GREENHOUSE GAS EMISSIONS FROM URANIUM MINING AND MILLING IN SASKATCHEWAN

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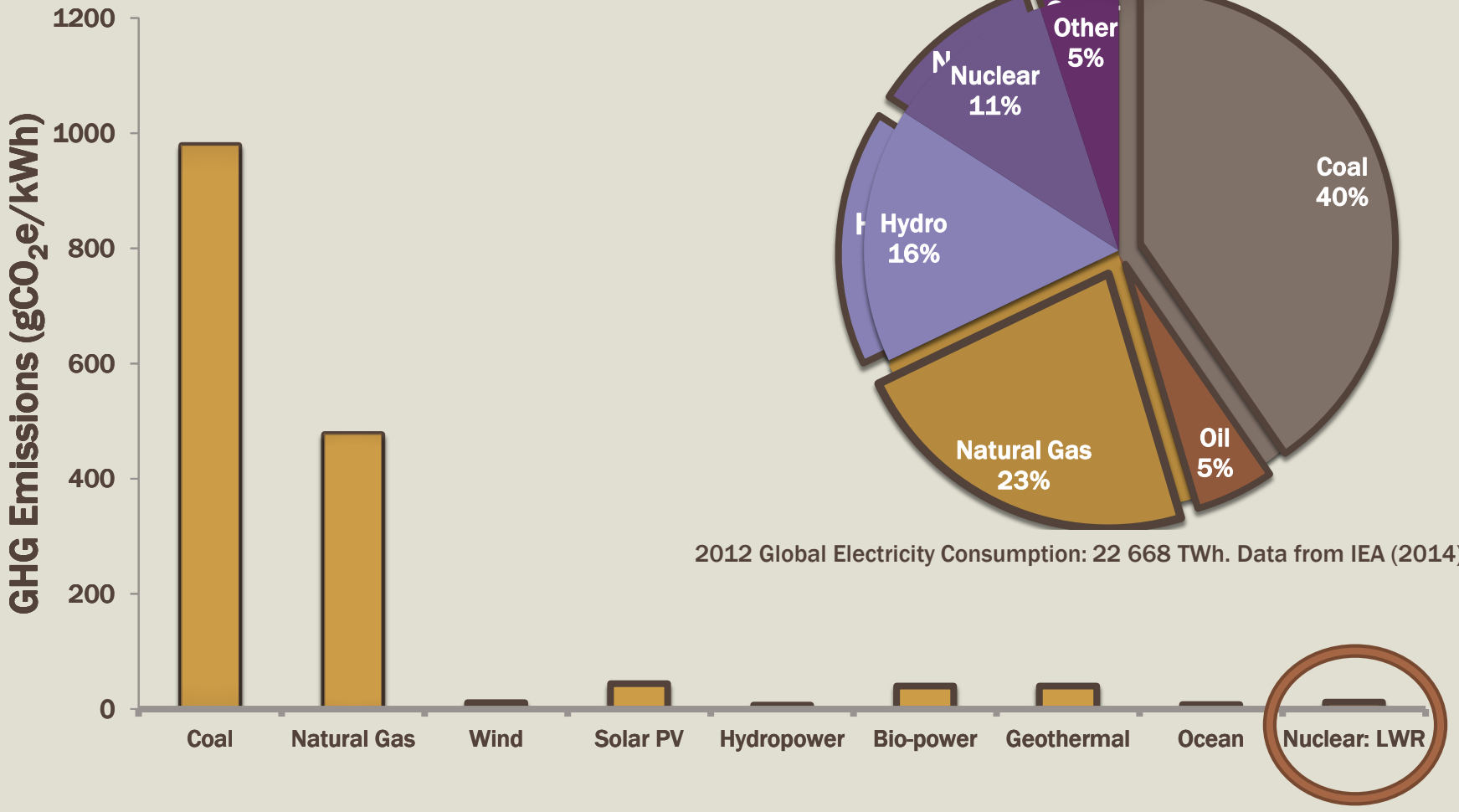
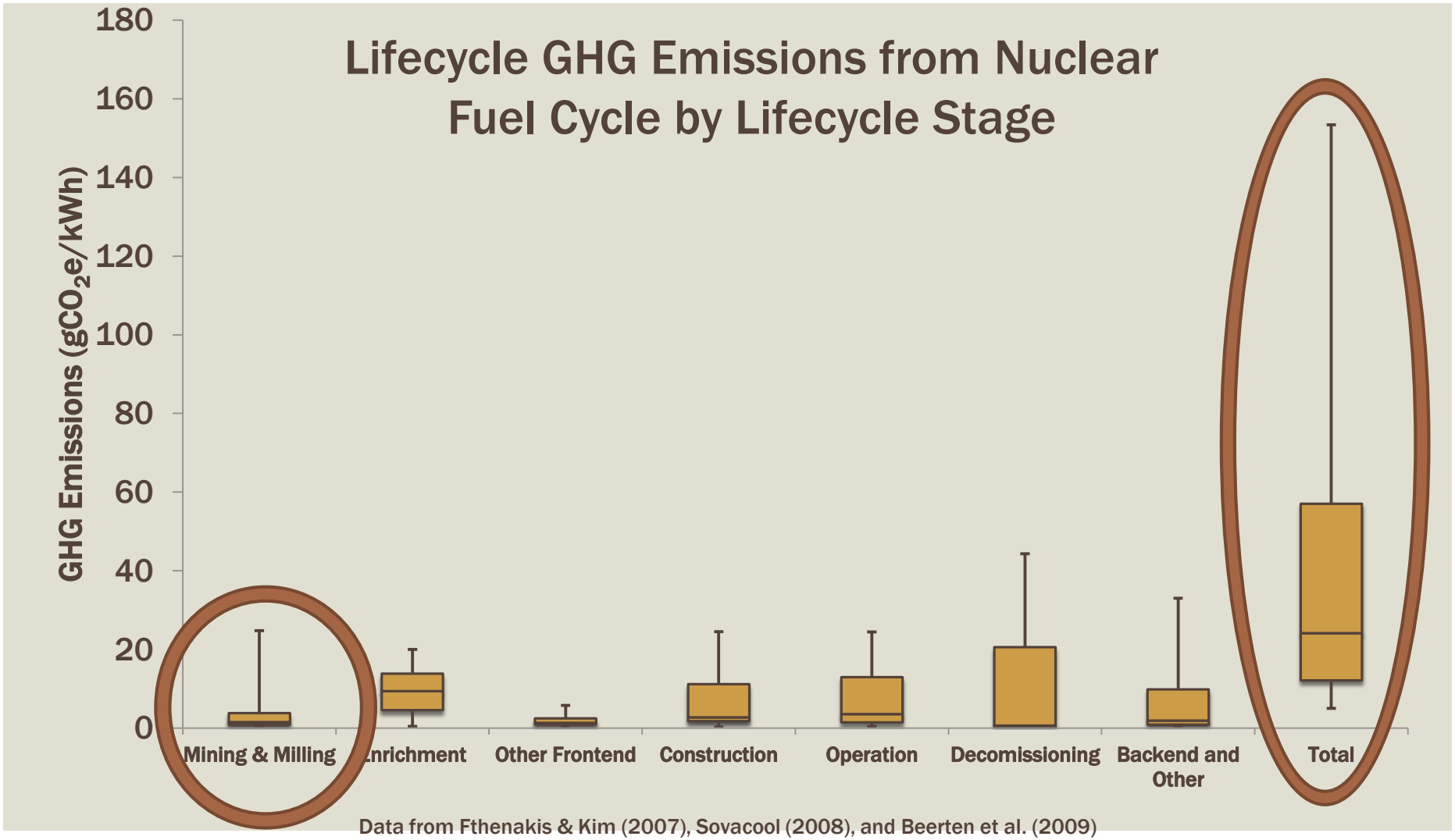
BACKGROUND



2012 Global Electricity Consumption: 22 668 TWh. Data from IEA (2014)

Data from Warner and Heath (2012)

BACKGROUND



Data from Fthenakis & Kim (2007), Sovacool (2008), and Beerten et al. (2009)

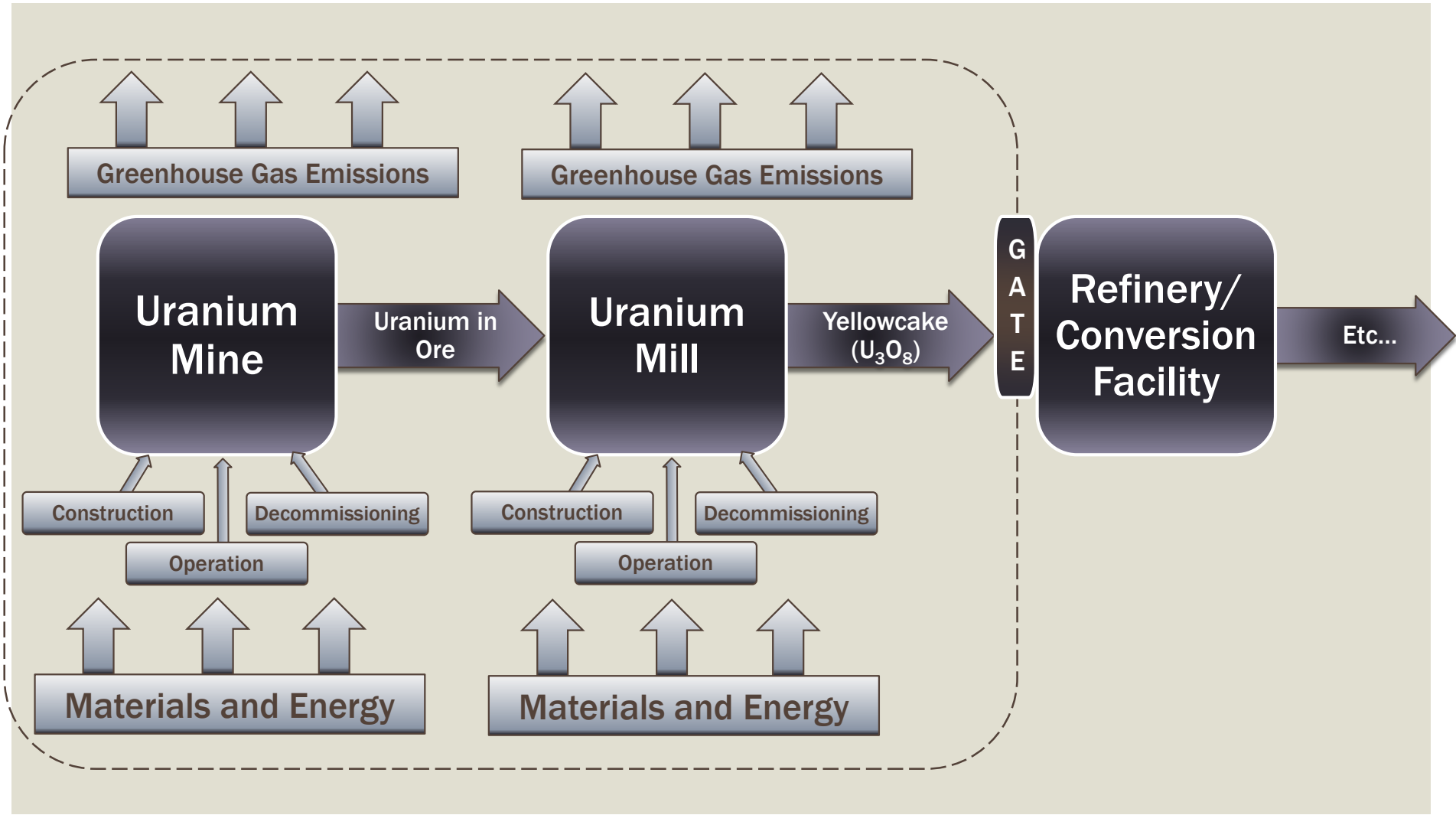
OBJECTIVES

1. Benchmark life cycle GHG emissions per kg of yellowcake (U_3O_8) from uranium mining-milling operations in Saskatchewan using actual production data
2. Identify emissions-intensive processes within the uranium mining-milling life cycle (hot spots)
3. Identify the largest sources of uncertainty with respect to calculating GHG emissions inventories for the mining-milling of uranium in SK

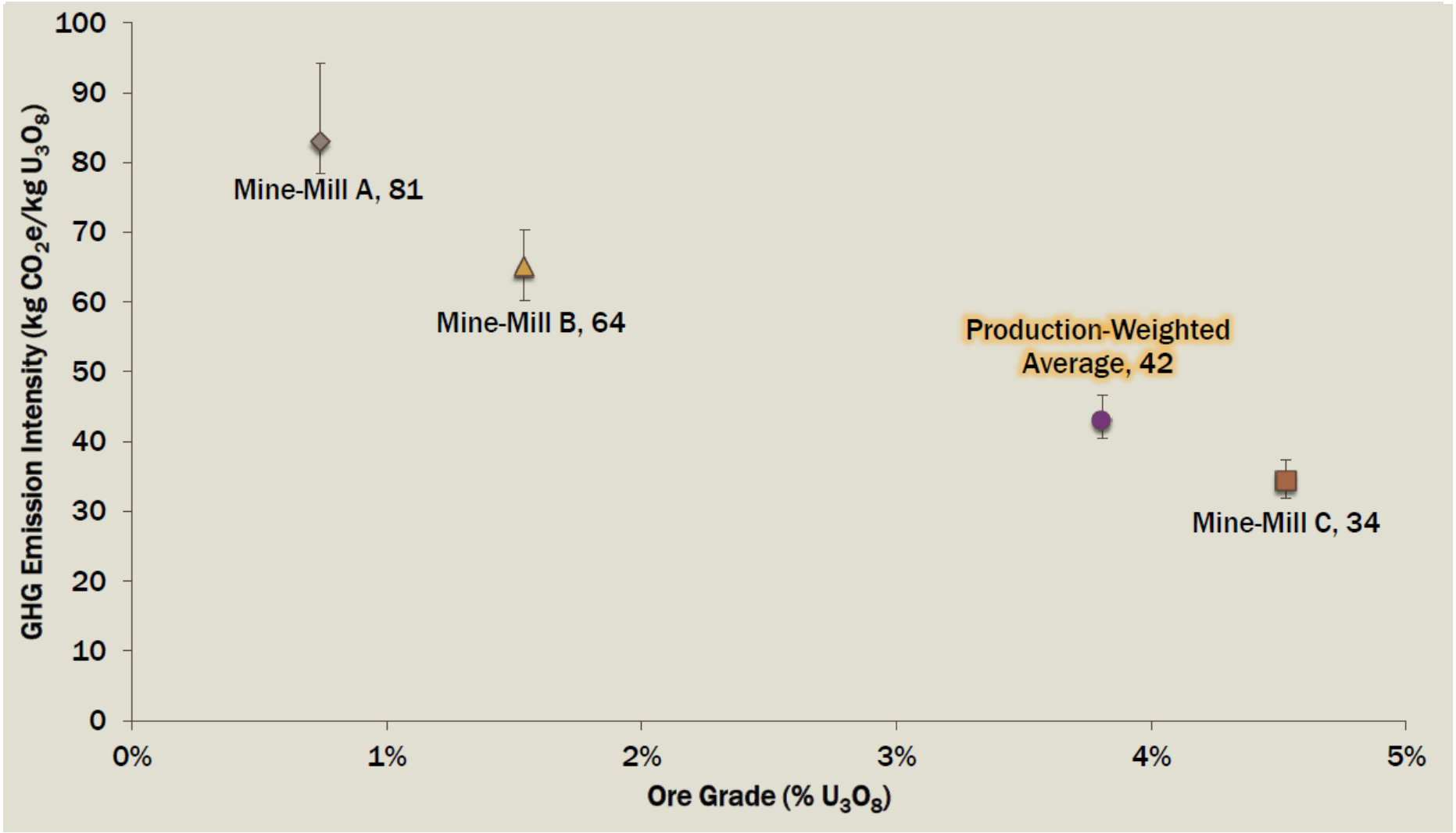
HYPOTHESIS

Due to the very high ore grades currently being mined in SK, life cycle GHG emission intensity for U_3O_8 from SK will be very low compared to values reported for other facilities around the world.

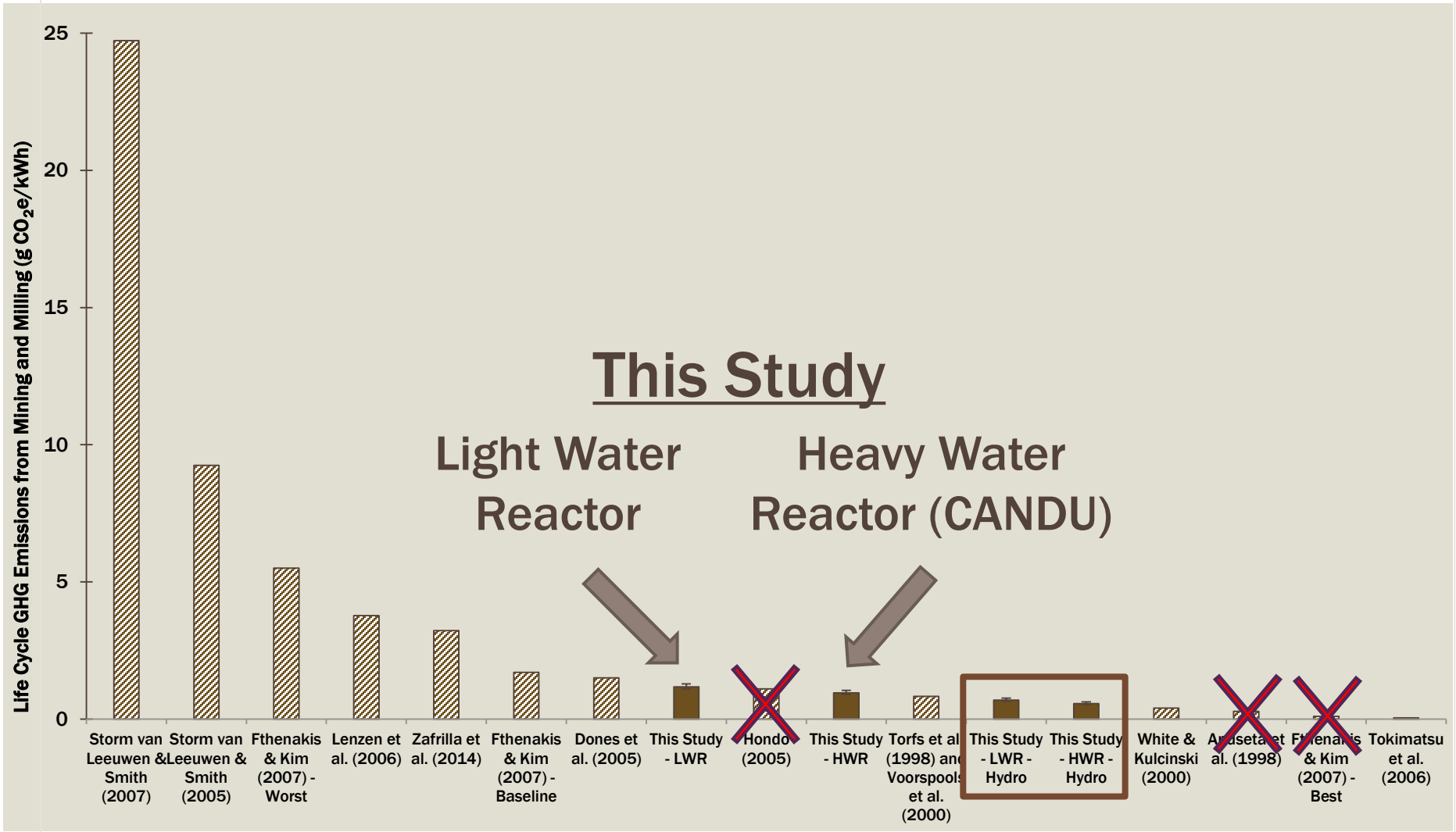
METHODOLOGY



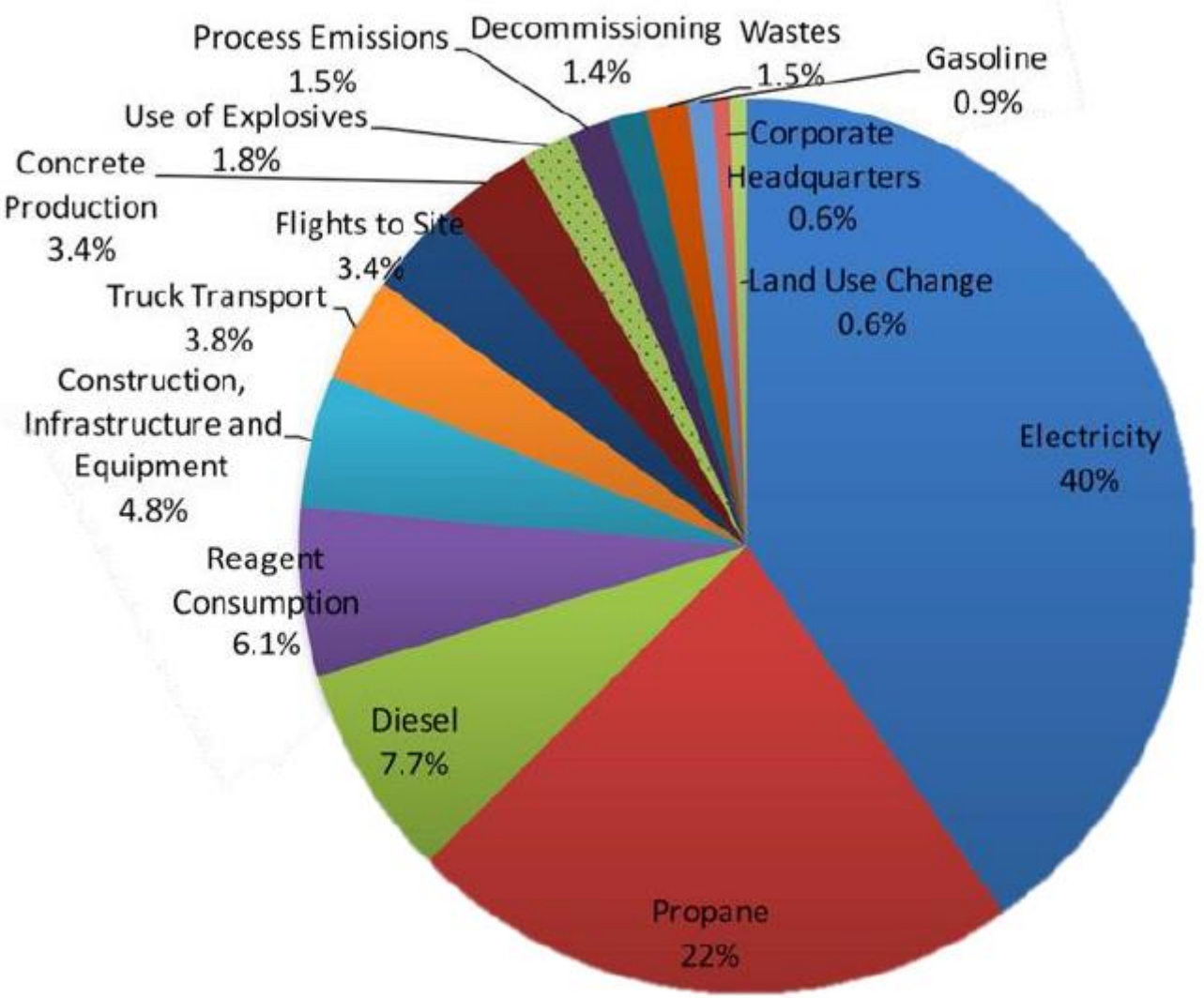
RESULTS
EMISSION INTENSITY



RESULTS
LITERATURE COMPARISON



RESULTS
EMISSION SOURCES



EMISSION SOURCES
ELECTRICITY: DEFAULT SCENARIO

SaskPower Grid Mix (2006-2013)

766 gCO_2e/kWh

19.4%

7 gCO_2e/kWh

Hydro

77.7%

2.9%

Coal, Gas, Other

983 gCO_2e/kWh

Wind

11 gCO_2e/kWh

But…

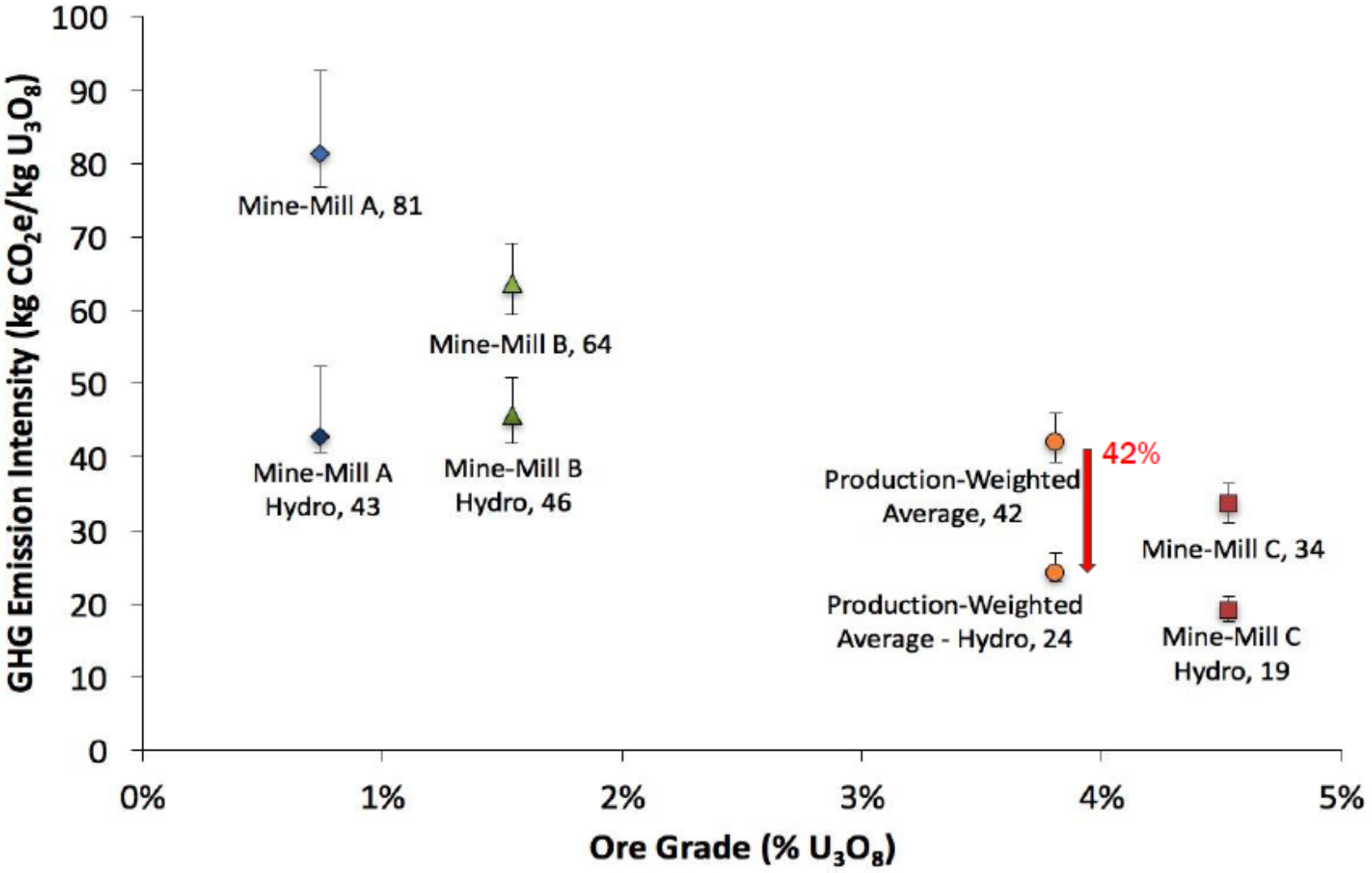
Electricity is supplied to Northern SK exclusively by hydroelectric facilities and an interconnection with Manitoba Hydro (96% hydro)

So…

Emissions from electricity consumption may be significantly lower

Taken from 2013 SaskPower Annual Report

EMISSION SOURCES
ELECTRICITY



SUMMARY

- Study provides only recent and comprehensive life cycle assessment of GHG emissions produced from uranium mining and milling operations in Saskatchewan
  - Average 42 kg CO_2e/kg U_3O_8 or ~ 1.1 g CO_2e/kWh
  - Results are very low compared to life cycle GHG emission studies for other areas of the world

ACKNOWLEDGEMENTS

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