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Mitigation Enabling Energy Transition in the MEDiterranean region

Urban Mines - The Other Side of Digital Transformation

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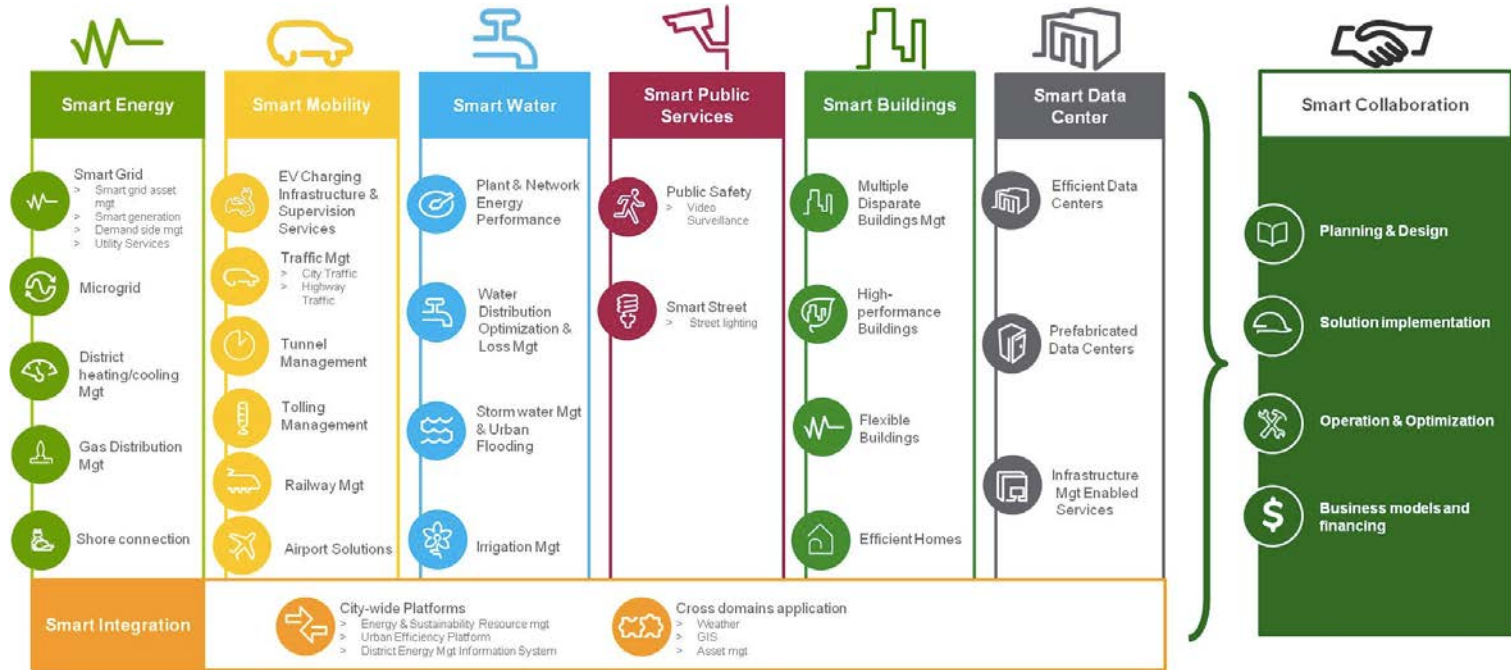
Sustainable City



Smart City



Sustainable Smart City



Challenges

- Volumes
 - Increasing sales of EEE, decreasing lifetimes
- Material Content
 - Valuable and energy-intensive precious metals
 - Toxic materials



Environmental & occupational safety problems

Ramifications:

- Toxic emissions from burning
- Soil & water contamination from chemical disposal
- Inefficient recovery of precious metals



Material	Occurrence in E-waste	Health and Environmental Impact
Beryllium (OECD 2003, Taylor et al. 2003)	copper-beryllium alloys, springs, relays and connections;	<ul style="list-style-type: none"> beryllium sensitization/chronic beryllium disease human carcinogens released as beryllium oxide dust or fume during high temperature metal processing
Cadmium	Contacts, switches, nickel-cadmium (Ni-Cd) batteries, printer inks and toners	<ul style="list-style-type: none"> persistent and mobile in aquatic environments (ATSDR 2000) damage to the kidneys and bone toxicity, released if plastic is burned or during high temperature metal processing
Lead	Circuit boards/ cathode ray tubes CTR (1 – 3 kg per CRT);	<ul style="list-style-type: none"> Risk for small children and fetuses Damage to the nervous system, red blood cells, kidneys and potential increases in high blood pressure; Incineration can result in release to the air
Mercury	Lighting devices that illuminate flat screen displays, switches and relays	<ul style="list-style-type: none"> Impacts the central nervous system Land filling and incineration of flat panel displays results in the release to the environment
PCBs (polychlorinated biphenyls)	Insulating fluids for transformers and capacitors, flame-retardant plasticizers	<ul style="list-style-type: none"> Suppression of the immune system, liver damage, cancer promotion, damage to the nervous system Damage to reproductive systems

The Global E-waste Monitor 2020

Quantities, flows, and the circular economy potential

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Supporting Contributors:







Arab Countries

Countries with the highest e-waste generation per sub-region

Eastern Africa

🗑️ 0.3 Mt | 0.8 kg per capita 📄 13% | 0.004 Mt 🧑 383

Ethiopia	55.2 kt
Kenya	51.3 kt
Tanzania	50.2 kt

Middle Africa

🗑️ 0.2 Mt | 2.5 kg per capita 📄 0.03% | 0.0001 Mt 🧑 80

Angola	125.1 kt
Cameroon	26.4 kt
Congo	18.3 kt

Northern Africa

🗑️ 1.3 Mt | 5.4 kg per capita 📄 0% | 0 Mt 🧑 240

Egypt	585.8 kt
Algeria	308.6 kt
Morocco	164.5 kt

Southern Africa

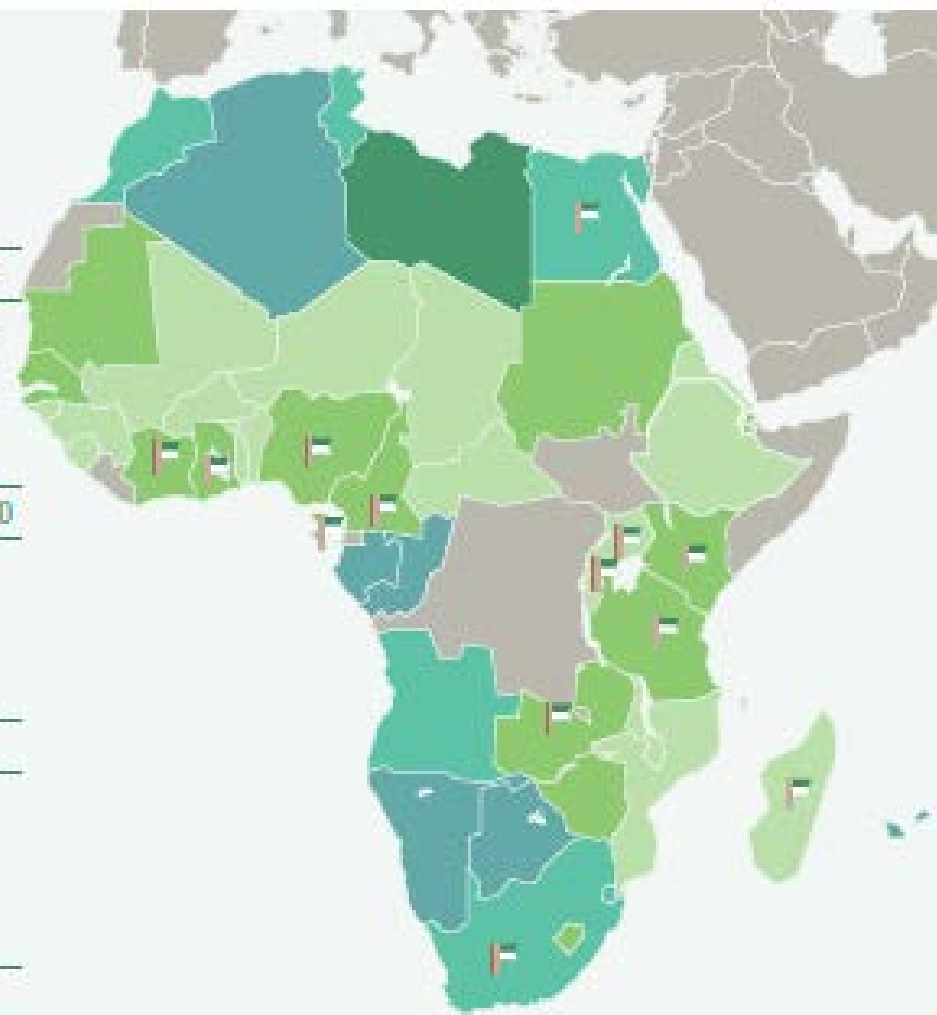
🗑️ 0.5 Mt | 6.9 kg per capita 📄 4% | 0.02 Mt 🧑 67

South Africa	415.5 kt
Botswana	18.8 kt
Namibia	15.7 kt

Western Africa

🗑️ 0.6 Mt | 1.7 kg per capita 📄 0.4% | 0.002 Mt 🧑 382

Nigeria	461.3 kt
Ghana	52.9 kt
Côte d'Ivoire	30.0 kt



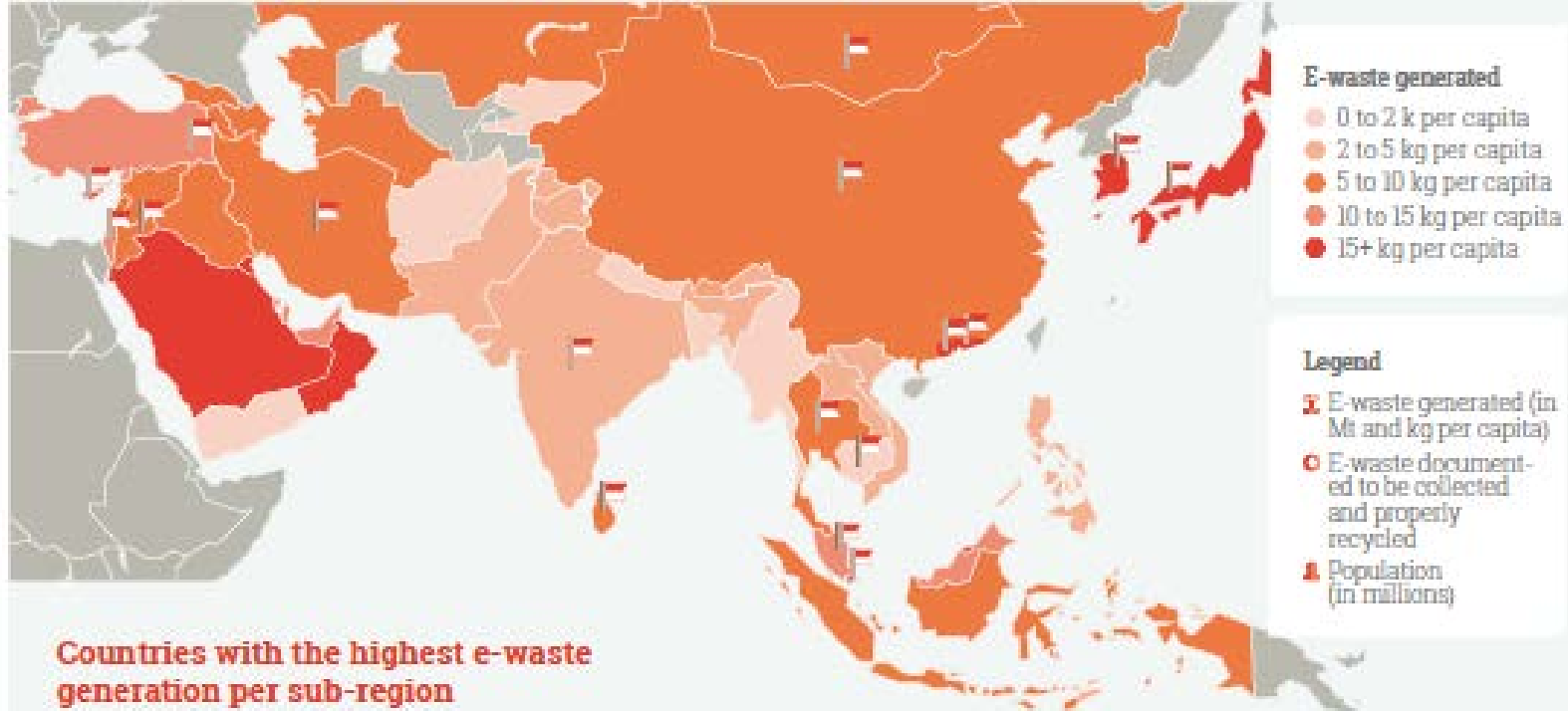
Legend

- 🗑️ E-waste generated (in Mt and kg per capita)
- 📄 E-waste documented to be collected and properly recycled
- 🧑 Population (in millions)

E-waste generated

- 0 to 1 kg per capita
- 1 to 3 kg per capita
- 3 to 5 kg per capita
- 5 to 10 kg per capita
- 10+ kg per capita

Arab Countries



E-waste generated

- 0 to 2 kg per capita
- 2 to 5 kg per capita
- 5 to 10 kg per capita
- 10 to 15 kg per capita
- 15+ kg per capita

Legend

- 📊 E-waste generated (in Mt and kg per capita)
- 🗑️ E-waste documented to be collected and properly recycled
- 👤 Population (in millions)

Countries with the highest e-waste generation per sub-region

Western Asia

📊 2.6 Mt | 9.6 kg per capita 🗑️ 6% | 0.2 Mt 👤 272

Turkey	847 kt
Saudi Arabia	595 kt
Iraq	278 kt

Central Asia

📊 0.2 Mt | 7.1 kg per capita 🗑️ 5% | 0.01 Mt 👤 31

Kazakhstan	172 kt
Turkmenistan	39 kt
Kyrgyzstan	10 kt

South-Eastern Asia

📊 3.5 Mt | 5.4 kg per capita 🗑️ 0% | 0 Mt 👤 656

Indonesia	1,618 kt
Thailand	621 kt
Philippines	425 kt

Eastern Asia

📊 13.7 Mt | 8.6 kg per capita 🗑️ 20% | 2.7 Mt 👤 1590

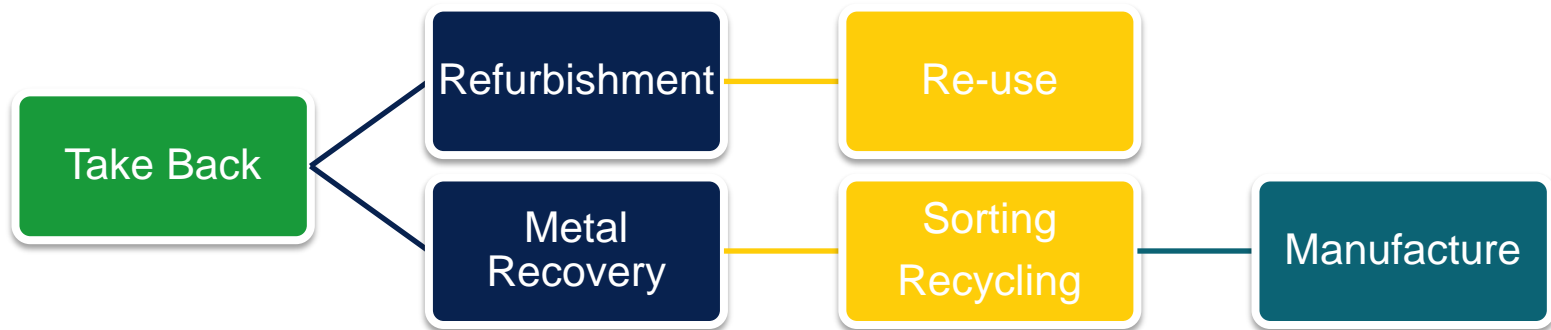
China	10,129 kt
Japan	2,569 kt
Republic of Korea	818 kt

Southern Asia

📊 4.8 Mt | 2.6 kg per capita 🗑️ 0.9% | 0.04 Mt 👤 1896

India	3,230 kt
Iran (Isl. Rep.)	790 kt
Pakistan	433 kt

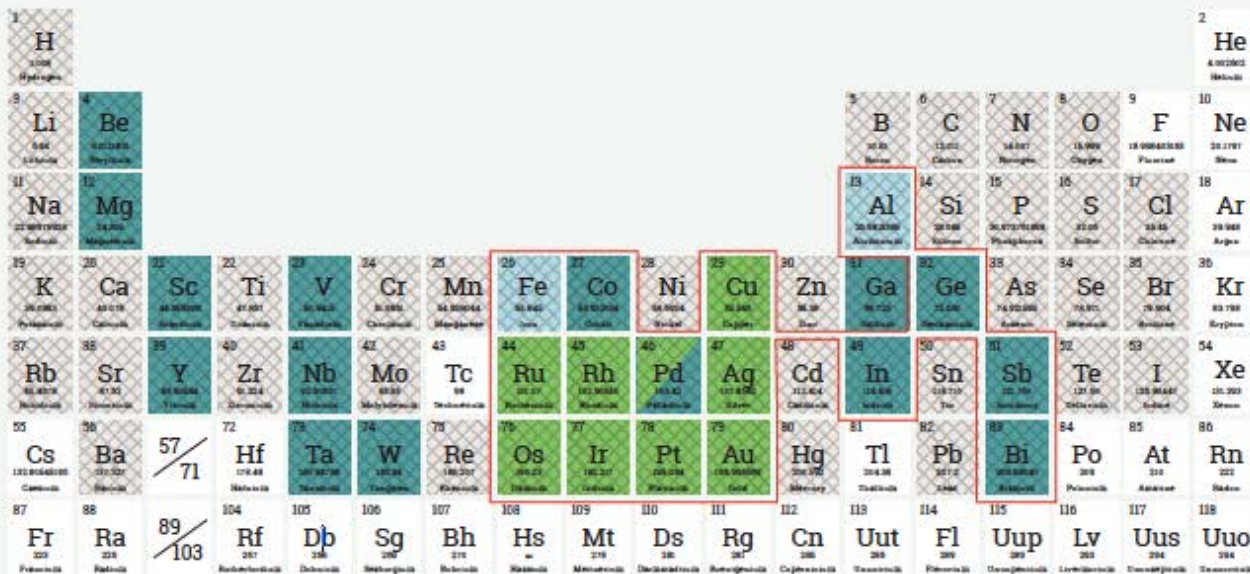
Electronic Waste Life Cycle



E-waste Proper Management Benefits

- Increase Job opportunities
- Extracting precious materials
- Refurbishment: Reduce energy consumption for producing new products – thus assist in the Climate change issue

Good news

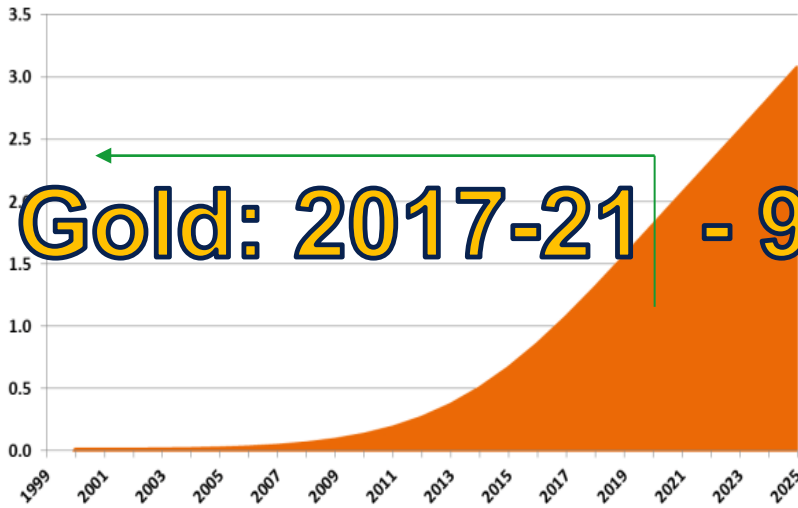


-  Elements found in EEE
-  Elements quantified in the report
-  Precious
-  Critical
-  Non-critical

Lanthanide Series		57	58	59	60	61	62	63	64	65	66	67	68	69	70	71
	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu	
	138.90547	140.12	140.90768	144.242		150.36	151.964	157.25	158.92535	162.500	164.93033	167.259	168.93423	173.054	174.967	
	Lanthanoids	Actinoids	Lanthanoids	Lanthanoids	Actinoids	Lanthanoids	Lanthanoids	Lanthanoids	Lanthanoids	Lanthanoids	Lanthanoids	Lanthanoids	Lanthanoids	Lanthanoids	Lanthanoids	Lanthanoids
Actinide Series		89	90	91	92	93	94	95	96	97	98	99	100	101	102	103
	Ac	Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr	
	227	232.0377	231.03688	238.02891	237	244	243	247	247	251	252	257	258	289	289	260
	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids	Actinoids

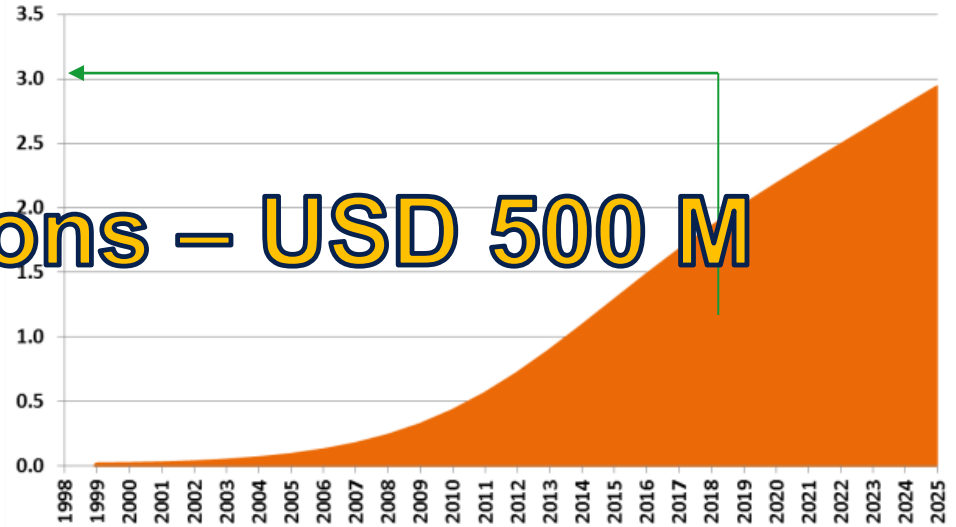
EGYPT - BO2W Project

Gold potential in EoL Mobiles cumulative [in tonnes]



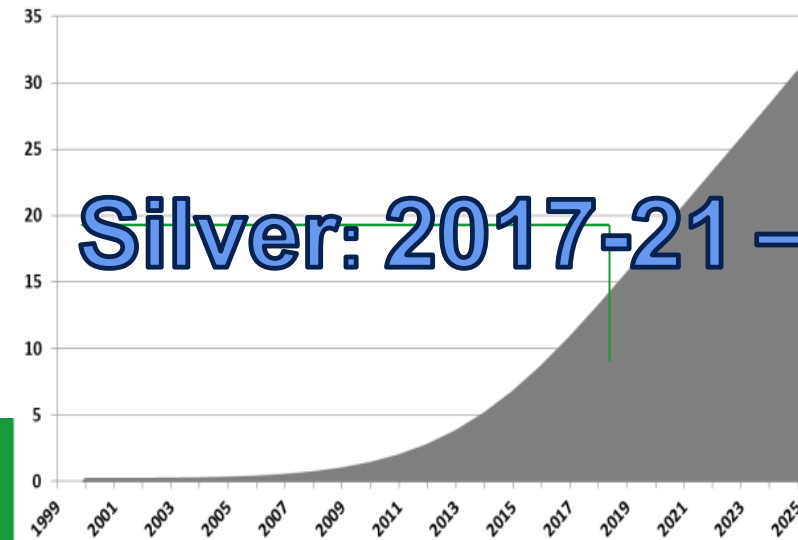
Gold: 2017-21 - 9 tons - USD 500 M

Gold potential in EoL Desktops cumulative [in tonnes]



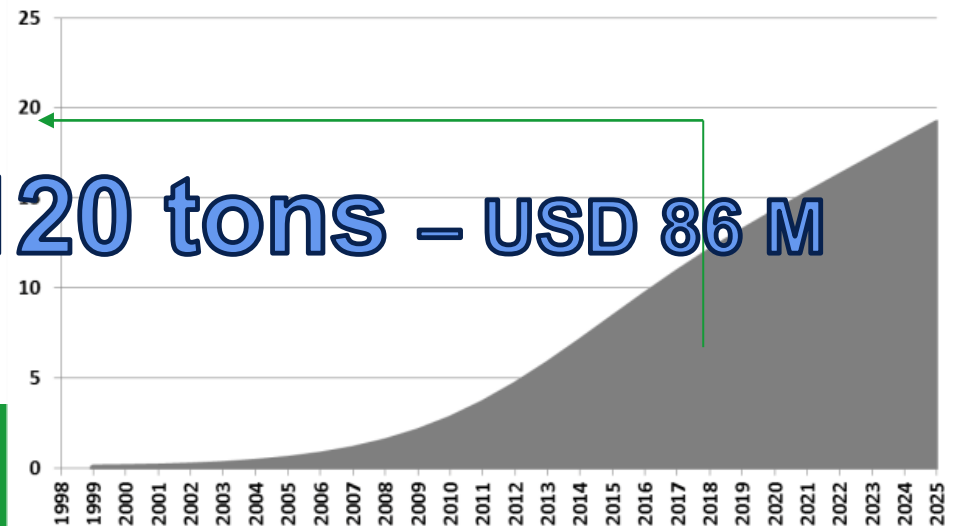
Gold: 2017-21 - 9 tons - USD 500 M

Silver potential in EoL Mobiles cumulative [in tonnes]



Silver: 2017-21 - 120 tons - USD 86 M

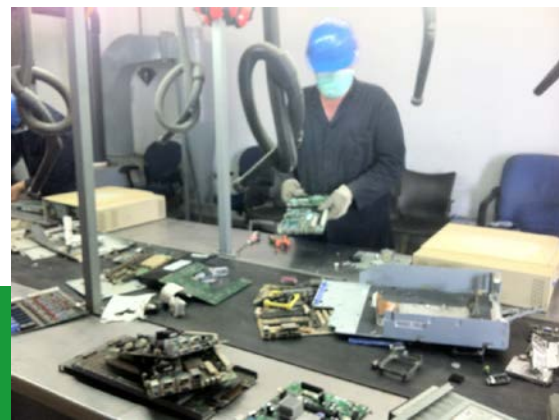
Silver potential in EoL Desktops cumulative [in tonnes]



Silver: 2017-21 - 120 tons - USD 86 M

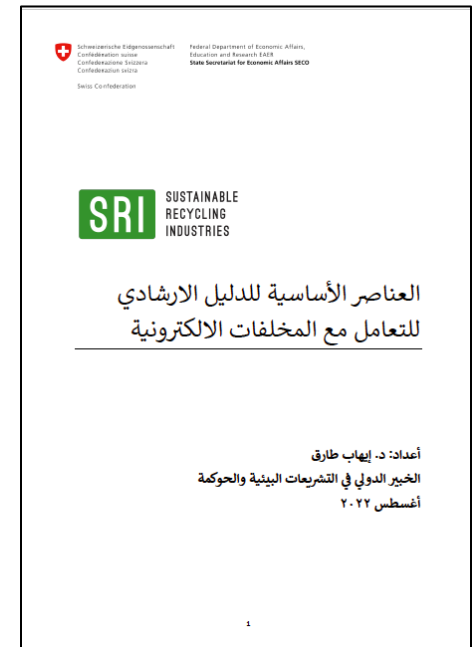
Egypt - Case STUDY

- Ewaste Proper handling is a Pillar of the National Digital Transformation Strategy
- Updating Formal Recyclers' Definition
- Establishing Government Collection and Refurbishing Center
- Regulations
- Capacity Building



E-waste Regulations

- Formal Recycler Definition
- Financing Mechanisms (EPR)
- Law
- Executive Regulations
- Guideliness



Contact us!



Mitigation Enabling Energy Transition in the MEDiterranean region

Together We Switch to Clean Energy

For any inquiries or comments,
please don't hesitate to contact
us

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