

# Lithium-ion battery recycling, trade and regional cooperation

A case study from Mauritius and the Indian Ocean region

Partner: Ministry of Foreign Affairs, Regional Integration and  
International Trade

Project presentation to TESSD

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# Introduction



## Policy Framework

2020 Circular Economy  
Action Plan established  
need for LIB management



## Growing Waste Stream

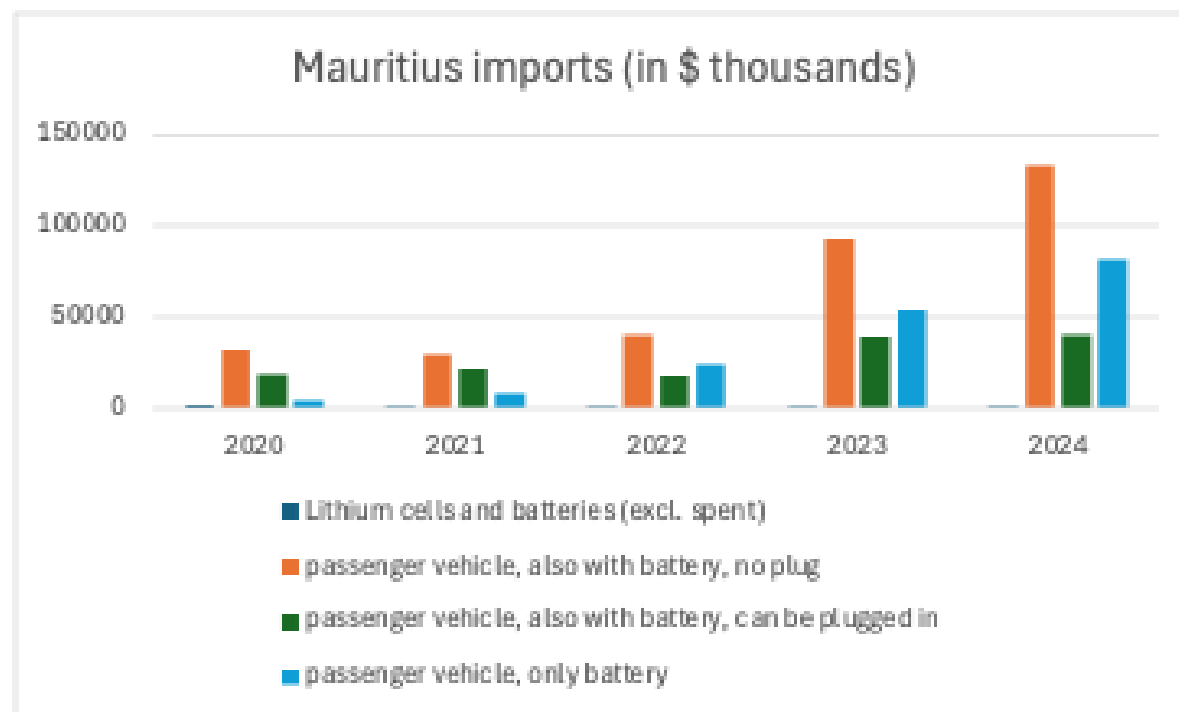
EV adoption increasing,  
from 100 units in 2018 to  
1000+ in 2023



## Environmental & Social Risks

Improper disposal causes fires,  
toxic leaching, and can be damaging  
to human health

# Battery imports are on the rise



- Cells and battery imports are on the rise
- But especially imports from hybrid vehicles and pure BEVs are increasing fast

# Technical recycling options



## Stage 1: Discharge

Eliminate residual charge for safety



## Stage 2: Dismantling

Separate hazardous from non-hazardous materials



## Stage 3: Black Mass

Shred cells into valuable mineral concentrate



## Stage 4: Metal Salts

Reprocess black mass into battery materials

# End-of-life treatment options



## Export Battery Packs

Minimal processing, highest transport costs



## Export Battery Cells

Some dismantling, lower transport costs



## Export Black Mass

Significant processing, much lower shipping costs



## Export Battery Salts

Highest value, lowest shipping costs

# Current state of battery collection

## **No Unified Policy**

Lack of extended producer responsibility regulations

## **Limited Collection**

Only B.E.M. collecting smaller lithium batteries

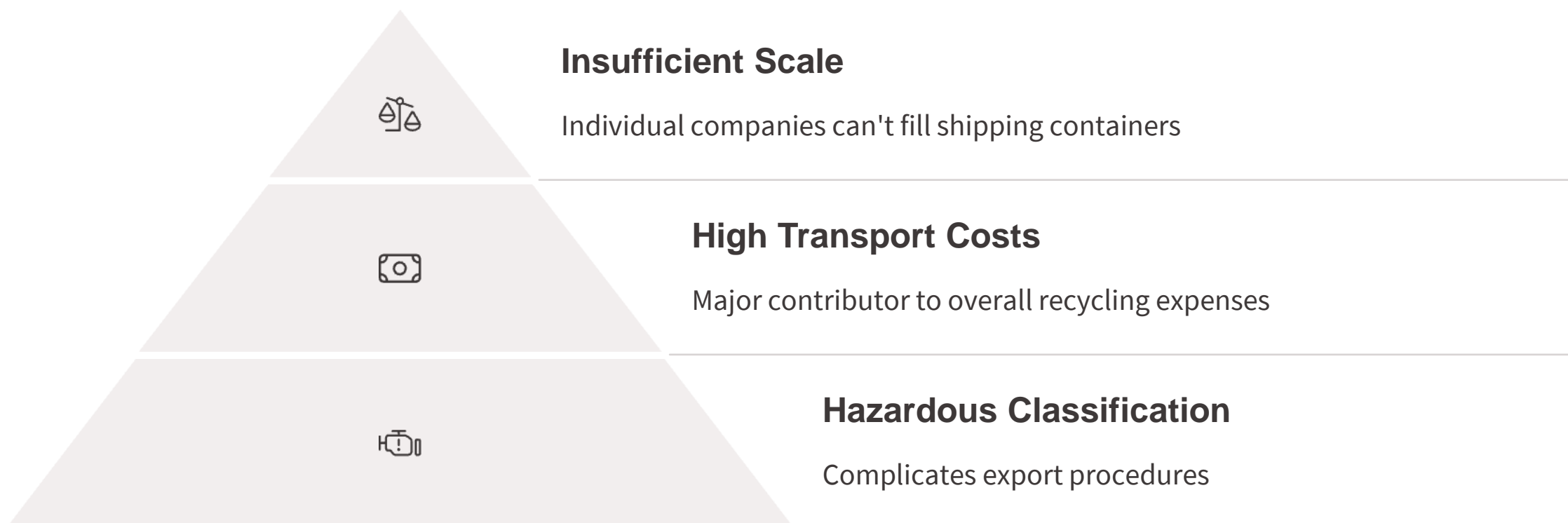
## **Safety Risks**

Improper storage causing fires, environmental damage

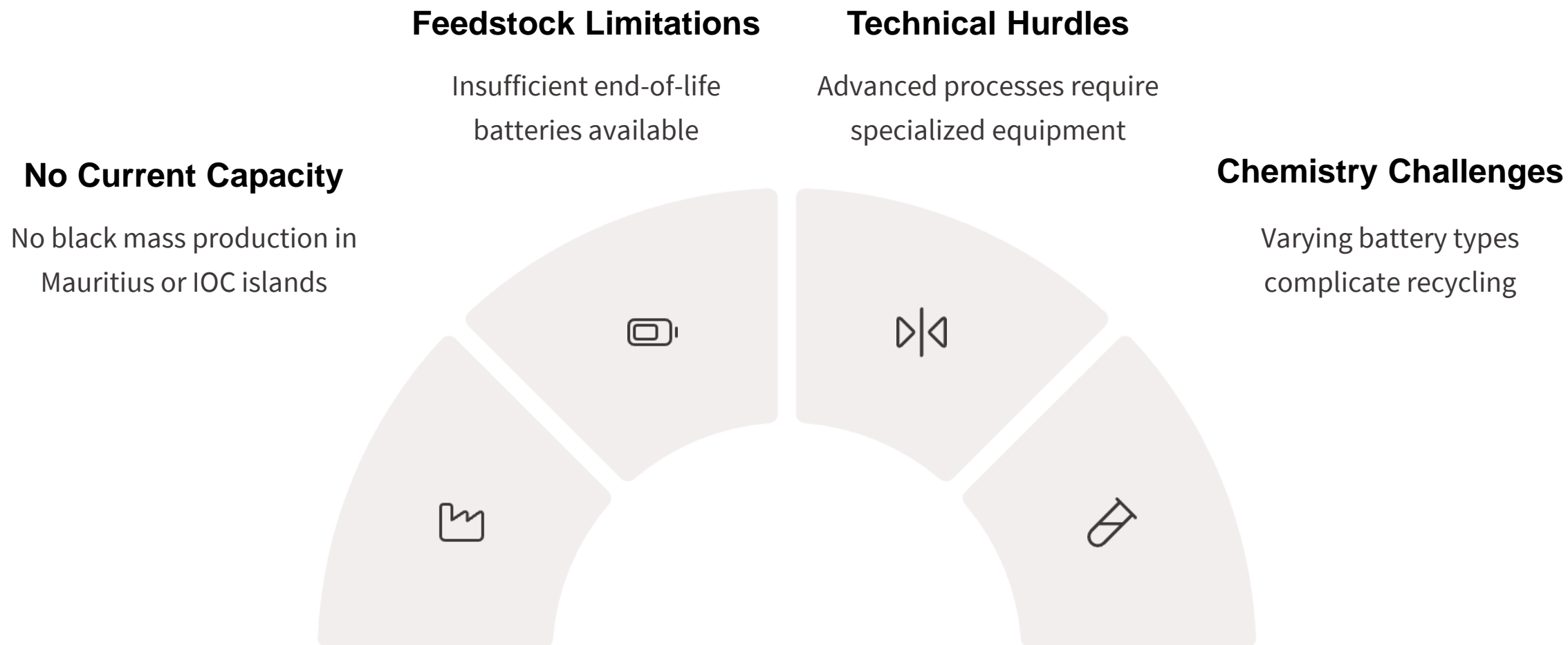
## **Repurposing Challenges**

Non-standardized designs hinder second-life applications

# Battery export challenges

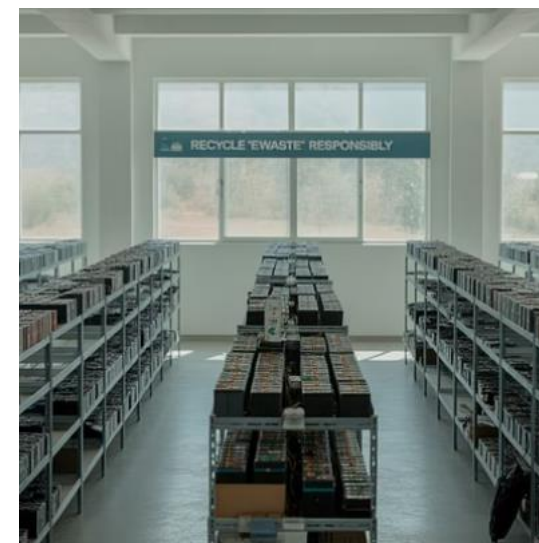


# Black mass production status





# Note: Regional recycling initiatives



- Reunion exports to France
- South Africa launching pilot operations and interested in cooperation with Mauritius
- Rwanda explored repurposing with 50% reuse potential → important to understand true mass of end of life batteries available for black mass shredding → currently underinvested in in Mauritius

# Trade policy challenges

## Hazardous Classification

Batteries defined as hazardous waste under Environment Protection Act

Complicates export procedures and regional cooperation

## Basel Convention

Requires prior informed consent for cross-border shipments

Approval process takes 6-12 months minimum

## Regional Restrictions

Madagascar, Comoros, Seychelles all prohibit hazardous waste imports

Blocks economies of scale for regional solutions

# HS classification challenges

## No black mass code

Meaning that black mass will continue to be qualified as hazardous waste

Even if transport is generally very safe and economic

## Tracking policy

Digital product passport can improve traceability and ensure safety

Needs investment into infrastructure & customs training

## Reform options

2022 added an e-waste heading, but more reforms are needed

HS system changes slowly, so need for interim-solutions to create scale

# Extended Producer Responsibility

## Draft Regulations

Ready for four years,  
but still awaiting adoption

## Stakeholder Consultation

Key recyclers not yet consulted  
on EPR legislation



## Financing Mechanism

Provides funds for infrastructure  
development, specifically discharge

## Scale Improvement

Huge potential to change volume of  
batteries in formal channels

# Regional cooperation potential



## **IOC Integration**

Economies of scale through regional hub approach



## **Green Recovery Lanes**

Streamlined procedures for trusted traders



## **Standards Harmonization**

Align with ISO 59014 and IEC standards



## **Pre-Consented Facilities**

Designated treatment centers to maintain trust

# Government incentives

Tariff Removal	No barriers for safety equipment imports
Repair Support	Remove barriers for repurposing equipment
Recycling Fees	Direct collected fees to upgrade recycling industry
Variable EPR	Adjust rates based on black mass market price

# Final recommendations



## **Finalize the EPR regulations**

Adopt regulations immediately



## **Create Centralized Interim Facility**

Centralize collection and black mass processing



## **Build IOC regional cooperation**

Aid for trade/investment to establish IOC battery recycling network and hub



## **Establish Green List System**

Fast-track responsible companies only



# Thank you!



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