

Enabling Strategic Secondary Copper in Canada: Policy Pathways for Domestic Recovery, Processing, and Use in Electrification and Sustainable Grid Expansion

Nazifa Rahman, MSc Sustainable Energy Development , School of Public Policy
Supervised by Dr. Robert J. Johnston, School of Public Policy



INTRODUCTION

Fibre deployment is releasing high-purity copper from Canada's telecommunications networks at a time when electrification, grid expansion, and AI data centres are increasing demand and new mines can take 10-15 years to develop.

Yet recovered telecom copper has no clear place in Canada's critical minerals framework. Much of its value therefore leaves the country as scrap rather than being strategically recovered and processed at home.

WHERE CANADIAN LAW PLACES IT

Secondary raw material:	No Canadian legal category (the gap)
Recovered material:	No binding federal definition
Hazardous recyclable material :	XBR 2021 (telecom copper sits here)
Waste:	CEPA and provincial legislation

RESULTS

5,500 t/yr

copper retiring from Canadian phone networks each year

RESEARCH QUESTION

How can Canadian policy enable the domestic recovery, processing, and strategic use of secondary copper from telecommunications network retirement?

OBJECTIVES

- 1 Map how federal, provincial, and sectoral instruments classify and govern secondary copper
- 2 Calculate the national volume retiring from carrier networks, with explicit uncertainty bounds
- 3 Compare telecom copper against four alternative supply pathways
- 4 Recommend sequenced, implementable policy instruments

METHODOLOGY

PHASE 1

Documentary policy analysis

Ten federal, provincial, and sectoral instruments coded for how they classify secondary copper and whether they link it to electrification.

PHASE 2

Material flow estimation

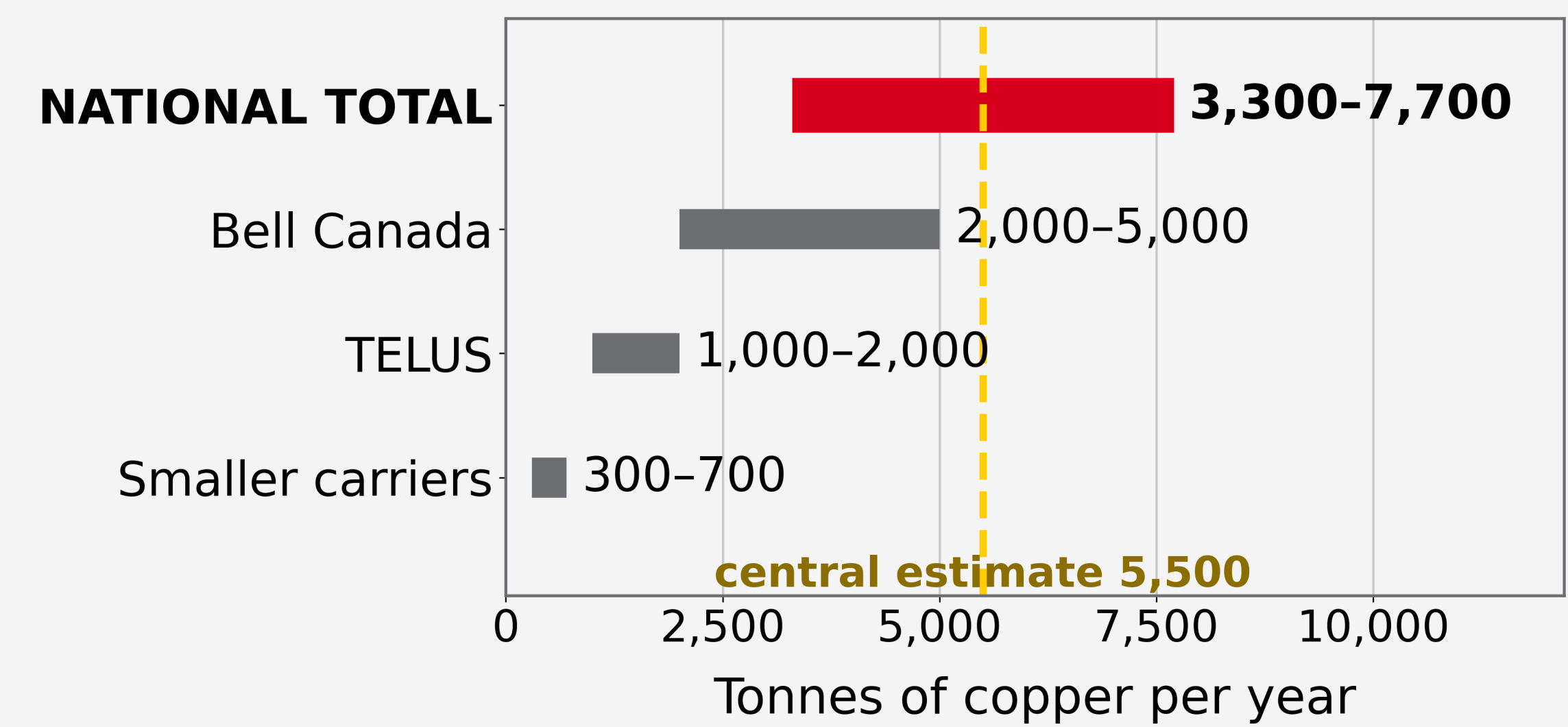
Carrier-specific model: $network\ retired \times copper\ intensity \times recovery\ rate$.
Low / central / high bounds with one-way sensitivity testing.

PHASE 3

Comparative pathway analysis

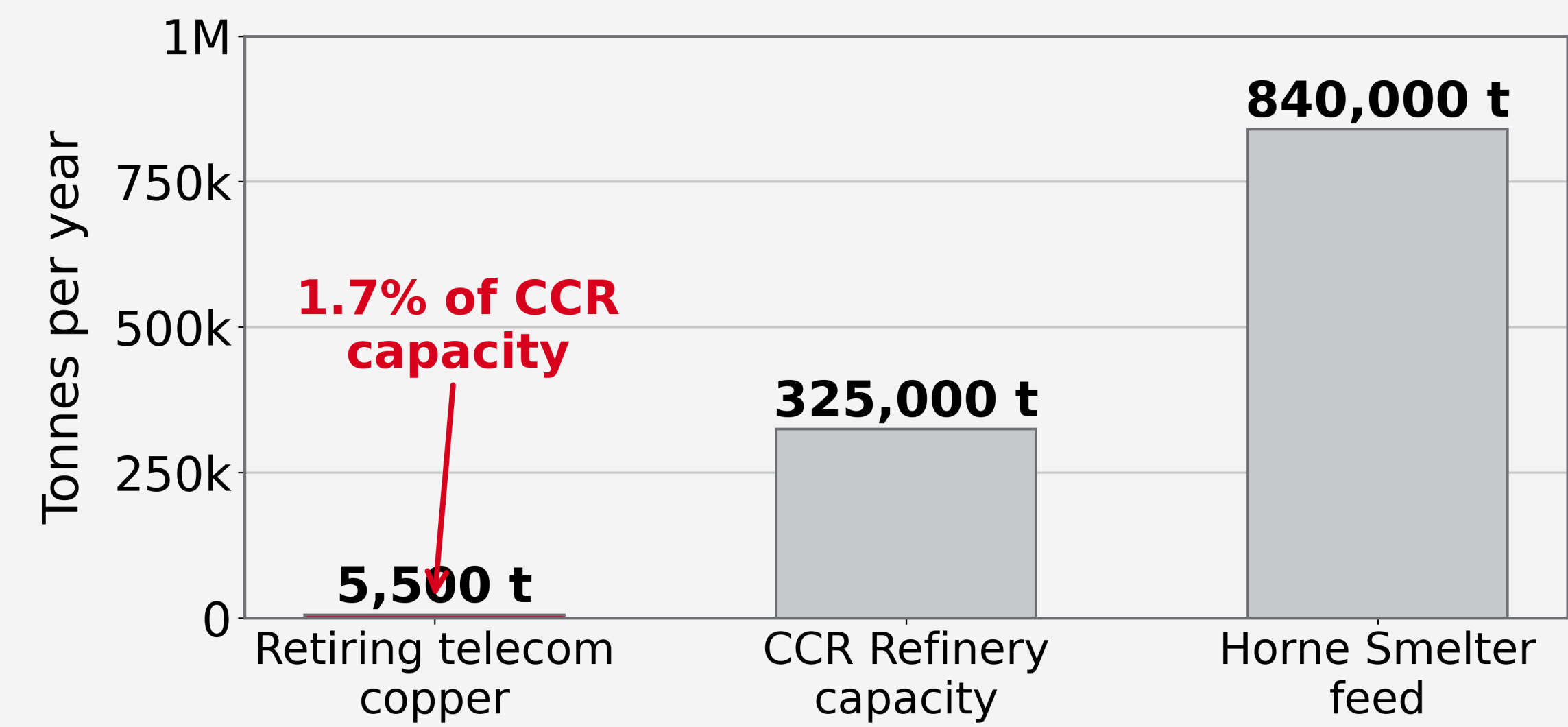
Five supply pathways across six dimensions. Each instrument rated *Robust*, *Moderate*, or *Fragile* by what it takes to implement

How Much Copper Is Retiring?



Rogers is excluded as its network carries no copper local loop.

Could Canada Process It?



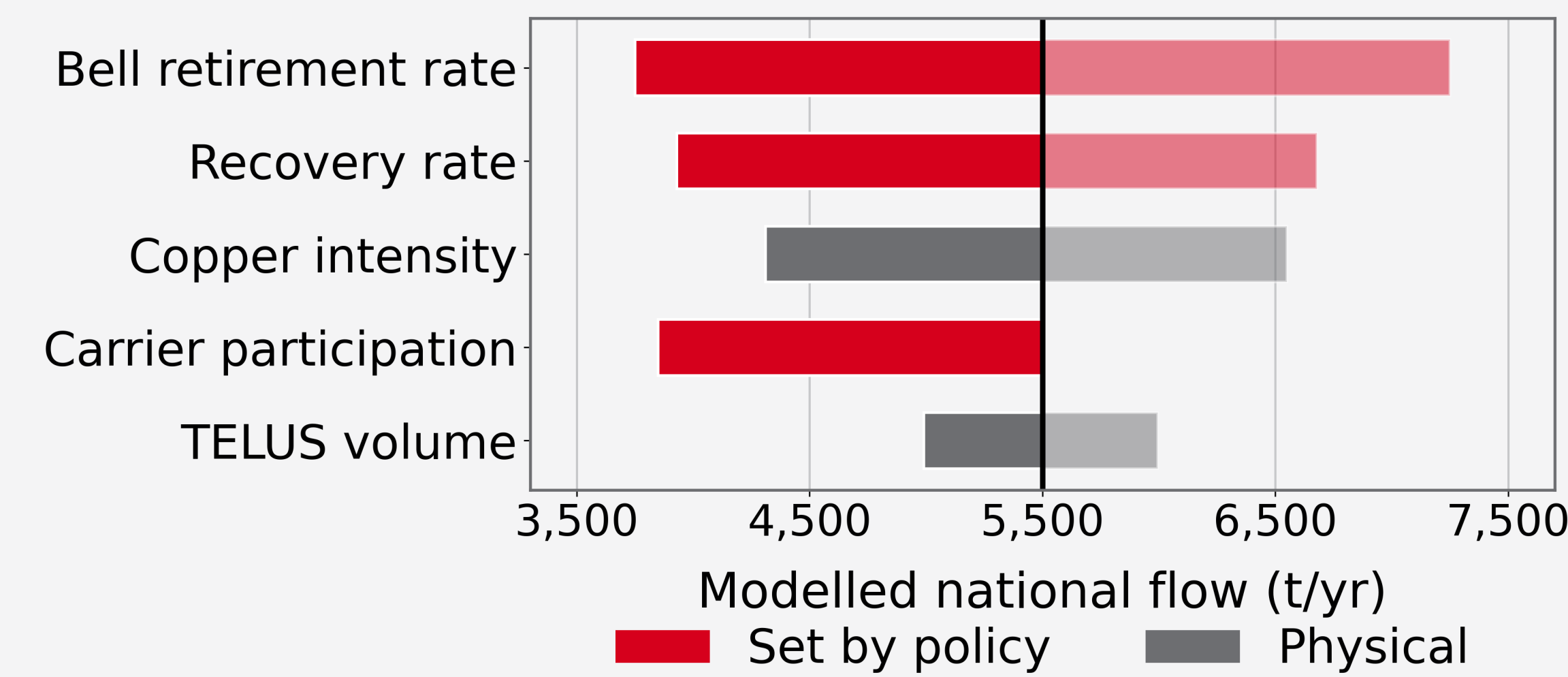
Canada's only smelter and only refinery already accept copper scrap.

Too small to justify new capacity but small enough to absorb into what exists.

SDGs of Focus:



What Drives the Estimate?

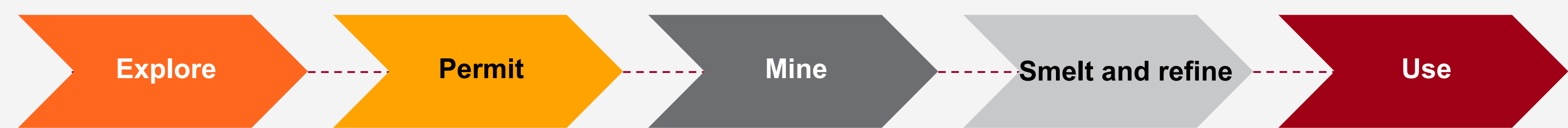


About 69% of the uncertainty sits with variables policy can move.

Recovery rate carries the most leverage; the Bell rate the most uncertainty.

FINDINGS: TWO WAYS TO SUPPLY COPPER

LINEAR MODEL: PRIMARY COPPER

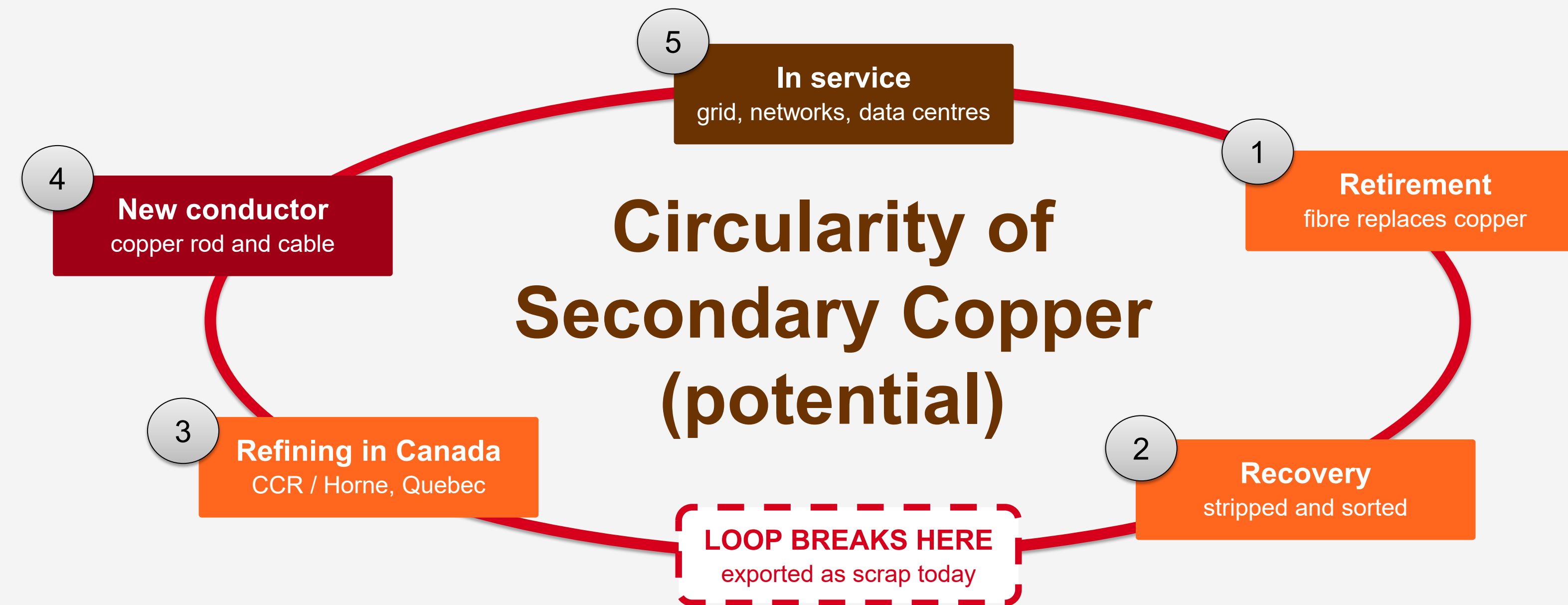


No return path — the material is not recovered into supply again.

10–15 years to first metal with ~8× the environmental impact

USD \$22,359 per tonne of annual capacity where Canada imports ~70% of its refined copper

Circularity of Secondary Copper (potential)



RECOMMENDATIONS

- 1 **Report copper retired**
CRTC review
Robust
- 2 **Create an end-of-waste route**
EU Reg. 715/2013 model
Moderate
- 3 **Recognize as source of mineral supply**
Critical Minerals Strategy
Moderate
- 4 **Prefer domestic cathode**
Grid procurement
Moderate

CONCLUSION

As Canada builds the infrastructure of the future, valuable copper is simultaneously being removed from the infrastructure of the past. Secondary recovery will not solve Canada's copper challenge alone, but it can turn an unavoidable network transition into a strategic domestic resource.

Canada's copper strategy should not begin and end at the mine. Policy must recognize secondary copper as a strategic resource and keep it in circulation to build a more circular, resilient domestic supply chain.

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IMAGE CREDITS

SDG icons: United Nations (2015). Charts and diagrams: author, from the sources listed.

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Full report and supplementary data available on request · nazifa.rahman@ucalgary.ca