



**Shot Peening Integration in Tempering Processes of Steels for  
Enhanced Fatigue Performance**

## **Project Presentation**

Place, Date

Speaker name – Organisation



**Funded by  
the European Union**

- **Call:** RFCS-2023 (Call of the research programme of the Research Fund for Coal and Steel)
  - **Start date:** 1 July 2024
  - **End date:** 31 December 2027
  - **Duration:** 42 Months
  - **EC Funding:** € 1.18 million
- **Coordinator:** I2M UNTERNEHMENSENTWICKLUNG GMBH (I2M)

- 5 partners, 4 countries:

**Austria (i2m), Germany (KIT, STRESSTECH), Spain (SIDENOR) and Italy (CRF).**



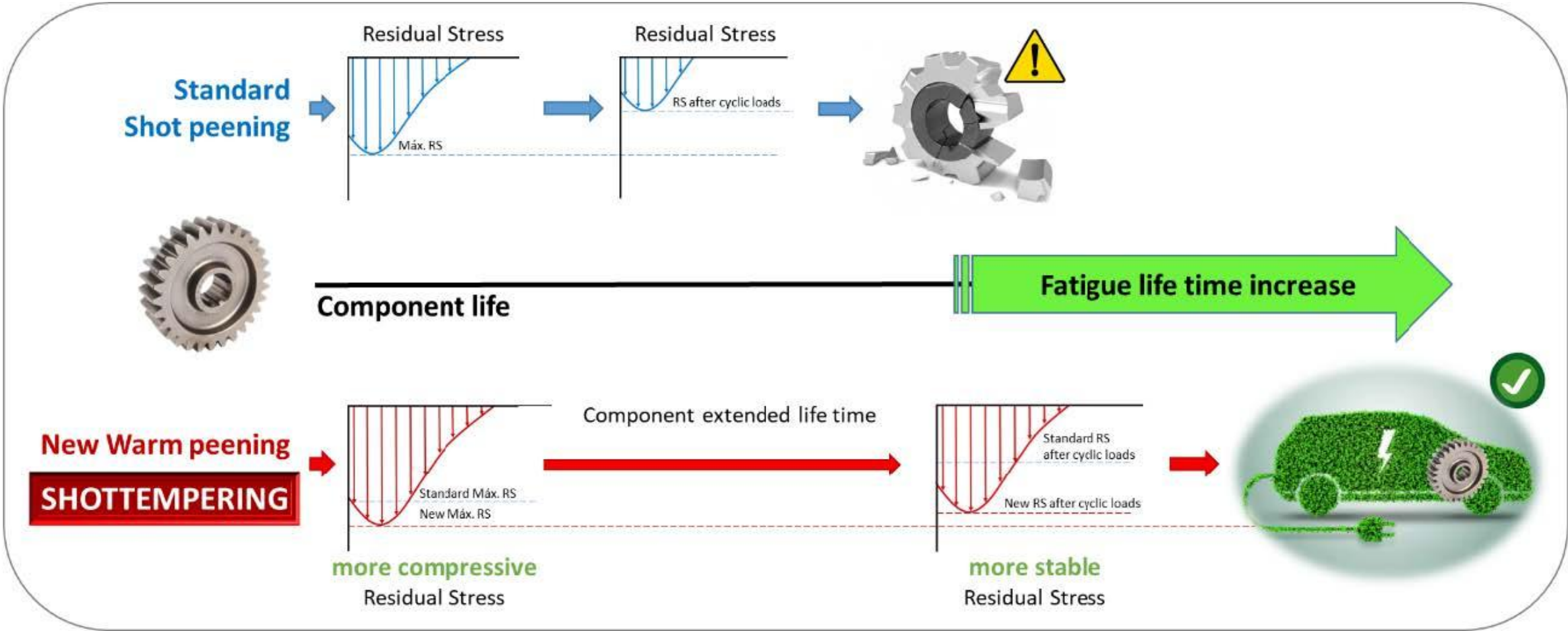
## Context and Challenges tackled by ShotTempering:

The considerably higher loads experienced by components in EVs compared to ICE powered vehicles necessitate novel manufacturing approaches. To successfully tackle this challenge **warm shot peening** offers high potential to substantially enhance component performance:

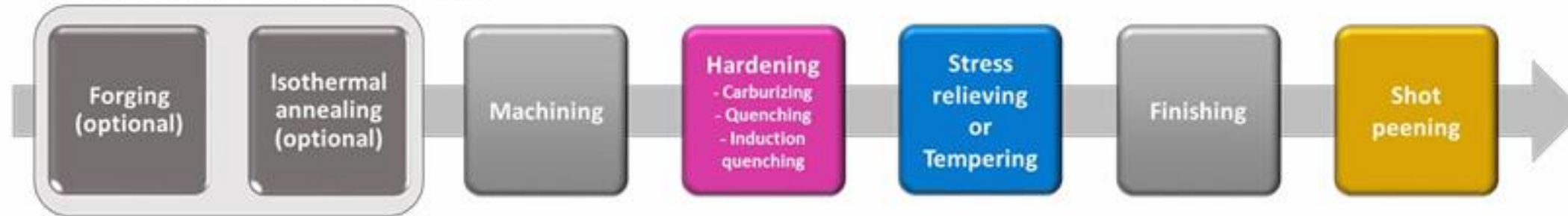
- to significantly enhance mechanical properties of parts, particularly fatigue resistance
- to boost overall efficiency of the process chain (energy consumption, resource utilization and time savings)

**ShotTempering** will enable the fabrication of improved components for electric vehicles (EVs) using **new more eco friendly shot peening manufacturing processes**, helping reach the EU CO2 emissions targets.

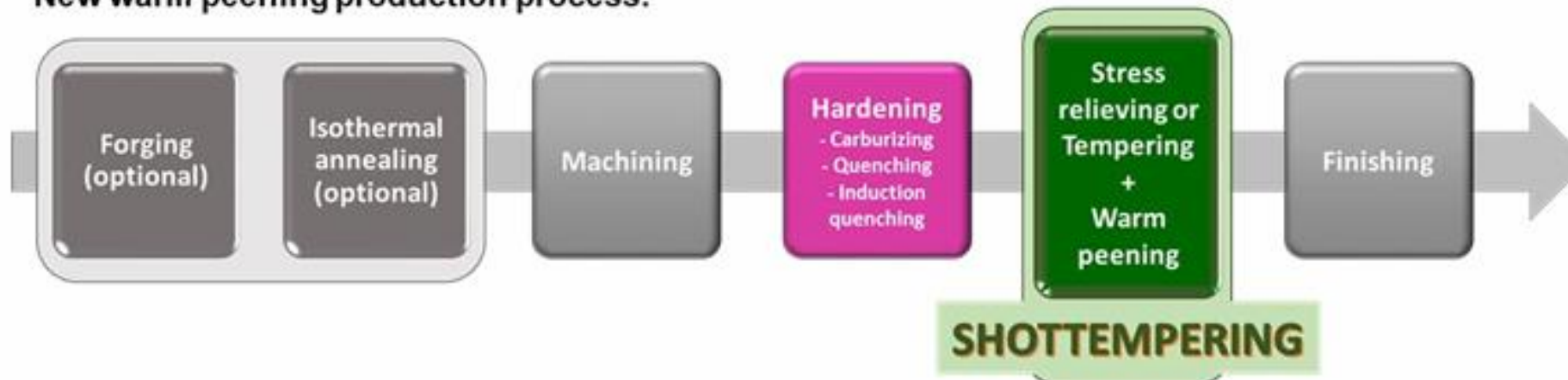




## Conventional production process:



## New warm peening production process:



- Integration of the shot peening in the tempering (or stress relieving) treatment by peening the material at elevated tempering temperatures (warm peening between 200 and 500 °C):
  - bigger and more stable compressive residual stresses than using the conventional process through beneficial interactions between tempering precipitation and residual stress initiation

# Main expected results

Development and optimization of a novel warm peening process that will, for the first time, implement shot peening at temperatures of up to 500 °C

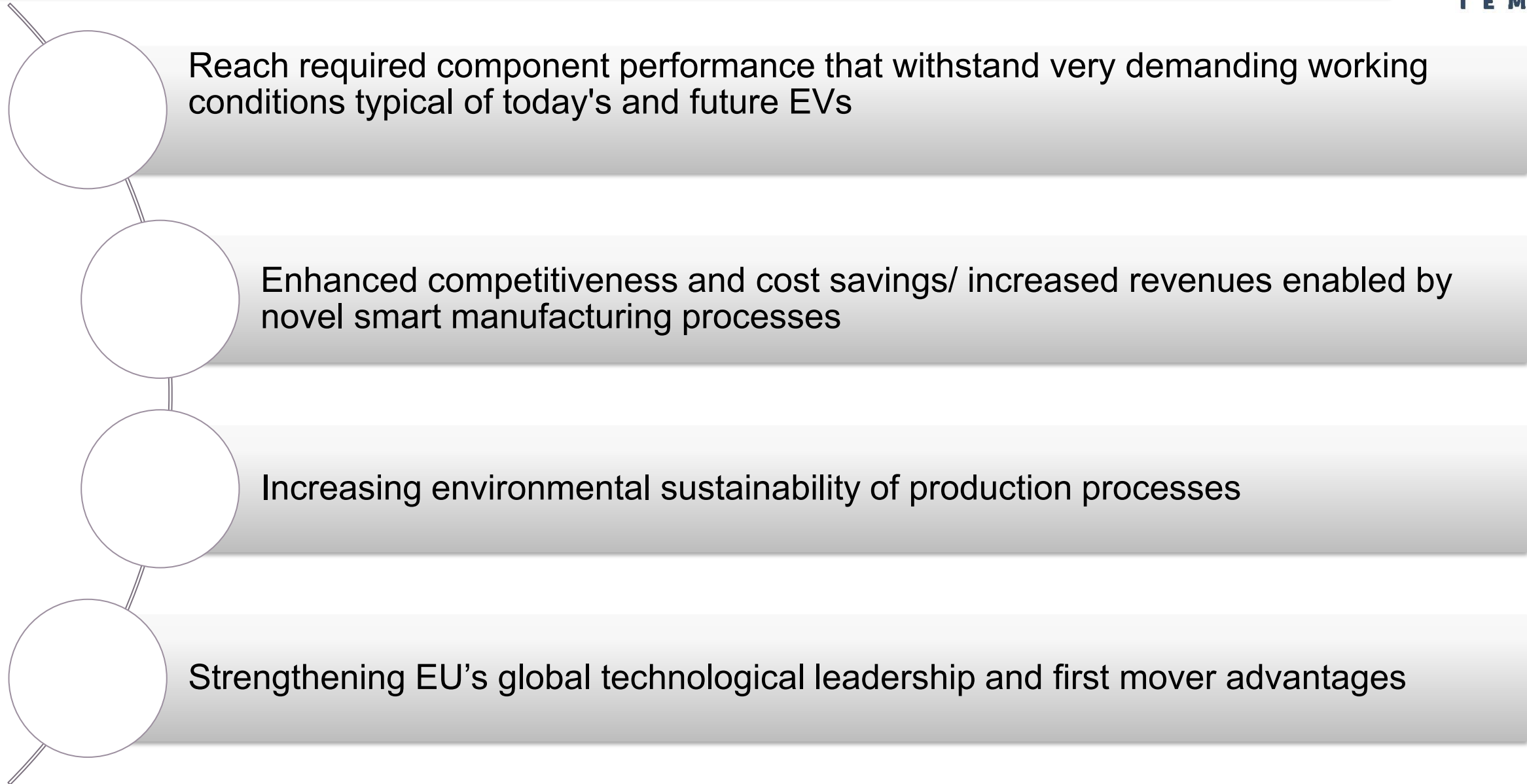
Increasing max. compressive residual stress value by 20-25 %

Assessment of the possibility of integrating the shot peening and the tempering operation in one single process (named warm peening)

Holistic analysis in terms of environmental, economic and societal aspects to evaluate the industrial implementation of the innovative warm peening technology

Improvement of the surface roughness evaluation to understand if warm peening would be combined with a stream finishing avoiding industrial grinding









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**Thank you for your attention!**

