SSbD in the Industrial Environment
Embedding SSbD in the manufacturing Value Chain

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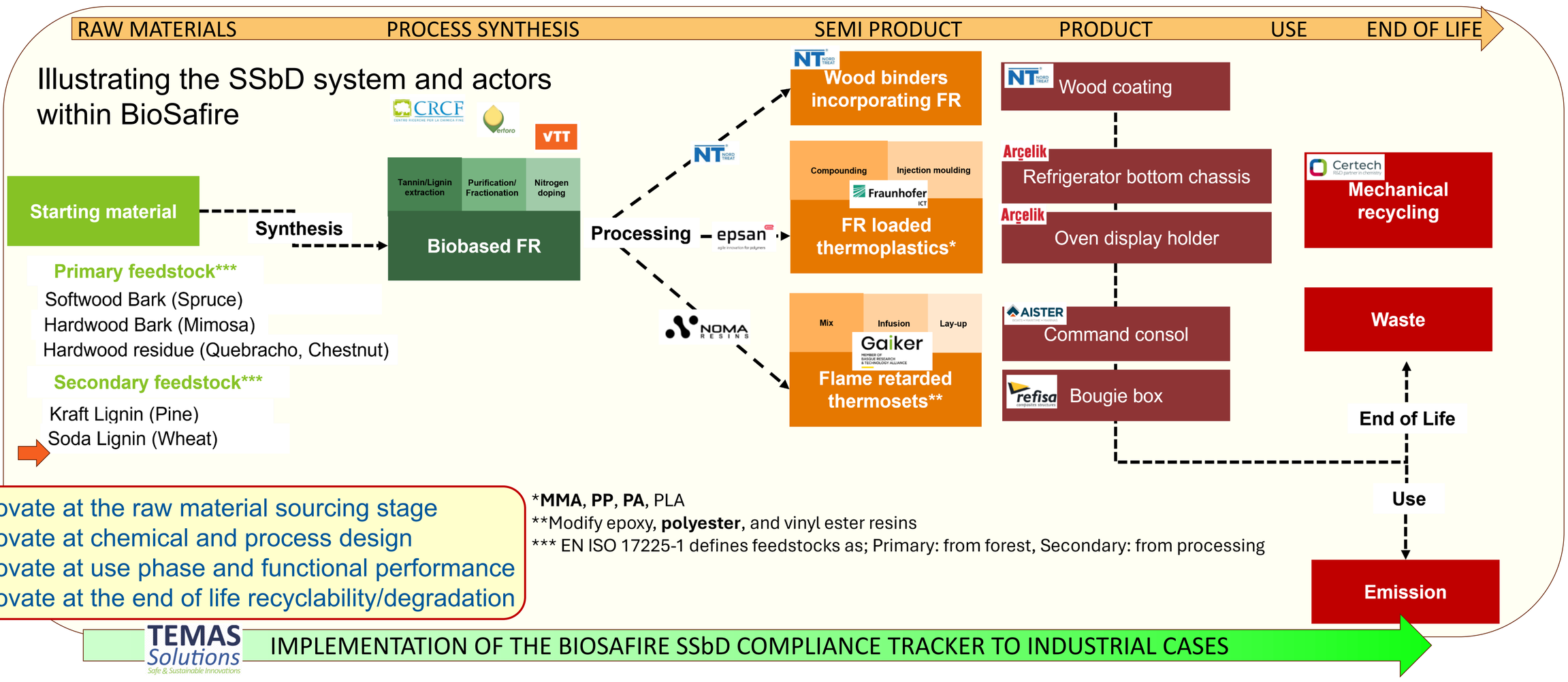
This poster illustrates the methodology applied to the development of biobased flame retardants (FRs) to ensure that SSbD becomes an integral part of **industrial product development** from research to manufacturing, based on a three pillars approach whereby Research, Development and Innovation (Pillar 1) and the stages of SSbD based on the JRC guidance (2024) as applied to the project case studies (Pillar 3) are seamlessly integrated through Pillar 2, where interoperability is confirmed and decisions are taken.

WHAT ➡ BIOSAFIRE aims to develop and manufacture **new, more sustainable and safer flame retardant materials** using biobased functionalized additives based on lignin and tannins.

HOW ➡

Innovate at the raw material sourcing stage
Innovate at chemical and process design
Innovate at use phase and functional performance
Innovate at the end of life recyclability/degradation

Illustrating the SSbD system and actors within BioSafire



*MMA, PP, PA, PLA
**Modify epoxy, polyester, and vinyl ester resins
*** EN ISO 17225-1 defines feedstocks as; Primary: from forest, Secondary: from processing

TEMAS Solutions — IMPLEMENTATION OF THE BIOSAFIRE SSbD COMPLIANCE TRACKER TO INDUSTRIAL CASES

IN PRACTISE ➡

In order to ensure that the work of developers and industry (Pillar 1) is closely linked through the whole process of product development to all aspects of SSbD, bridging Pillar 2 has been established to promotes close adherence to the principles of SSbD. Products developed in this way will almost certainly be regulatory compliant so market ready products will not face obstacles when looking for investors

Regulators cooperating in this process will also become aware of upcoming trends and developments within industry

Pillar 1

Material Development

Produce FRs from renewable sources

Integrate biobased FRs into polymeric matrices or encapsulate for wood coating

Deliver efficient flame retardancy (char barrier formation) to final products with minimal smoke formation and heat releases.

Evaluate recyclability potential of biobased FRs

Pillar 2

Interoperability & Decision Making

Functionality driven innovation technical standards to guarantee performance effectiveness and comparison with benchmark conventional FRs

Consider the whole life cycle; unknown persistence, bioaccumulation, and toxicity for biobased FRs when alone, integrated into matrices or transformed after incineration.

Make the scale up more cost efficient

Pillar 3

SSbD Framework

Valorisation of EU paper by-products or agro-waste under-valorized or burned for energy

Reduce reaction steps and the use of toxic chemicals and solvents

Convert biobased FRs synthesis process (chemical) waste into resources

Reduce potential for migration or leaching of biobased FRs

Ensure minimal toxicity of emissions and residual char during use

Where R&I meets SSbD

NEXT STEPS ➡

Industry has to experience the benefits of complying with the requirements of SSbD in order for it to become widely accepted. It must be seen and presented by developers as a support tool or mechanism which will enable a new product to be regulatory compliant at the stage of market launch.

BioSafire will help establish SSbD compliance through tools including a tiered system with well defined steps and control points.
In the coming period the project partners will focus on finalising the application of SSbD to bio-based flame retardants

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