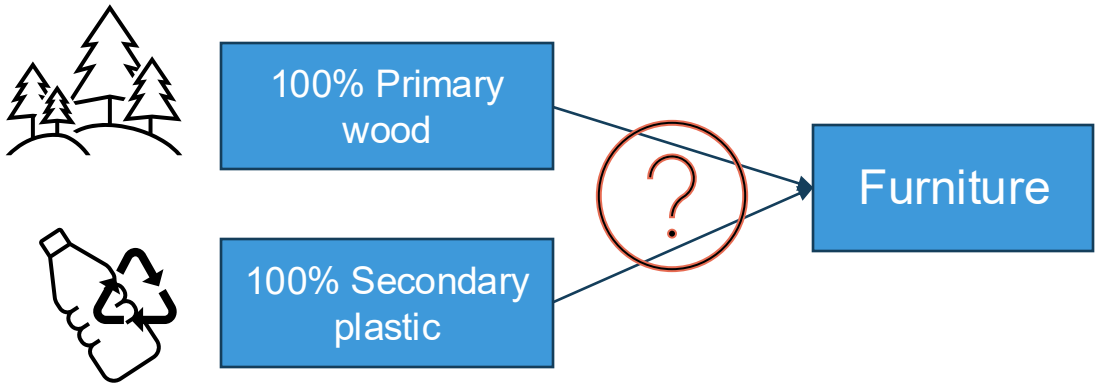


- The composting phase foresees the reduction of the mass due to moisture loss and degradation of the organic material

$$[\, R_2'(\alpha)(1 - A_{out})(E_{recEoL} - E_V^* \cdot Q_{out}) \,]$$

b. Primary materials **mixed** with different* secondary materials





- Can be possible that industrial processes foresee the 'mix' of 100% primary materials with 100% secondary materials that have different from the primary one (e.g., plastic and wood):
  - The PoS shall be carefully identified
  - The Secondary materials different from the primary one that are used **might change the properties** and design of the final product.

Possible examples

IT DOES NOT CHANGE THE design of the final product or the FU (used in a certain amount)

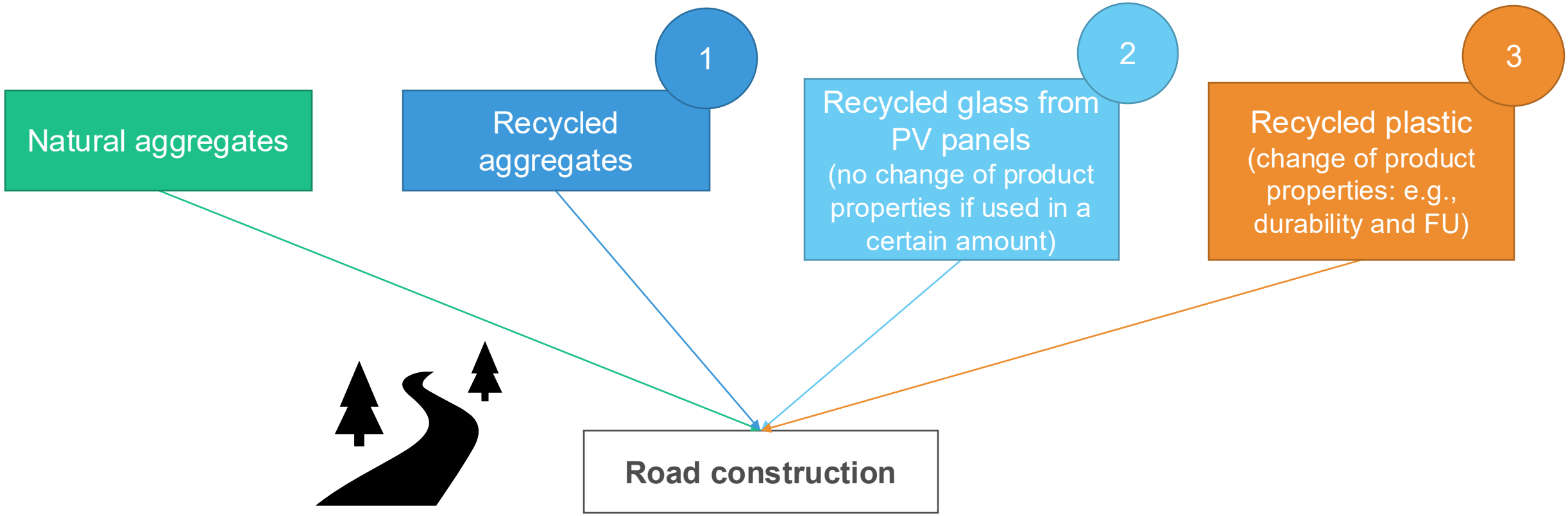
- Recycled Glass from PV used in road construction
- Blast Furnace Slag in concrete for buildings construction

IT CHANGES THE design and the FU

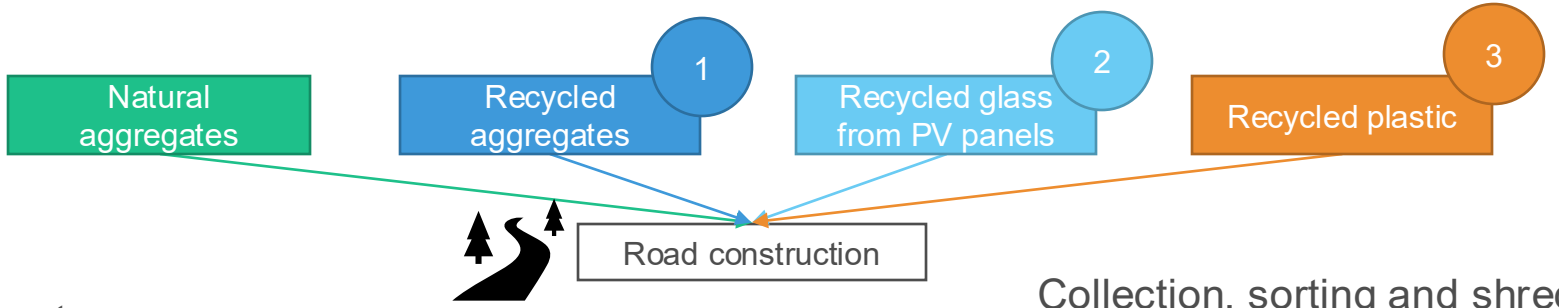
- Recycled plastic in light concrete
- Plastic in the asphalt – change of the durability and strength of the asphalt

*different properties, structures, and behavior under various environmental, mechanical and chemical conditions

b. Example of primary materials **mixed** with different secondary materials



b. Example of primary materials **mixed** with different secondary materials



1

Natural aggregates

Collection, sorting and shredding of wasted aggregates

$$M \cdot [E_v (1 - R_1) + R_1 (A_{in} \cdot E_{rec} + (1 - A_{in}) E_v \cdot Q_{in})]$$

Secondary aggregates for natural aggregates substitution

2

$$M \cdot [E_v (1 - R_1) + R_1 (A_{in} \cdot E_{rec} + (1 - A_{in}) E_v \cdot Q_{in})]$$

e.g., collection, sorting, and shredding of glass from PV panels

3

Plastic recycling process

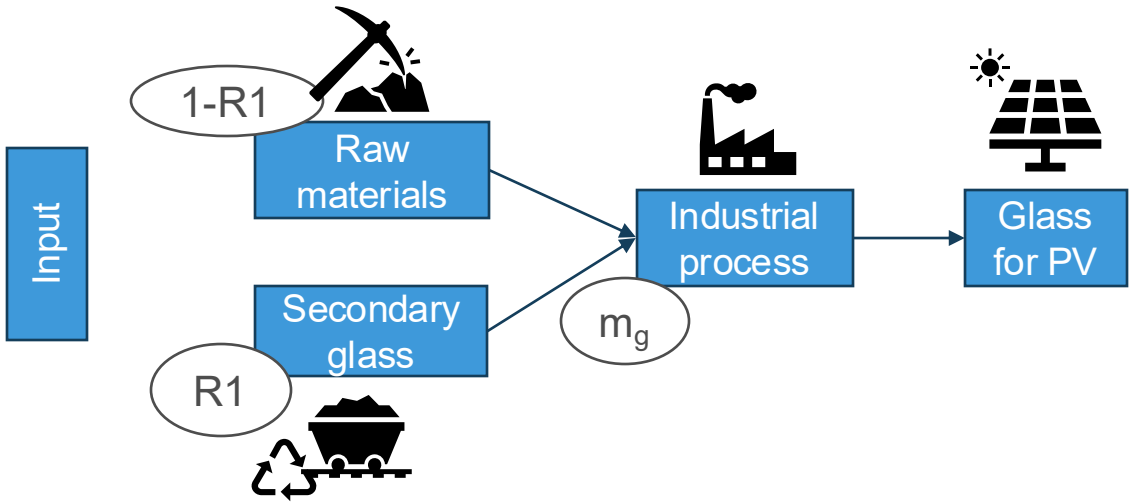
Primary plastics that would have been used whether secondary plastic was not available

$$R_1 = 1, \quad m_p \cdot [(E_{rec} \cdot A_{in} + (1 - A_{in}) Q_{in} \cdot E_v]$$

Secondary plastic for low-grade plastic application

$$R_1 = 0, \quad m_{agg} \cdot [E_v]$$

b. Example of CFF application (E*v ≠ Ev) for glass in PV



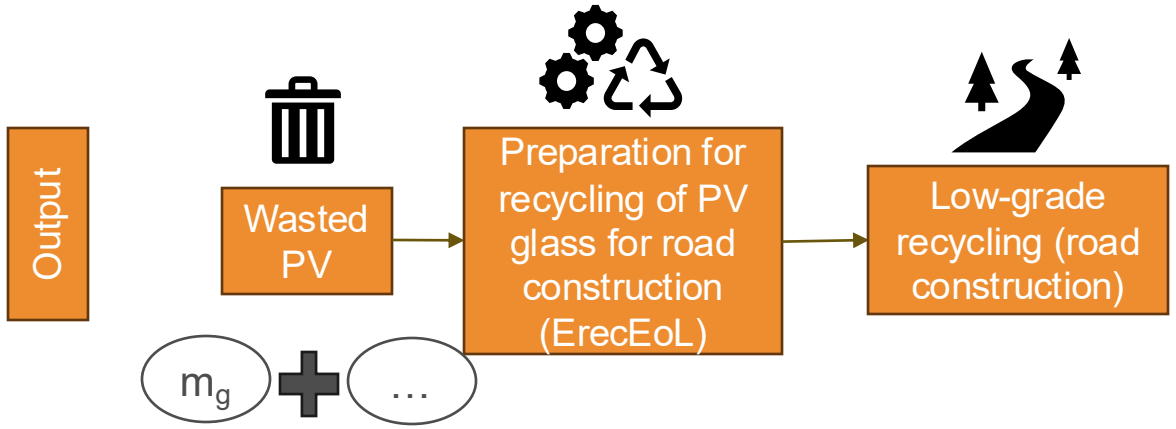
Primary raw material substituted by the secondary glass

0.2, high demand of recycled glass

Glass recycling process

$$\mathbf{m_g} \cdot [\, E_v\,(1 - R_1) + R_1(A_{in} \cdot E_{rec} + (1 - A_{in})\, E_v \cdot Q_{in})]$$

Mass of pure glass used for producing PV glass



0,8, high supply of secondary aggregates compared to the demand

Natural aggregates

$$\mathbf{M} \cdot [\, R_2(1 - A_{out})(E_{rec_{EoL}} - E_v^* Q_{out}]$$

Mass of PV glass (equal to m_g plus additional materials added for producing PV glass)

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Discussion 3 – E*v different from Ev

- Any other suggestion for modelling waste processed to obtain different secondary materials?
- Is the modelling of materials with similar or equal physical characteristics easy of understanding?

[15 min]

4. Biowaste valorisation: Compost and anaerobic digestion

a. Composting

b. Secondary fuels from waste and Anaerobic digestion

c. Manure

Current EF recommendation:
"Compost, including digestate coming out of the anaerobic digestion, shall be treated in the ‘material’ part (Equation 3) like recycling with A = 0.5. The energy part of the anaerobic digestion shall be treated as a normal process of energy recovery under the ‘energy’ part of Equation 3 (CFF)".

a. Composting – material recovery

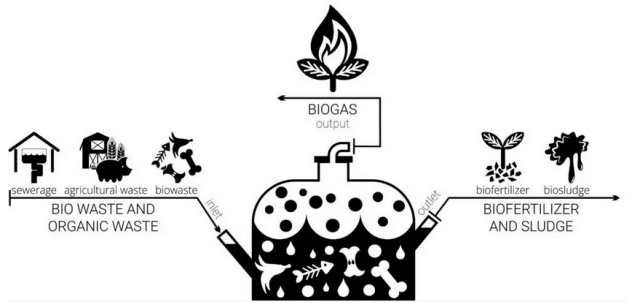
	Compost is used on agricultural fields Assumed to substitute fertilizers - **CFF applied per compound (see chemical recycling)**.
Aout	0.5
R2	Refers to the kg of compost / kg organic waste input
ErecEoL	Composting activities per unit of mass of produced compost
Ev*	Mineral fertilizers (NPK)*
Open points	• Mass flow in R2 (see chemical recycling) • Calculation of Ev* and Qout
Compost used in Input	If compost is used as input: Ain=0.5, Ev=mineral fertilizers.

- **Qout** can be calculated based on e.g., the quantity of phosphorus **potentially available** in the compost (expert judgment or case specific reports can be used to better define the best approach), defining the **amount of chemical compound replaced by the organic fertilizer**.
- If compost is used in forests or parks, it is considered disposal and it is modelled in the E_D part of the formula (E_D will be associated also to the composting phase, as well as to other emissions due to compost 'use')

*case of secondary materials substituting different primary materials

b. Anaerobic digestion with energy production

- **AD shall be modelled within the energy part of the formula**.
  - **EER [per mass of waste input]:**
    - biowaste collection + waste pre-treatment + AD reactor
    - Digestate management (e.g., composting, transport, storage, application) * (1-A)
    - Avoided mineral fertilizers * (1-A)
  - **B=0**, default, to incentivize the energy recovery from waste (instead of compositing)

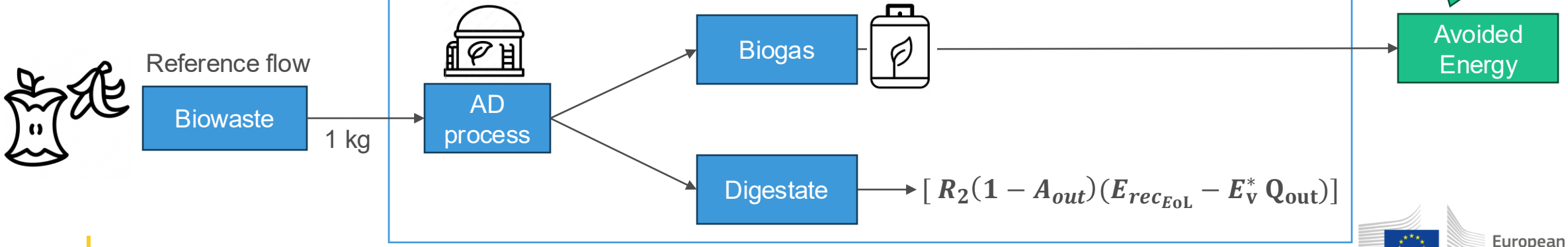


$$R_3(1-B)(E_{ER} - LHV\ X_{ER_{heat}}\ E_{SE_{heat}} - LHV X_{ER_{Electricity}} E_{SE_{Electricity}})$$

e.g.,, [kgCO$_2$e / kg$_{waste}$]

[kWh / kg$_{waste}$]

e.g.,, [kgCO$_2$e / kWh]



System boundaries - E_{ER}

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b. Energy/fuels from waste

- **Fuel from waste --> 'energy' part of the CFF**
  - Biogas/CH_4 from AD
  - Biogas/CH_4 from landfilling
  - Hydrogen from e.g., gasification processes
  - SRF (see Chapter 5)
- **Fuels production and combustion included in E_{SE}**

$$R_3(1-B)(E_{ER} - \boldsymbol{LHV\ X_{ER_{heat}}\ E_{SE_{heat}} - LHVX_{ER_{Electricity}} E_{SE_{Electricity}}})$$

- When B = 0, 100% of the benefits & burdens are allocated to the product from where the waste is generated and 0% to the product using the biofuels.

CONSEQUENCE

- The 'energy' part of the CFF models benefits & burdens of **both production and combustion (i.e., fuels burning included in E_{ER})**
- **The 'energy' part of the CFF should be intended** to model the production and consumption of any fuel.

- Some secondary materials (e.g., hydrogen) can be used both as 'material' and as energy vectors.
- If B = 0, in some cases, recycling might be disadvantaged compared to the production of energy fuels.
- Burdens and benefits are variable depending on the use of the energy vector.

c. Modelling of manure from animal farms

Current EF method (Allocation – 4.5.1.2) – there are three options:

- Co-product (if with economic value) - economic allocation
- Residual (if without economic value) – without allocation. Impacts of the management included in the system
- **Manure as a waste: CFF**

Proposal for the application of the CFF:

- **Used as is:**

$$[\,R_2(1-A_{out})(\sout{E_{rec_{EoL}}} - E_v^* \, Q_{out})]$$

- **AD and digestate direct use**

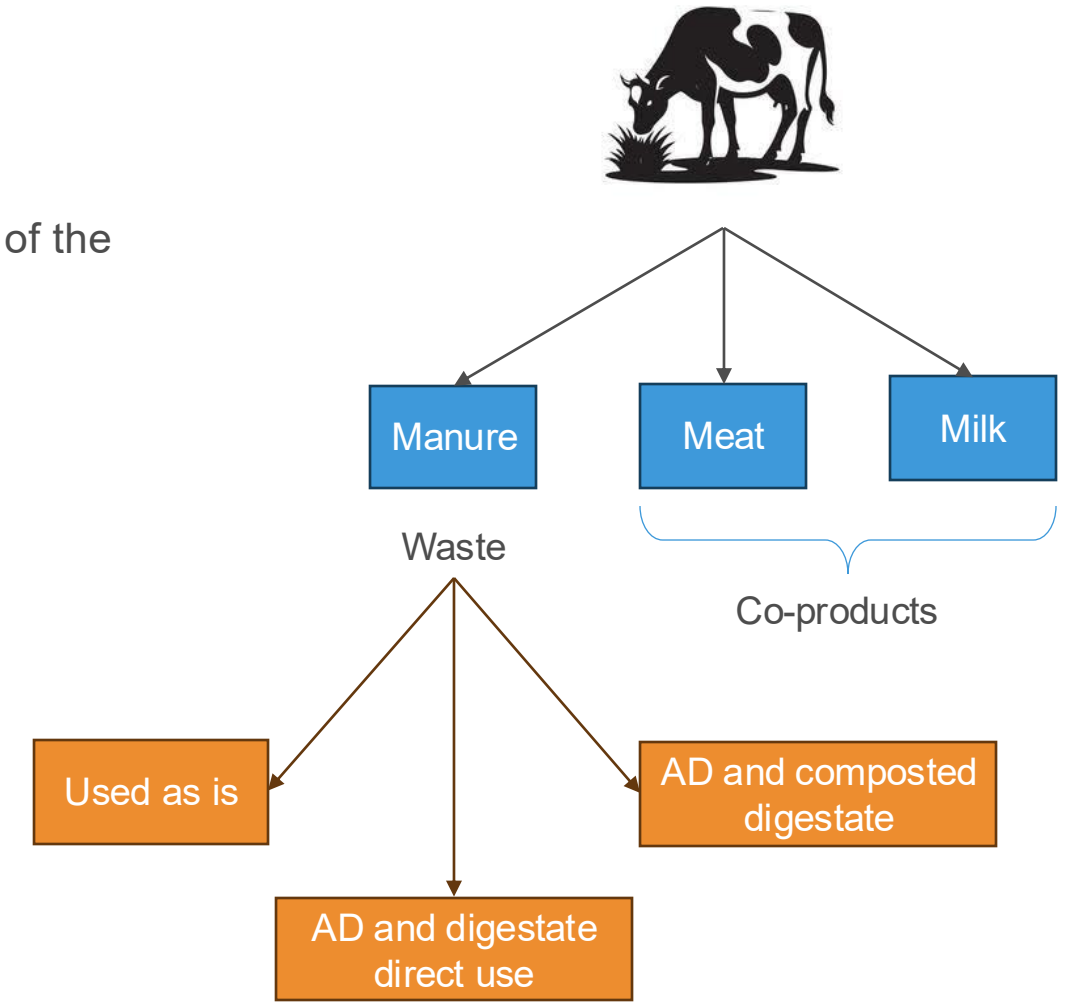
$$R_3(1-B)(E_{ER} - LHV\ X_{ER_{heat}}\ E_{SE_{heat}} - LHV X_{ER_{Electricity}} E_{SE_{Electricity}})$$

$$[\,R_2(1-A_{out})(\sout{E_{rec_{EoL}}} - E_v^* \, Q_{out})]$$

- **AD and composted digestate**

$$R_3(1-B)(E_{ER} - LHV\ X_{ER_{heat}}\ E_{SE_{heat}} - LHV X_{ER_{Electricity}} E_{SE_{Electricity}})$$

$$[\,R_2(1-A_{out})(E_{rec_{EoL}} - E_v^* \, Q_{out})]$$



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Discussion 4 – Biowaste valorisation

- Is the modelling of composting straightforward?
- Is the modelling of AD and manure straightforward?

- Additional issues to be tackled or any other suggestion for modelling?
- Any additional comment linked to the allocation of by-products (e.g., manure)?

[15 min]

5. Modelling of composite and complex products and 'energy' part of the CFF

a. Modelling of complex and composite products recycling

b. Recovery of bottom ash from incineration of metal scraps

c. Secondary recovered fuels production and consumption

a. Challenges of modelling the EoL of composite/complex products

- Modelling of the **dismantling** of a composite product, e.g., inclusion/exclusion in the ErecEoL.
- Modelling of the **recycling of complex products** that are not dismantled in single materials but are recycled as they are, e.g., batteries or electronics sent to a metallurgical process.

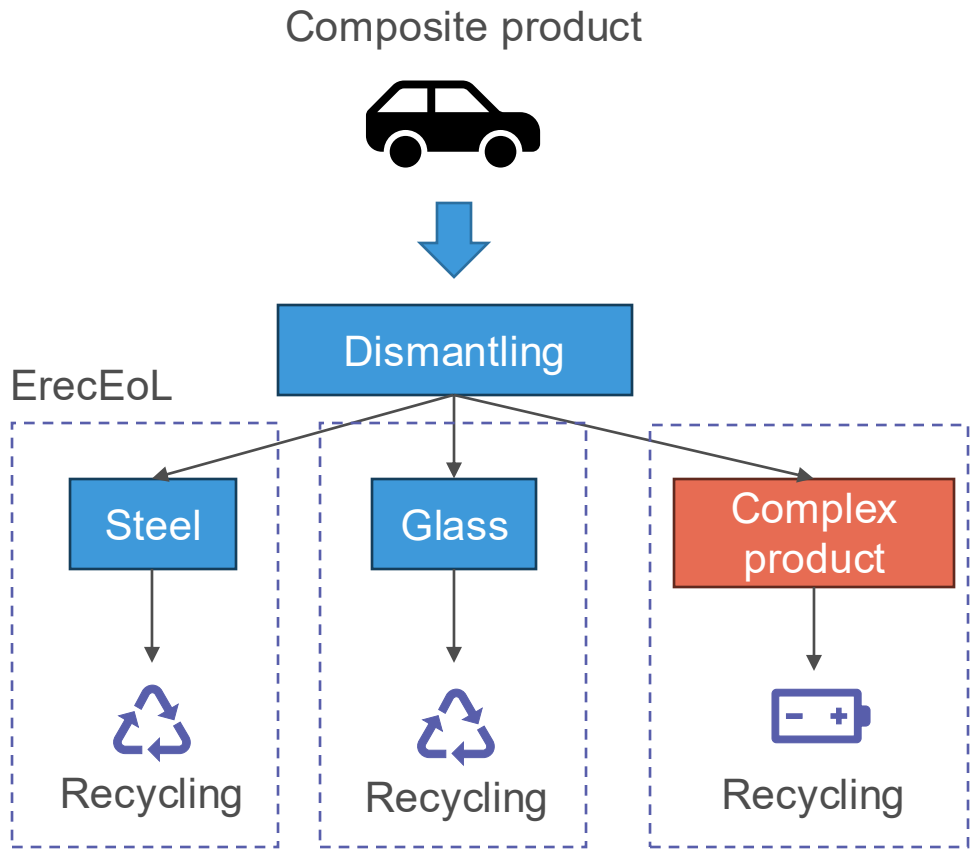
a. Modelling complex and composite products recycling

- Composite products can be dismantled/disassembled, and single materials can be separated

- Complex products are made with **materials difficult to be extracted by the dismantling phase** (e.g., printed wiring boards, battery cells) and with complex EoL management.

- **Secondary datasets of recycling in the CFF should model** the material (e.g., secondary metals from battery cells - reference flow associated to the material output).

- **Dismantling (of composite products) is out of scope of the MATERIAL recycling process** and should be included in the PRODUCT EoL and it is no multiplied by A.



Datasets modelling a product or component recycling can be developed, but they shall not be associated to secondary datasets to be used for the CFF
(e.g., recycling of 1 kg of used tires vs. 1 kg of rubber recycling from used tires - ErecEoL).

a. Example of modelling a composite product recycling

CFF applied per material

Used tires appropriate collection for recycling

Collection and Pre-treatment (e.g., dismantling)

Steel waste for recycling

Tires preparation for recycling

Steel scrap

Rubber

Textile

Steel recycling from used tires

$$(1 - A_{out})R_2\,(E_{Rec_{Eol}} - E_v^*\,Q_{out})$$

$$R_3(1 - B)(E_{ER} - LHV\,X_{ER_{heat}}\,E_{SE_{heat}} - LHVX_{ER_{El}}E_{SE_{El}})$$

$$(1 - R_2 - R_3)E_D$$

Rubber recycling from used tires

$$(1 - A_{out})R_2\,(E_{Rec_{Eol}} - E_v^*\,Q_{out})$$

$$R_3(1 - B)(E_{ER} - LHV\,X_{ER_{heat}}\,E_{SE_{heat}} - LHVX_{ER_{El}}E_{SE_{El}})$$

$$(1 - R_2 - R_3)E_D$$

$$(1 - A_{out})R_2\,(E_{Rec_{Eol}} - E_v^*\,Q_{out})$$

$$R_3(1 - B)(E_{ER} - LHV\,X_{ER_{heat}}\,E_{SE_{heat}} - LHVX_{ER_{El}}E_{SE_{El}})$$

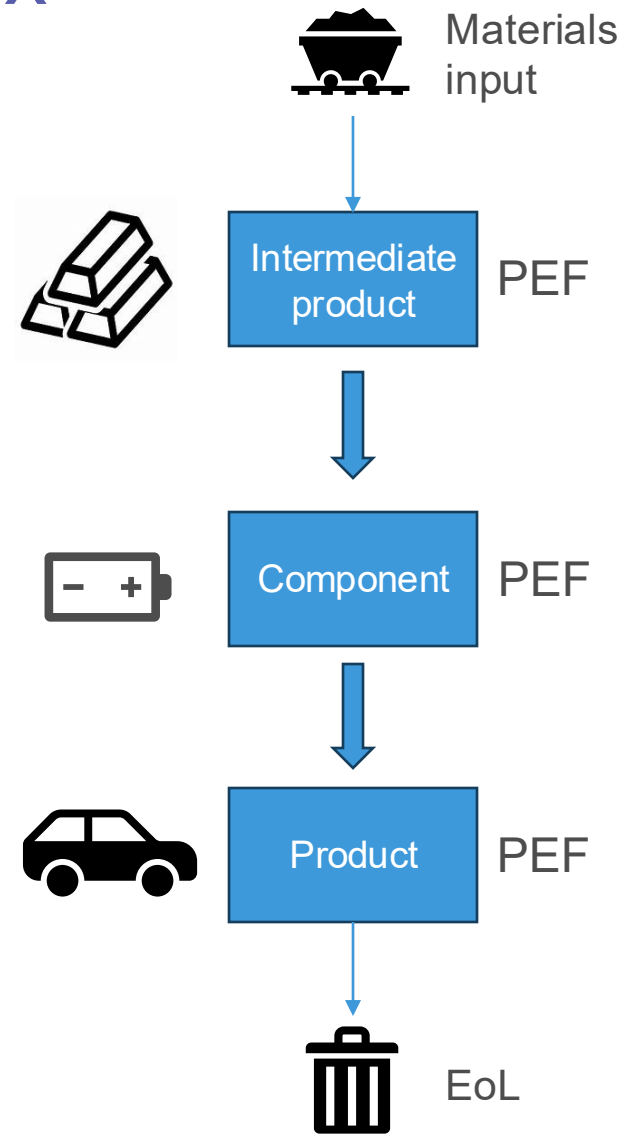
$$(1 - R_2 - R_3)E_D$$

Dataset: Recycling of used tires

a. PEF/datasets of composite and complex products products

- Goal and scope of the PEFCR related to the complex product is defined by the TS
  - **EoL can be included**, as well as the use phase

- Datasets to be provided once the PEF study has been developed:
  - Product under scope of the PEFCR (e.g., cradle to grave)
  - **Datasets to be used for third parties PEF studies** of complex/composite products that include the component under scope (cradle to gate datasets).
    - When applicable, EoL to be excluded (modelled by the manufacturer of the next product system).
    - Secondary datasets of **recycling and disposal of the composite component** (e.g., used tires).



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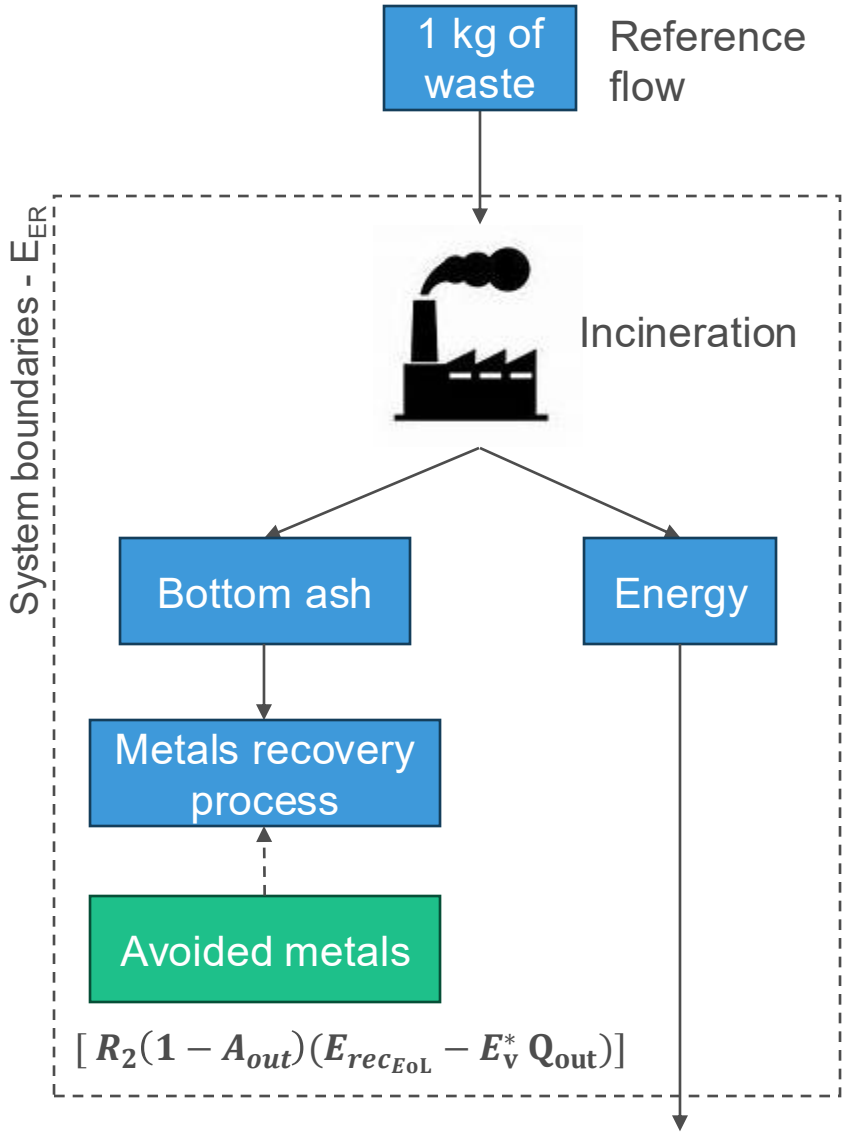
b. Recovery of bottom ash or slag from incineration of metal scraps

- Burdens due to **bottom ash disposal** should be included in the datasets (EER)*

- For **metals recycling from bottom ash, burdens and benefits should be included** (if applicable) and estimated through the CFF.

  - **R2** = share of metals recycled after bottom ash treated (e.g., 30% of metals inflow into the waste to energy plant)
  - **ErecEoL** = treatment process to obtain 1 kg of metal from bottom ash
  - **E*v =** primary metals production
  - **Limitation: to avoid double counting, statistics referring to R2 (recycling of metals) from mechanical pre-treatment shall not include the scraps from bottom ash.**



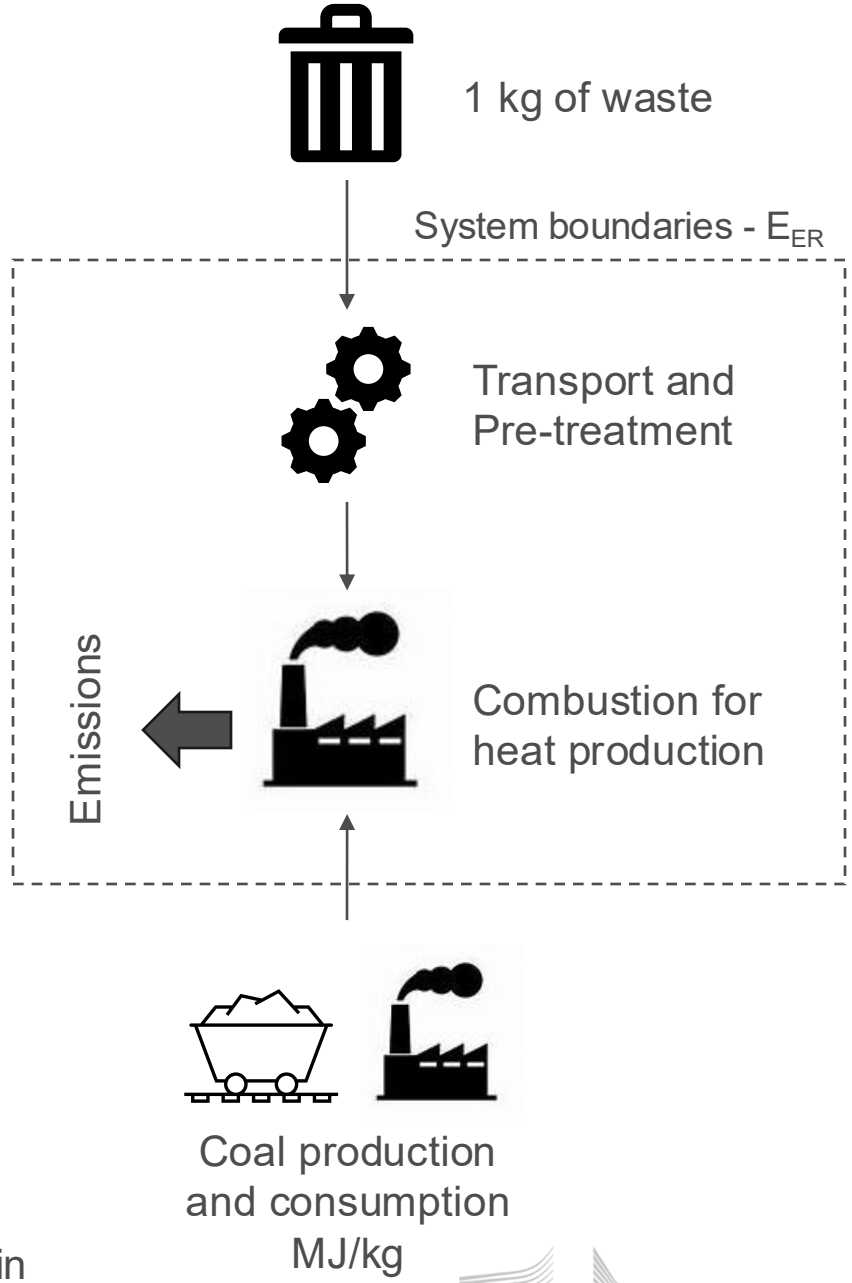
$$R_3(1-B)(E_{ER} - LHV\ X_{ER_{heat}}\ E_{SE_{heat}} - LHV X_{ER_{El}} E_{SE_{El}})$$

*Same case applied for the AD process

c. Solid recovered fuel (SRF) production and consumption

- Non-recyclable and combustible materials --> production of solid recovered fuel (SRF)* --> 'energy' part of the CFF (as in slide #38)
  - **E_{ER} = impacts due to waste pre-processing, and combustion at the cement kiln** (potentially burning 100% SRF),
  - **E_{SE}** = impacts **due to coal production and combustion in the cement kiln**, associated to the combustion efficiency (X), and the LHV of the SRF produced.

$$R_3(1-B)(E_{ER} - LHV\ X_{ER_{heat}}\ E_{SE_{heat}} - LHV X_{ER_{Electricity}} E_{SE_{Electricity}})$$



* The material is processed to obtain a fuel that can be potentially used in cement kilns to substitute fossil fuels (i.e., coal or methane).

Next steps

Next activities

- **Collect comments** from the members:
  - Send us your feedback via the EU survey for this TAB: https://ec.europa.eu/eusurvey/runner/3ca0edf6-5991-c282-8636-77a9a5462245
  - Feedback deadline: **13th of July 2025**
  - The questionnaire allows for submitting PDFs in case you are providing additional material or studies supporting your feedback.
  - In case of technical issues, this can be submitted to: ENV-ENVIRONMENTAL-FOOTPRINT@ec.europa.eu
- Consider this modelling features to be added to the EF Recommendation

Discussion 5 – Complex products and 'energy' part of the CFF

- Is the recycling of composite and complex products clear?
- Is the bottom ash from incineration plant right to be included in secondary datasets? Is the modelling clear?
- Is the modelling of solid recovered fuels straightforward?

- AOB?

[15 min]

Thank you

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