ACHIEF

2-YEARS PROGRESS WORKSHOP

BOOSTING HIGH-PERFORMANCE MATERIALS FOR ENERGY INTENSIVE INDUSTRIES

Thursday 1st December 2022
9:30-12:00 CET

Funded by the European Union

Innovative high performance Alloys and Coatings for HIghly EFficient intensive energy processes

EU H2020 project ACHIEF

The project has received funding from the European Union's Horizon 2020 research and innovation program under Grant Agreement N° 958374.

Agenda

TIMING	PROGRAMME
9:30-9:45	**Introduction and presentation of ACHIEF** Marie Cabaret, CEA
9:45-10:10	**Artificial intelligence for material selection** Tom Andersson, VTT
10:10-10:35	**PDC coatings development with improved high temperature corrosion and erosion resistance** Sébastien Vry, CEA
10:35-11:00	**Innovative high-temperature and creep resistance materials based on HESs models** Pilar Rey Rodríguez, AIMEN
11:00-11:25	**Advanced Cr-steels with 15% improved creep resistance and high temperature corrosion resistance** Lorena Callejo, TECNALIA
11:25-11:50	**Sensors developments with the ability to withstand harsh Environments** Andreas Pohlkötter, Engionic group
11:50-12:00	**Conclusions and wrap up** Marie Cabaret, CEA

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Speakers

Tom ANDERSSON - VTT

Pilar REY - AIMEN

Sébastien VRY - CEA

Lorena CALLEJO - TECNALIA

Andreas Pohlkötter - Engionic group

Last minute change : Britta Koch – Engionic group

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Project overview

Grant agreement no.: 958374

Coordinator: COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES (CEA), France

Participants: 11 partners from 6 EU countries (Belgium, Finland, France, Germany, Italy, Spain) & Turkey

Duration: 1 October 2020-31 March 2024 (42M)

Project budget: 5.8 MEUR

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Partners

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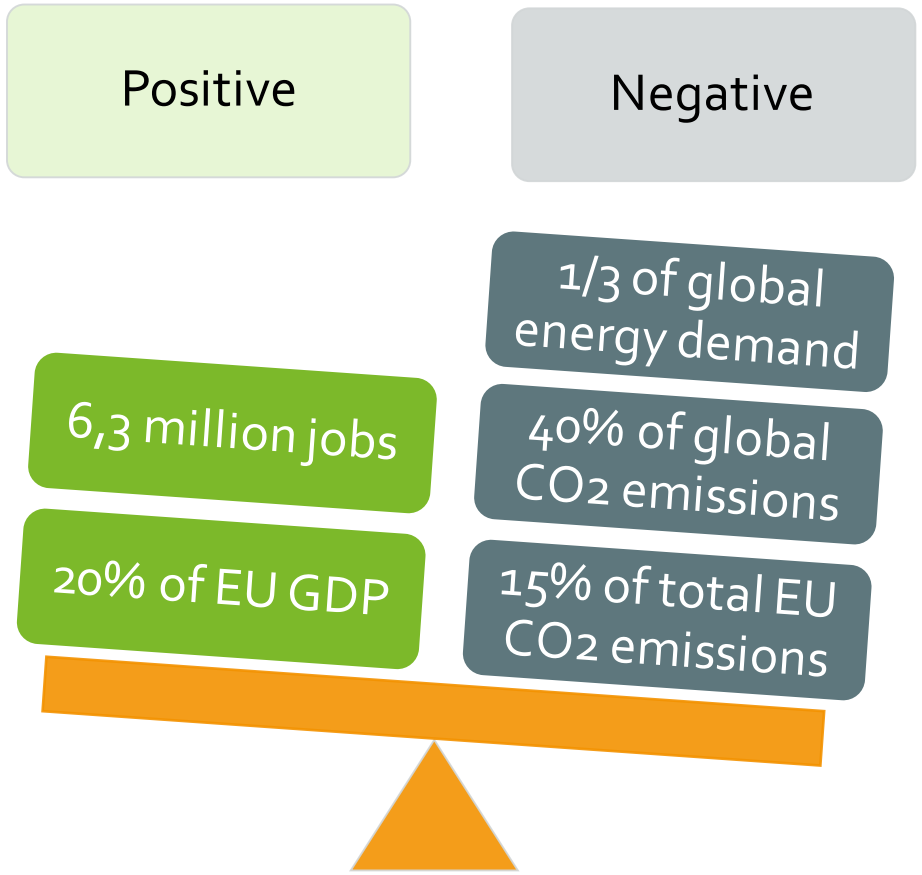
The importance & challenges of Energy Intensive Industries (EIIs)



Source: T. Wyns, G. Khandekar, I. Robson (2018), Industrial Value Chain: a bridge towards a carbon neutral Europe, Report of IES-VUB & EEA (2019) Annual European Union greenhouse gas inventory 1990–2017 and inventory report 2019. Brussels: European Environment Agency.

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The ACHIEF concept

Goal: Improving process performance and energy efficiency in EIIs by developing more durable materials components and equipment

How will ACHIEF work?

- Implementing novel Integrated Artificial Intelligence-aided Materials Toolbox (IAIMT)
- Developing novel efficient materials & coating solutions
- Validating the developed materials & coating solutions in three end user's cases: aluminum, steel, petrochemicals
- Promoting and disseminating the results of the project

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The ACHIEF objectives

- Developing models for materials design based on computational modelling & AI (WP2)
- Developing novel protective Polymer Derived Ceramic (PDC) coatings with improved high-temperature erosion and corrosion resistance (WP3)
- Developing innovative high-temperature strength and creep resistance materials based on novel High-Entropy Alloys (HEAs) to allow reaching higher process temperatures (WP4)
- Designing a new high Chromium steel grade with creep resistance 15% improved (WP5)
- Developing temperature and strain Fiber Bragg Grating sensors to be embedded in components fabricated with HEA materials or coated with PDC coatings (WP6)
- Demonstrating the performance and efficiency of the developed materials and coating solutions in three use cases: PDC coatings & HESA nano-composite coatings in aluminium use case, HESA materials in steel use case, PDC coatings in petrochemical use case (WP7)
- Promoting and disseminating the results of the project (WP8&9)

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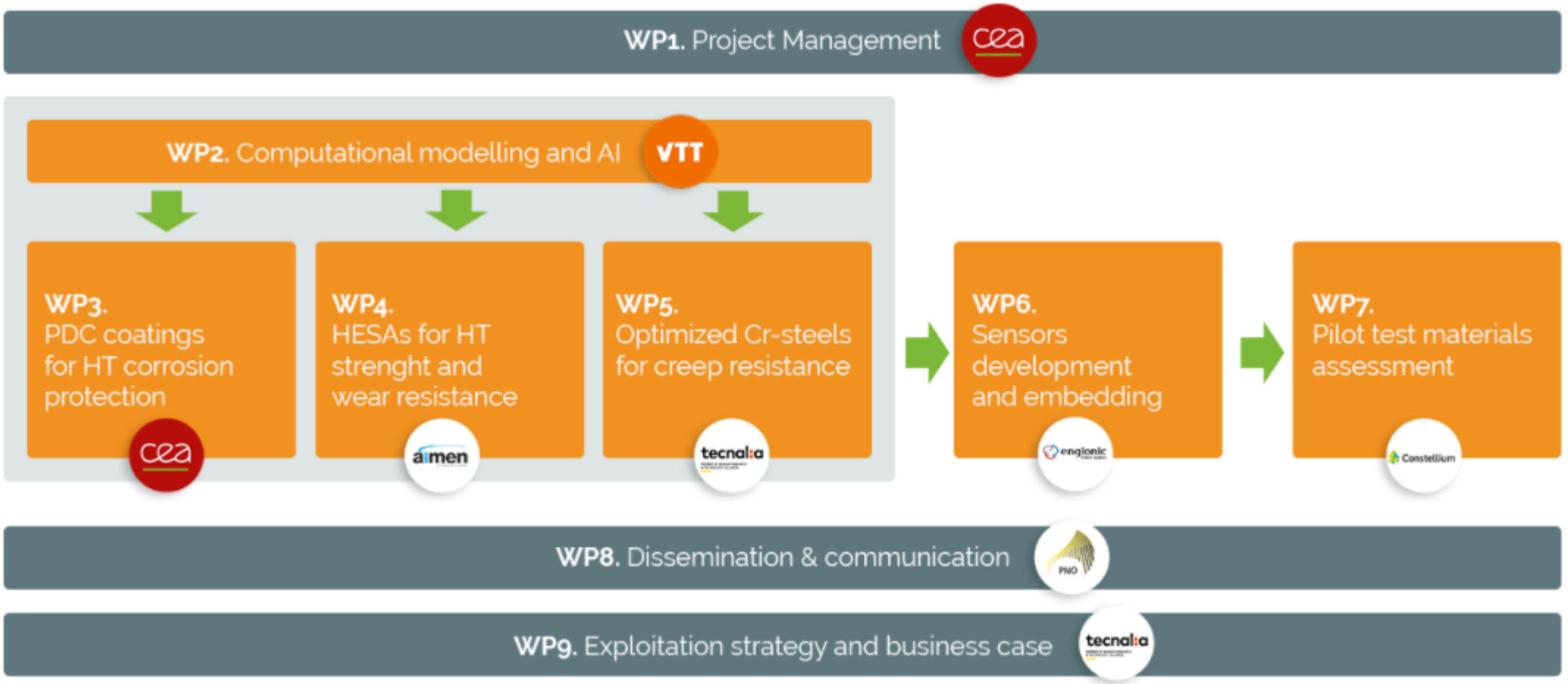
ACHIEF Workplan



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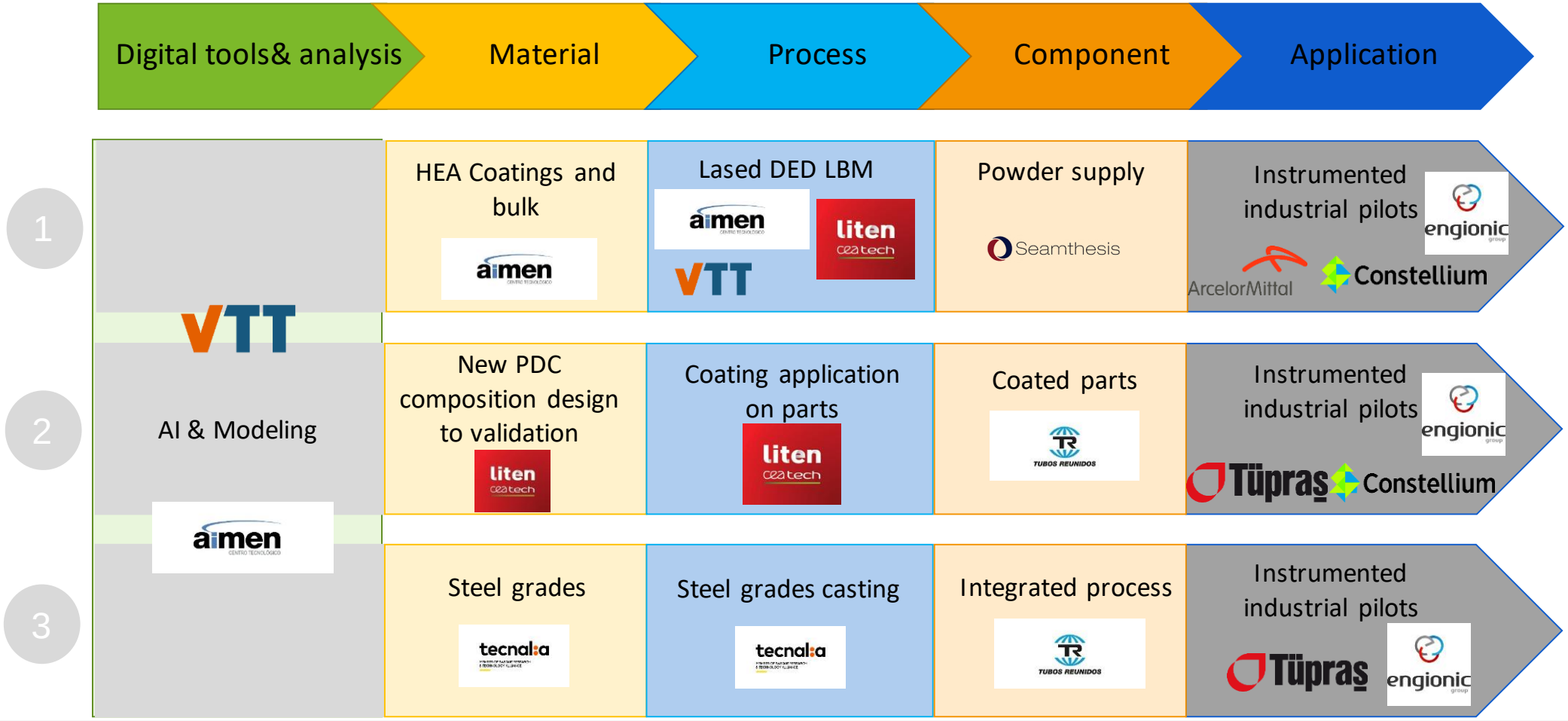
ACHIEF value chain



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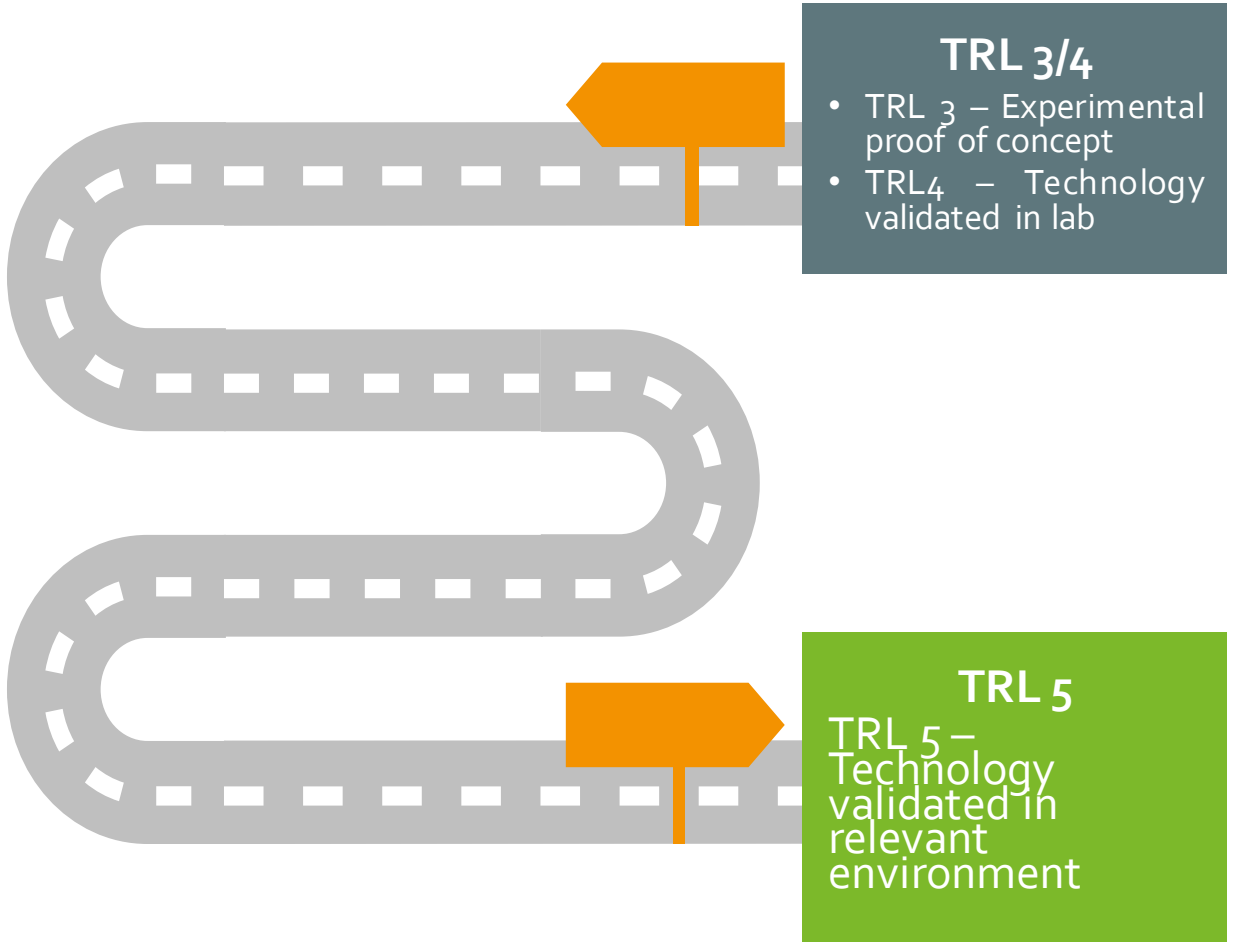
From TRL 3 to TRL5

ACHIEF addresses different technological and materials solutions, starting from TRLs 3-4, with the goal of taking them to an overall final TRL5.

These solutions will be further studied and developed through extensive laboratory tests for screening of advanced high-performance materials (TRL3). Subsequently, the concept will be validated at laboratory level (TRL4), followed by its demonstration at relevant environments in three end user's cases (TRL 5): CONSTELLIUM (France), ARCELOR MITTAL SESTAO (Spain), TUPRAS (Turkey).



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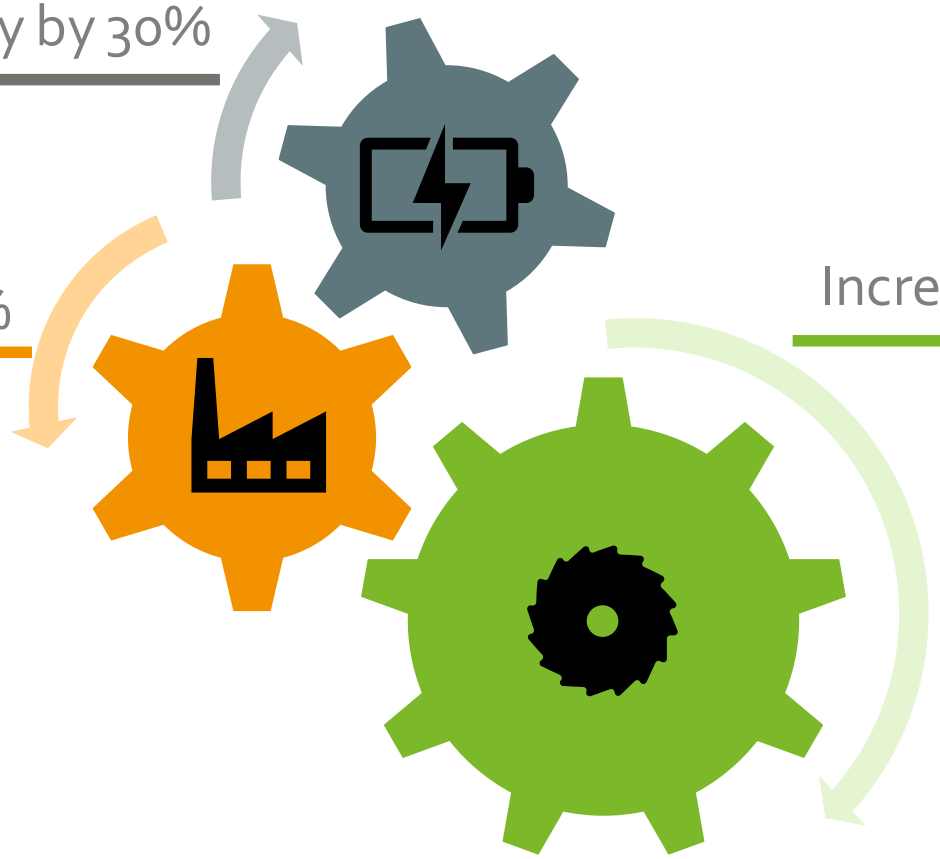
Expected impacts

Improving energy efficiency by 30%

Reducing CO2 emissions by 20 %

Increasing equipment lifetime >20%



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Thank You for following our conference

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Next steps

- Validation of the novel materials at lab scale
- Implementation at industrial scale
- Validation of the novel materials at industrial scale
- Work on exploitation of the novel materials to be deployed in other EIIs

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Get in touch for more information!

Project coordinator: Marie Cabaret-Lampin
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Vist our website: https://www.achief.eu/

Follow us on Twitter!
@ACHIEF42681668

Follow us on LinkedIn!
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