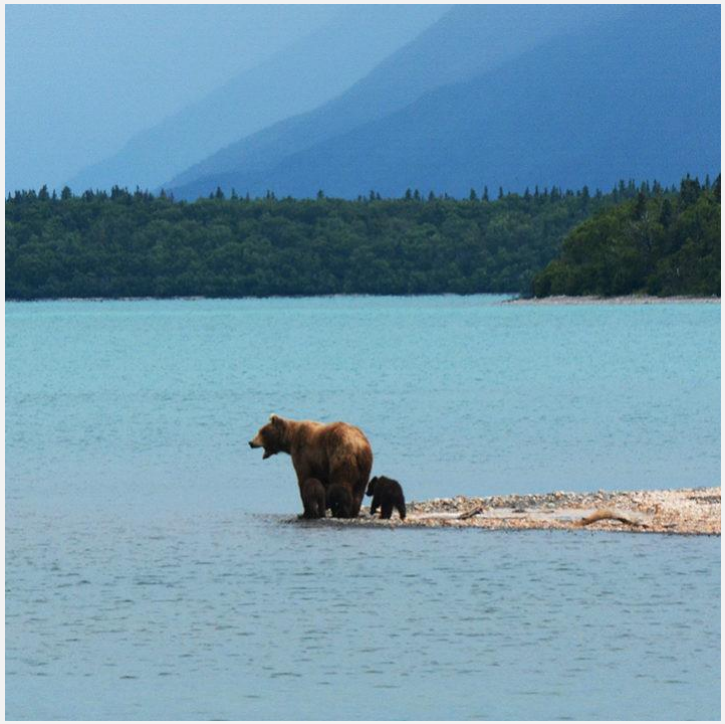
MAKING CLEAN ENERGY CLEAN, JUST & EQUITABLE

Payal Sampat - ***Mining Program Director***

Benjamin Hitchcock Auciello - ***Making Clean Energy Clean, Just and Equitable Coordinator***

HOW WE CAME TO THIS WORK

- Earthworks has over 30 years experience supporting communities on the frontlines of extractive industries in the US, and around the world.
- In recent years we have seen an uptick in copper, nickel, lithium, cobalt and other mining projects described as "critical" for the energy transition.
- This powerful greenwashing narrative is used as justification to expand mining from Alaska to the salt flats of Argentina and Chile, the coastal and rainforests regions of Indonesia and PNG, and even the depths of the ocean.



Bristol Bay watershed, Alaska – threatened by the proposed Pebble copper/gold mine

WHY MINING IS A THREAT TO COMMUNITIES, CLIMATE AND ECOSYSTEMS

- Potential impacts of increased minerals demand on frontline communities, climate and ecosystems:
  - Human rights abuses: forced displacement, conflict, and pollution for workers and communities
  - Disproportionate threats to indigenous rights and livelihoods
  - Toxic waste and deadly tailings disasters
  - Freshwater pollution & use reduces water access and quality for ecosystems and communities
  - Carbon-intensive - metals mining is responsible for 10% of global carbon emissions

Brumadinho mine waste disaster, Brazil, January 2019: an estimated 250 people killed

OPPORTUNITY FOR A JUST TRANSITION

- Earthworks supports the transition to a renewables-powered future – one that is just and equitable, and doesn't harm communities and the environment through increased mining impacts
- This must be be an ***opportunity moment*** – to not only transition to a low-carbon economy but also reduce our dependence on dirty mining.
- Can't replicate the mistakes of the dirty fossil fuel based energy system we're seeking to replace.
- To better understand the data, we commissioned research from Institute for Sustainable Futures at the University of Technology, Sydney

Families protesting impacts of Ramu nickel mine, Papua New Guinea

KEY METALS FOR CLEAN ENERGY TECHNOLOGIES

Batteries & electric vehicles (EVs)
- Lithium-ion (Li-ion) – current tech
- Lithium-Sulfur (Li-S) – new tech
- Lifetime: 10 years (battery) 15 years (vehicle)

Solar PV
- Silicon (c-Si) – 95% of market
- Copper Indium Gallium Selenium (CIGS)
- Cadmium Telluride (CdTe)
- Lifetime: 30 years

Wind Power
- Permanent magnet (PMG) – 20% of market
- Without permanent magnet (non-PMG)
- Lifetime: 30 years

	Batteries			Solar PV			Wind Power	
	Li-ion	Li-S	EV	c-Si	CIGS	CdTe	PMG	Non-PMG
Aluminium	X			X	X	X	X	X
Cadmium						X		
Cobalt	X							
Copper	X			X	X	X	X	X
Dysprosium			X				X	
Gallium					X			
Indium					X			
Lithium	X	X						
Manganese	X							
Neodymium			X				X	
Nickel	X							
Silver				X				
Selenium					X			
Tellurium						X		

Cumulative Demand

	Cumulative demand in 2050 compared to reserves		Cumulative demand in 2050 compared to resources	
	Maximum scenario	Minimum scenario	Maximum scenario	Minimum scenario
Aluminium	2%	1%	1%	1%
Cadmium	4%	2%	0%	0%
Cobalt	423%	135%	120%	38%
Copper	18%	13%	4%	3%
Dysprosium	19%	12%	11%	7%
Gallium	2%	1%	0%	0%
Indium	51%	28%	16%	9%
Lithium	280%	86%	85%	26%
Manganese	14%	5%	0%	0%
Neodymium	13%	8%	7%	5%
Nickel	136%	43%	77%	25%
Selenium	11%	7%	7%	4%
Silver	52%	29%	21%	12%
Tellurium	75%	42%	48%	27%

Key findings: reduce demand and increase reuse

- **Electric vehicles** are the main driver of demand for key metals
- A combination of **recycling and increased efficiency** has the most potential to reduce demand, but cannot meet all demand
- Need to **design transport and energy systems to minimise batteries**, through promoting public/active transport and car-sharing and using storage only when needed.

- **Batteries and EVs:**
  - Recycling of batteries happening to a degree because of economic value in the materials.
  - Not all types of metals are being recovered in recycling process (e.g. only highest value metals Co & Ni but not Li & Mn)
- Policy interventions will be needed to encourage recycling to recover all metals

MAKING CLEAN ENERGY CLEAN, JUST & EQUITABLE: PLATFORM FOR CHANGE

Boost Recycling and Minimize Toxicity

- Scale up use of recycled minerals – corporate + policy shift
- Product take-back requirements, design batteries and RE technologies for disassembly and efficient recycling
- Prioritize health and safety for workers and communities.

- **Ensure Responsible Minerals Sourcing**
  - Where sourcing from new mining is absolutely necessary, operations must adhere to stringent environmental and human rights standards, such as those developed by the multi-stakeholder Initiative for Responsible Mining Assurance (IRMA, www.responsiblemining.net), with independent, third-party assurance of compliance and civil society oversight.

- **Shift Consumption and Transportation**:
  - Rethink how we consume products and transport goods and people
  - Prioritize investments in electric-powered public transit
  - Equity in access to benefits of clean energy and transit
  - Can't tech fix out way out of this

MAKING CLEAN ENERGY CLEAN, JUST & EQUITABLE

Payal Sampat
psampat@earthworksaction.org
twitter: @payalsampat

Benjamin Hitchcock Auciello
bhitchcock@earthworksaction.org
twitter: @BenjAuciell0

https://earthworks.org/mcec

Alaskan wild salmon imperiled by Pebble mine