



MINERAL RAW MATERIALS AND THE CIRCULAR ECONOMY

DAY ONE

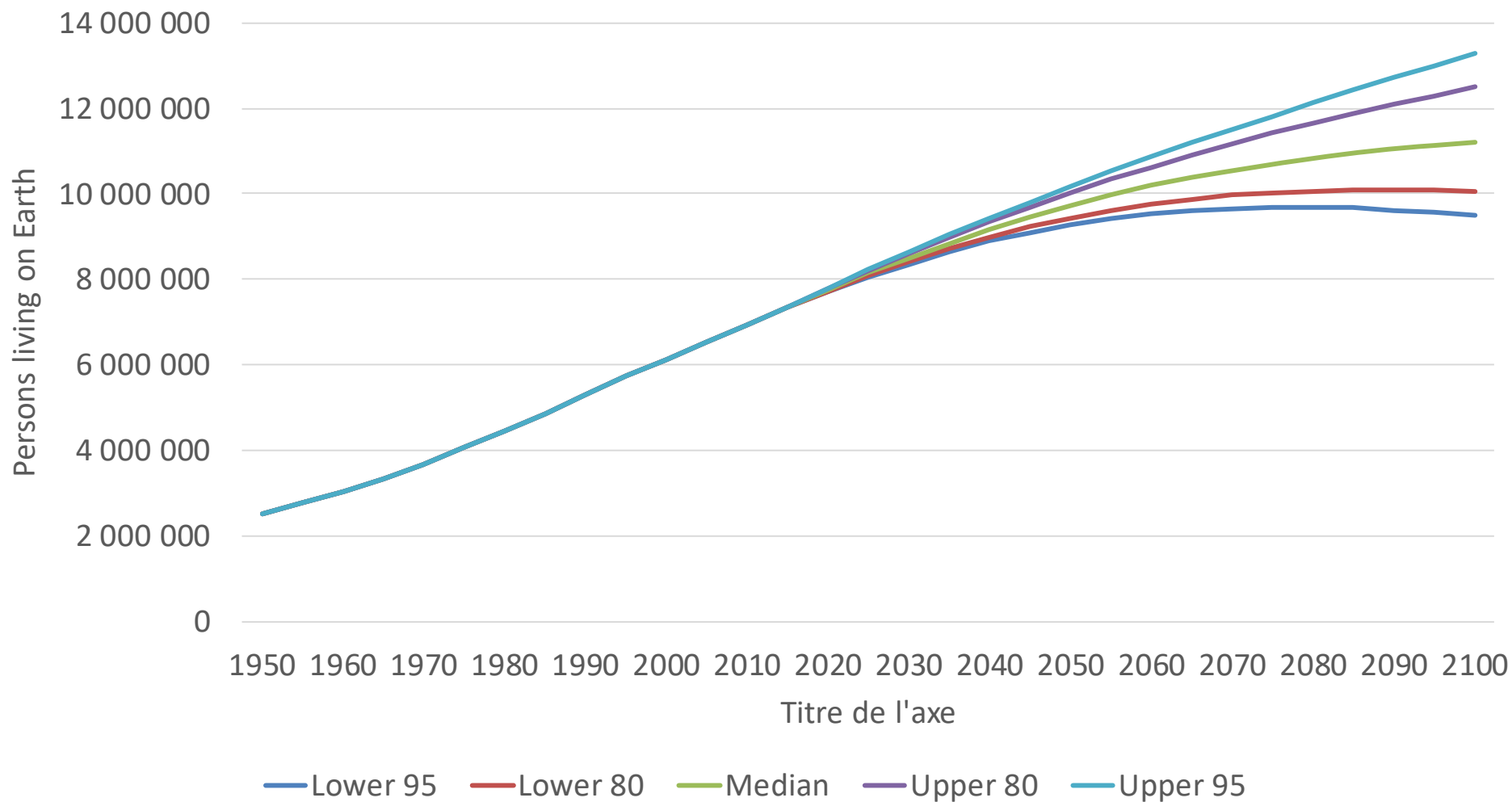
EPF 2016-2017

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These are major drivers that will shape the XXIst century

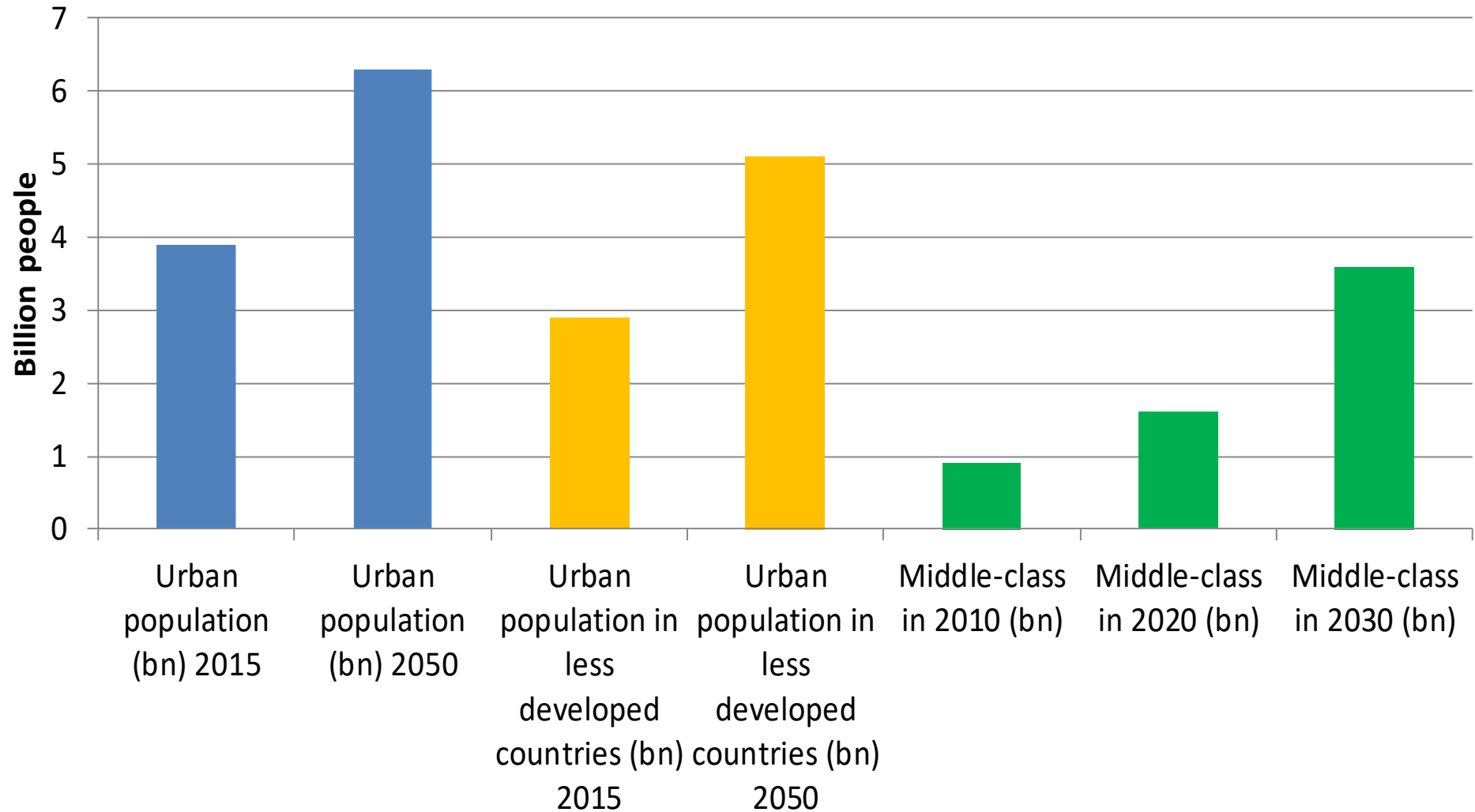
Probabilistic Population Projections based on the World Population Prospects: The 2015 Revision

Data source: United Nations (2015). Probabilistic Population Projections based on the World Population Prospects: The 2015 Revision. Population Division, DESA.

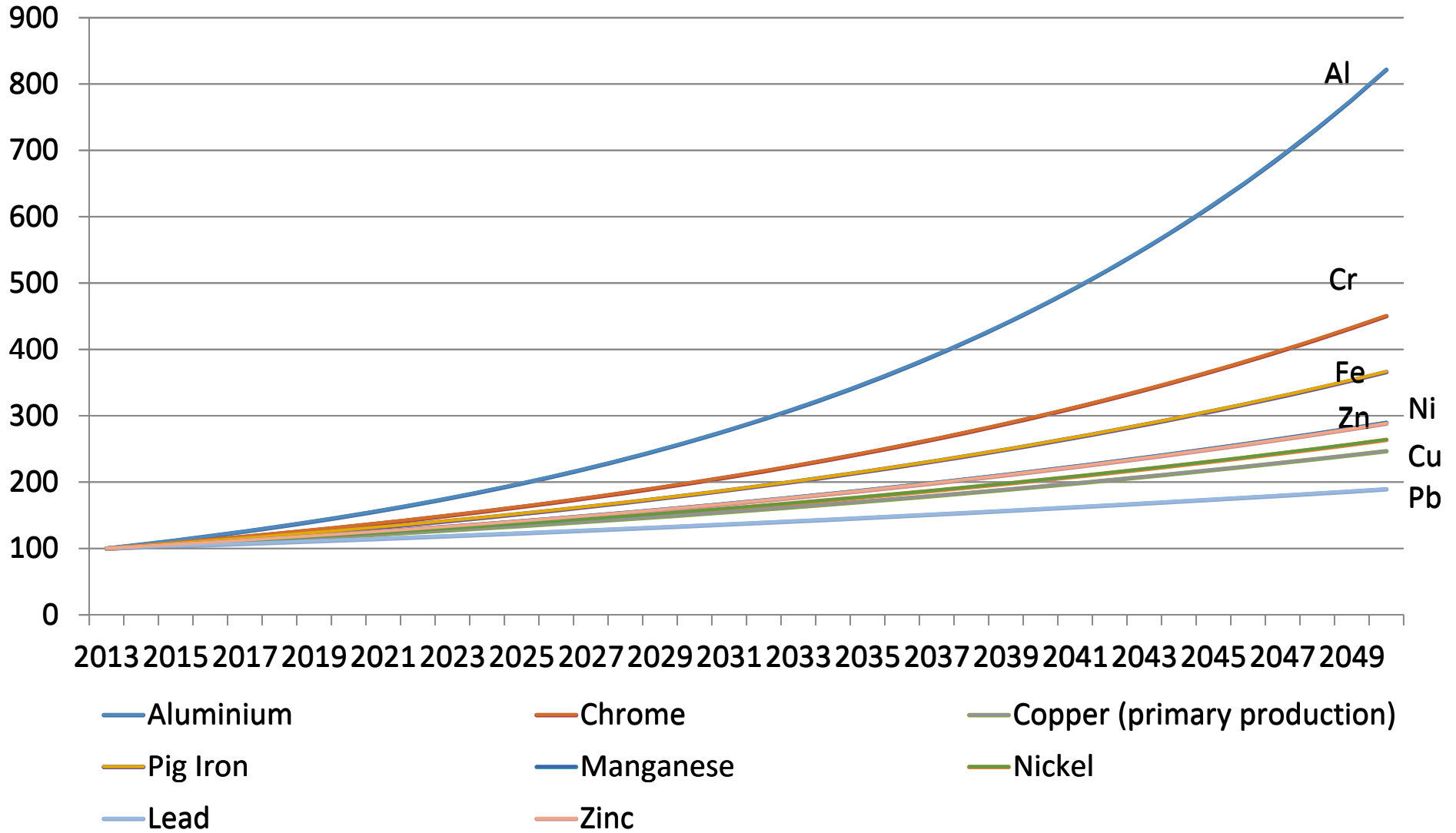


These are major drivers that will shape the XXIst century

Data sources: 1- Urban population: UN World population prospects 2014 revision -
Middle-class development: Brandi C., Büge M. - 2014 - A Cartography of the New Middle Classes in Developing and Emerging Countries



Production/ demand scenario from 2013 to 2050: infrastructure metals
Computed from Historical USGS data (data series 140) for either the 19



Impact on the minerals and metals demand, by 2035, of 42 innovative technologies assessed by the German Fraunhofer Institute for Systems and Innovation Research together with the Federal Institute for Geoscience and Raw Materials (BGR)

Derived from: Marscheider-Weidemann F., Langkau F., Hummen S., Erdmann L., Tercero Espinoza L., Angerer G., Marwede M., Benecke S. - 2016 - Rohstoffe für Zukunftstechnologien 2016 - Fraunhofer IRB Verlag, Stuttgart (Germany) - Disponible en ligne:

http://www.bgr.bund.de/DERA/DE/Downloads/Studie_Zukunftstechnologien-2016.pdf?blob=publicationFile&v=3

Metal	Demand20xx / Production2013		Emerging technologies
	2013	2035	
Lithium	0	3.9	Lithium-ion batteries, lightweight airframes
HREE (Dy/Tb)	0.9	3.1	Magnets, e-cars, wind power
Rhenium	1	2.5	Super alloys
LREE (Nd/Pr)	0.8	1.7	Magnets, e-cars, wind power
Tantalum	0.4	1.6	Micro-capacitors, medical technology
Scandium	0.2	1.4	SOFC fuel cells
Cobalt	0	0.9	Lithium-ion batteries, XTL.
Germanium	0.4	0.8	Fibre optic, IR technology
Platinum	0	0.6	Fuel cells, catalysts
Tin	0.6	0.5	Transparent electrodes, lead-free solders
Palladium	0.1	0.5	Catalysts, seawater desalination
Indium	0.3	0.5	Displays, thin layer photovoltaics
Gallium	0.3	0.4	Thin layer photovoltaics, IC, WLED
Silver	0.2	0.3	RFID
Copper	0	0.3	Electric motors, RFID
Titanium	0	0.2	Seawater desalination, implants

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