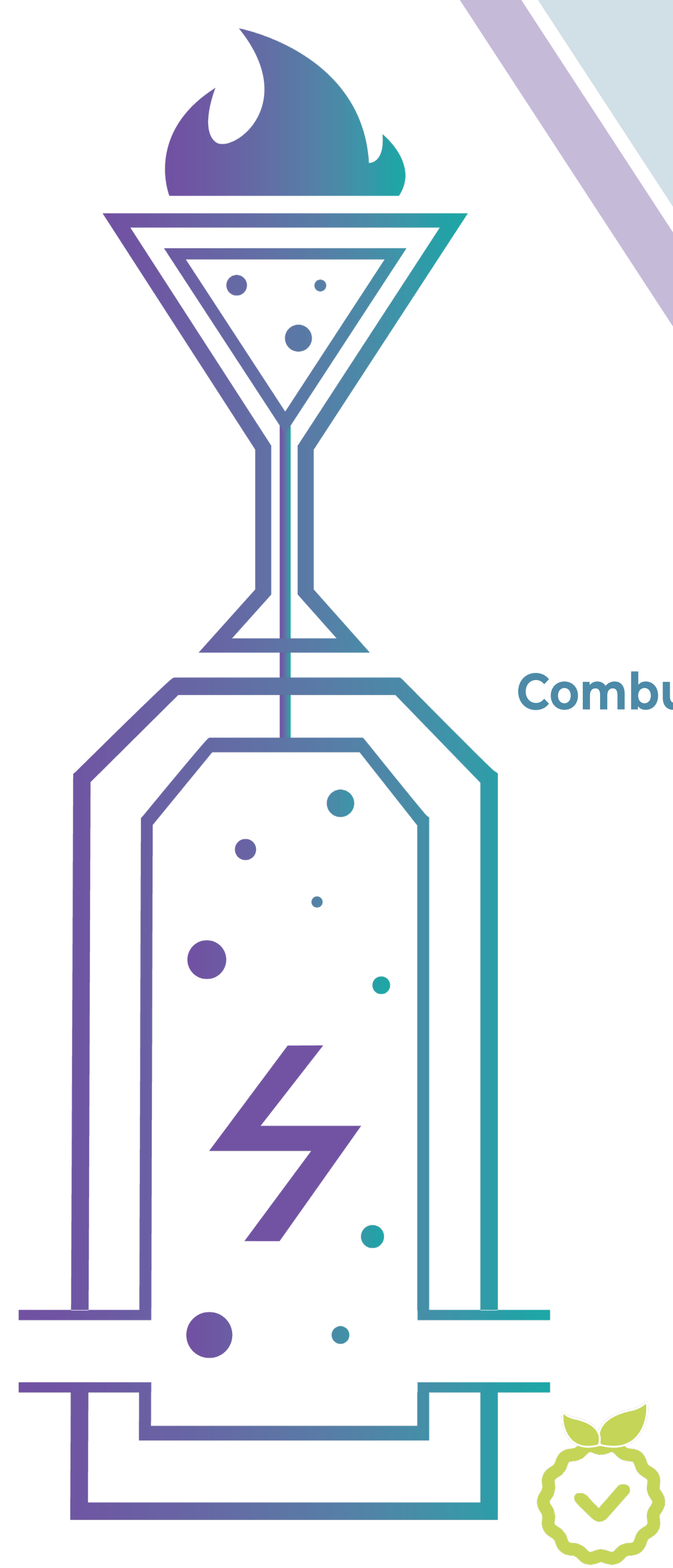




CAIPIR[NH₃A

Combustion of liquid ammonia, assisted by plasma discharges, as a novel and clean energy conversion method

COCKTAIL INGREDIENTS: “CAIPIRINH₃A”

- An experimentally validated NH₃ combustion kinetic model with multiple plasma-induced effects and sub-mechanisms incorporated.
- Efficient and stable NH₃ plasma systems for plasma assisted combustion.
- Tailored & optimised combustor components and smart & active control systems.
- Optimal integration of all modules and extensive TRL4 testing.
- A sustainable and extrovert approach through LCA, LCC, market studies.
- Tailored dissemination, exploitation & communication strategy to maximise its market uptake.

THE PRODUCT: PLASMA MIST NH₃ BURNER (PLASMI-NH₃ BURNER)

The Plasma Mist Ammonia (PlasMi-NH₃) burner will be a fully operational combustor, integrating unique plasma systems, an efficient L-NH₃ injection system, and advanced combustion control strategies to enhance NH₃ combustion while minimising NO_x emissions. Its development will be supported by accurate kinetic modeling, plasma technology, computational fluid dynamics, and combustion simulations.

TECHNICAL BENEFITS

High Efficiency: Matches conventional diesel engines with 40% thermal efficiency.

Low Emissions: Tier 4 NO_x compliance (≤ 7.5 g/kWh).

Faster Ignition: Over 50% quicker ignition and a 20% wider combustion range.

Clean Exhaust: Near-zero NH₃ slip (<10 ppm).



Maritime



Automotive



Aerospace



Power
Generation

A next-generation NH₃ combustion system with no secondary after treatment for NH₃ and NO_x reduction, simplifying operations and enabling a more compact design, perfectly engineered for the transportation and energy sectors.



www.caipirinh3a.eu



caipirinh3a-project



@caipirinh3a



info@caipirinh3a.eu

IMPACT

Societal:

- No harmful fumes to improve air quality and public health.
- Reduced noise pollution.
- Supports employment and public acceptance of NH₃ as a fuel.



Techno economical:

- Strengthens EU self-reliance and resilience in the energy sector.
- Boosts NH₃ technology development for a profitable, sustainable fuel economy.



Environmental:

- No greenhouse gases produced.
- Zero toxic emissions to restore the environment & recover biodiversity.
- Sustainable transport and increased renewable energy adoption.



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