

# ***SUPREME***

*Eu Framework Programme for R&I - Innovation Fund  
Synergies Workshop*

08-Feb 2023

**ENRICO FORLIN**  
**MBN NANOMATERIALIA SPA**

# Overview & Background of



**Sustainable and flexible powder metallurgy processes optimization by a holistic reduction of raw material resources and energy consumption.**

*Funding programme: SPIRE-07-2017 – **Integrated approach to process optimization** for raw material resources efficiency, excluding recovery technologies of waste streams (H2020-EU.2.1.5.3)*

*Advanced manufacturing and processing - **Sustainable, resource-efficient and low-carbon technologies in energy-intensive processes industries***

*Concept:* - Fast-growing industrial production routes for **advanced ferrous and non-ferrous metals**.  
- Integrated, flexible and **sustainable processes for powders manufacturing** and metallic parts  
- Reduction of the raw material resources losses while improving energy efficiency, production rate and CO<sub>2</sub> emissions



*Focus: **Mechanical alloying for metal powder production***

*Result: **Higher energy efficiency** for production of steel-based powder*

*-32% CO<sub>2</sub> eq emissions*



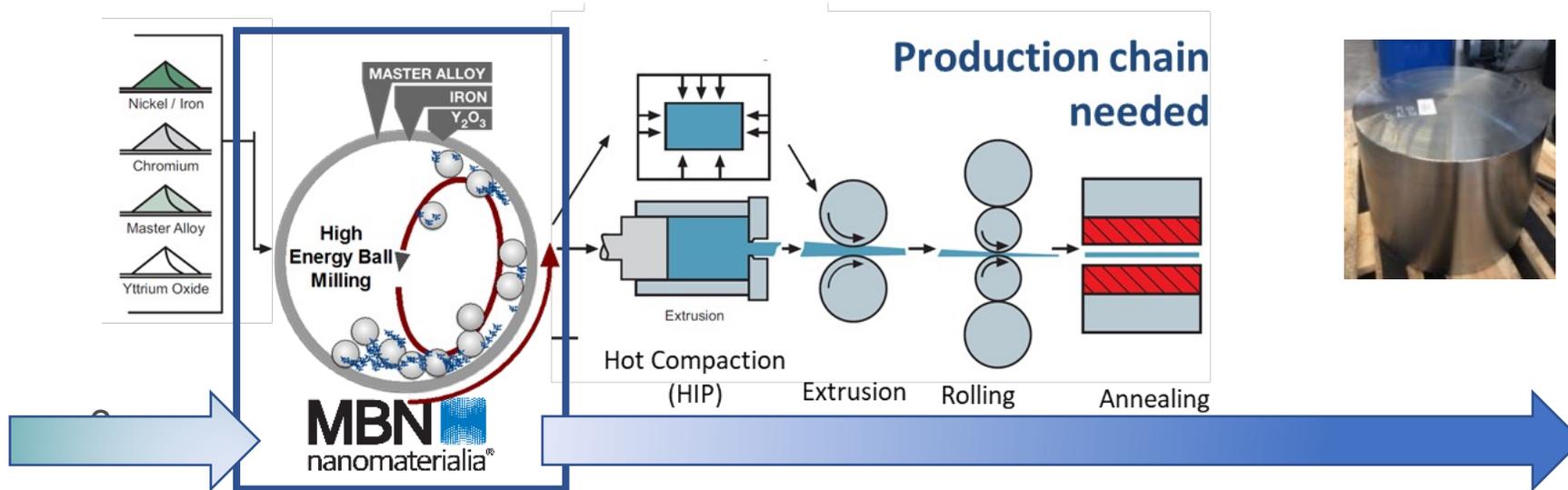
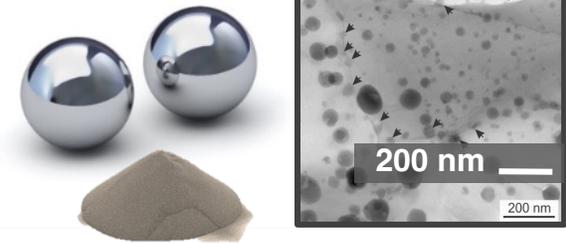
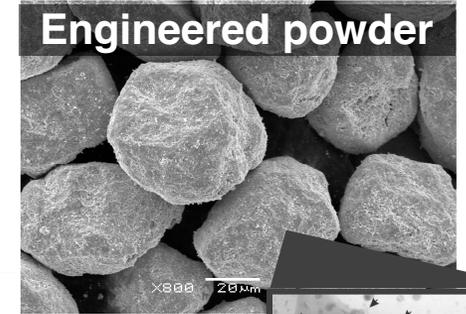
# Deployment Prospects

Oxide Dispersion Strengthened ODS steel for energy sector

*Market Opportunity: 100 tons market in semi-finished products*

Deployment of efficient powder production process needs a focused value chain from raw material supplier to application engineering

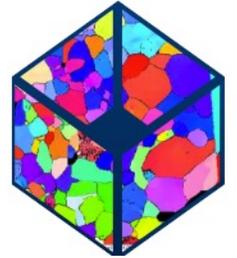
e.g. components for gas turbines, high temperature furnaces, nuclear applications



# Deployment Prospects

**Fund opportunity**: supporting focused **collaborative actions** between SMEs and industrial actors in the value chain

- High level metallurgical **know-how**
- Availability of **customized** raw materials
- Pilot and scaled **facilities** for metal forming (HIP, extrusion and forging)  
with process **flexibility**
- Intensive efforts for **qualification** (e.g. creep tests)



# Deployment Prospects

## Main Challenges:

Substitution of well-established materials from conventional metallurgy routes requires **demonstration of technical and economical effectiveness in a real application environment**, supported by reproducible data from **field tests**

→ TRL7 achievement requires the involvement of the value chain

Deployment from past collaborations for advanced materials: MBN as SME involved in **joint development** with research centres and powder metallurgy companies for tool sectors and hardfacing coatings.

New products



Thermal & Cold Spraying



# Thank you



**MBN**  **nanomaterialia**<sup>®</sup>



MBN Nanomaterialia S.p.A.  
Via G. Bortolan, 42  
31050 Vascon di Carbonera (TV)  
ITALY

T. +39 0422 447311  
F. +39 0422 447318

<http://www.mbn.it>

*e-mail:* [research@mbn.it](mailto:research@mbn.it)