Materiais e sustentabilidade

Setores estratégicos para a UE

Materiais e sustentabilidade

Setores estratégicos para a UE

Li-ion battery technology is rapidly being deployed for both e-mobility and energy storage for intermittent electricity generation. The technology is increasingly relevant for defence applications;

Fuel cells (FCs) are an important energy conversion technology, which together with hydrogen as fuel, will offer a high potential for decarbonisation of the energy system and e-mobility in the future, although large-scale deployment has not yet taken place;

Wind energy is already one of the most cost-effective renewable energy technologies for climate-change mitigation and will remain a growing sector in the EU industrial base;

Electric traction motors are central components in e-vehicles. Permanent magnet motors containing rare earth elements are particularly efficient and attractive for current and future e-mobility applications.

Photovoltaic (PV) technology together with wind energy will lead in the transformation of the global electricity sector; PV panels are also relevant for space applications;

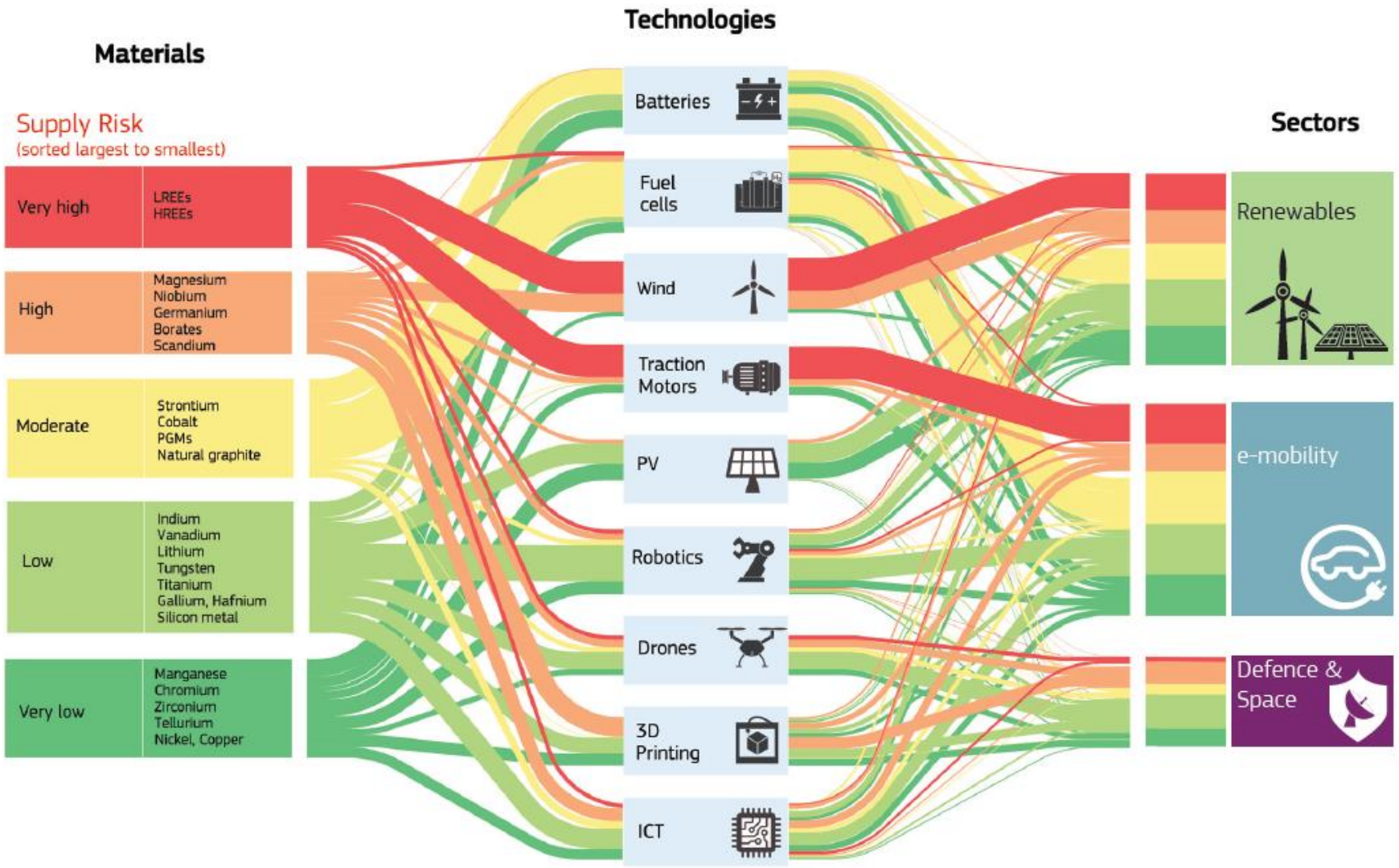
Robotics is an emerging technology with an increasing role in future manufacturing, including defence and aerospace, as well as energy technologies and automotive applications;

Drones (Unmanned aerial vehicles or UAV) are increasingly deployed for both civil and various defence applications;

3D Printing (3DP, Additive manufacturing or AM) will rapidly reshape traditional supply chains and replace conventional manufacturing, in particular in defence and aerospace. It will lead to a significant shift in the amount and types of raw materials and processed materials consumed;

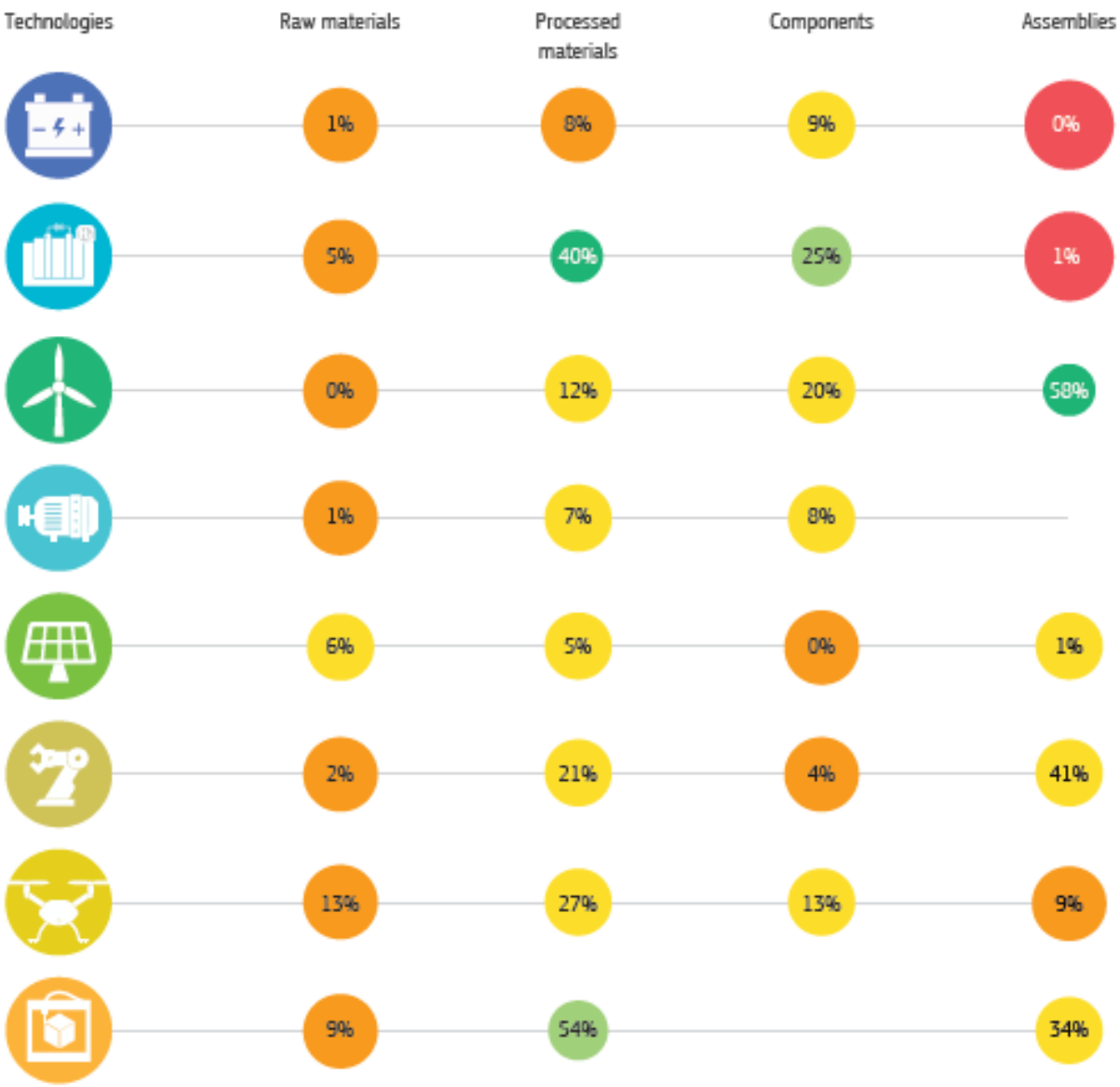
Digital technologies sustain the enormous digital sector enabling all technologies evaluated in this study.

Setores estratégicos para a UE



Materiais e sustentabilidade

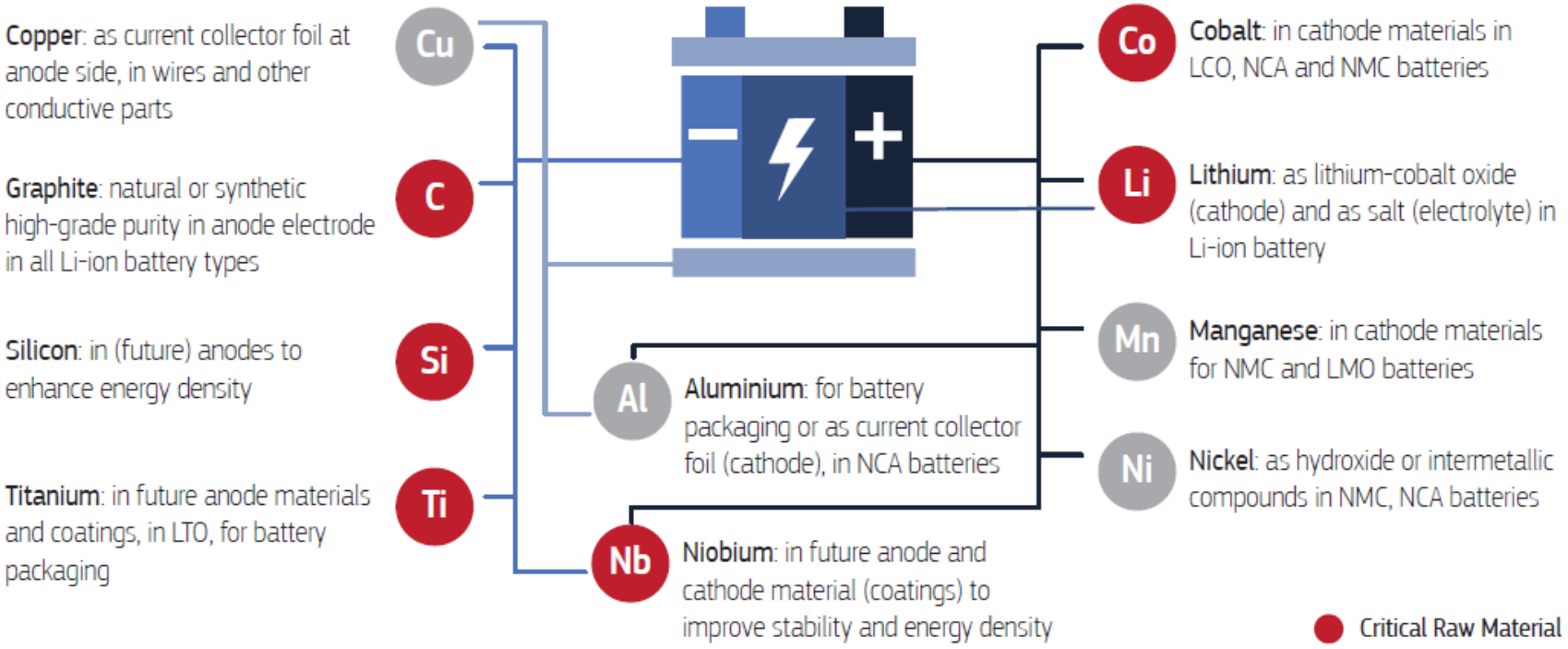
Estrangulamentos



Materiais críticos e não críticos

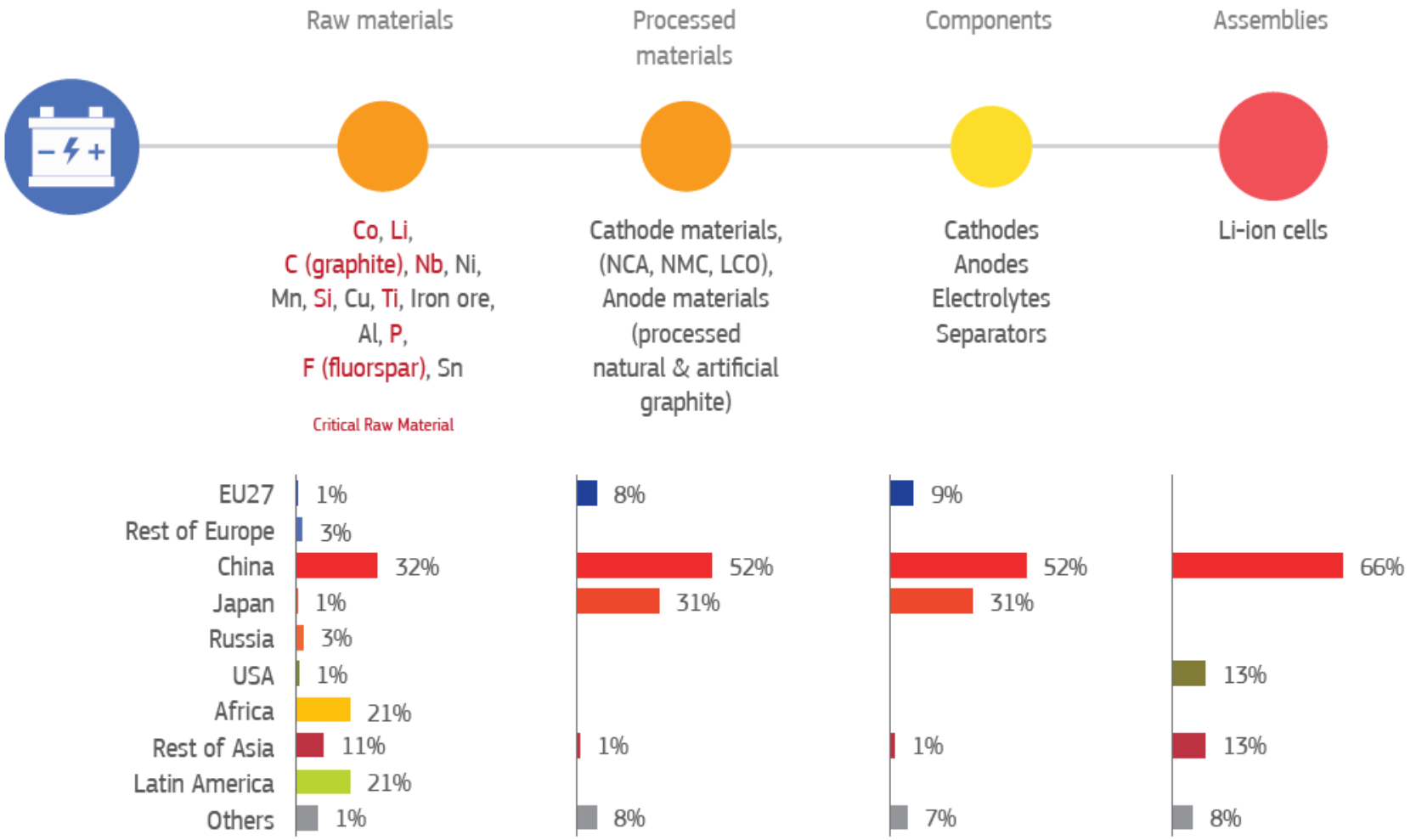
Supply Risk	Material									
	LREEs		●	●	●		●	●		●
	HREEs		●	●	●		●	●		
	Magnesium		●				●	●	●	●
	Niobium	●		●				●	●	
	Germanium					●		●		●
	Borates		●	●	●	●	●	●	●	●
	Scandium							●	●	
	Strontium		●				●	●		
	Cobalt	●	●	●			●	●	●	●
	PGMs		●				●	●		●
	Natural graphite	●	●				●	●		●
	Indium					●	●	●		
	Vanadium		●				●	●	●	●
	Lithium	●	●				●	●		
	Tungsten						●	●	●	
	Titanium	●	●				●	●	●	●
	Gallium					●	●	●		●
	Silicon metal	●	●		●	●	●	●	●	●
	Hafnium							●	●	
	Manganese	●	●	●			●	●	●	●
	Chromium		●	●			●	●	●	●
	Zirconium		●				●	●	●	●
	Silver		●			●	●	●		●
	Tellurium					●	●	●		●
	Nickel	●	●			●	●	●	●	
	Copper	●	●	●	●	●	●	●	●	●

Baterias de lítio: elementos críticos



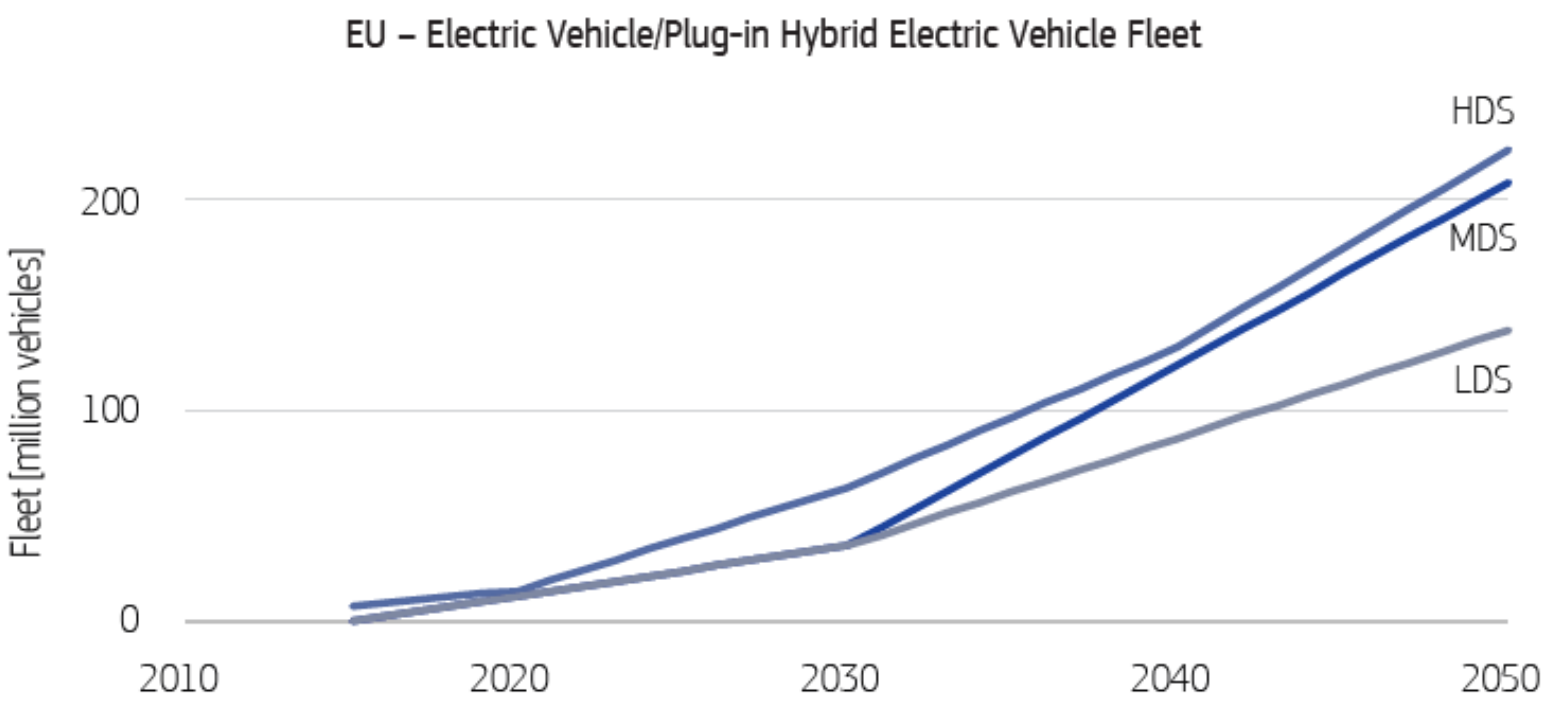
Materiais e sustentabilidade

Baterias de lítio: riscos de estrangulamento



Baterias de lítio: perspetivas de procura

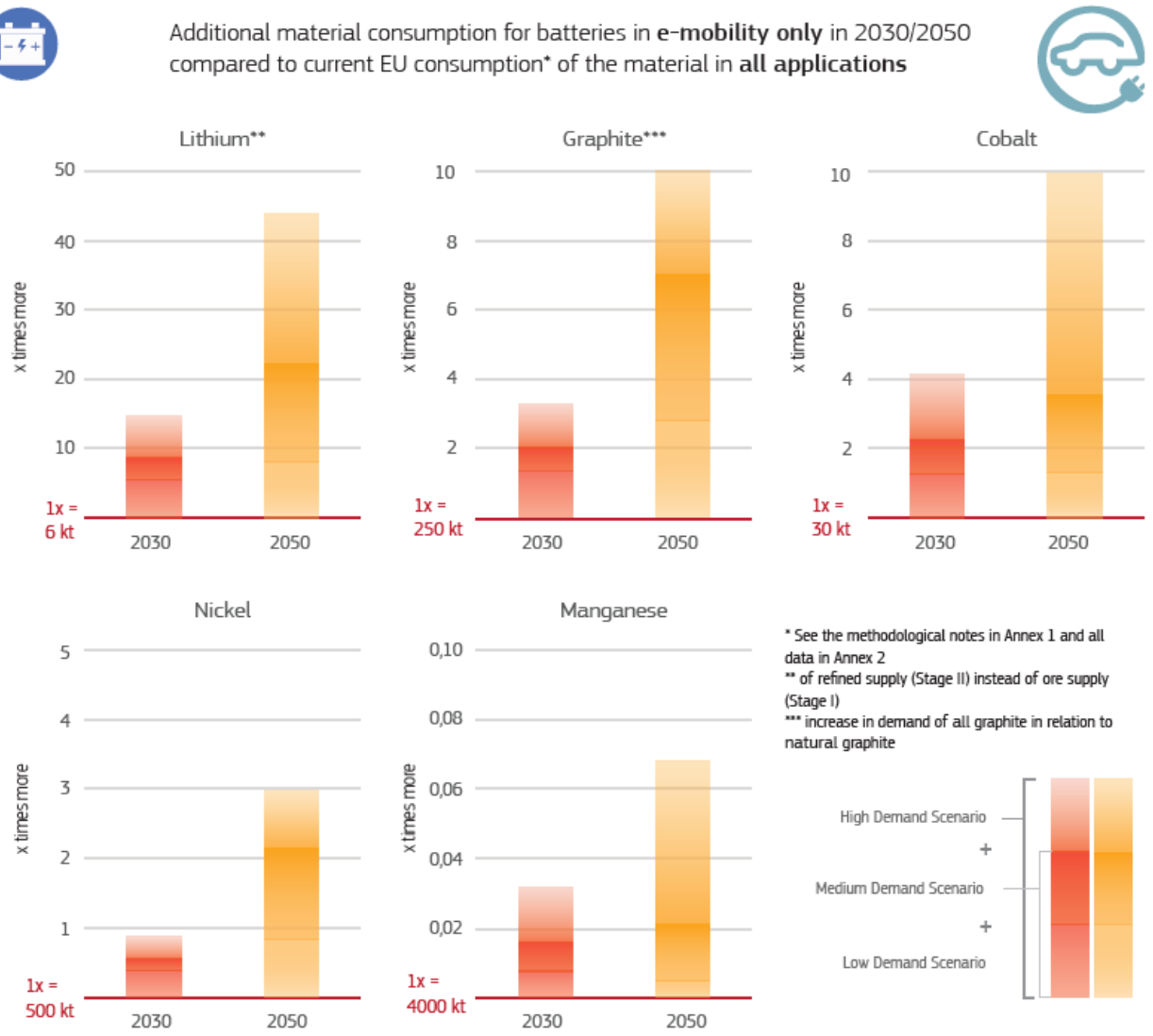
Mobilidade elétrica



Materiais e sustentabilidade

Baterias de lítio: perspetivas de procura

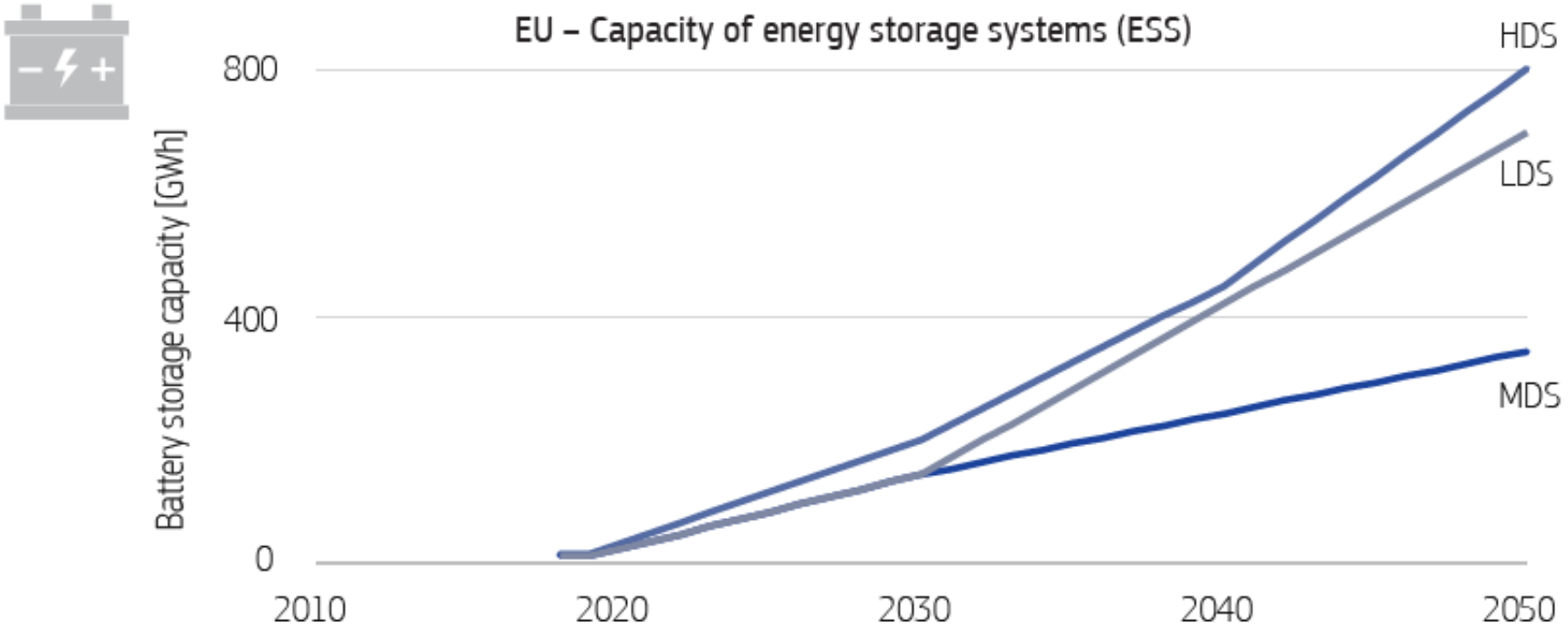
Mobilidade elétrica



Materiais e sustentabilidade

Baterias de lítio: perspetivas de procura

Mobilidade elétrica

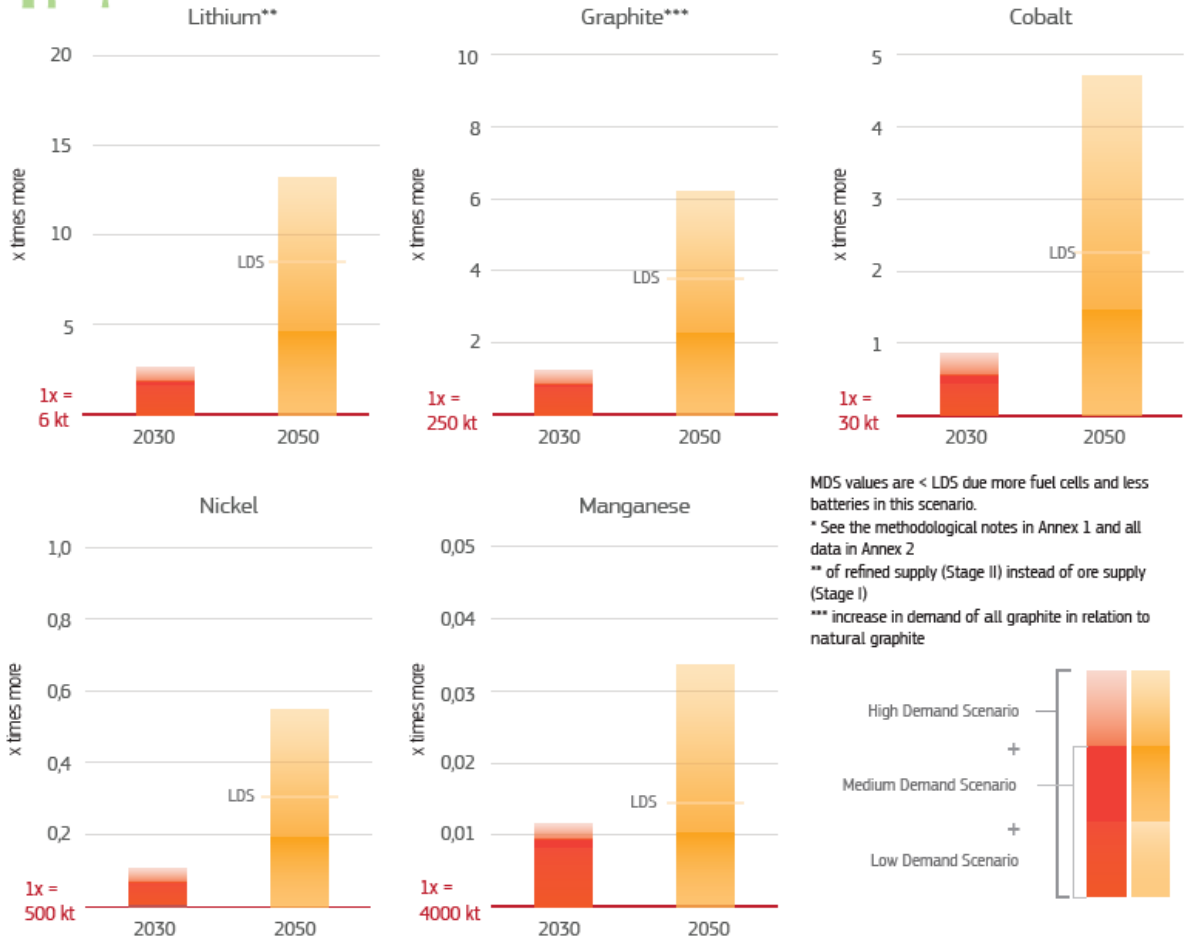


Materiais e sustentabilidade

Baterias de lítio: perspetivas de procura

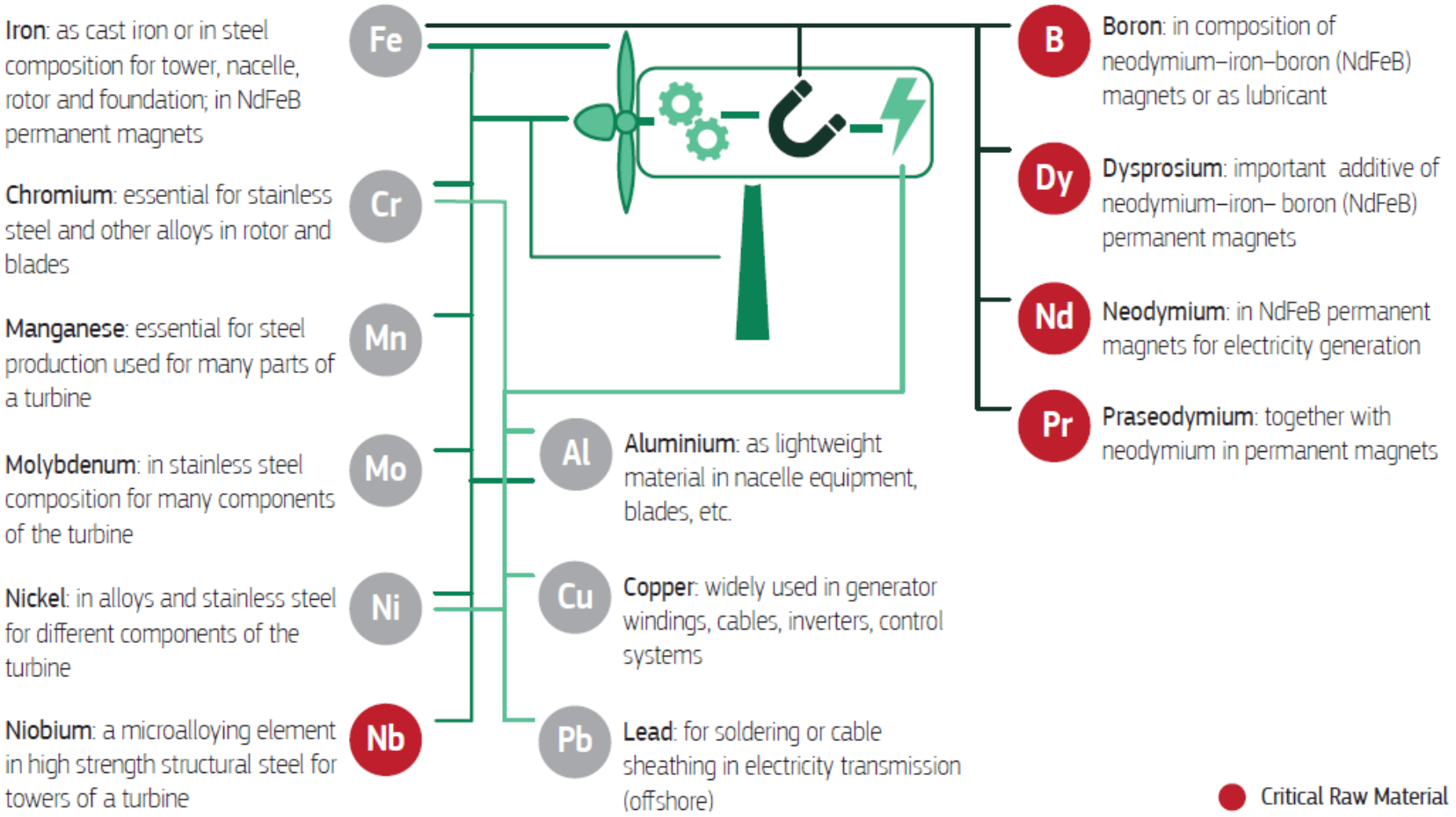
Sistemas de armazenamento de energia

Additional material consumption for batteries in **renewables only** in 2030/2050 compared to current EU consumption* of the material in **all applications**



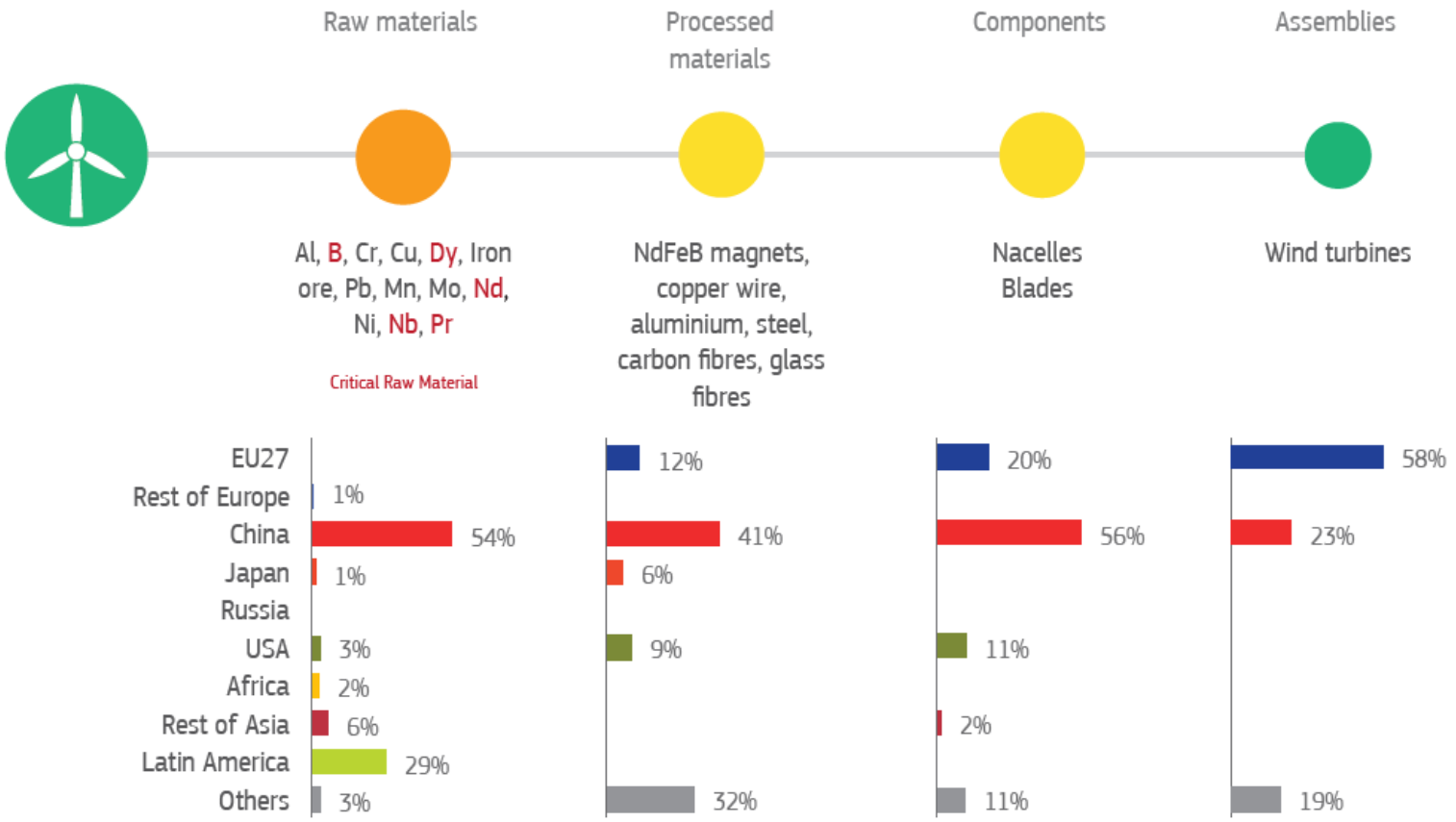
Materiais e sustentabilidade

Turbinas eólicas: elementos críticos

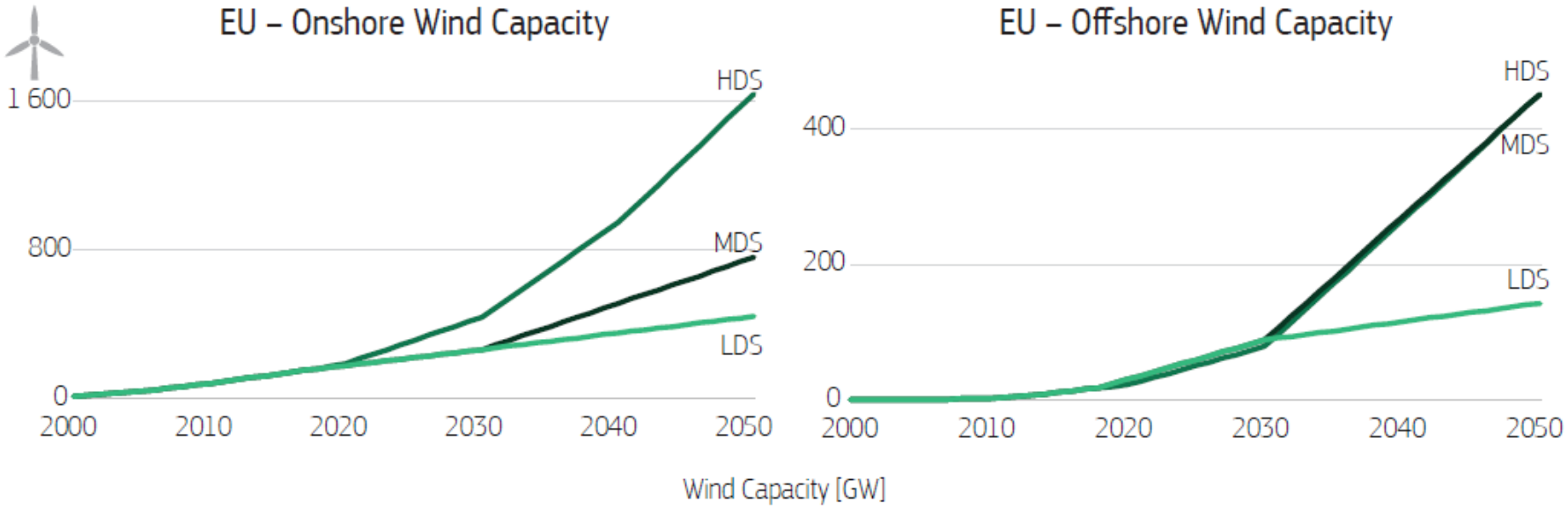


Materiais e sustentabilidade

Turbinas eólicas: riscos de estrangulamento

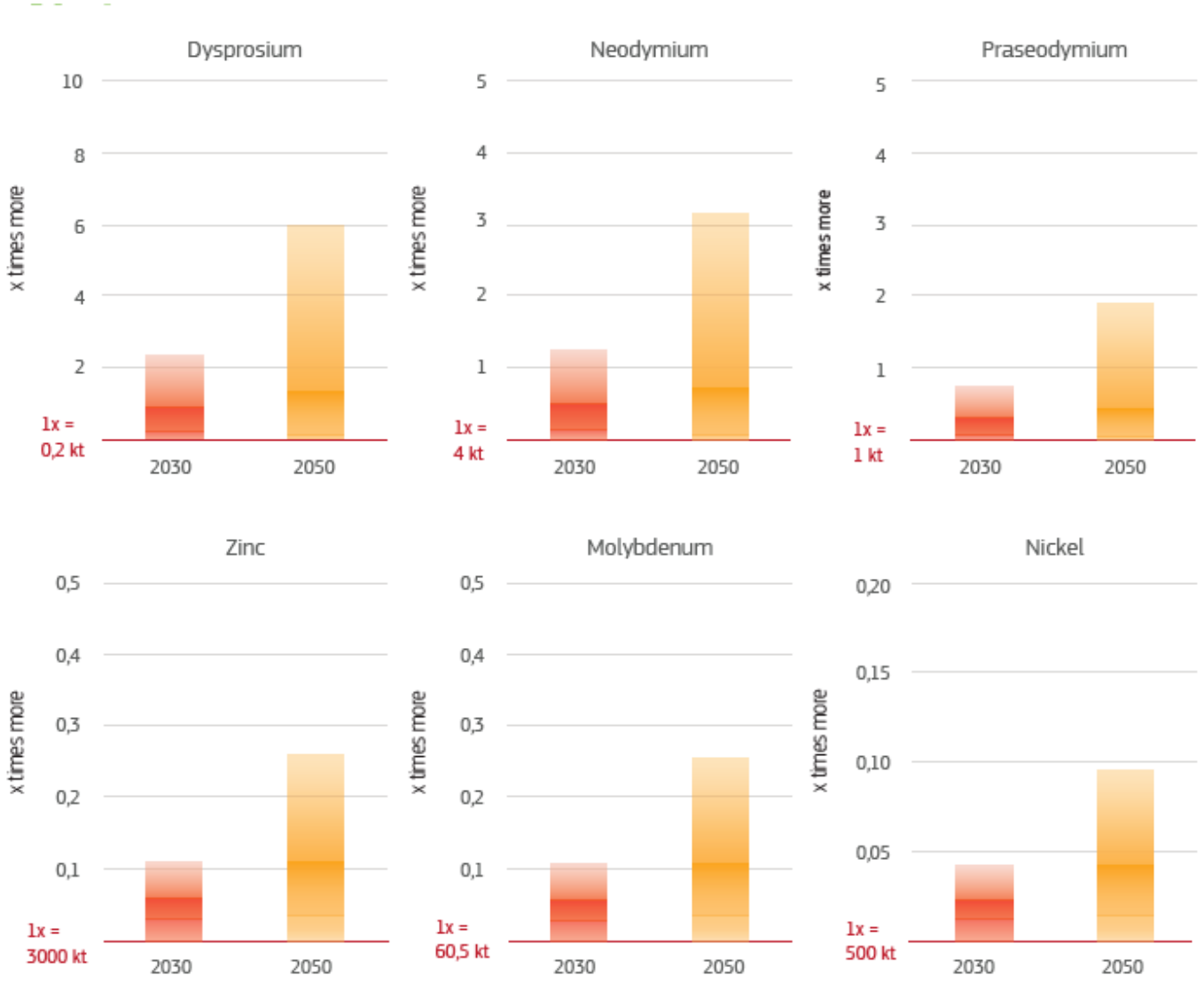


Turbinas eólicas: perspetivas de procura



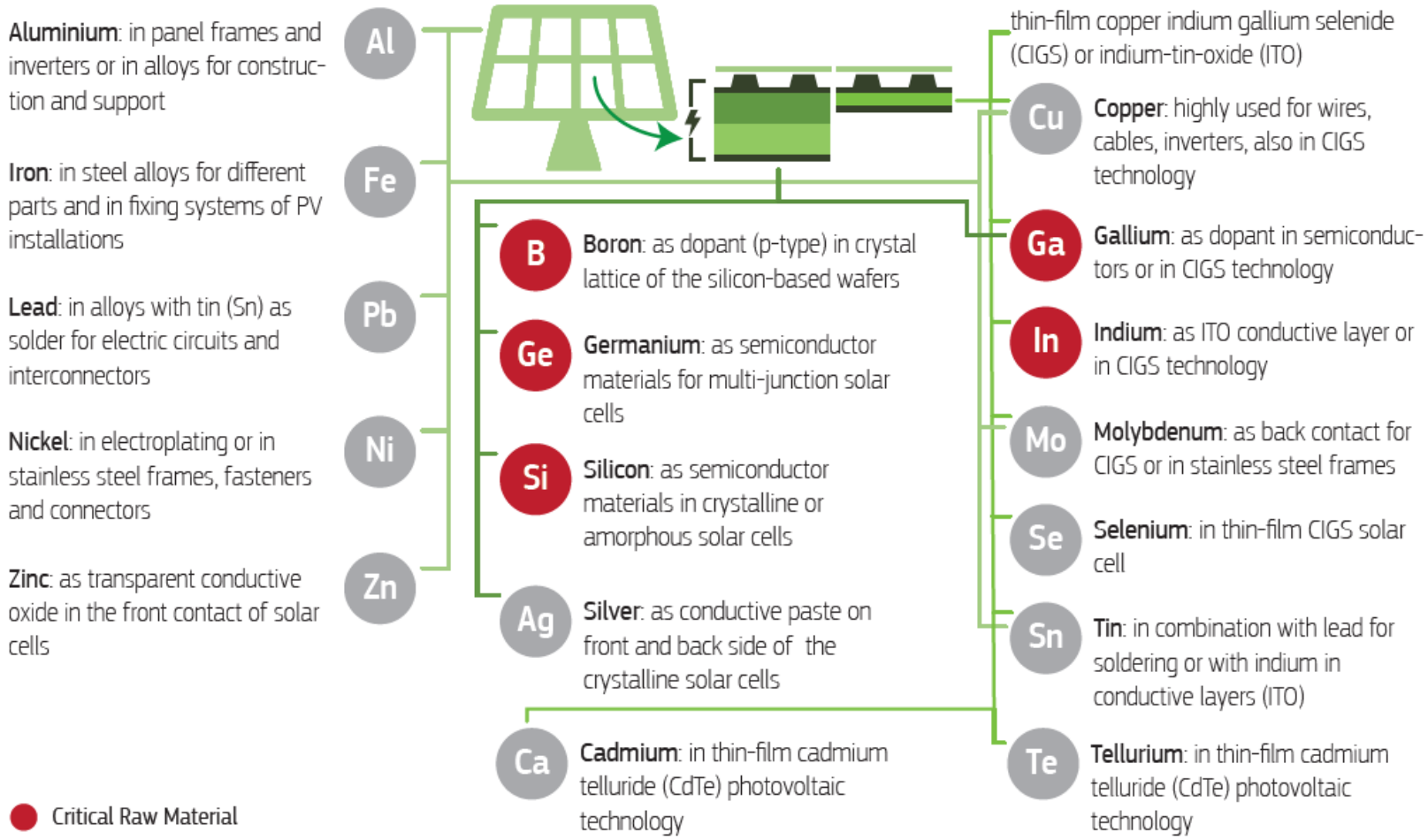
Materiais e sustentabilidade

Turbinas eólicas: perspetivas de procura



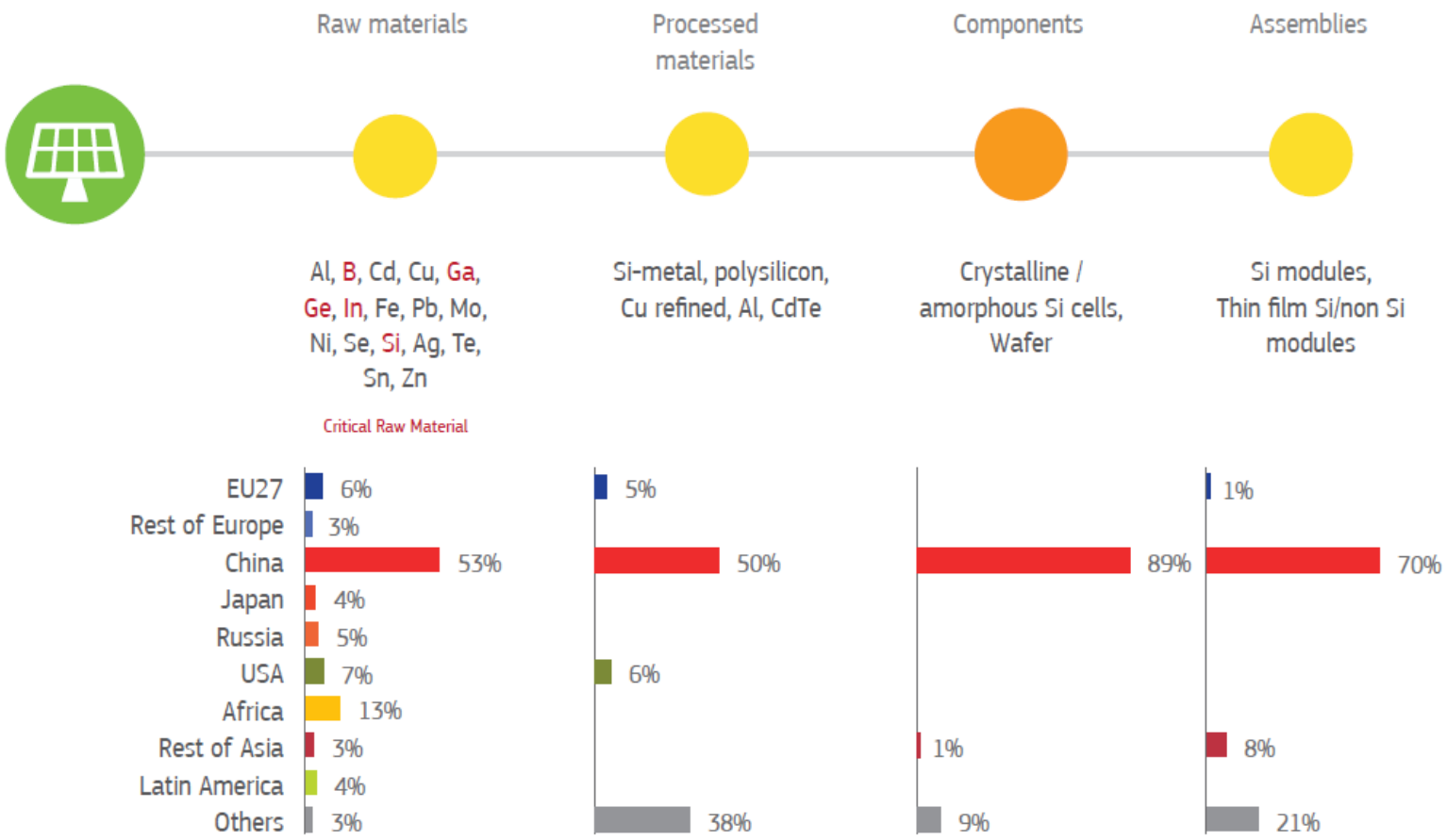
Materiais e sustentabilidade

Painéis fotovoltaicos: elementos críticos



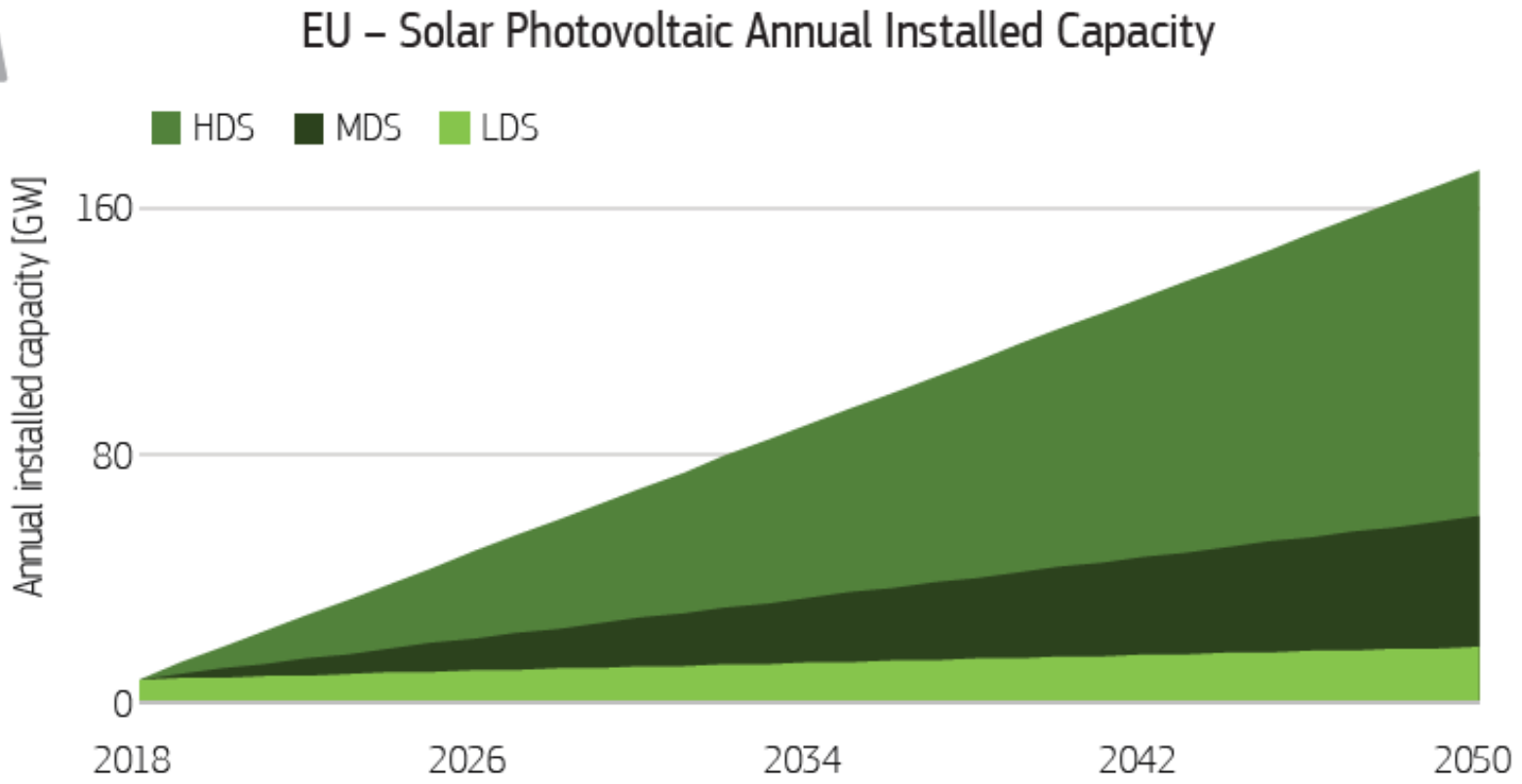
Materiais e sustentabilidade

Painéis fotovoltaicos: riscos de estrangulamento



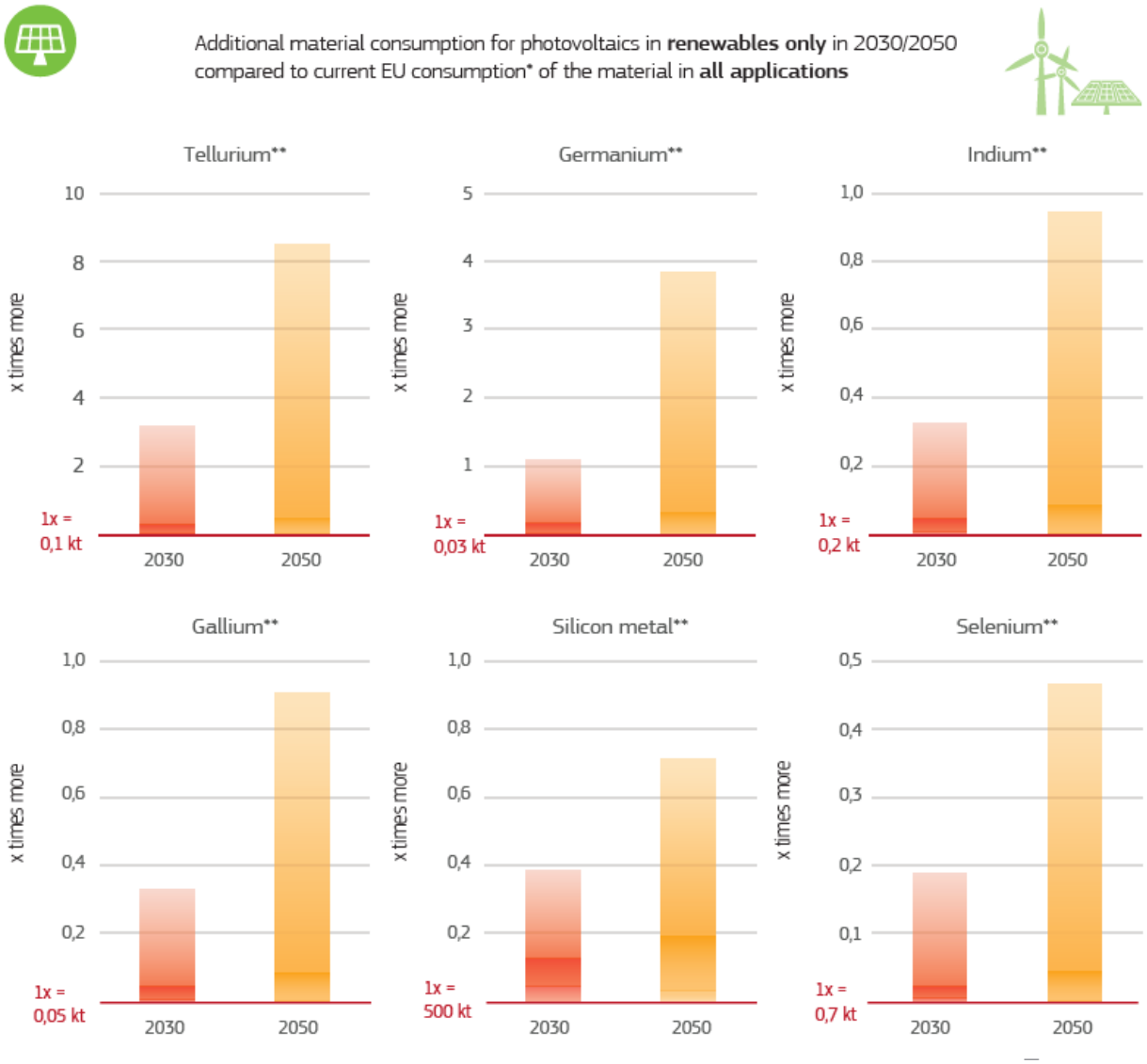
Materiais e sustentabilidade

Painéis fotovoltaicos: perspetivas de procura



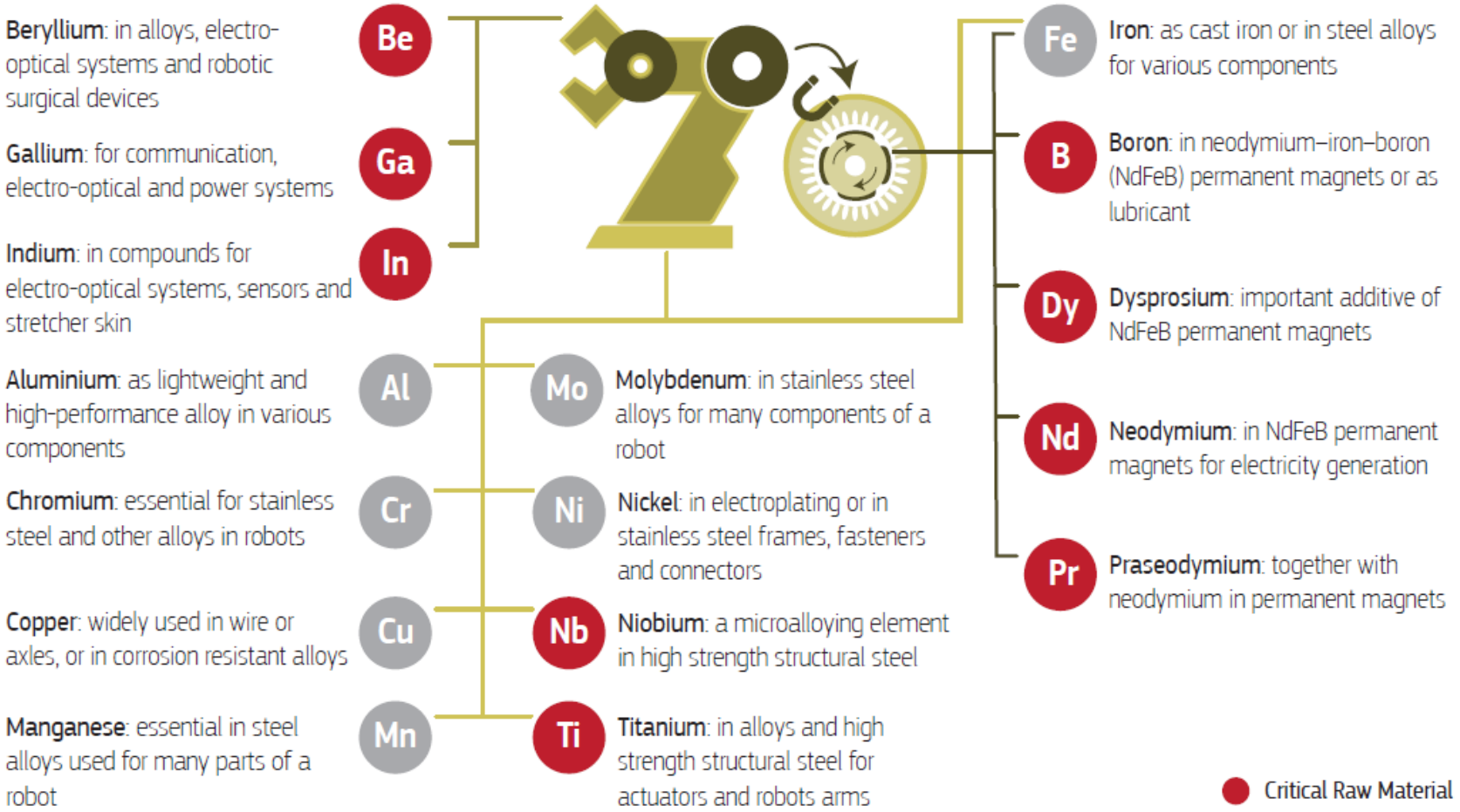
Materiais e sustentabilidade

Painéis fotovoltaicos: elementos críticos



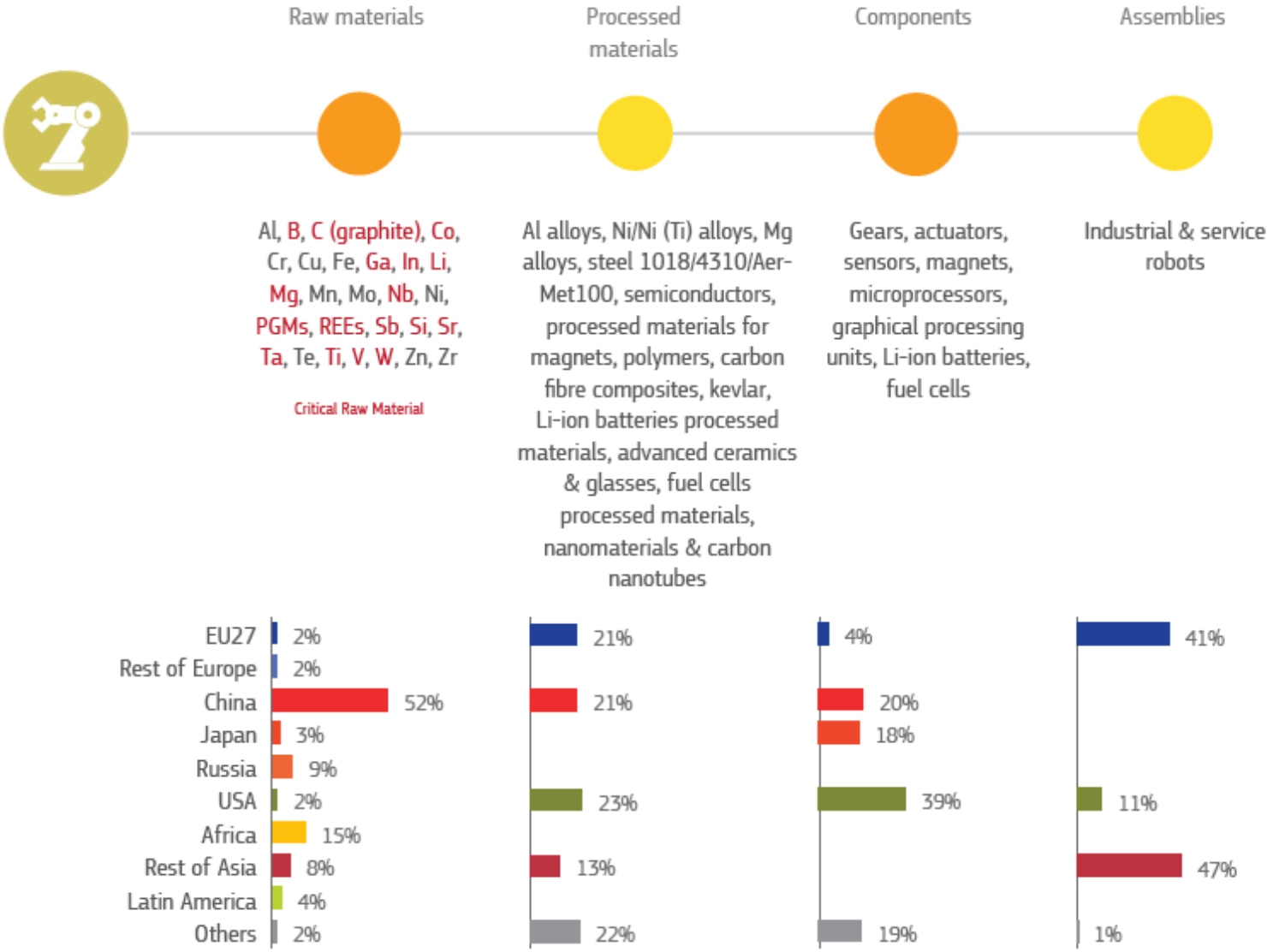
Materiais e sustentabilidade

Robótica: elementos críticos



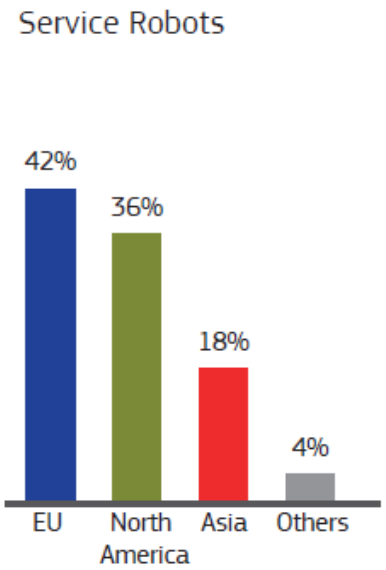
Materiais e sustentabilidade

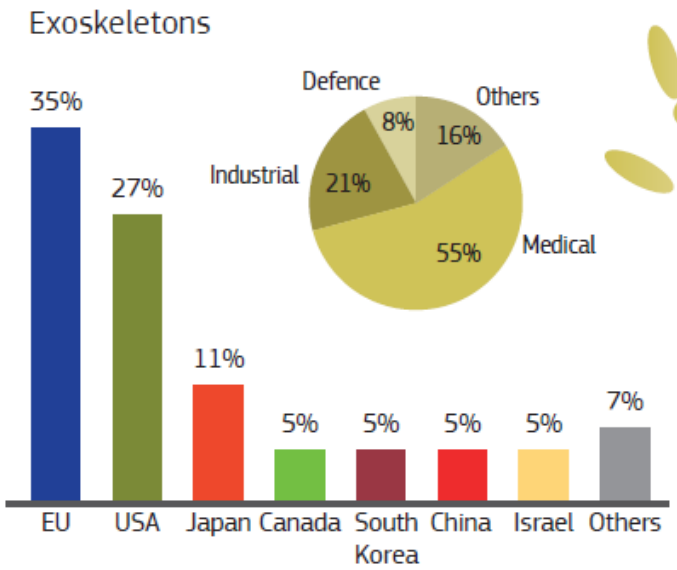
Robótica: riscos de estrangulamento

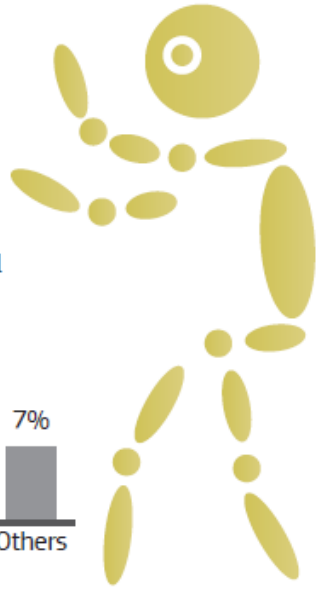


Materiais e sustentabilidade

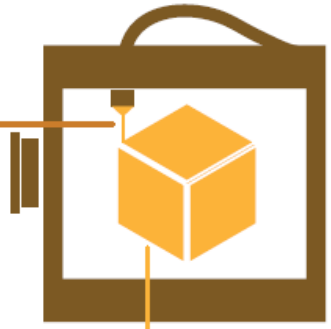
Robótica: taxa de produção por país







Manufatura aditiva: elementos críticos



Aluminium: main alloy family used in 3DP for aerospace, light and stiff, cabins interiors

Iron: main alloy family of stainless steels in structural and engine parts

Nickel: for Ni and Ni-Ti alloys (Hastelloy series), ductile and corrosion resistant, in turbine and engine parts

Titanium: main alloys family, lighter than Al-Mg alloys, high strength, for aerospace and medical

Magnesium: in high-performance Al-Mg alloys

Chromium: corrosion resistant in CoCr alloys, gas-turbines, engines, dental and medical

Cobalt: in various super-alloys, CoCr, in gas-turbines, engine, dental and medical

Al Fe Ni Ti Mg Cr Co

Copper: alloying element in Ni and super-alloys

Hafnium: Ni-based super-alloys, high strength-high temp. applications

Manganese: as alloying element in various Ni-alloys

Molybdenum: Alloying element in various Ti-alloys, adds strength

Cu Hf Mn Mo

Nb Sc Si W V Zr

Niobium: in super-alloys, Ti-Al-Nb alloys, in engines, blades, valves, rotors

Scandium: for lightweight - high strength non-structural parts and fittings

Silicon: as alloying element in light-weight Al-Mg alloys

Tungsten: in various heat resistant super-alloys, in stainless and hardens tool steels, turbine blades and vanes

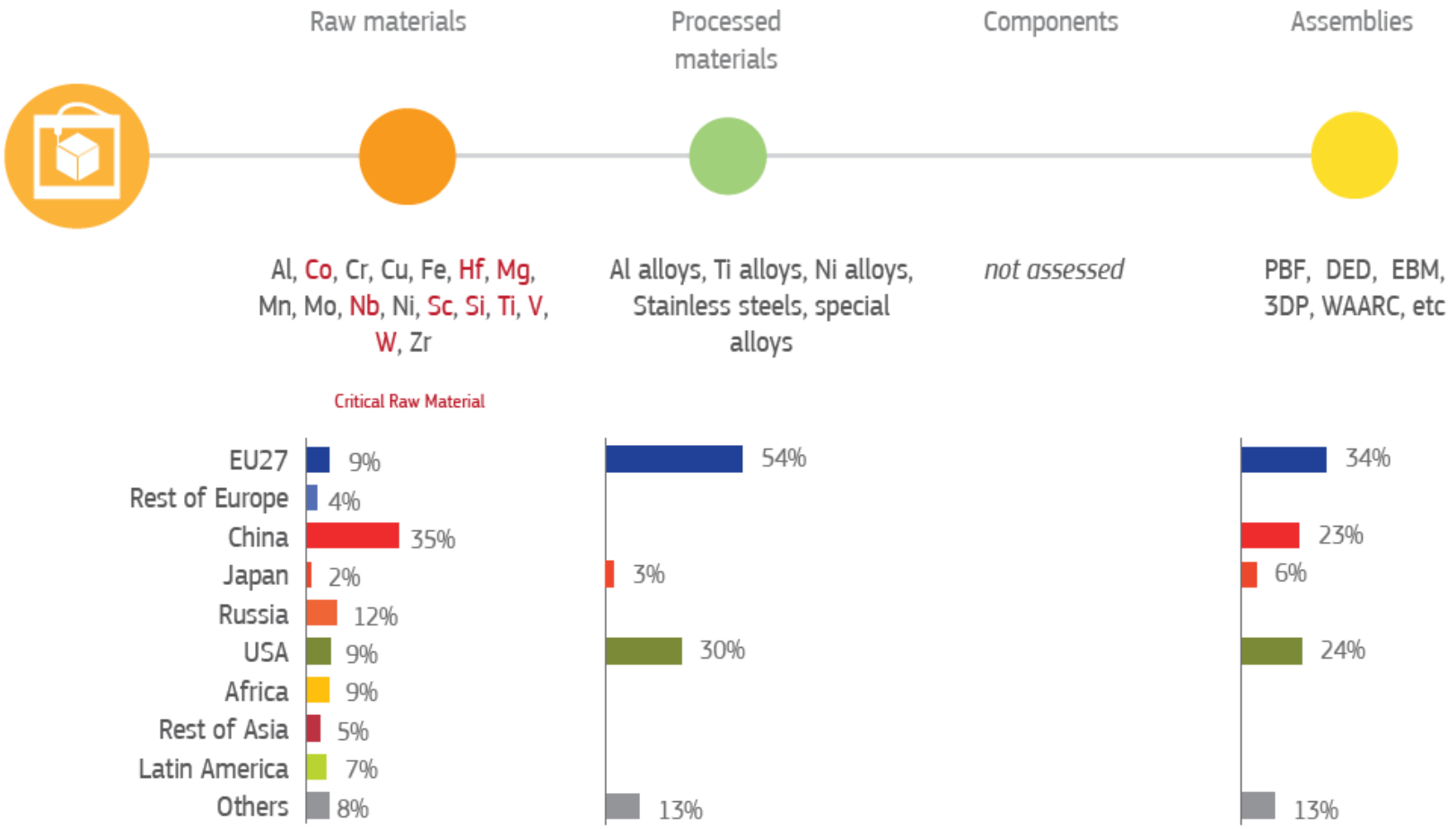
Vanadium: alloying element in various Ti-Al alloys

Zirconium: element in Ti-alloys, in Bulk Metallic Glass, sprockets, springs, gears, sensors

● Critical Raw Material

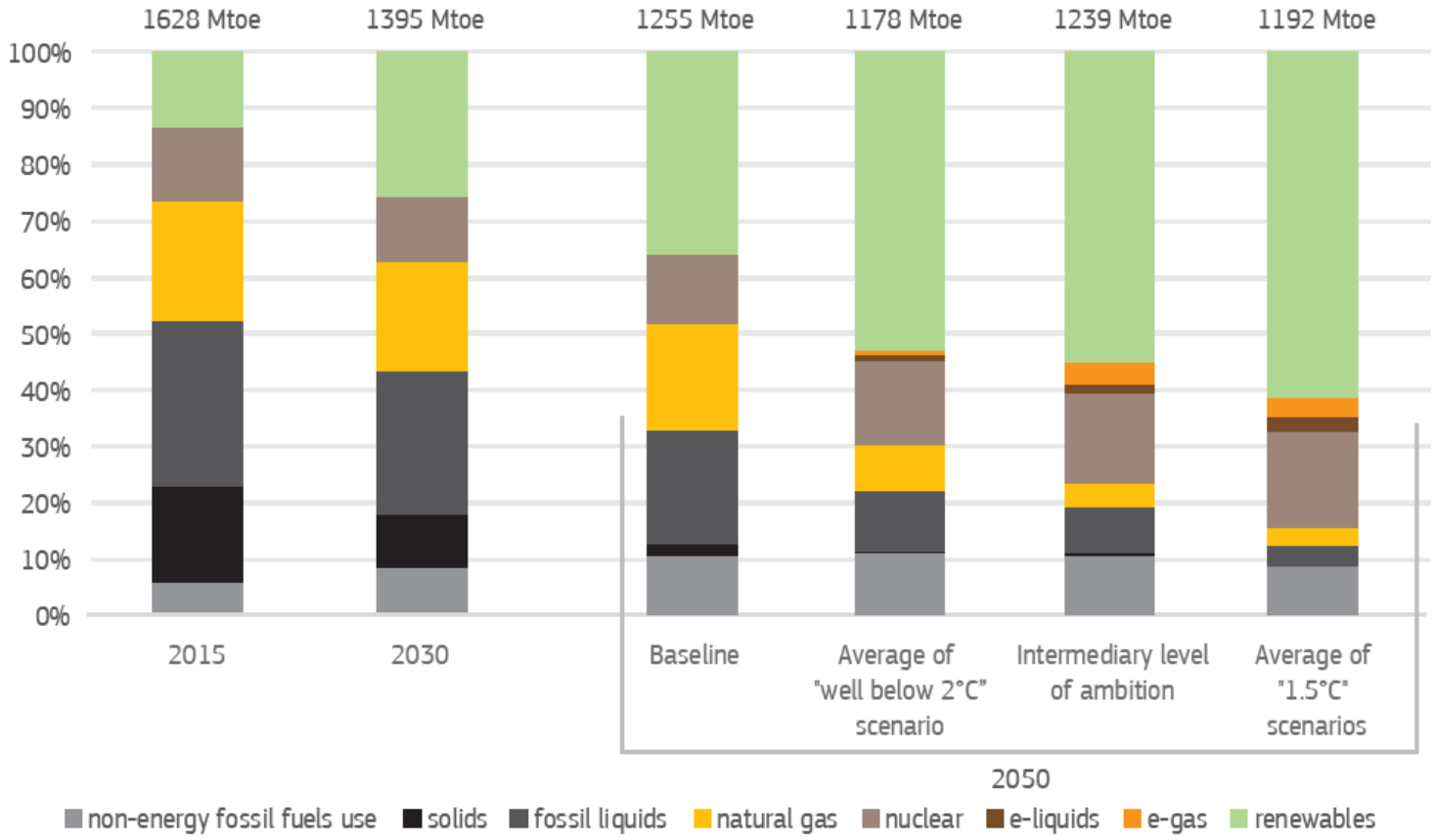
Materiais e sustentabilidade

Manufatura aditiva: riscos de estrangulamento

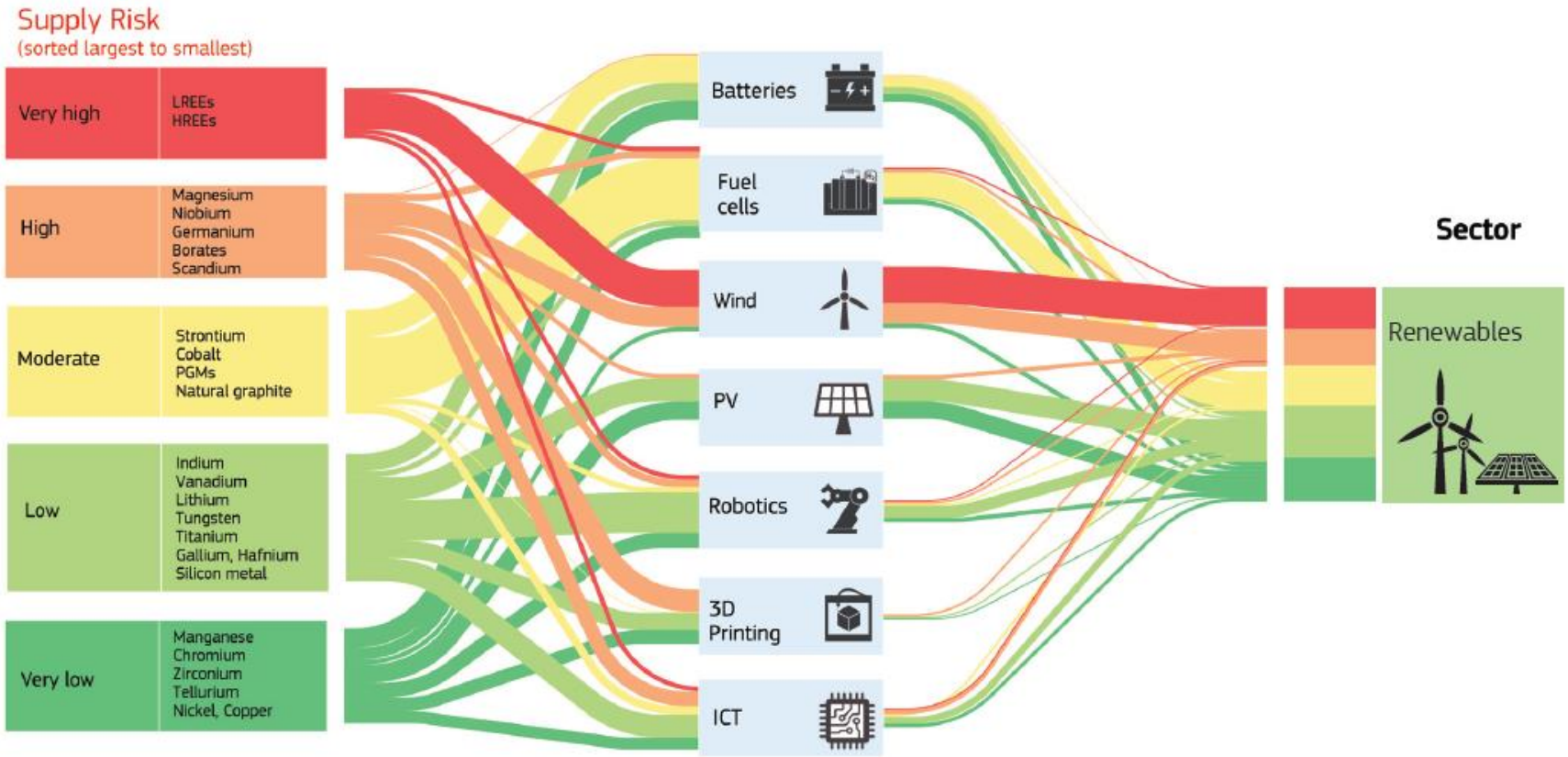


Energias renováveis – desafios

A transição para uma sociedade de baixo carbono dependerá da implementação em larga escala de tecnologias renováveis. Até 2025, pretende-se que mais de 80% da eletricidade produzida na EU seja proveniente de fontes renováveis.



Energias renováveis – desafios



Energias renováveis – desafios

Figure 48. List of critical and non-critical raw materials used for renewables ranked by their 2020 supply risk