

INNOVATIVE SOLUTIONS FOR THREE MAIN SUSTAINABLE AVIATION FUEL (SAF) PRODUCTION ROUTES

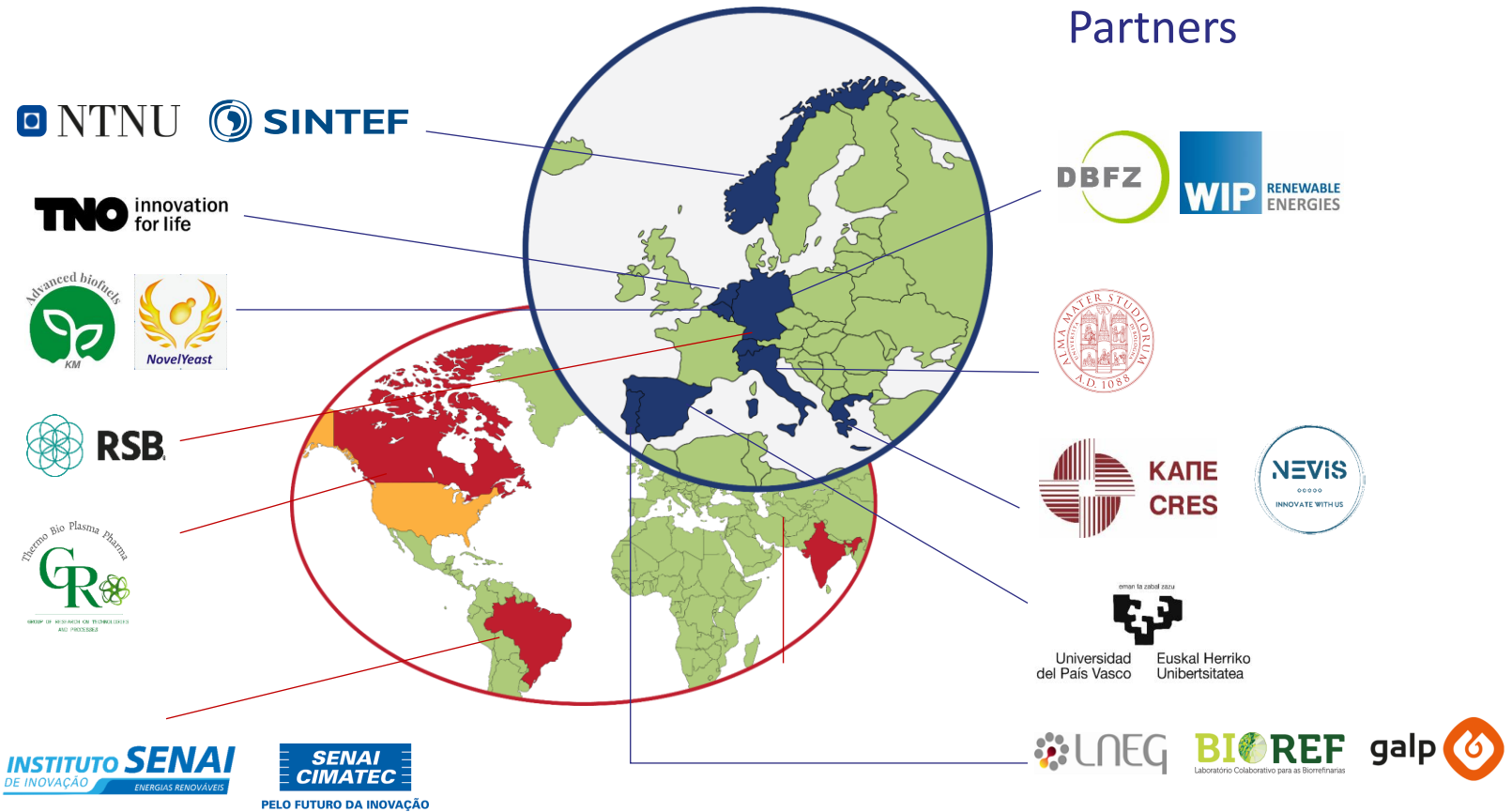
Myrsini Christou,
Biomass Department, CRES, Greece



Project details

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

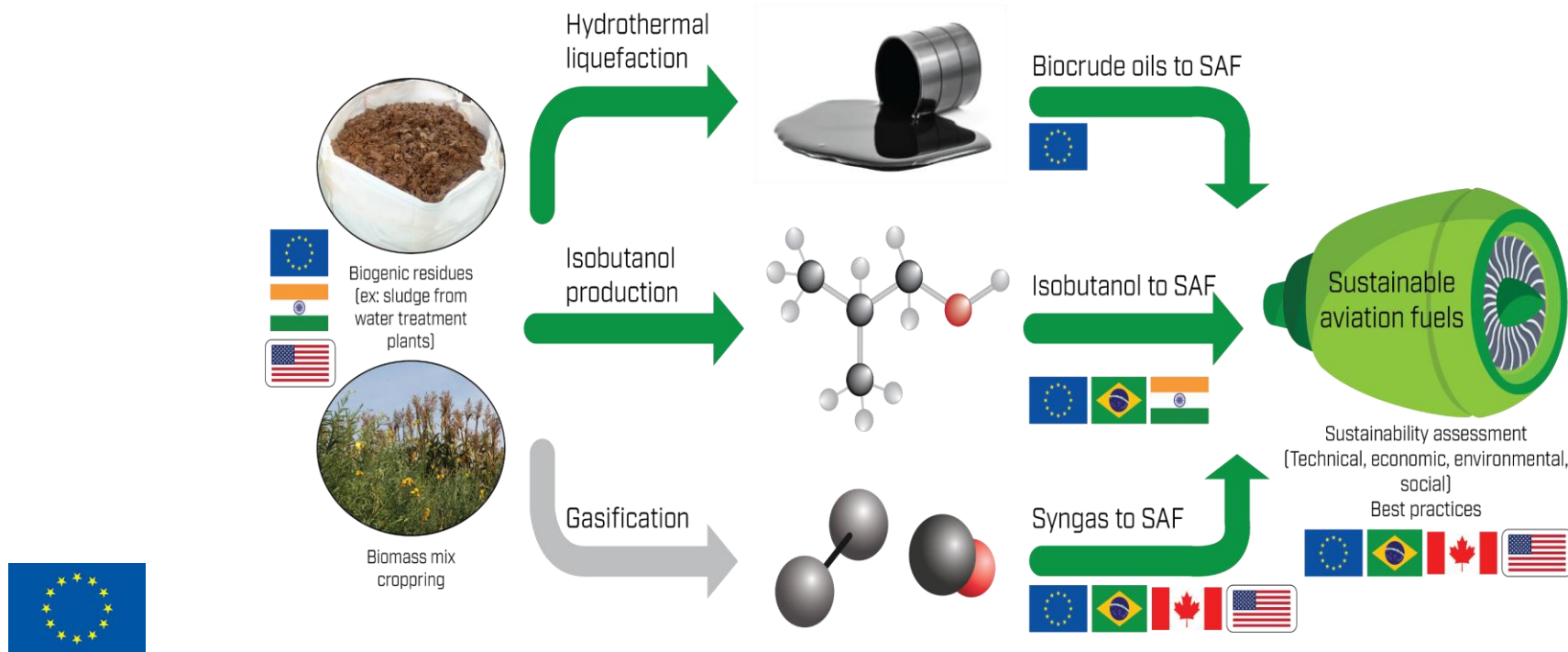
The consortium



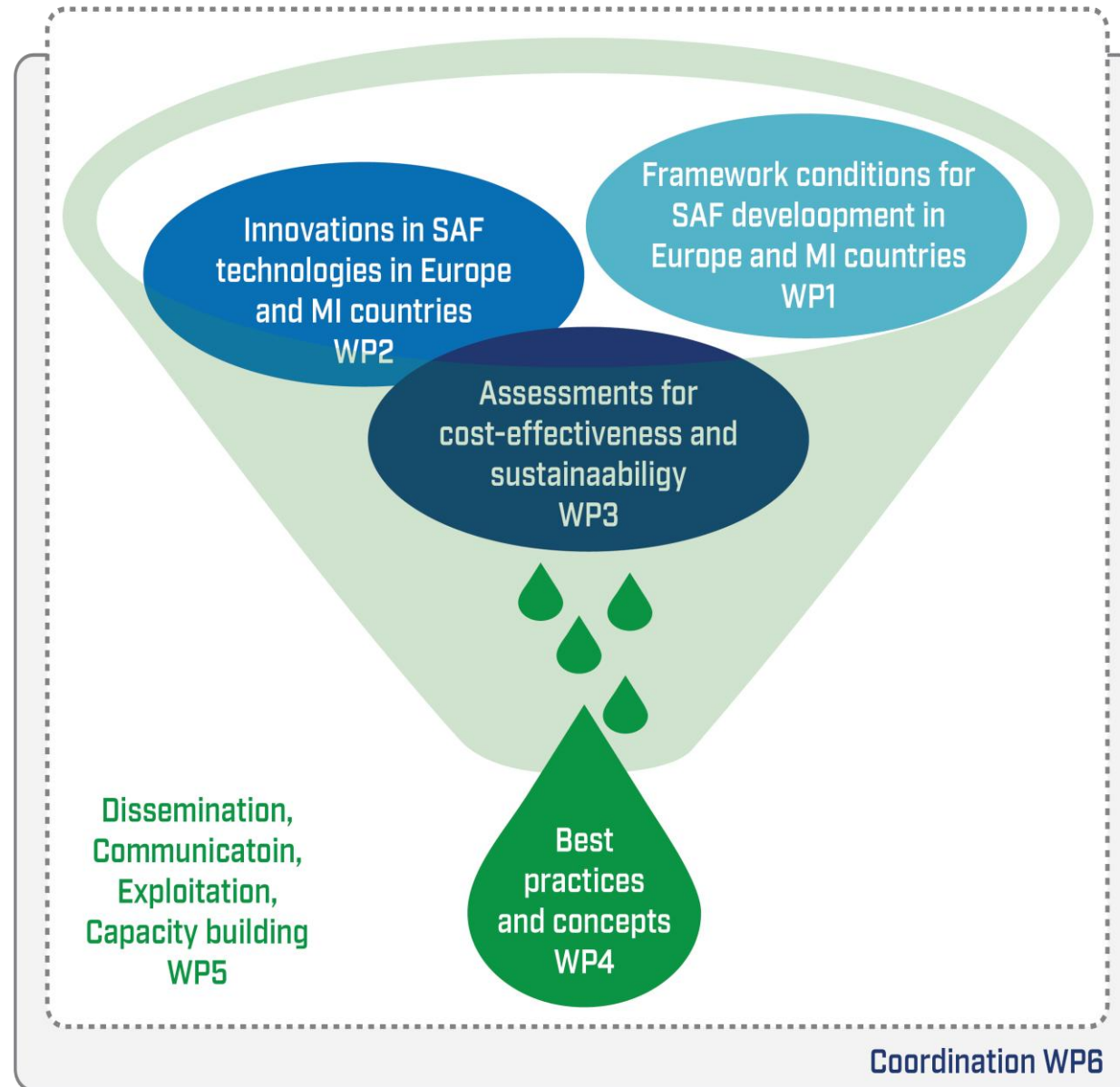
Associated Partners

Objectives

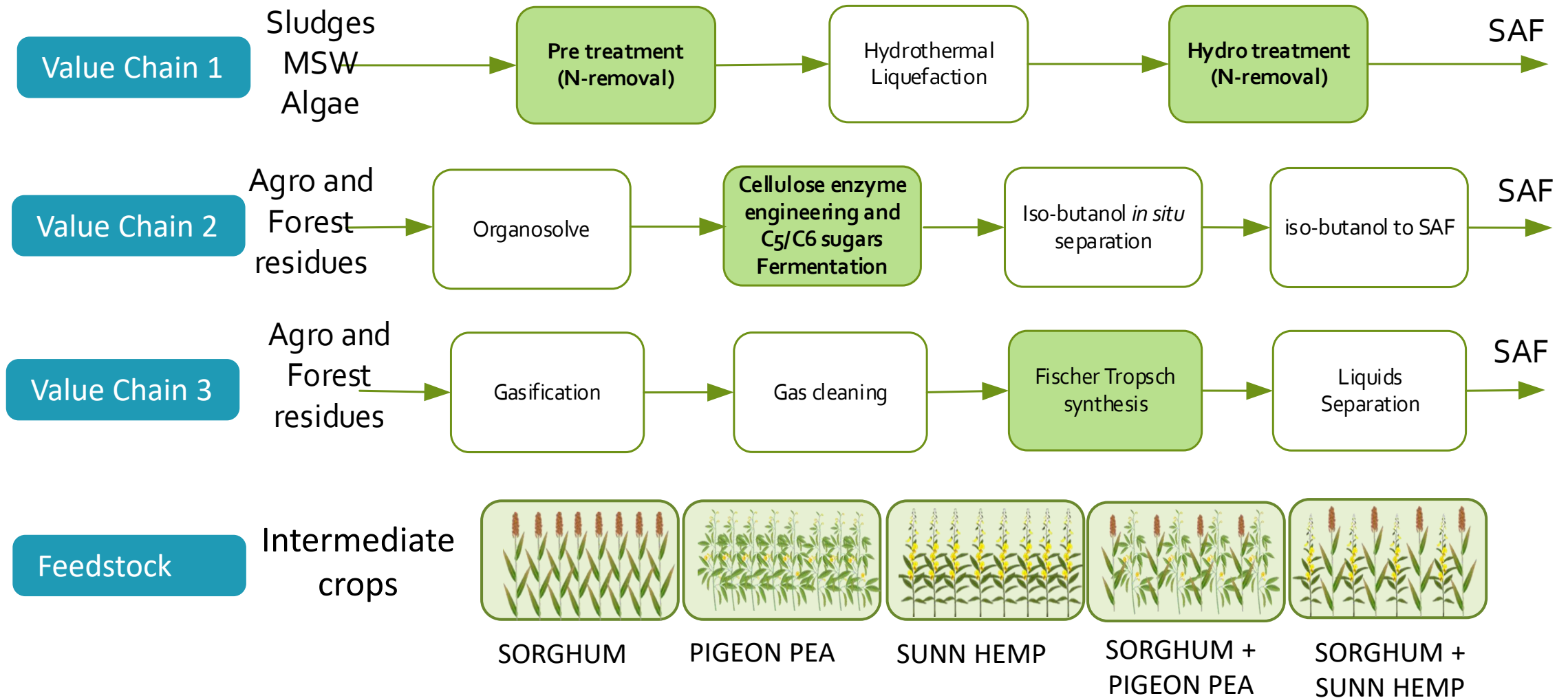
To develop **best practices** (based on improved innovative technologies) and **concepts** (founded on market access knowledge) along **three most promising pathways for SAF development** in both Europe and Mission Innovation Countries, considering their technical feasibility, economic viability, and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



Approach



Innovations



Activities



Biocrude oils to SAF value chain

- Hydrotreatment is the most mature and established technology for nitrogen removal/reduction from HTL crude bio-oils (literature review).
- The evolving landscape of HTL technologies and nitrogen removal processes underscores the importance of interdisciplinary research in achieving sustainable bio-oil production.
- 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 SAF production.

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.

Syngas to SAF value chain

- SAF selectivity through conventional Fischer-Tropsch processes is well below 50% (literature review).
- Development of alternative syngas to SAF route through olefin production.

Activities



Alternative sustainable feedstock schemes

- 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.
- Design and testing in field trials of mixed-cropping systems as intermediate crops, significantly increasing the availability of dedicated biomass for SAF.

SAF Policies

- Detailed analysis and mapping exercise of the existing policies and strategies for the deployment of SAF.
- Overview of SAF policy support actions in EU, Brazil, Canada, China, India, USA.

ICARUS 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 (Concawe), airports and airlines.

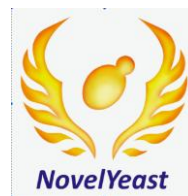
Thank you

Stay tuned....



Myrsini Christou
mchrist@cres.gr

Partners



Associated Partners



ICARUS has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement no. 101122303