



INTERNATIONAL COOPERATION FOR SUSTAINABLE AVIATION BIOFUELS

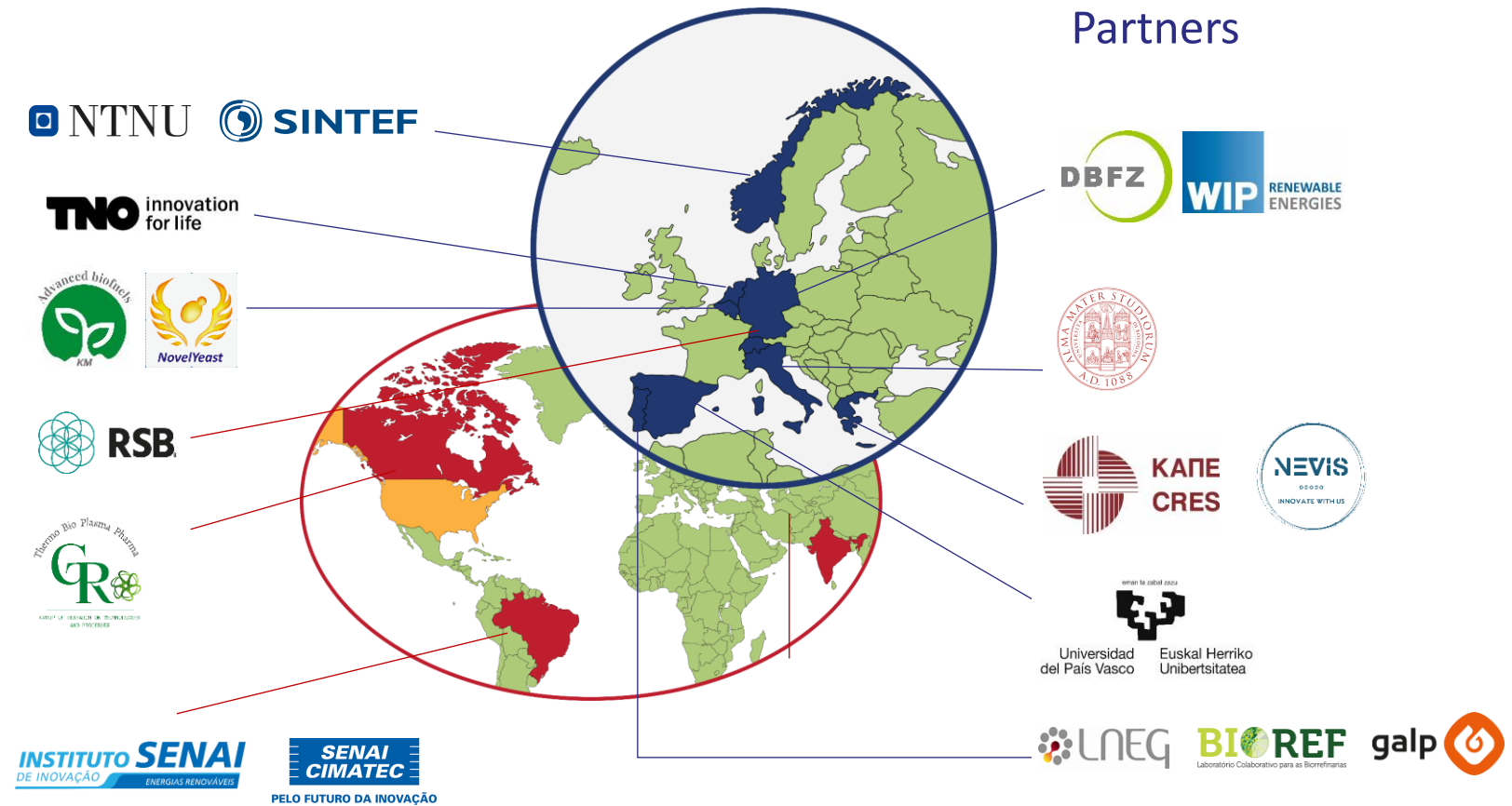
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Project details

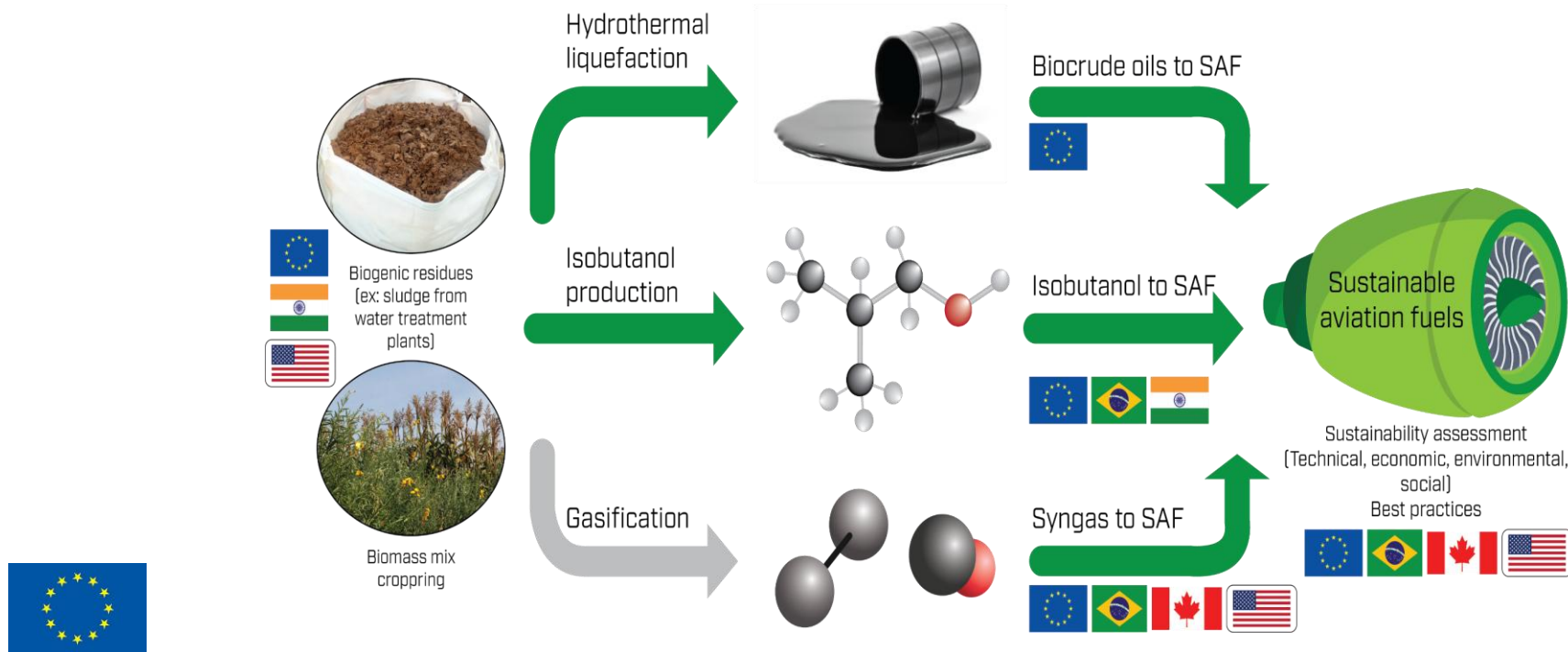
- ✓ International Cooperation on Sustainable Aviation Biofuels
- ✓ HORIZON EUROPE
- ✓ 36 months
- ✓ 15 European partners from 9 countries
- ✓ 3 partners from 2 Mission Innovation Countries (MIC)
- ✓ €3 161 948.25

The consortium

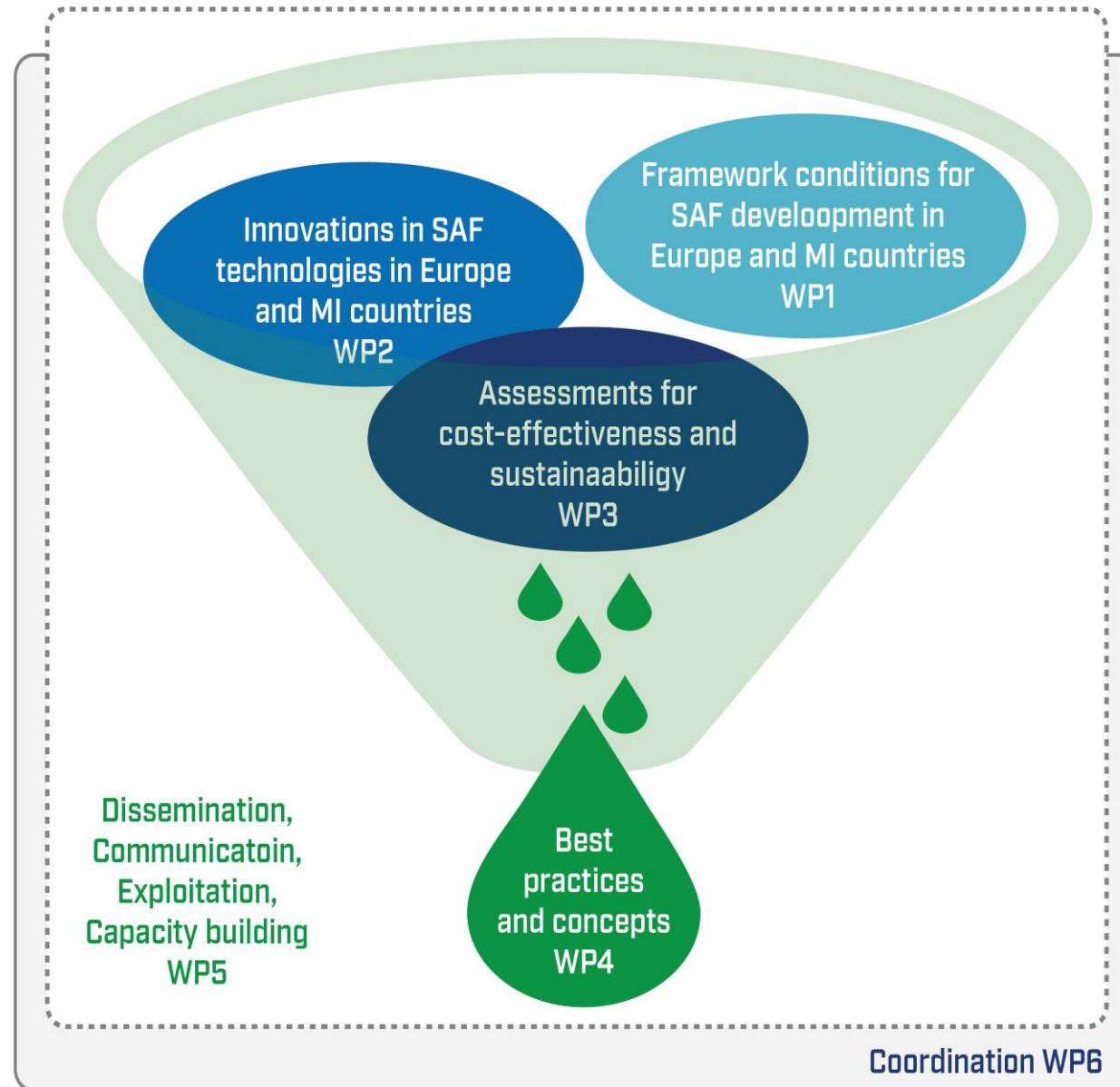


Objectives

To develop **best practices** (based on improved innovative technologies) and **concepts** (founded on market access knowledge) along **three most promising pathways for SAF development** in both Europe and Mission Innovation Countries, considering their technical feasibility, economic viability, and environmental impact.



Approach

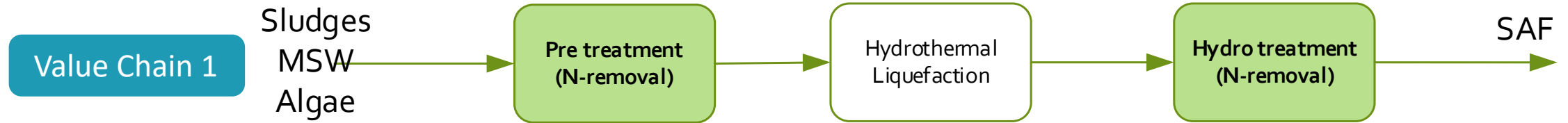


Framework conditions for SAF developments in Europe and MIC



- Investigation of waste streams and bioenergy carriers, like non-conventional oleaginous yeasts, strains for isobutanol production, and syngas, exploring the dynamic landscape of SAF production.
- Overview of current and innovative sustainable feedstock with focus on RED III Annex IX Part A sustainable resources to be in line with the ReFuelEU Aviation
- Overview of technological approaches in the various X (biocrude oils/isobutanol/syngas) to SAF value chains.
- GAP analysis of systemic constrains in each X to SAF Value Chain
- Analysis of policy overview and legislation in force

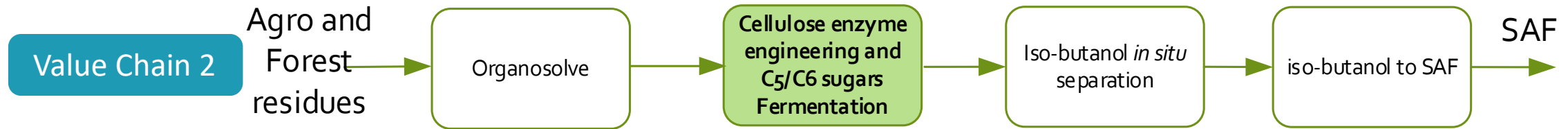
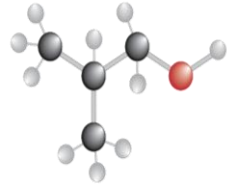
Innovations



Biocrude oils to SAF value chain

- Hydrotreatment is the most mature and established technology for nitrogen removal/reduction from HTL crude bio-oils.
- Evaluation of pre-treatment methods for nitrogen removal from microalgae before the HTL process.
- Continuous HTL tests with pretreated microalgae followed by hydrotreatment of the biocrude oils for nitrogen removal to SAF production.

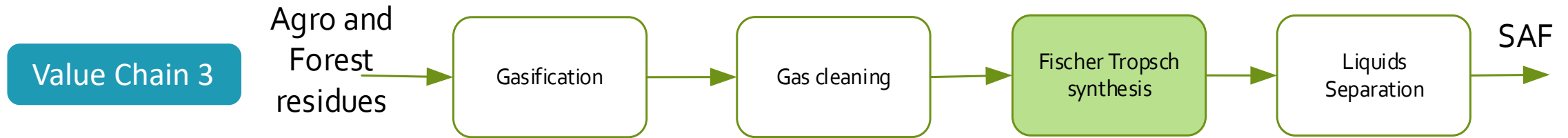
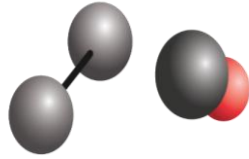
Innovations



Isobutanol to SAF value chain

- Development of a new 2G yeast strain to selectively produce isobutanol using both C5 and C6 streams from lignocellulosic biomass hydrolysates.
- Design of a novel fermentation and pervaporation module to produce high purity isobutanol under continuous operation.
- Development of a catalytic process that selectively produces SAF range hydrocarbons using heterogeneous catalysts under flow condition.
- Validation of the isobutanol to SAF value-chain by assessing the SAF quality under industrial requirements.

Innovations



Syngas to SAF value chain

- SAF selectivity through conventional Fischer-Tropsch processes is well below 50% according to literature review.
- Development of alternative syngas to SAF route through olefin production (SOSAF).
- SOSAF offers high SAF selectivity with highly tunable products. Potentially more cost efficient relevant for small scale application.

Innovations



Feedstock

Intermediate
crops



SORGHUM



PIGEON PEA



SUNN HEMP



SORGHUM +
PIGEON PEA



SORGHUM +
SUNN HEMP

Alternative sustainable feedstock schemes

- Design and testing in field trials of mixed-cropping systems as intermediate crops
- Define the species combination ratios in the mixed cropping system to regulate the lignocellulosic and mineral composition of blended feedstocks.
- Mix cropping systems, integrated within a conventional food crop rotations will increase biomass availability by 3 to 4 times, contribute to a more efficient use of land resources and reduce GHG emissions.

Assessments for cost-effectiveness and sustainability



- Sustainability review of SAF supply chains, taking into account techno-economic data, environmental impacts, social aspects and social acceptance
- Sustainability assessment for each specific value chain and options to improve performances
 - ✓ Technical analysis
 - ✓ Economic analysis
 - ✓ Life cycle assessment
 - ✓ Social sustainability assessment and social acceptance
- SAF policies and markets
 - ✓ Detailed analysis and mapping exercise of existing policies and strategies for the deployment of SAF.
 - ✓ Overview of SAF policy support actions in EU, Brazil, Canada, China, India, USA.

Best practices and concepts



- Development of future best practices and concepts along the entire value chain for the three technological pathways.
- Elaboration of a set of recommendations to accelerate the scaling up of ICARUS value chains and guidance for SAF certification.
- Assessment of SAF development in Africa.
- Coordination with oil sector, airports and airlines.

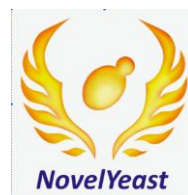
Thank you

Stay tuned....



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Partners



Associated Partners



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