Science, Technology and Innovation for Sustainable Consumption and Production

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EU SWITCH-Asia Regional Policy Support Component

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UN environment
United Nations Environment Programme

switchasia POLICY ADVOCACY

Funded by the European Union

EU SWITCH-Asia II Project

UN environment

Component 1: Grants – directly by the European Union to support implementation of projects
Component 2: Facility: Consortium led by GIZ International
Component 3: Regional Policy Advocacy (RPA) by UN Environment AP

The overall objective of the Policy Advocacy Component at Regional Level is to strengthen the dialogue at regional, sub-regional and national policies on Sustainable Consumption and Production in Asia, thereby contributing to green growth and reduction of poverty in Asian countries.

Transforming-AP About POLICY FINANCE BUSINESS TECHNOLOGY CULTURE Agenda & Download Photos & Videos Location Press Information Event Partners

Transforming Asia Pacific: Innovative Solutions, Circular Economy and Low Carbon Lifestyles

17 - 19 September 2018 | Bangkok

VIEW LIVE

UN environment United Nations Environment Programme switchasia POLICY ADVOCACY Funded by the European Union SACEP asean

TECHNOLOGIES ARE UNDERPINNED BY COMPLEX SUPPLY CHAINS

INCREASED POPULATION?

One person's lifetime footprint

2,800
tonnes Materials

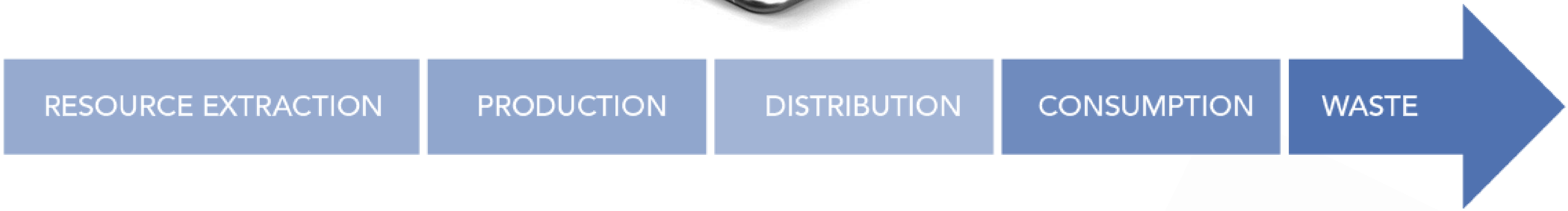
2,000
tonnes CO_2

20,000
GJ Energy

225,000
kL Water

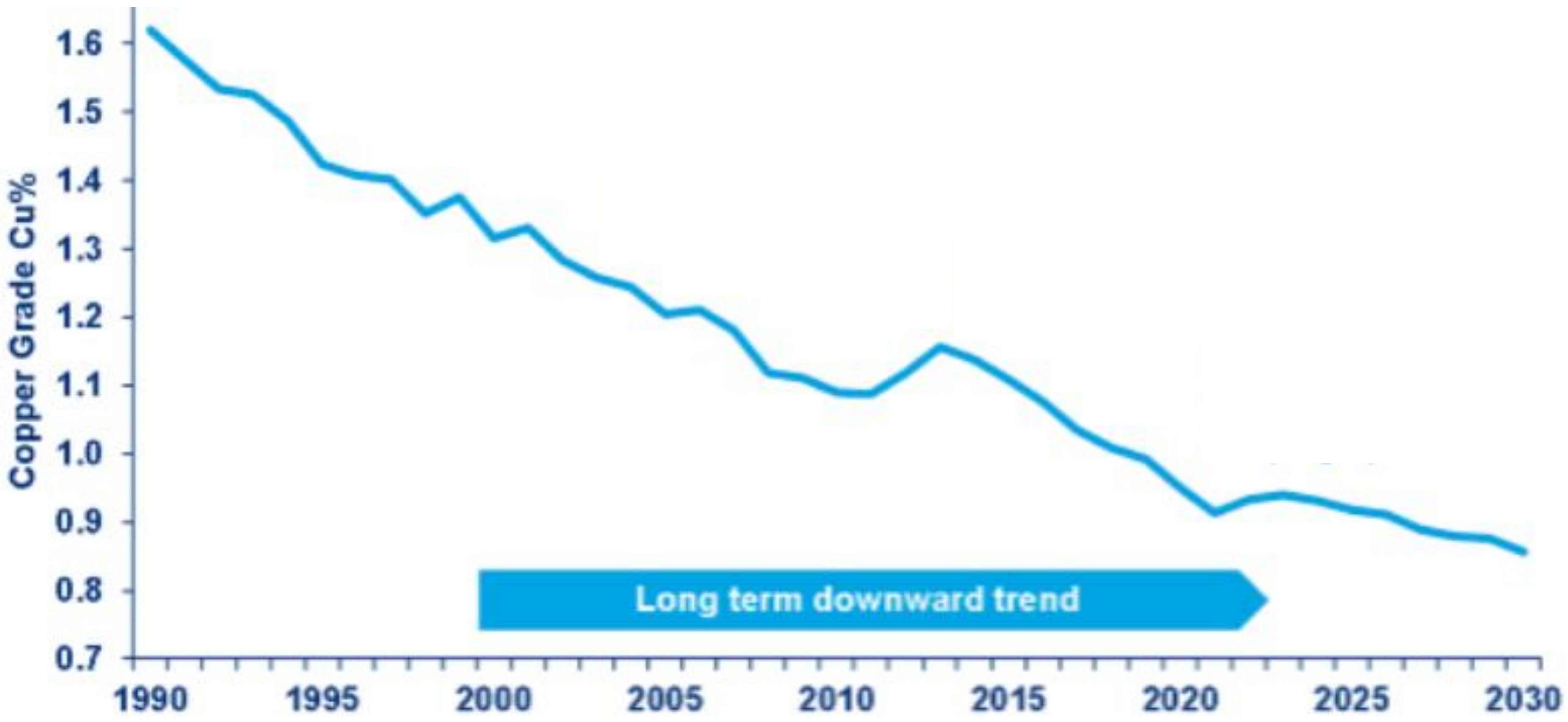
12:03
Wed, 29 Aug
Samsung
GALAXY Note II
SkyDrive
People

LINEAR ECONOMY

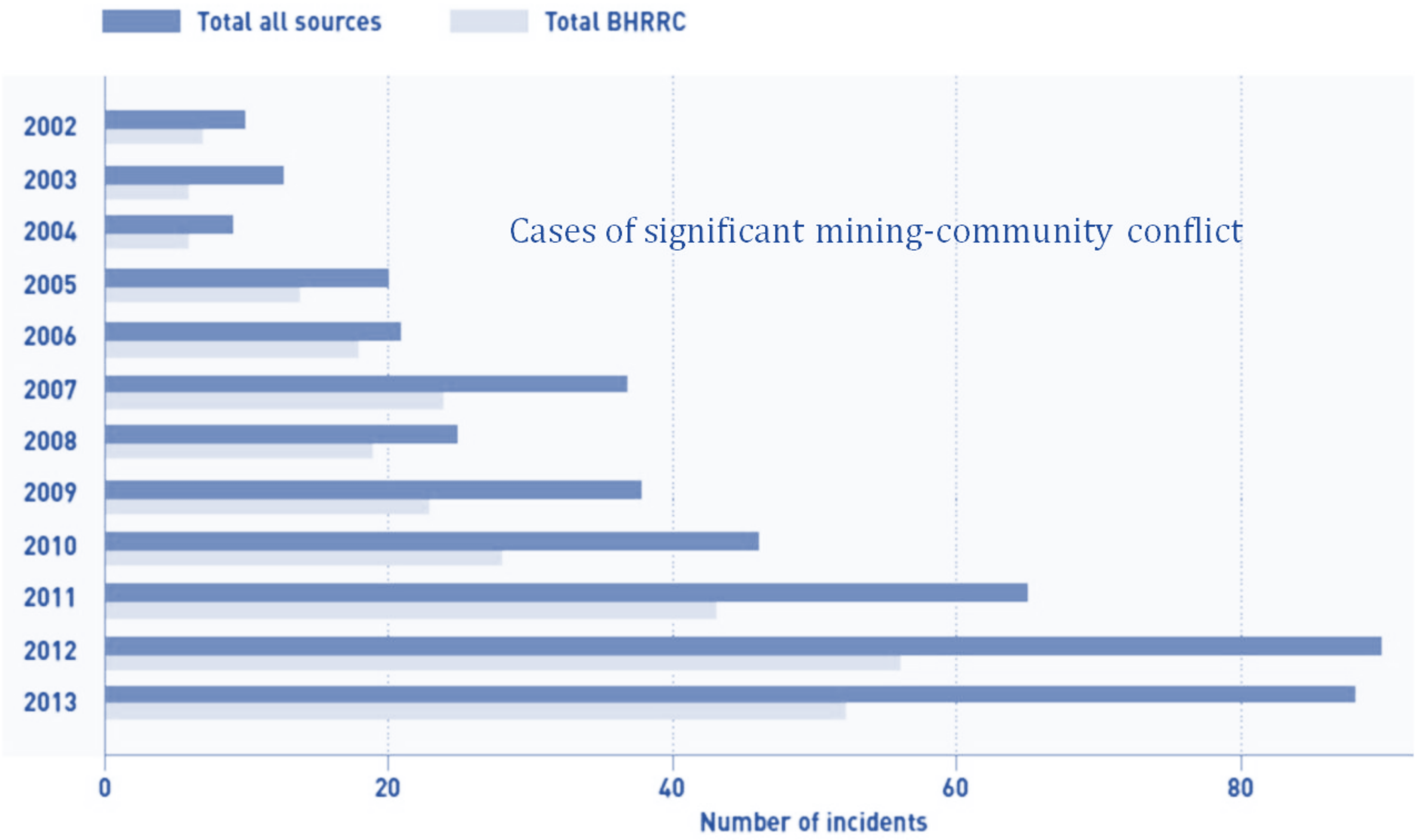


GEOLOGICAL SCARCITY-

ORE GRADES DECLINING



GEOGRAPHIC SCARCITY
DEPOSITS IN AWKWARD PLACES



GEOGRAPHIC SCARCITY

...REALLY AWKWARD PLACES

ASTEROIDS

DEEP SEA

CUTE SWEDISH TOWN

GEOGRAPHIC SCARCITY
...REALLY AWKWARD PLACES

Space mining a step closer as Japan successfully lands rovers on ASTEROID

SPACE mining is one step closer after Japan successfully landed two rovers on the surface of an asteroid.

Share Tweet 51

By **Rachel O'Donoghue** / Published 22nd September 2018

ASTEROIDS

Deep-Sea Mining for Rare-Earth Metals Looms, as Do Environmental Questions

From Environment & Energy Report REQUEST A DEMO

Turn to the nation's most objective and informative daily environmental news resource to learn how the United States and key players around the world are responding to the environmental...

By Adam Allington and Stephen Lee

Once thought too expensive and too difficult, commercial scale mining of the deep sea is poised to become a reality as early as 2019. But scientists warn reaching rare minerals on and under the sea floor could cause irreversible damage to an

DEEP SEA

Swedish town makes unprecedented move for iron ore mine

Hugues Honore | April 02, 2015

6 0

CUTE SWEDISH TOWN

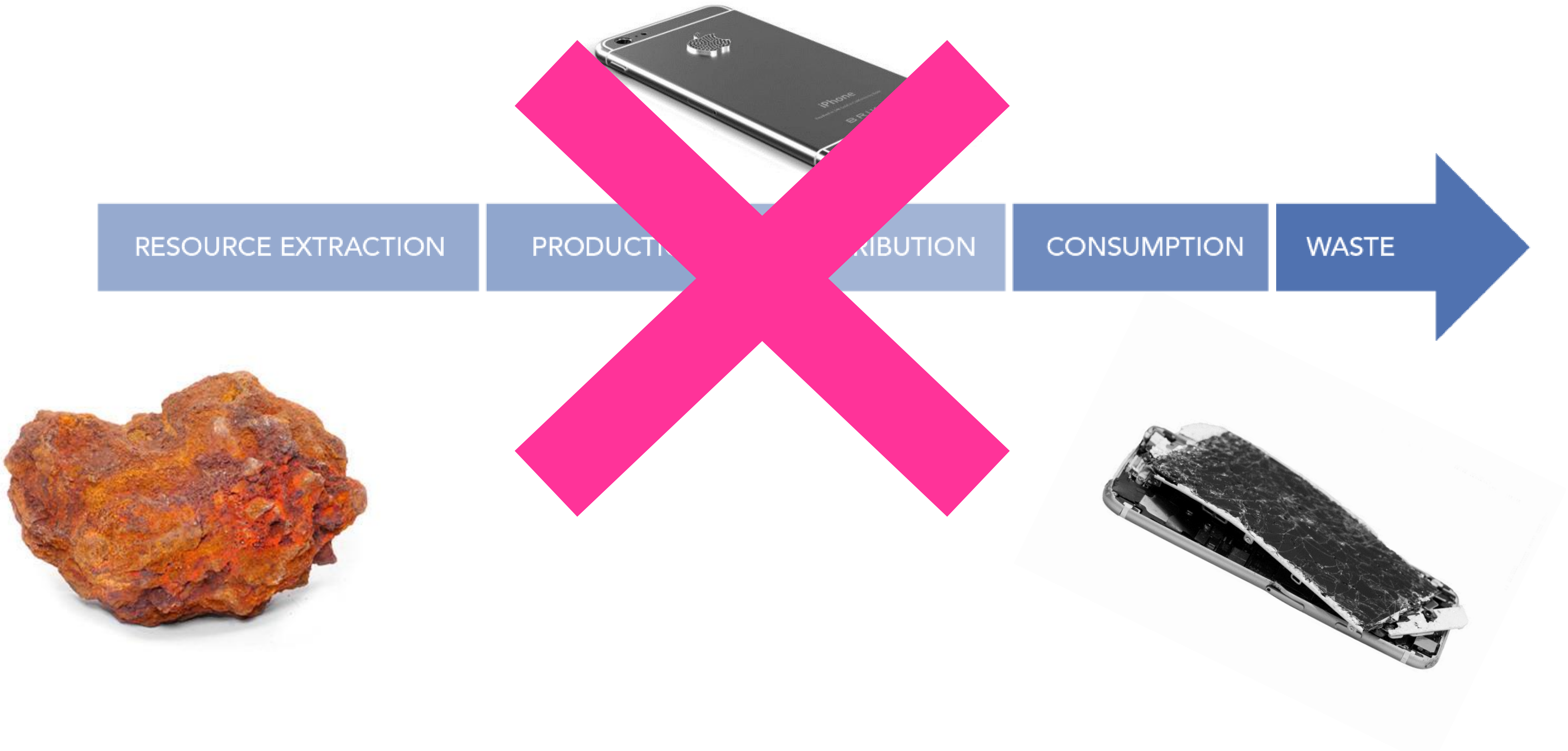
GEOPOLITICAL SCARCITY

COUNTRIES HAVE MONOPOLIES ON CRITICAL MINERALS

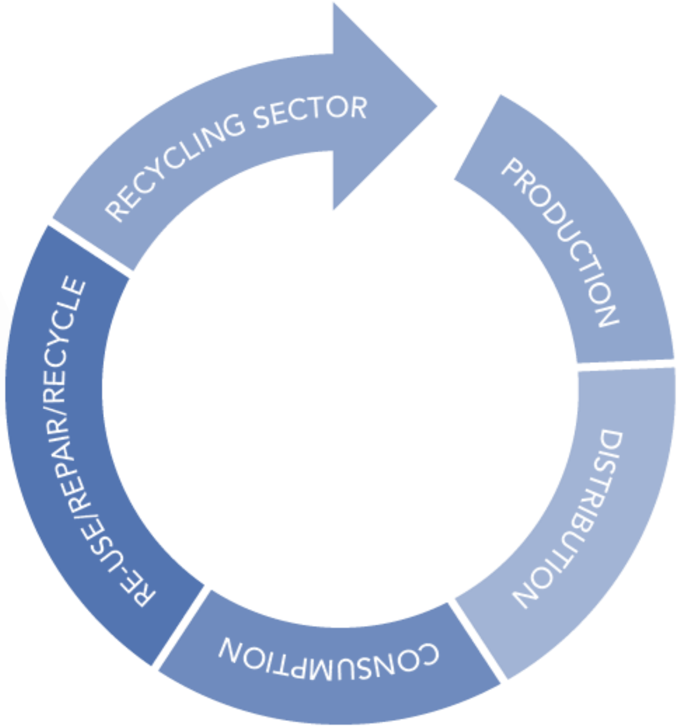
China rare earth: US, EU, Japan accuse China of hoarding minerals needed for technology parts

By **DON MELVIN** Associated Press
Tues., March 13, 2012

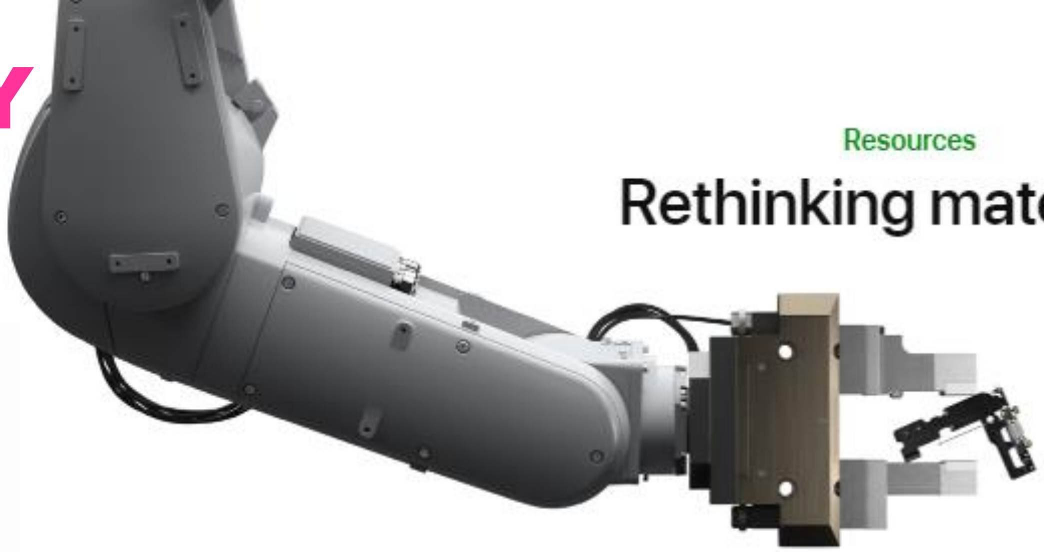
~~LINEAR~~ ECONOMY



CIRCULAR ECONOMY



CIRCULAR ECONOMY
APPLE



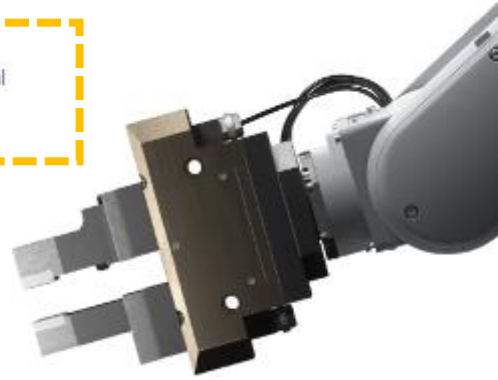
Resources

Rethinking materials.

Mining less from the earth. And more from old devices.

There are a lot of valuable materials inside old devices that are perfect for making new products. The challenge is that recovering them is extraordinarily complex and hard to do efficiently. So we've put our passion for innovation into piloting new recycling technologies. With advancements like Daisy, our newest disassembly robot, we can recover more materials and at a higher quality.

Ultimately, we want to make products using only renewable resources or recycled material. And we want to return an equivalent amount of material to the market, to be used by us or others. Our ambition is that one day we'll extract nothing from the earth.



Meet Daisy, the ultimate recycling robot.

Our newest disassembly robot, Daisy, is the most innovative and efficient

INNOVATIONS CAN SUPPORT SUSTAINABLE CONSUMPTION AND PRODUCTION

1. Big data and Internet of Things

Big Data refers to datasets that are so big and complex that traditional computers and data processing software cannot handle them. Often, this data is captured from devices such as sensors, mobile devices, cameras, and microphones. It's then processed by super computers and algorithms, in real time.

IoT is a network of smart, interconnected devices and services capable of sensing or listening to requests or needs, and then acting on them. IoT technology can monitor metrics such as air and water quality, energy consumption, temperature and traffic flows.

1. Big data and Internet of Things

Smart meters have had a big impact in the Philippines, where incomes are low and electricity prices are high.

Power distributor Manila Electric Co. targets 3.3m ‘smart’ meters installed by 2024.

It will also allow customers to efficiently manage their energy usage and budget through consumption information, alerts and notifications.

2. BLOCKCHAIN

Blockchain is a transaction ledger where blocks of new information can be added, but old blocks cannot be changed. Transactions on the blockchain are performed across a network, with no need for a central intermediary such as a central bank.

2. BLOCKCHAIN

- Peer to peer clean energy sharing (Power Ledger led trial in Bangkok's Sukhumvit neighbourhood)
- Supply chain transparency (Provenance used blockchain to monitor Indonesia's tuna industry)
- Tokenising recycling (TrustNote lets citizens digitally tag their recyclables using an app, and be rewarded with tokens they can redeem on renewable energy products, or recycled items)
- Carbon footprinting (Blockchain can track supply chain carbon emissions)
- Rewarding good behavior (Goodchain is a platform where brands place products and pledge consumer tokens to causes.)
- Enabling charity (Bitgive and Bithope are two cryptocurrency charities)

3. ARTIFICIAL INTELLIGENCE

AI, or machine learning, refers to technologies that can analyse enormous volumes of data and automate decision-making and complete tasks.

3. ARTIFICIAL INTELLIGENCE

The International Transport Forum expects shared transport fleets using AI powered self-driving vehicles to take nine out of 10 cars off city streets in the future.

The Climate Corporation's Climate Fieldview software uses deep learning to analyse data entered by farmers and IoT sensors. Farmers can optimise their seed investments, manage fertilisation, and analyse crop performance, get a real-time snapshot of field health.

SCIENCE CAN SUPPORT SUSTAINABLE CONSUMPTION AND PRODUCTION

LIFE CYCLE ASSESSMENT

What is the difference between:

- Internal combustion engine?
- eVehicle powered by the grid?
- eVehicle powered by solar power?

LIFE CYCLE ASSESSMENT

Type	Distance (km.)	Fuel economy (litre/100km.)	Round trip	Fuel consumption	Unit	$	CF	Unit	Carbon	Unit	Carbon footprint from baseline: Compare to EV GRID	Compare to IC	compare to PV EV
Gasoline	30	4.4	2	1.5	litre		3.362925	kg CO2/	5.044387	kg CO2	359%	100%	2097%
Type	**Distance (km.)**	**Fuel economy (kWh/100km.)**	**Round trip**	Electricity consumption	Unit	$	CF	Unit	Carbon	Unit			
Electricity -GRID*	30	16.6	2	3	kWh		0.469	g CO2/kWI	1.407	kg CO2	100%	28%	585%
Type	**Distance (km.)**	**Fuel economy (kWh/100km.)**	**Round trip**	Electricity consumption	Unit	$	CF	Unit	Carbon	Unit			
Electricity -PV*	30	16.6	2	3	kWh		0.0802	g CO2/kWI	0.2406	kg CO2	17%	5%	100%

Assumption: Daily travel distance of car is 30km

*Assuming fuel economy of BMW's i3(94 A.h)

1 day = 60 km

LIFE CYCLE ASSESSMENT

		Fuel Economy	Carbon intensity of energy	Carbon footprint	
Internal combustion engine?	30km	4.4 L per 100 km	3.4 kg CO_2 per liter	4.4 kg CO_2	100%
eVehicle powered by the grid? Thailand	30km	16.6 kWh per 100 km	0.47 kg CO_2 per kWh	2.3 kg	53%
eVehicle powered by the grid? China	30km	16.6 kWh per 100 km	1.04 kg CO_2 per kWh	5.2 kg	117%
eVehicle powered by solar power?	30km	16.6 kWh per 100 km	0.08 kg CO_2 per kWh	0.4 kg	9%

THANK YOU

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