

Implementation of A Green & Complete Circular Economy – From Wastes to Advanced Materials



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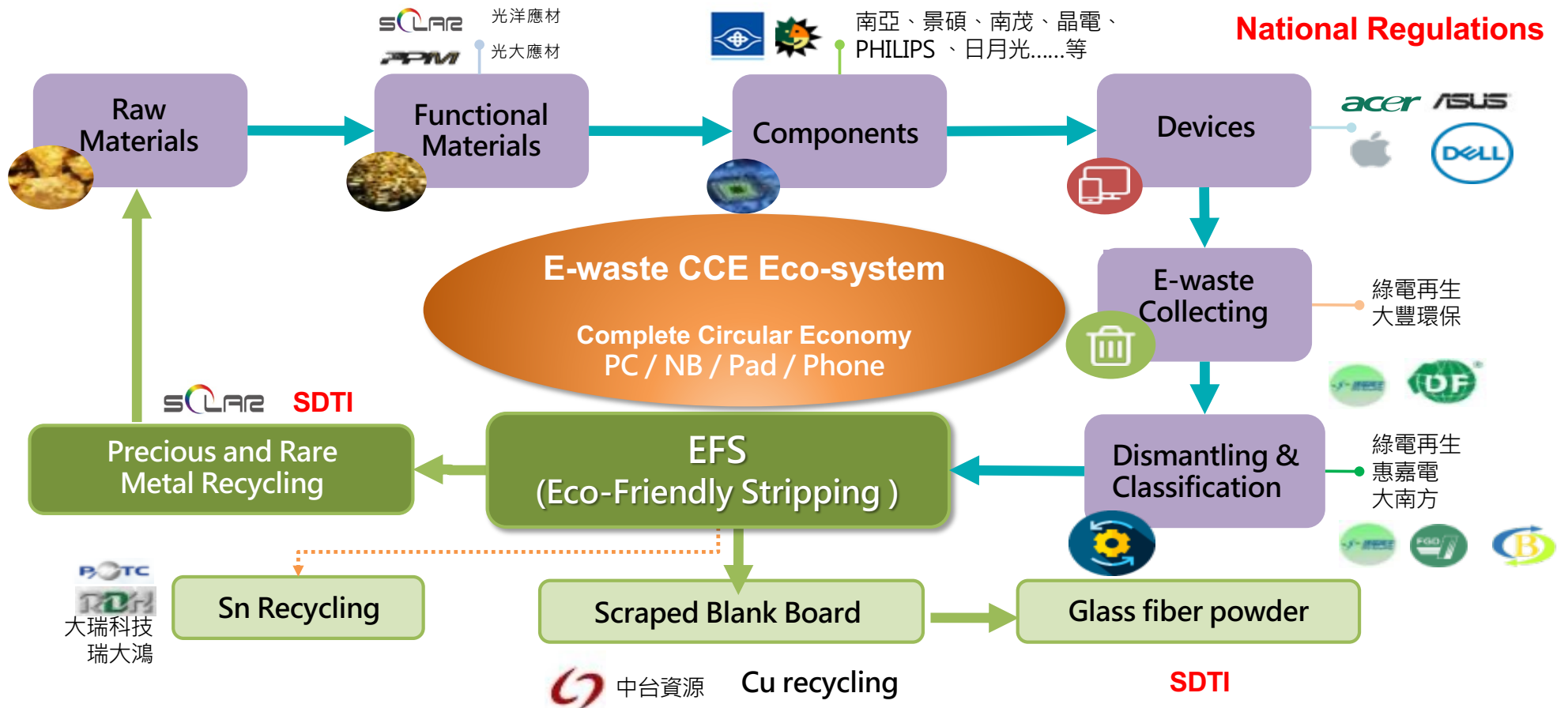
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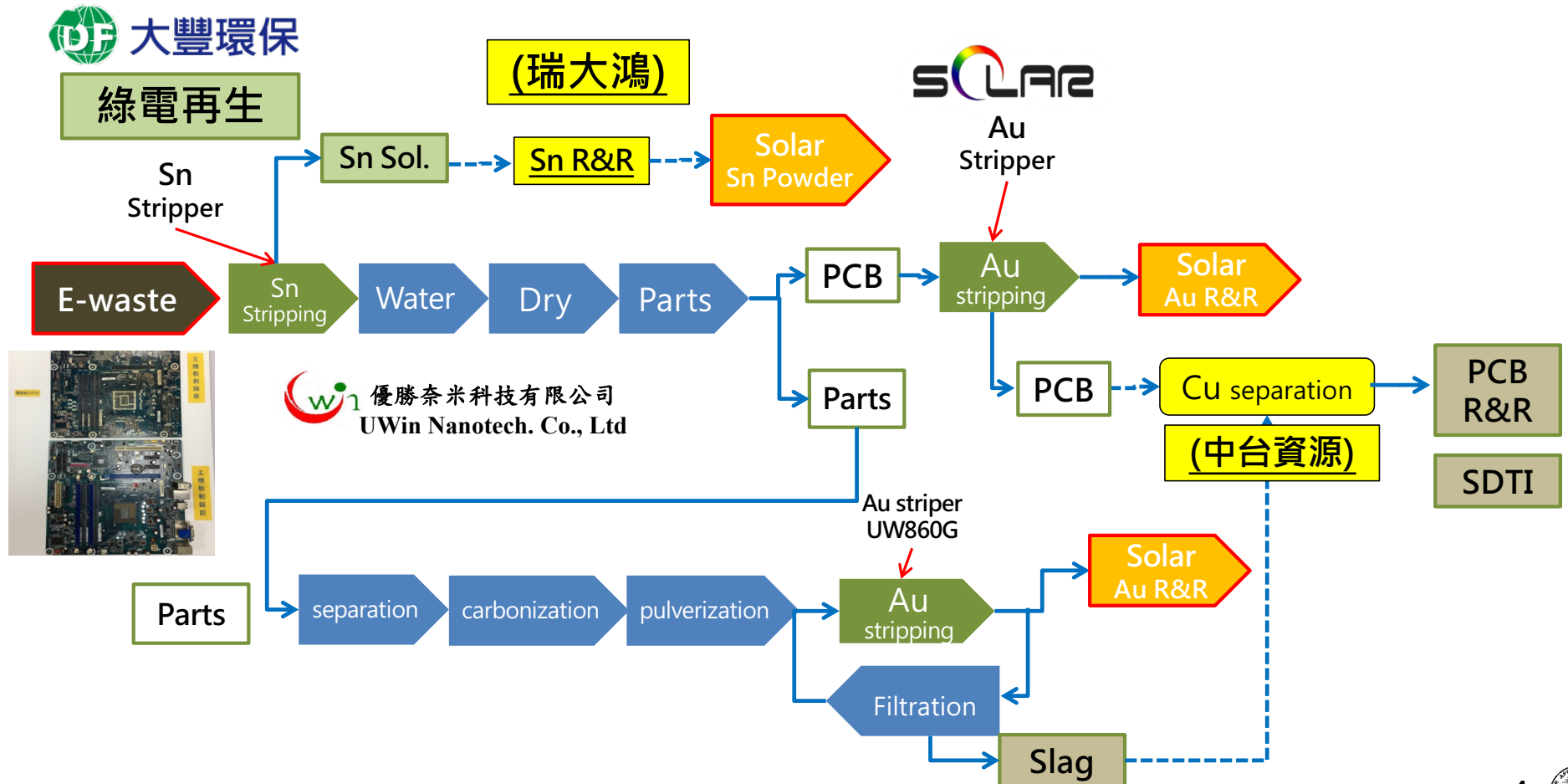
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Human Threat – E-waste is engulfing the world

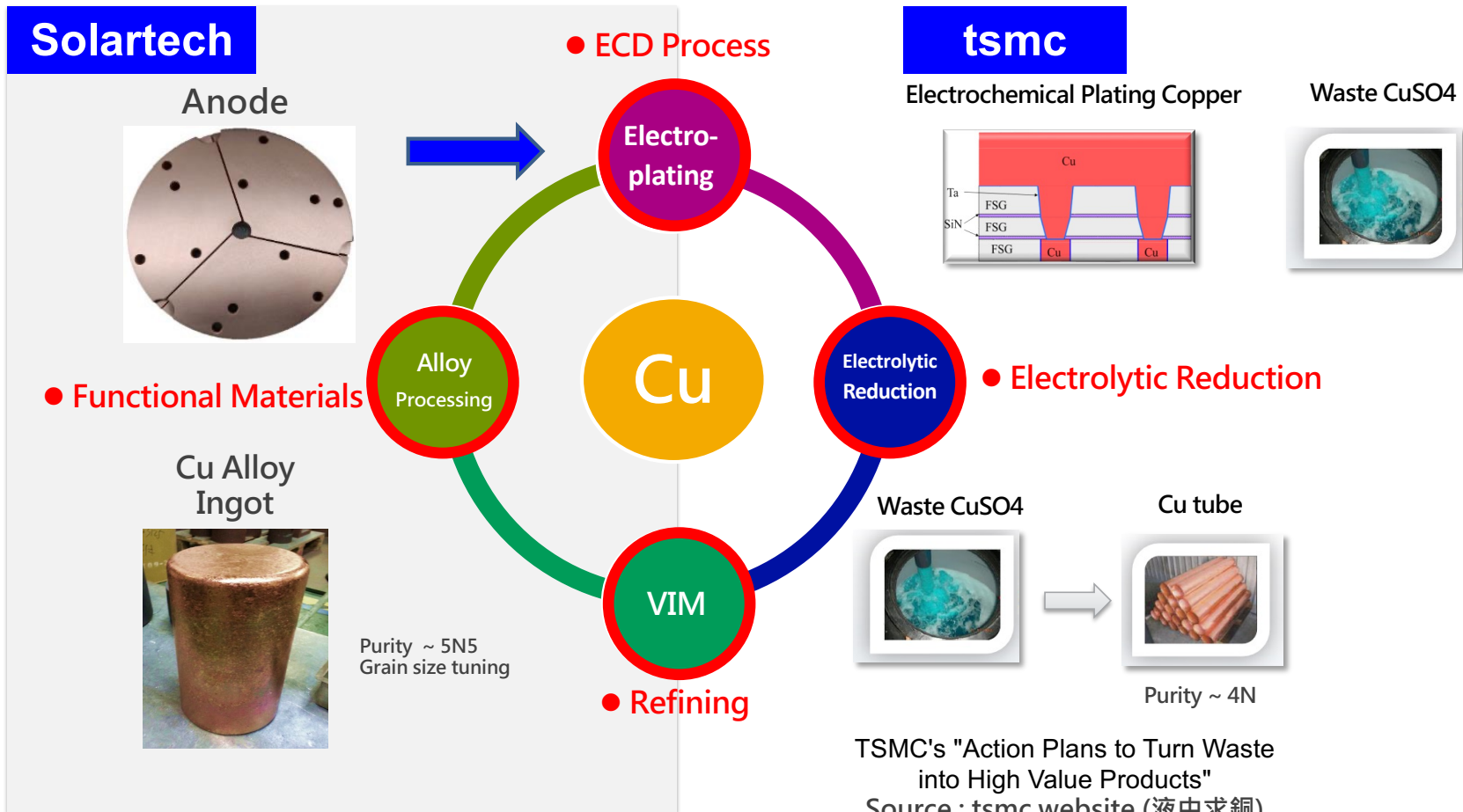


Eco-system of E-waste R & R developed in Taiwan



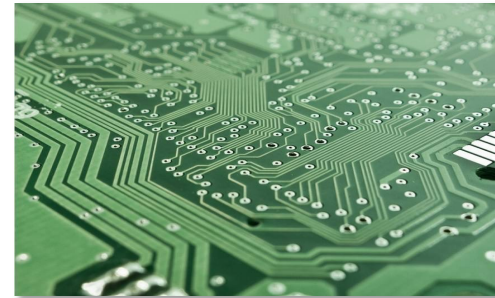


Collaboration of CE model in SEMI – tsmc_CSR (2020.05)



Multi - Circular Economy (MCE) : Geopolymer

- Developed by National Taipei University of Technology
- Technical transfer to Super Dragon Technology Co., Ltd.



PCB

- **Waste PCB powder**
- **Waste glass powder**

Geopolymer materials:



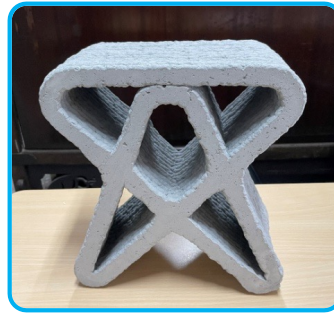
- **Basic oxygen furnace slag (BOFs)**
- **Fly ash**
- **Alkali liquid**



The Applications of Geopolymer (Taiwan, 2022)



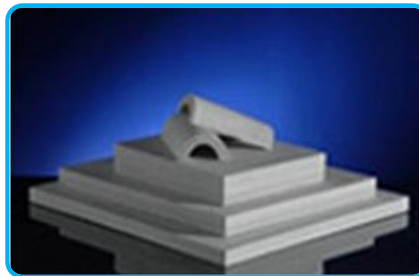
HS Brick



3D- Printing



Grass Brick



Green Building



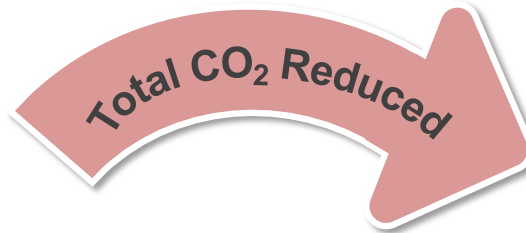
Wall Tiles

Contribution in carbon reduction at Solartech in 2022 – by means of scrap recovery and refining (R&R)

Mining



Annual CO₂ reduction through R&R
441,564 Tons
(sum of Au, Ag, Pt, Ru, Pd, In, Ga)



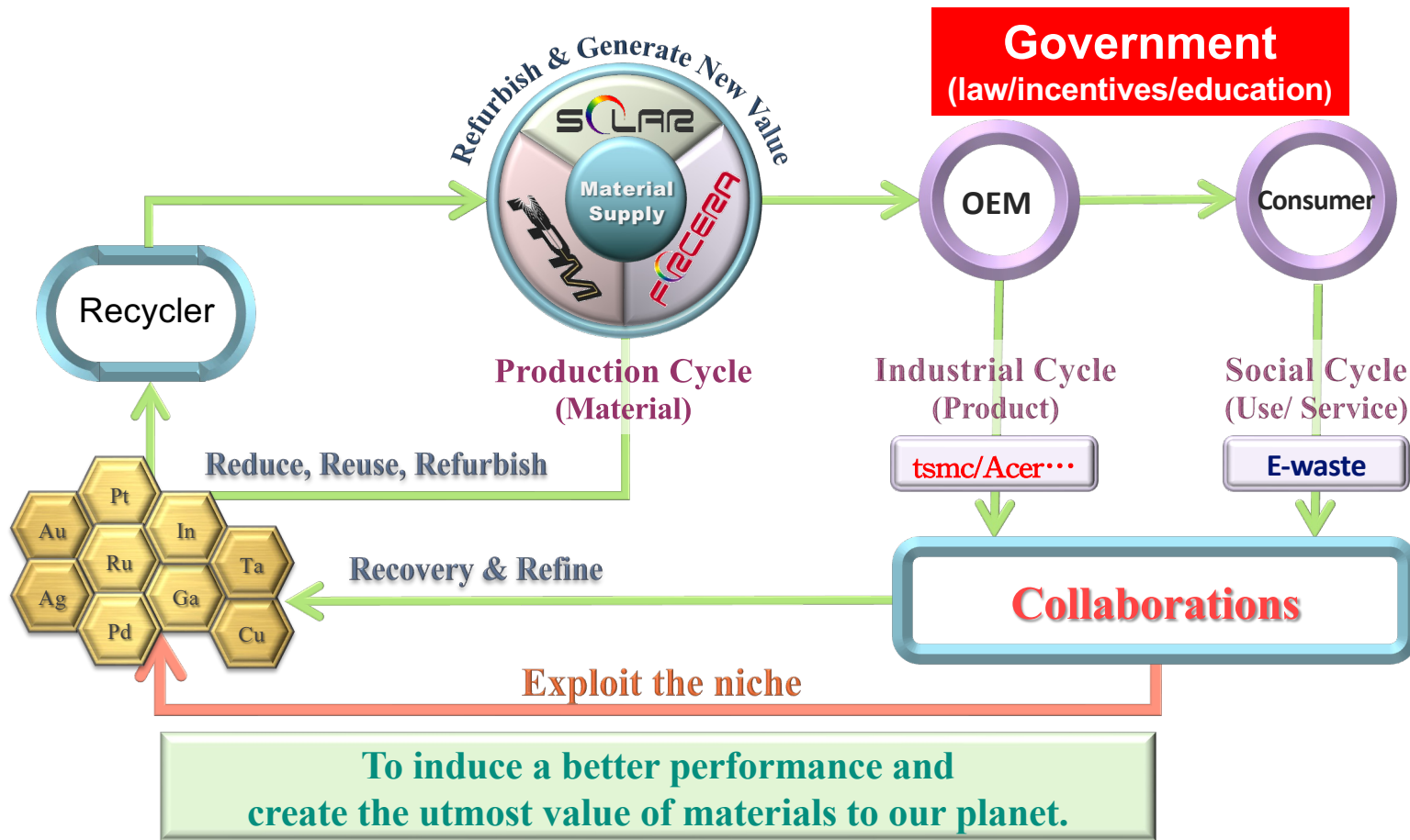
≈ Carbon emission of 98,783 people
≈ Carbon sequestration of 1,128 NY Central parks

Note 1: Carbon emission per capita WW – 4.47Tons
Note 2: Carbon sequestration of NY Central Park/y – 391 Tons

Urban Mining



Value Chain of A Green & Complete Circular Economy (GCCE)



Suggestions to increase percentage of recycled materials

Role of OEM :

- Categorize scraps, wastes and related precisely in order to recycle them efficiently and completely.
- Collaborate with professional and well-experienced recyclers to increase the percentage of recycled materials via win-win commercial models.

Role of recycling industry :

- Develop the green technologies and processes, typically for precious & rare metals as well as rare earth materials with low grades.
- Enhance the collection channels/models for recycled materials via win-win situations.
- Build-up capability of digital transformation in treating recycled materials and related processes.

Role of government :

- Set-up collection points in convenient places to encourage citizens/customers to drop their e-wastes or materials there for further recycles (for instance, convenient stores in Taiwan).
- Establish specific zones to allow controllable e-wastes for materials to import for recycling when technologies are available.

Role of consumers :

- Reserve/keep valuable e-wastes or materials and drop them to specific places regularly.
- Consult professional experts and try to establish good habits to treat e-wastes or materials.