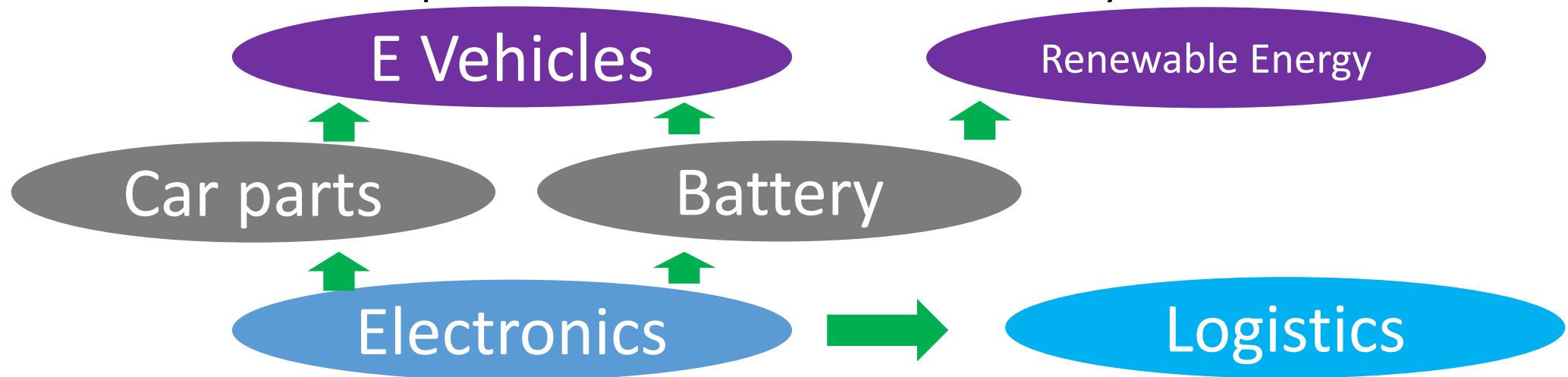


The manufacturing of vehicle batteries in China

Au Lap Hang
Labour Education and Service Network
lhau@lesnhk.org

Recent developments in electronics industry

- Turning industrial centers to commercial/financial centers
- Factory sites becoming real estate projects
- Industries with higher value-added are encouraged: Battery, LCD, Solar panel
- Workers moving to service sector -> result of factory closure
- Decrease in export does not mean Chinese industry declines

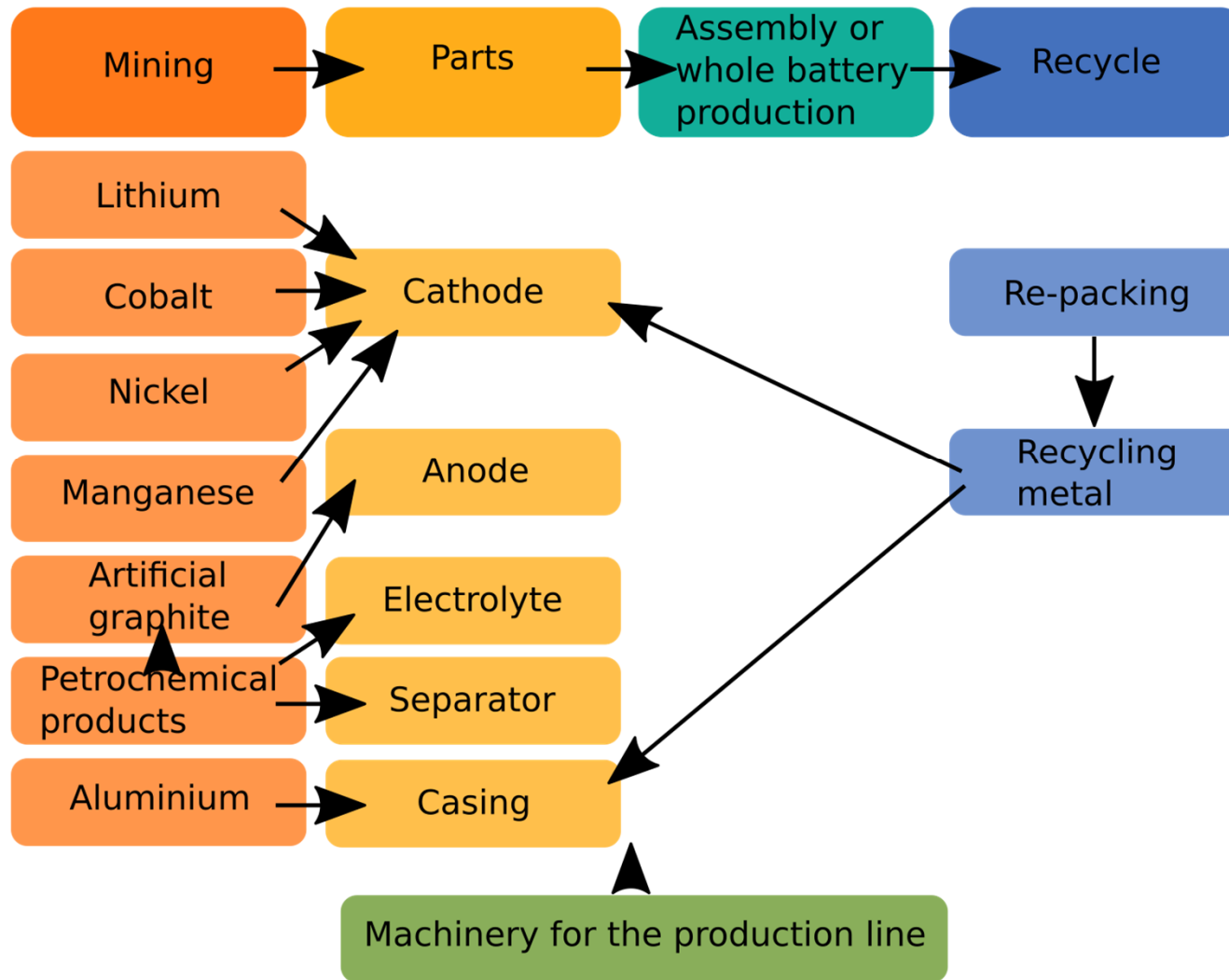


Boom of battery manufacturing

- 40-60% of material cost of an electric vehicle
- Now: Batteries for vehicles = 7 × Batteries for phones
- New productions lines are set up -> over production



The Lithium-ion battery supply chain



They can treat workers MUCH better - if profitable

Working condition of a battery factory

	An ordinary factory	A major battery factory
Contract	Often missing, depends on factories	Workers have employment contracts
Basic salary	The minimum wage required by law	Higher than minimum wage
Salary increment	According to changes in minimum wage required by law	Company has its own payscale
Overtime	Overtime of 80hr per month is common	>50% of interviewed workers work less than 18hr overtime per month
Social Insurance	Contribution to Pension Insurance is always missing	Factory applied social insurance for workers
Dormitory	Built by company, 4-8 people per room	Built by government, applied by company, 2 people per room

Potential problems with battery production

- Chemical Poisoning (extraction, production, recycle)
- **Cobalt:** Toxic, Carcinogenic, Reproductive harm, Asthma trigger, Gene damage
- **Acetone:** Irritate eye and skin, toxic, Birth defects, Endocrine disruption, Reproductive harm
- **Dimethyl carbonate:** Reproductive harm
- Strict control on workers - hard to monitor
- Factory closure

Supply chain integration

- Major companies are expanding along the supply chain
- Major battery producer buying mines
- Raw material companies investing on production facilities
- One step further, car producers form joint venture with battery producers
- Motivation: secure raw material and high added values

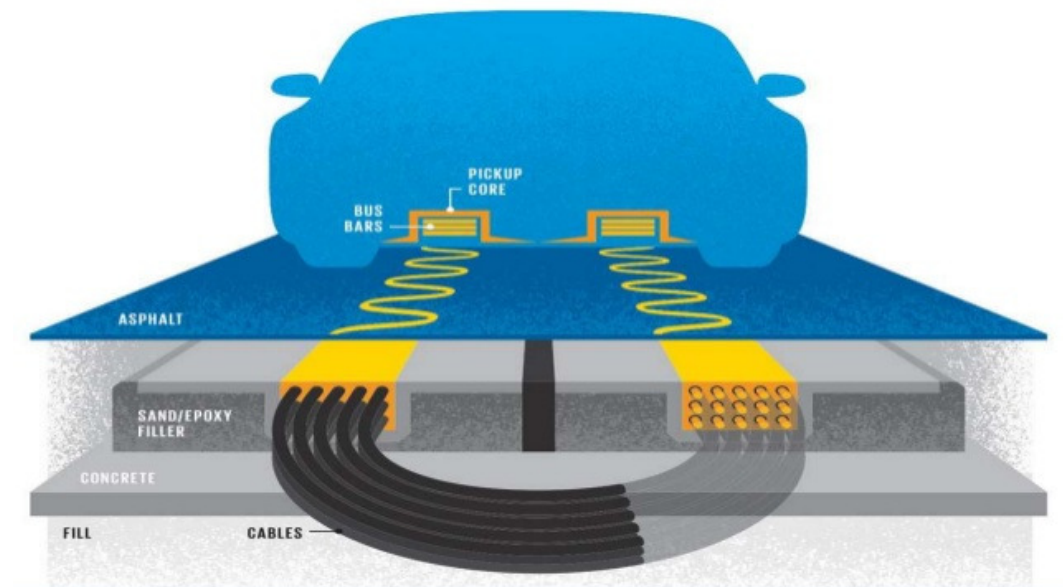
	Mining	Production	Recycle
Tianqi	Lithium mines in Australia, Chile, China	Electrode	
Ganfeng	Lithium mines in Argentina, Australia, Ireland, USA	Electrode and whole battery	Experimental facility
Jinchuan	Cobalt mines in DRC and Zambia		Small facility
CATL	Lithium mine in Canada	Whole battery Factories at China and Germany	Small facility
GEM		Electrode	Battery metal

Recommendation I – supply chain monitoring

- Public sector: major user of EVs
- Social requirements during procurement
- Supply chain transparency
- Companies fulfilling basic labour standards
- Avoiding harmful procedures
- Living wage and job security

Recommendation II – infrastructures for EVs

- EVs need new infrastructures to operate
- With suitable facilities, fewer battery metal is needed



Thank you