Engineering, integration and permits for renewable and electrified heat demonstrators in process plants

THE CALL

HORIZON-CL4-2027-02-MAT-PROD-32-two-stage

Efficient energy input from renewable sources and energy management in the process industries

Innovation Action, lump sum, EUR 7–9 million · TRL 4–5 to 6–7 · Processes4Planet · stage 1: 2 Feb 2027 · stage 2: 2 Sep 2027

EXPECTED OUTCOME OF THE CALL → IPE CONTRIBUTION

Pilot demonstration, preferably in a real industrial environment	Integration in the host unit: design basis, tie-ins designed on a laser scan, utilities and grid connection, mechanical, piping, E&I and steel design, HAZOP inputs, commissioning support
Electrified, hybrid and renewable heat at 100–500 °C and above 500 °C	Process-integration studies for heat pumps, electric heaters and hybrid set-ups (e.g. electric preheating before fired heating), with energy and mass balances
Storage against fluctuating renewable supply	Layout, structural, safety and electrical integration of thermal-storage modules next to running units
At least 20 % lower CO2 footprint; GHG baseline; business case	Baseline energy data from the host plant, CAPEX/OPEX at demonstration and industrial scale, replication study for other plants
Permitting and deployment	Permit documents for a Slovak host site (EIA, IPPC, building permit); engineering inputs to local permitting elsewhere

RELEVANT IPE REFERENCES

- Duslo Strážske: boiler house of 13.1 MW thermal input with EIA notification, IPPC change and building-permit design (2022); detail design of a heat exchanger for nitrous-gas preheating, KD2 nitric-acid plant (2026).
- ENVIRAL Leopoldov: extension of the CHP plant with a 20 t/h boiler and a 1.9 MWe turbine (2023); Kronospan / DUKOL Ostrava: steam turbine and generator (2018–2022).
- U. S. Steel Košice: chromium-free passivation on tinning lines EC2 (2015–2017) and EC1 (2021–2024), from laser scan to supervision.
- Horizon Europe proposal CO2-THERMOS (HORIZON-CL4-2026-01-MAT-PROD-31, Processes4Planet, coordinated by Imperial College London) – evaluated 15/15, grant agreement in preparation.

WE ARE LOOKING FOR

Coordinators; owners of heat-pump, electric-heating and thermal-storage technologies; advanced-material and insulation suppliers; industrial host sites; RTOs for LCA and GHG methodology.

IPE ROLE

Partner, or work-package lead for engineering, demonstration design, permitting and replication. IPE designs, integrates and permits the pilot and demonstration units of the consortium.

DISCIPLINES

Process, mechanical and piping, I&C, electrical, civil and steel structures, in one team

DESIGN TOOLS

Aspen Plus simulation, AVEVA E3D and OCTAVE Forte 3DWorks, CAESAR II pipe stress; 3D design on laser scans

PERMITTING IN SLOVAKIA

EIA, IPPC and SEVESO inputs, building permits; IPE prepares the applications, the authorities decide

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