Exploring the Issues Surrounding the Keystone XL Tar Sands Pipeline

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Canada's Boreal Forest overlays Alberta's tar sands deposits

Tar sands extraction has significant environmental impacts

Air pollution, water pollution, green house gas emissions, toxic waste

Tar sands bitumen

THE GRIM CONSEQUENCES OF RAPID GROWTH OF CANADIAN TAR SANDS PRODUCTION

The devastating effects of tar sands development are projected to worsen considerably, posing additional threats to air quality, climate, water resources, Canada's Boreal forest and the indigenous peoples who have lived in the region for thousands of years.

INDUSTRY PLANS TO MORE THAN TRIPLE PRODUCTION FROM 2010 LEVELS BY 2030. BASED ON AN EVALUATION OF EXISTING OPERATIONS, THIS EXPANSION WOULD RESULT IN THE FOLLOWING IMPACTS:

2030

TOXIC WASTE

TOXIC WASTE & MINING OPERATIONS

150%

increase in toxic waste from mining operations

CARBON POLLUTION

GREENHOUSE GAS EMISSIONS

250%

increase in carbon pollution

FRESHWATER USE

FRESHWATER USAGE

170%

growth in freshwater use

NITROGEN OXIDES

SULFUR DIOXIDE

PARTICULATE MATTER

AIR POLLUTION

230% increase in emissions of nitrogen oxides

160% increase in sulfur dioxide emissions

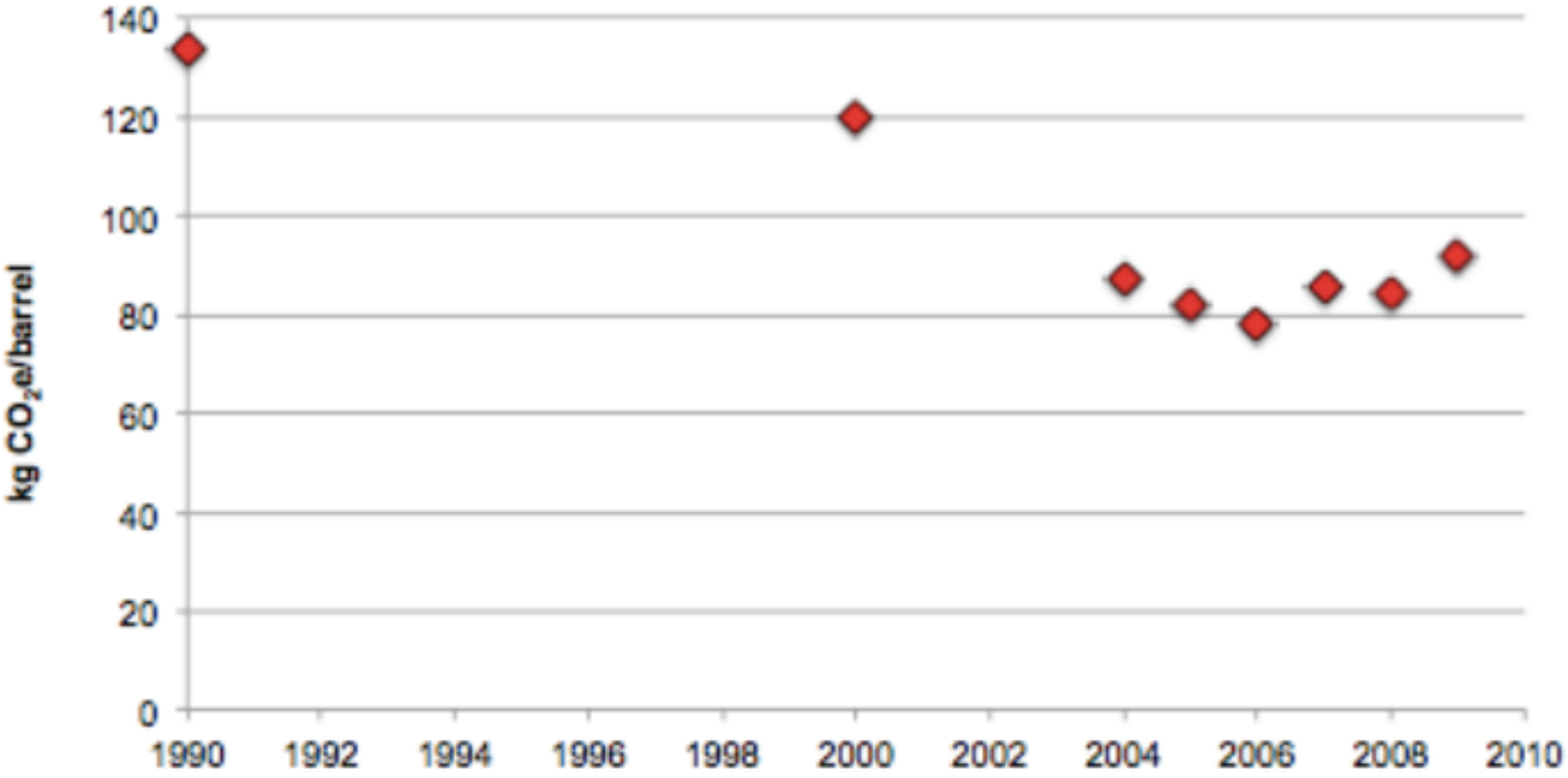
190% increase in particulate matter

2010

environmental defence

NRDC

Changes in GHG intensity of tar sands crude



Source: Pembina Institute

Carbon intensity likely to increase

Unburnable Carbon

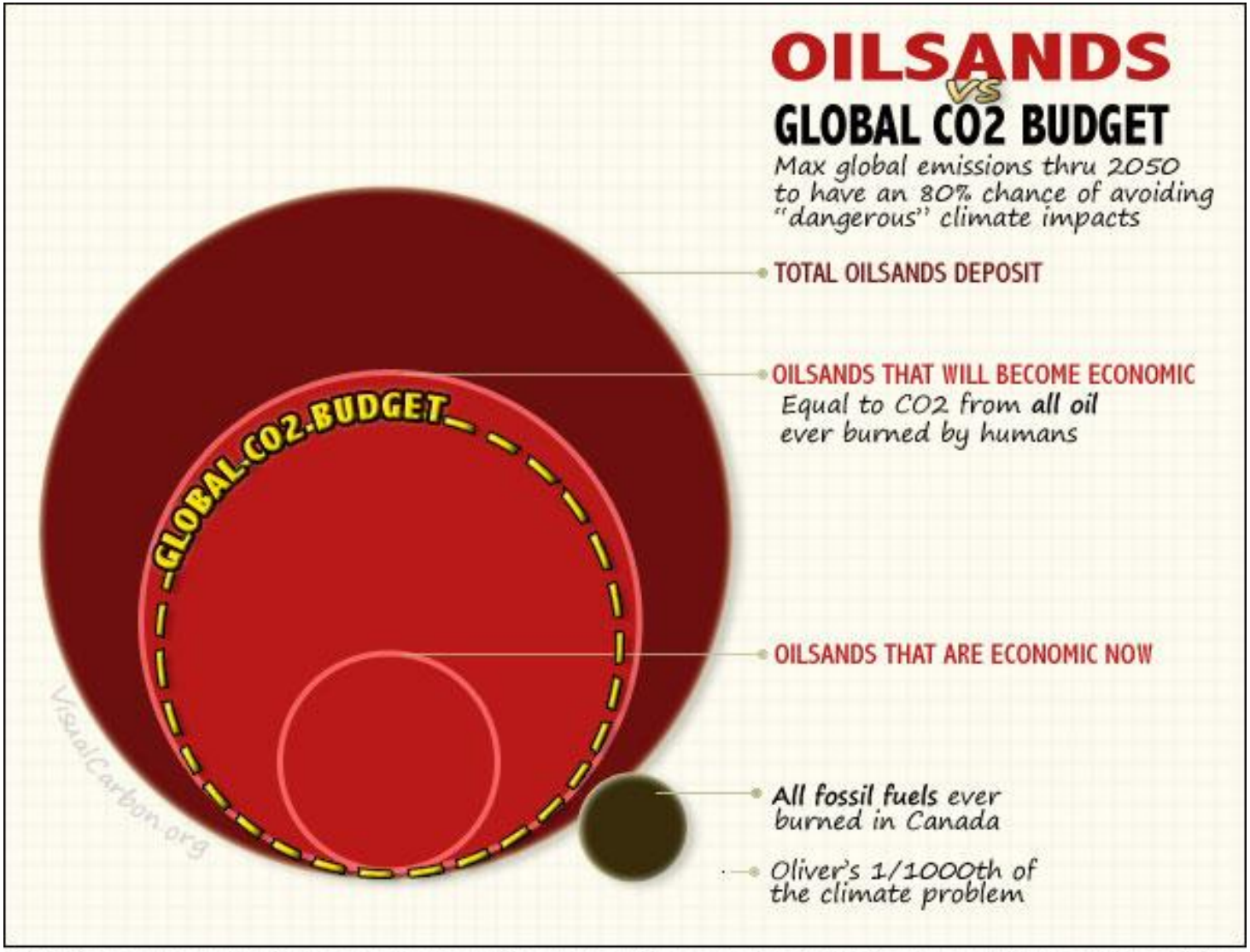
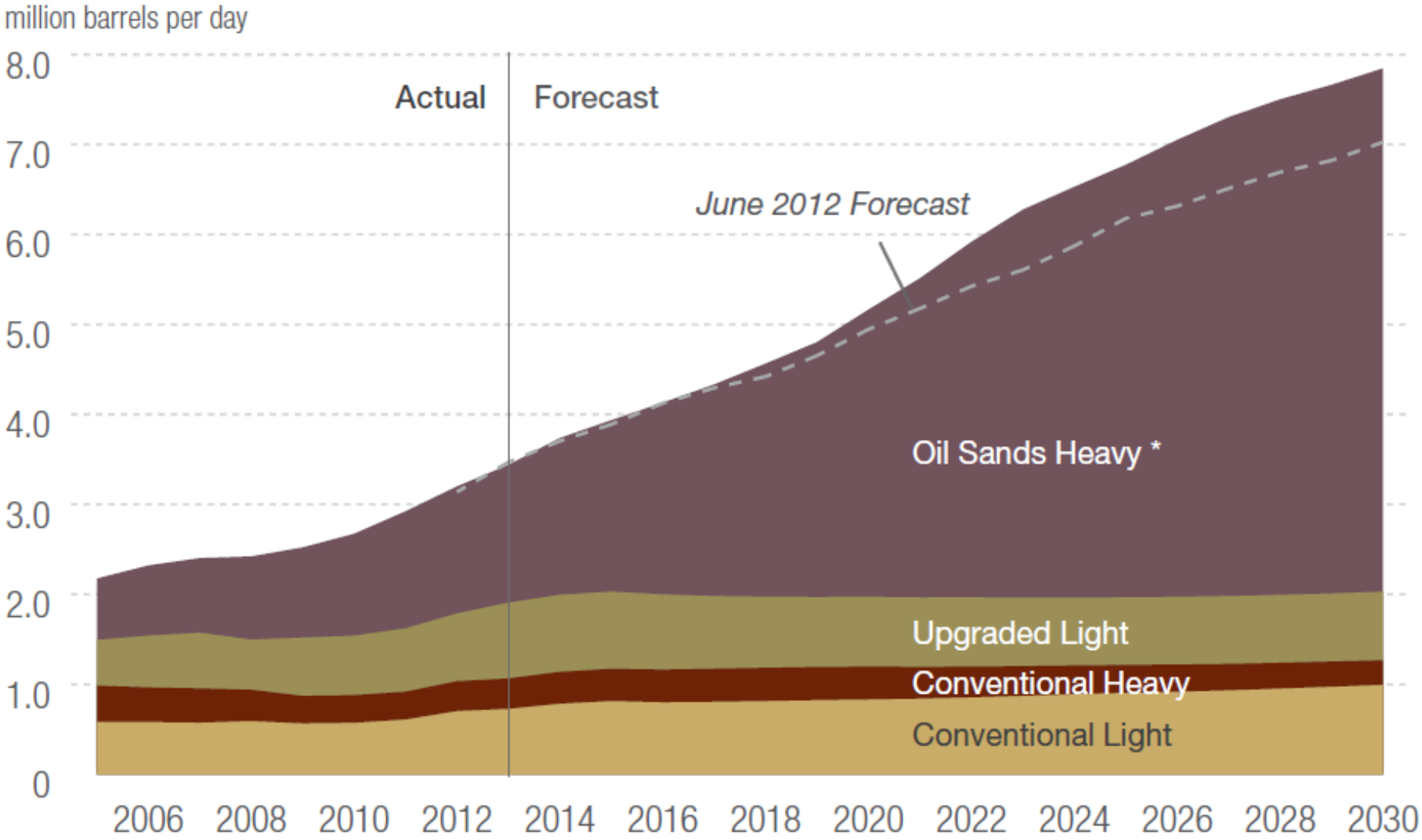
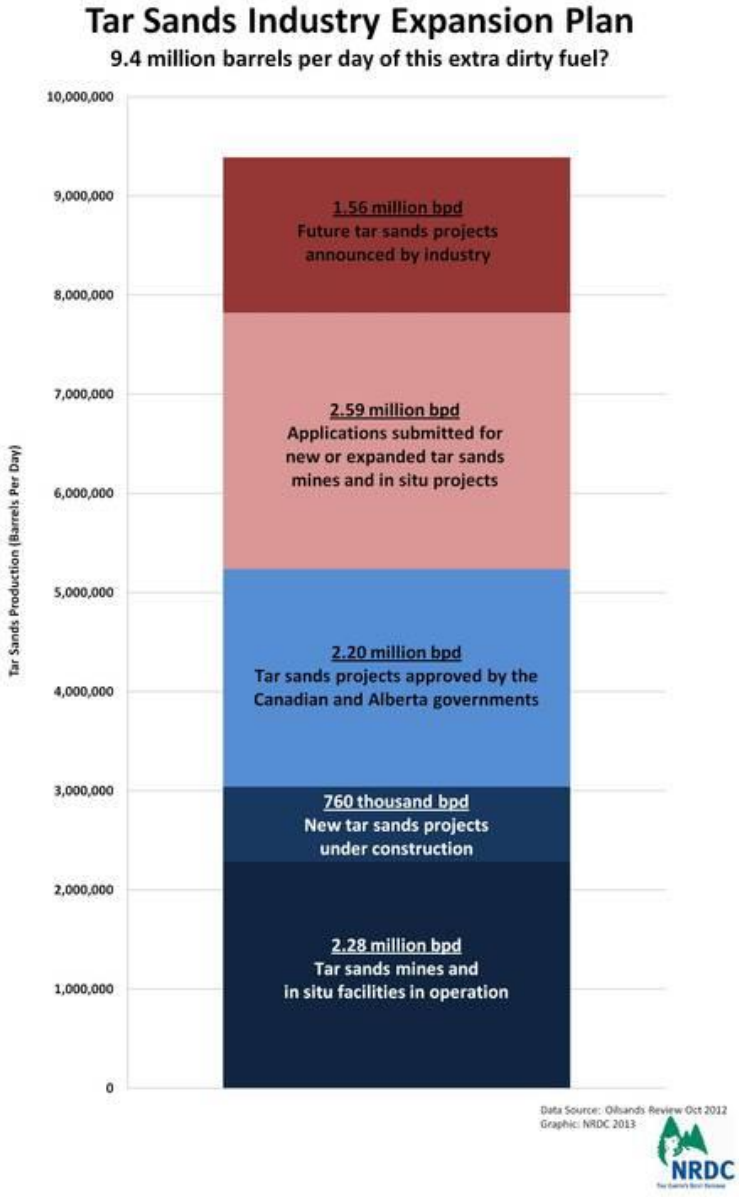


CHART: Barry Saxifrage at VisualCarbon.org and VancouverObserver.org. DATA: Past emissions (CAIT). Oilsands "economic now" and "deposit" from Swart&Weaver "Alberta oil-sands and climate: Warming from well-to-wheel emissions". "Deposit" (1,030 GtCO2) also called "Oil In Place (OIP)". Value for oilsands "will become economic" is 50% of OIP as estimated by Dr. James Hansen. Remaining Global CO2 Budget (466 GtCO2) from Meinshausen "Greenhouse-gas emission targets for limiting global warming to 2 °C" in Nature updated to reflect CO2 emitted since then. VERSION: May10, 2013.

Industry plans to triple production



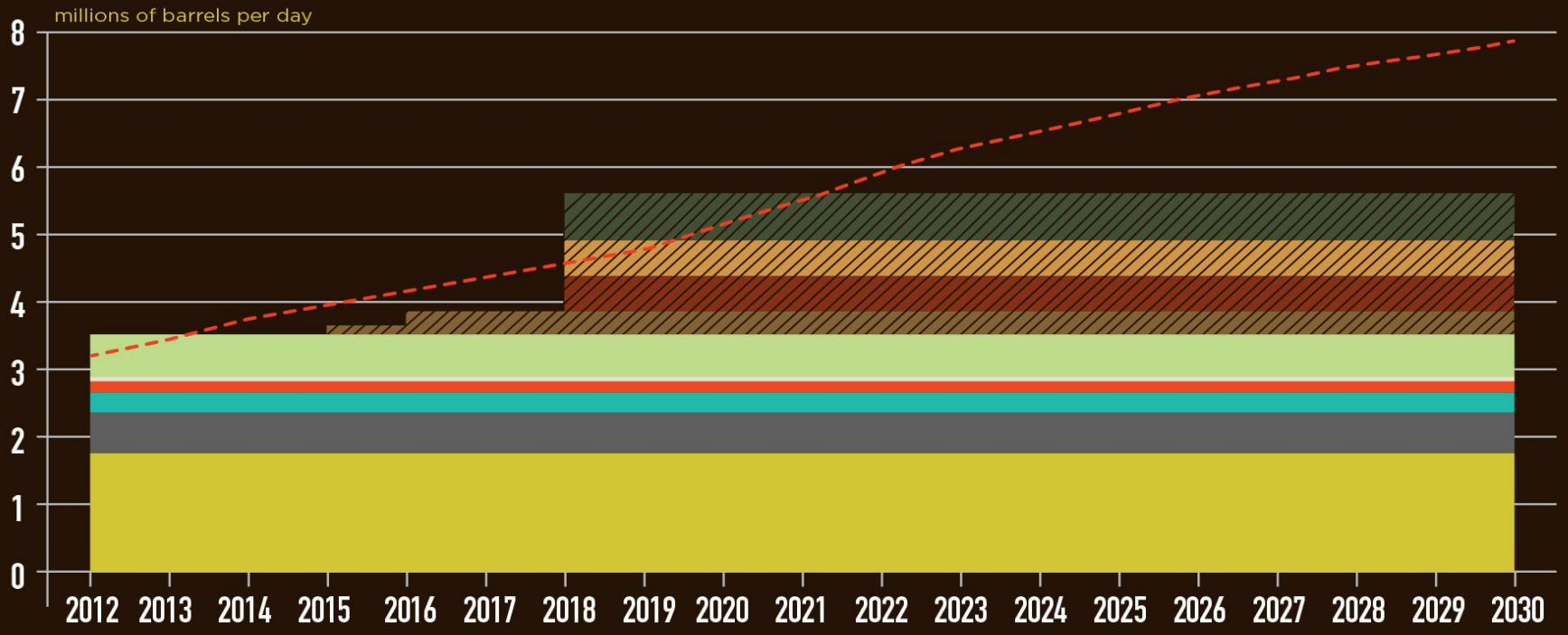
Industry's current expansion plan



PIPELINE AND TAR SANDS CAPACITY

WESTERN CANADIAN SUPPLY FORECAST (WCSB) VERSUS TAKEAWAY CAPACITY WITHOUT KEYSTONE XL

The Keystone XL tar sands pipeline is a critical part of the industry's plan for tar sands oil production expansion. In the unlikely event that all new proposed pipelines were built, industry would be unable to meet projected supply takeaway needs without Keystone XL.



WCSB PRODUCTION

- Western Canadian Crude Supply (Tar Sands + Conventional Crude)

EXISTING PIPELINES

- WCSB Refineries
- Western Corridor
- Express
- Trans Mountain
- Keystone 1
- Enbridge Mainline

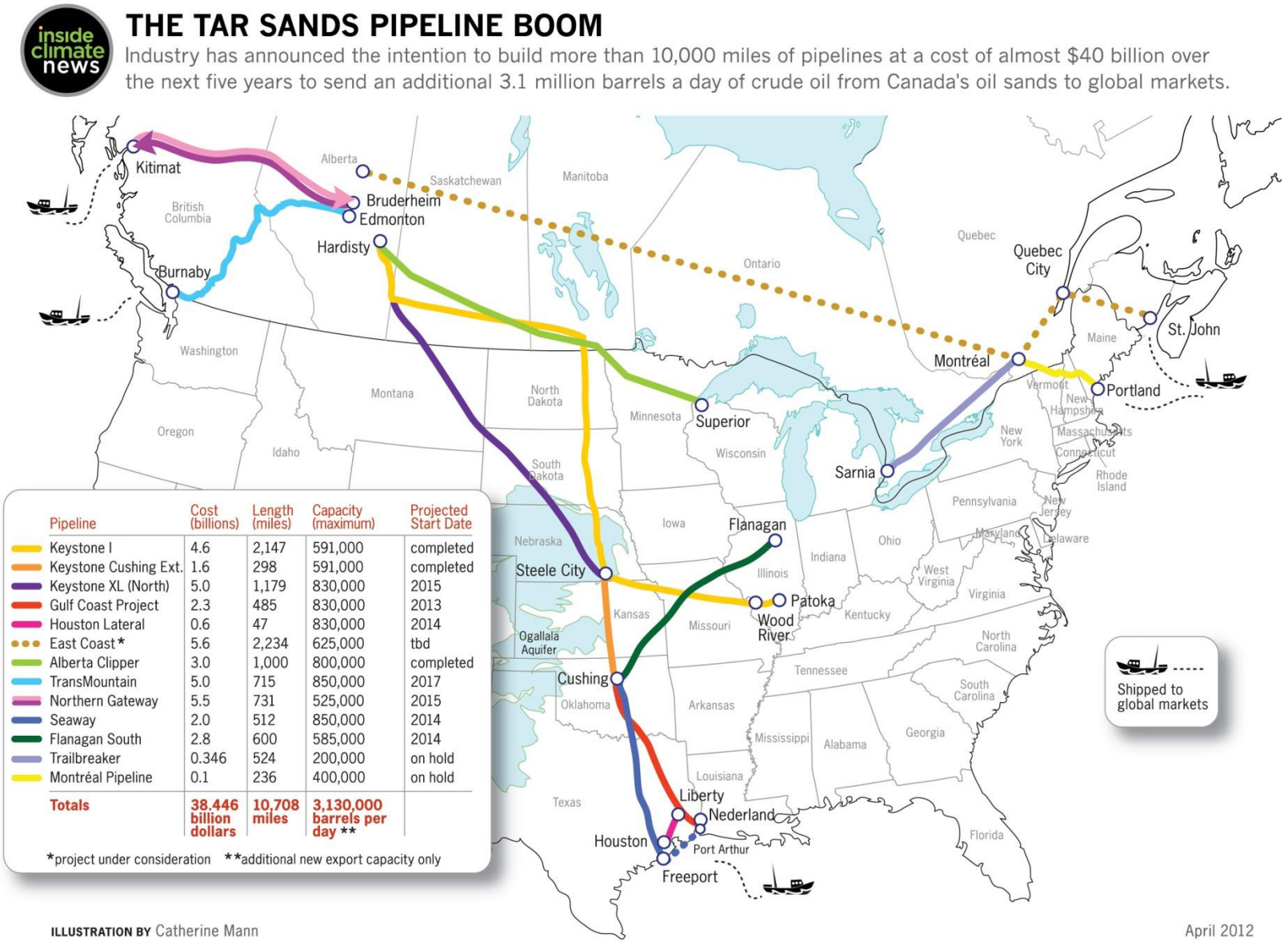
PROPOSED PIPELINES

- TransCanada Energy East
- Trans Mountain Expansion
- Northern Gateway
- Alberta Clipper Expansion

NRDC
THE EARTH'S BEST DEFENSE

Sources: CAPP, *Crude Oil, Forecasts, Markets and Pipelines*, June 2013;
Goldman Sachs, *Getting oil out of Canada: Heavy oil diffs expected to stay wide and volatile*, June 2013.

Industry Pipeline Ambitions

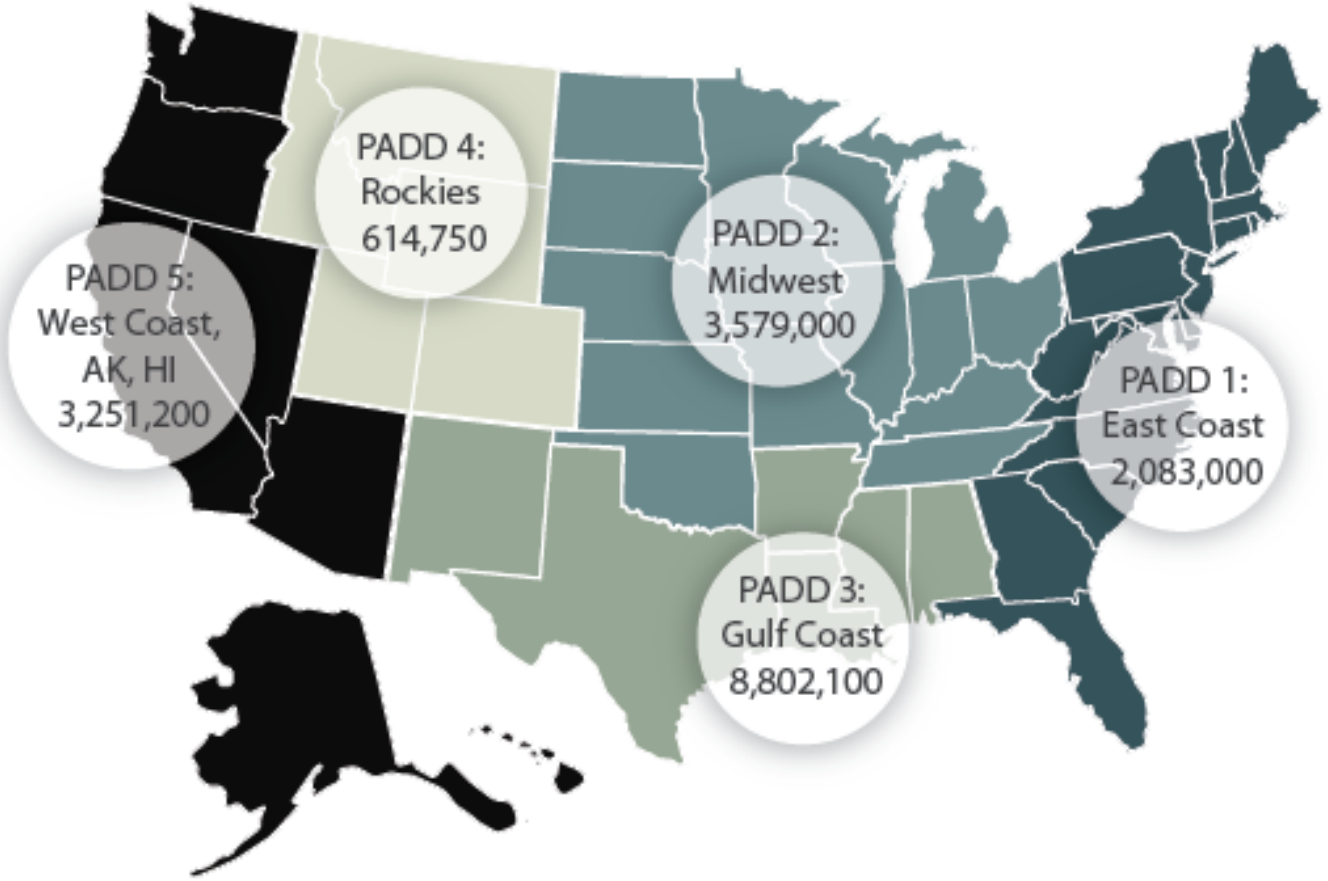


Keystone XL


Existing Keystone pipeline
Proposed Keystone XL expansion
CANADA
Fort McMurray
Manitoba
Tar sands
Alberta
Edmonton
British Columbia
Saskatchewan
Hardisty
Saskatch.
Regina
Vancouver
Ontario
Winnipeg
Seattle
Missouri
N.D.
Montana
Billings
U.S.
S.D.
Mississippi
Sand Hills
Neb.
Omaha
Illinois
Patoka
0
400
MILES
Denver
Steele City
Kansas
St. Louis
Missouri
Cushing
Okla.
Arkansas
Ogallala Aquifer
Dallas
Texas
Pacific Ocean
Houston
Port Arthur
Gulf of Mexico
MEXICO

U.S. Refinery Districts

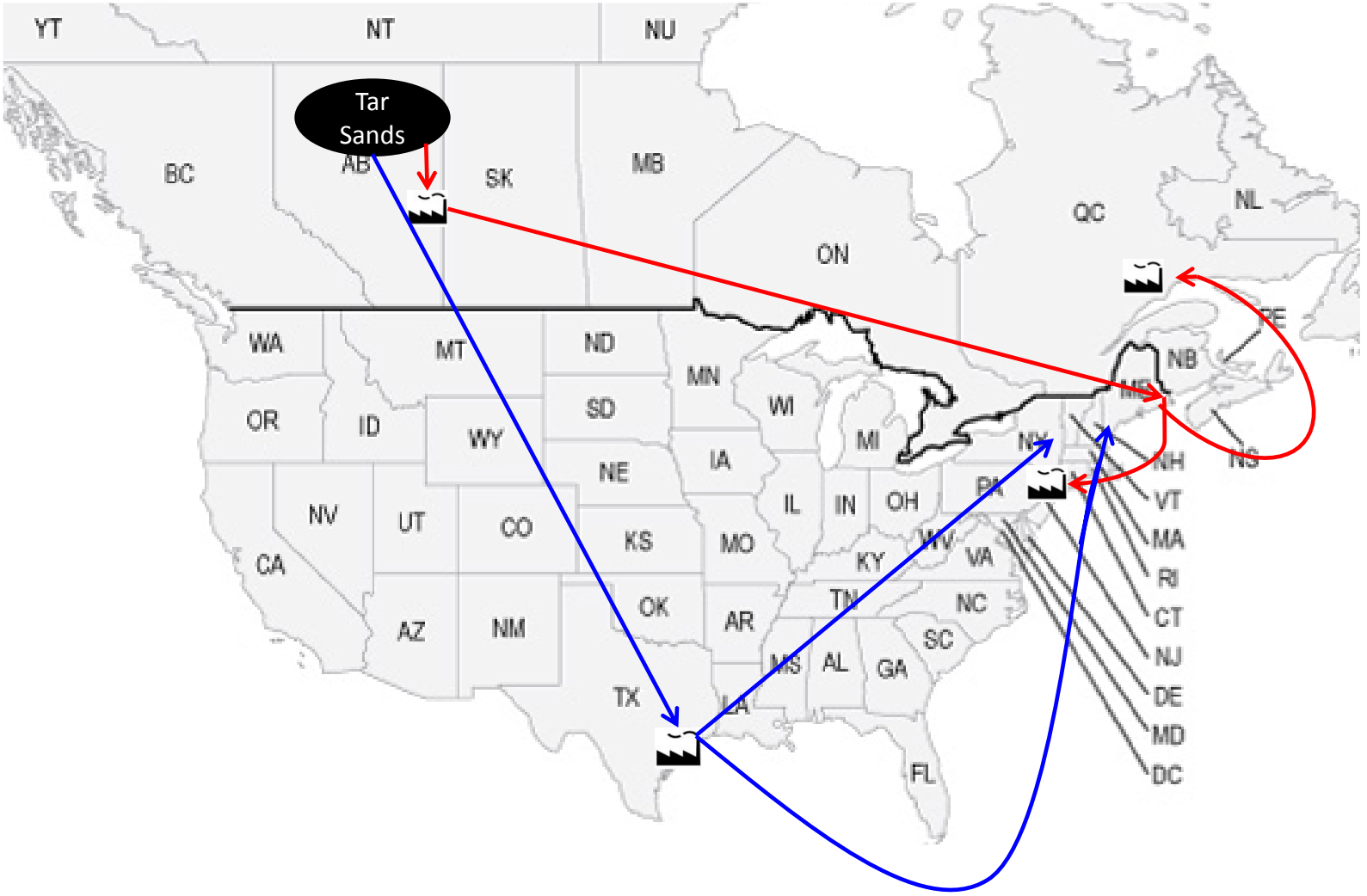
Map of PADD Districts (barrels per day of capacity, 2010)



Tar sands refined in Gulf Coast can reach U.S. Northeast and Mid-Atlantic as fuel product

Credit: FinancialPost.com

Impact of Keystone XL decision on carbon footprint of fuel in other regions



Conclusion

- If approved, the Keystone XL tar sands pipeline would:
  - Increase annual carbon emissions by up to 24.3 million metric tons per year.
  - Increase average carbon intensity of U.S. fuel stock
  - Enable significant expansion of tar sands production
- Public engagement is critical

Thank you