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RE4Industry – 100% Renewable Energies for Europe's Industry

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EUREC Workshop
Decarbonising high temperature heat in Industry

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www.re4industry.eu

At a glance

RE4Industry: 100% Renewable Energies for Energy Intensive Industries

11 partners from 6 countries (AT, BE, DE, ES, GR, NL)

Starting date: 1st September 2020 - Duration: 36 months

Type of the project: Coordination and support actions (CSA)

RE4Industry actions

RE4Industry methodology:
7 actions targeted to generate confidence, facilitate vision, provide support and ensure market options to EIIs

A strong engagement strategy following a multiactor approach

A dialogue with and within EIIs and EII organizations

A thoughtfully review of RE technologies and options for a 100% RE production by 2050

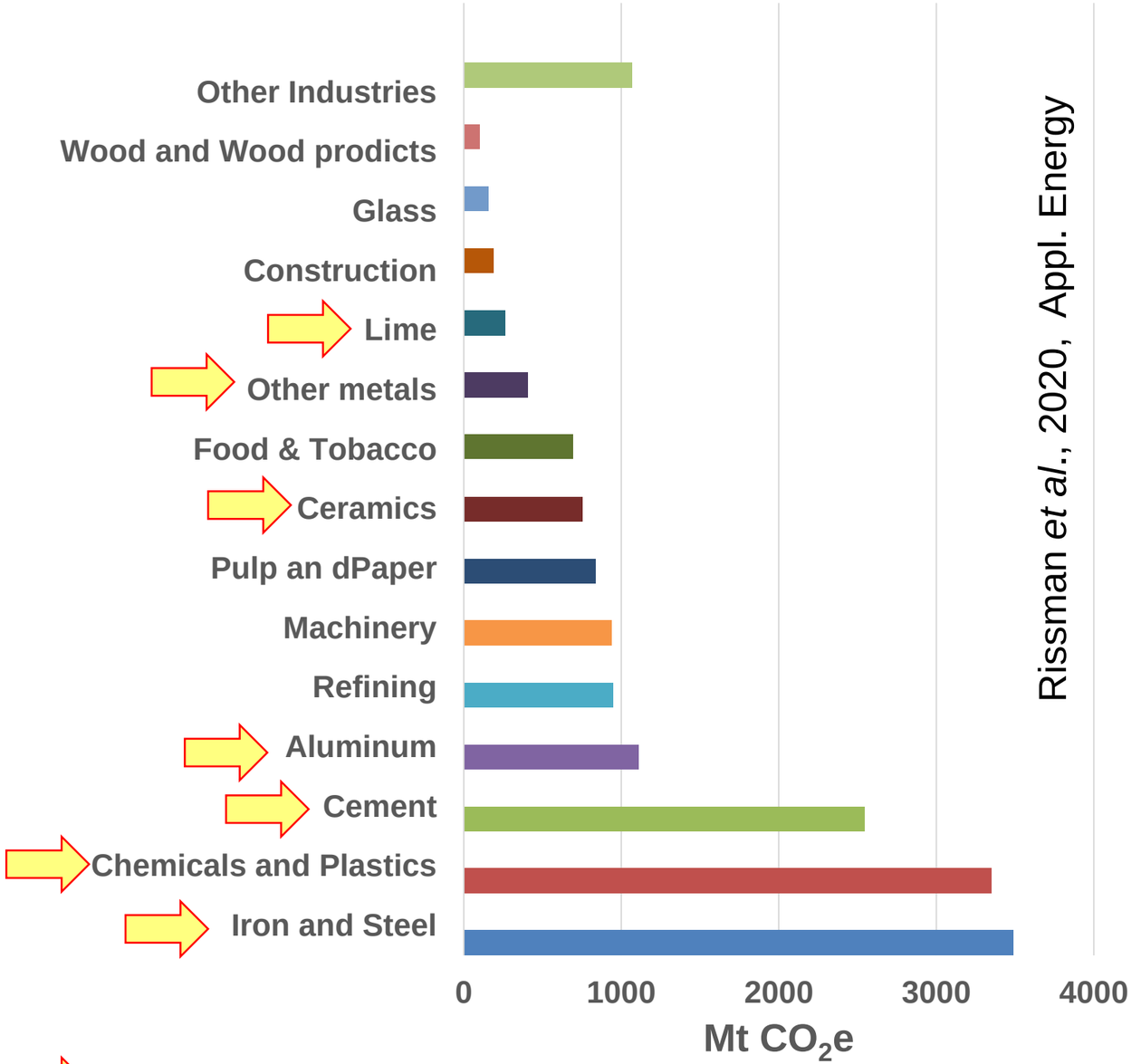
Insights into industry retrofitting and promotion of RE integration

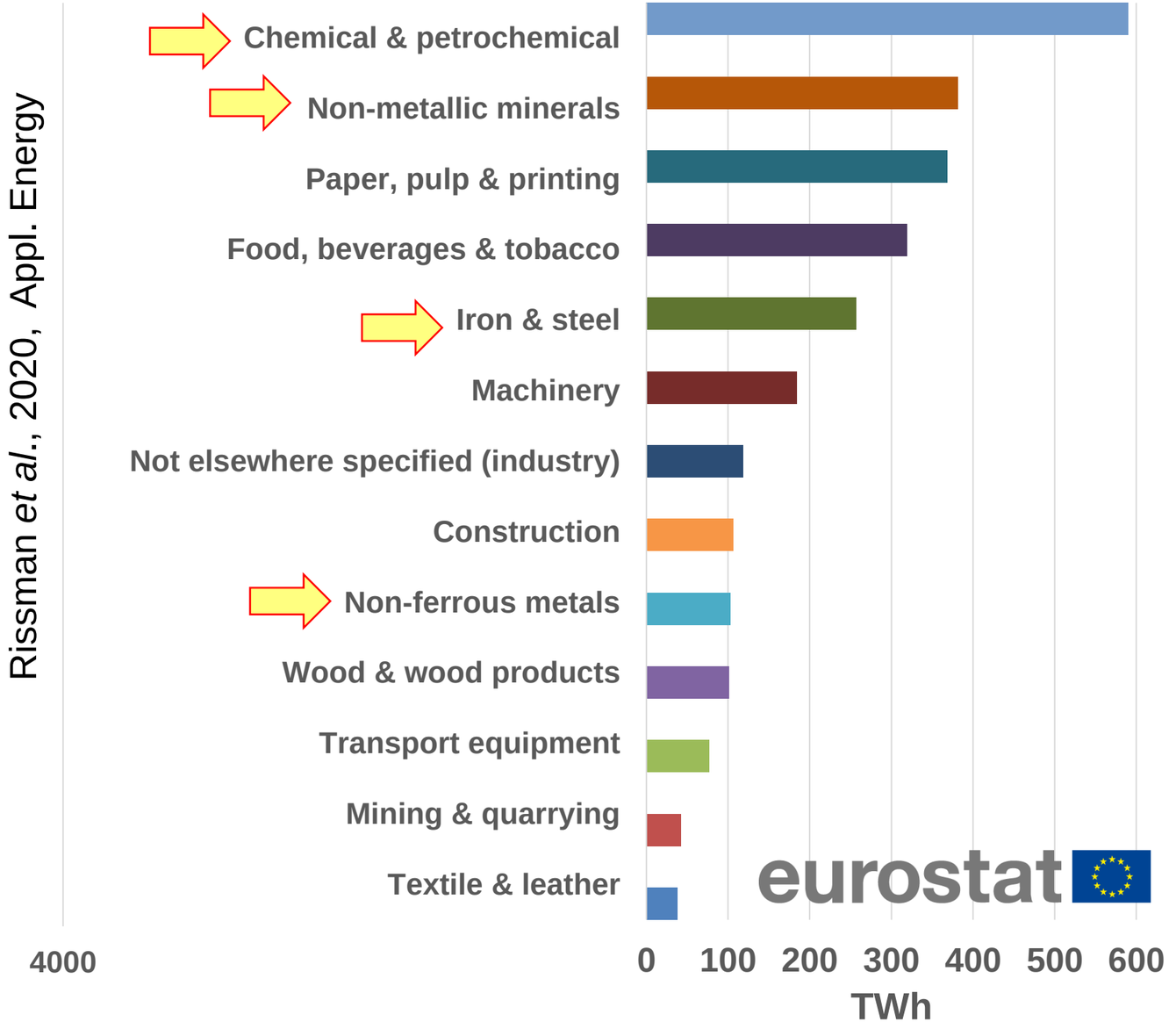
Recommendations for the uptake of RE by EIIs and advocacy

Multiplication and replication

A solid dissemination and communication strategy

Context: CO_2 emissions and energy consumption by industry





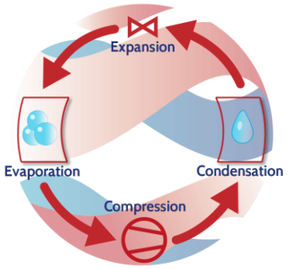
The arrow indicates avialable analysis on this sector

Source: Plotted from information found in the Eurostat database: https://ec.europa.eu/eurostat/web/energy/data/energy-balances (accessed on May, 2022)

Renewable technologies within the scope of -2030-

1. Heat

Solar thermal



Heat pumps

Geothermal

Biomass

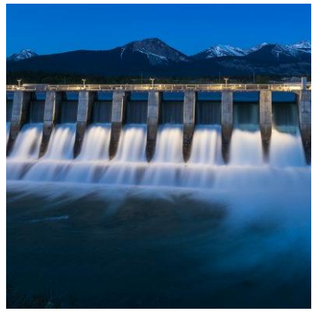
Biofuels

Green hydrogen

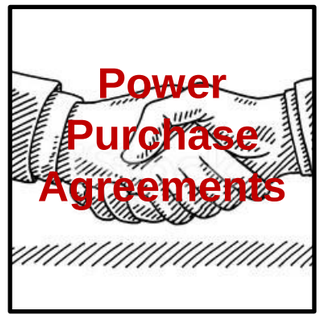
2. Electricity

Photovoltaics

Wind

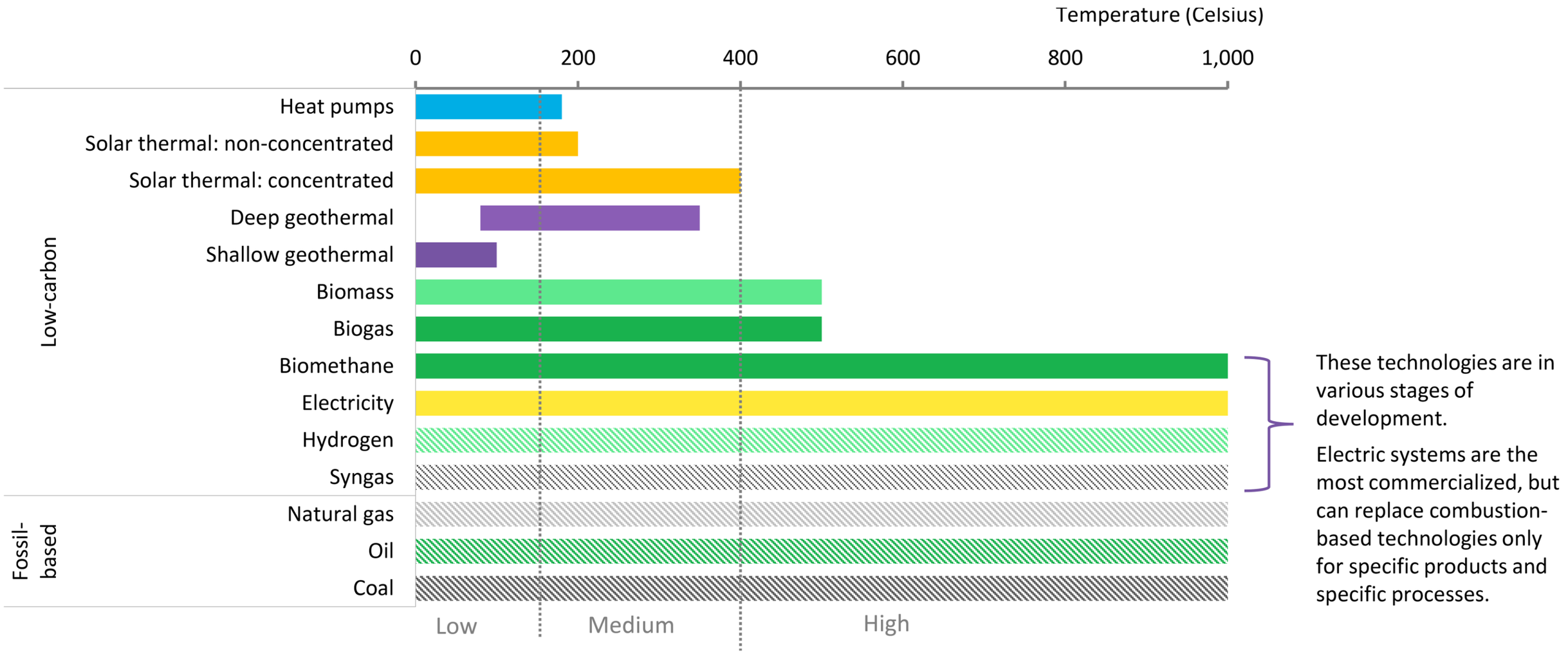


Hydraulic



Renewable PPAs

Heating technologies and fuels – max output temperature



These technologies are in various stages of development.

Electric systems are the most commercialized, but can replace combustion-based technologies only for specific products and specific processes.

Source: Oxford Energy Institute, BloombergNEF, EHPA, IEA-SHC. Note: Shaded technologies/fuels were not included in the scope of this analysis.

RE4Industry Industrial case studies

Energy sources:

- **Electricity** → Green electricity (PPAs, photovoltaics, etc.)
- **Natural gas** → Biomethane (no modification), Green H_2 (needs modifications)
- **Coal** → Biochar (lower efficiency)
- **Steam** → Electric boiler



Findings

Electrification will be key thanks to the gradual **decrease of renewable power price** and the **conversion of natural-gas-dependent processes**

Industrial **processes** that are **not** readily **eligible for electrification** will still be needing **a form of renewable heat**

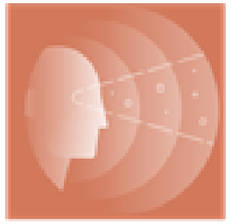
From **concentrating solar power** and **heat pumps to geothermal energy** to supply a **broad range of temperatures needed**

Biomass will be a **key element in the decarbonisation** of not only **conventional combustion systems** but also as a **biofuels feedstock**

Biomethane can allow a **straightforward transition** from using fossil-based natural gas to **renewable gas**

Green hydrogen production technologies will require to **increase** their **maturity** and **availability** all over Europe

RE4Industry "Vision"



RE4Industry project vision

	2030	2050
TECHNOLOGY OPTIONS	Conventional RE heating • Biomass • Bioenergy carriers • Solar (high T) • Geotherm	• Conventional RE heating / power • New RE (solar thermal, bio syngas) • H_2 (electrolysis / syngas) • e-fuels (synthesis fuels from RE based hydrogenation of CO2 captured)
Achiveable rates	• CO2 balance > 0 (reduced according to RE use) • RE use < 50%	• CO2 balance ≤ 0 • RE use ≈100%
CURRENT SECTOR NEEDS	• Existing options for retrofit • Cases already implemented • Lessons learned • Insight in cost / economics • Opportunities (e.g. for financing, long term RE contracting) • Positive social perception • Influence for a better framework	• Scope to understand the future options on RE • Implications for retrofitting to produce and adopt e-fuels • Energy balances and key indicators of adopting each RE alternative (for an early decision making in short-medium term) • Expected costs for RE use
	Short – medium term	Long term

Conclusions

Energy intensive industries' **decarbonisation will occur** through a progressive use of an **energy mix** that allows European industrial sectors to **remain competitive** in a global scale

Each industrial sector will require **specific renewable energy solutions**, especially those **top greenhouse gas emitting** industries

RE4Industry has also been conceived as an **initial point of discussion** to be shared with potential decision makers to favor a **transition of Energy intensive industries to full decarbonisation**

Share your

Renewable Energy experience

Become a RE4Industry sucess case!

Facilitate for Energy Intensive Industry sectors in Europe to a smooth and more secure transition towards the adoption of Renewable Energies (RE) in their production processes and facilities

We are looking for industrial success cases that can serve as an inspirational example for other industries in the European EII sector

Targeted technologies and applications

Successful implementation or **industrial R&D**, through demonstration projects, integration of various forms of renewable energy sourcing in the productive processes:

Targeted industries

RE4Industry is primarily targeting success cases from the following **Energy Intensive Industries sectors**:

Interested in becoming a RE4Industry success case?

Express your interest at **rainer.janssen@wip-munich.de**

RE4INDUSTRY
Renewable energies for industries

WIP RENEWABLE ENERGIES

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