

Carbon
Sequestration
Leadership Forum
June 16th, 2015



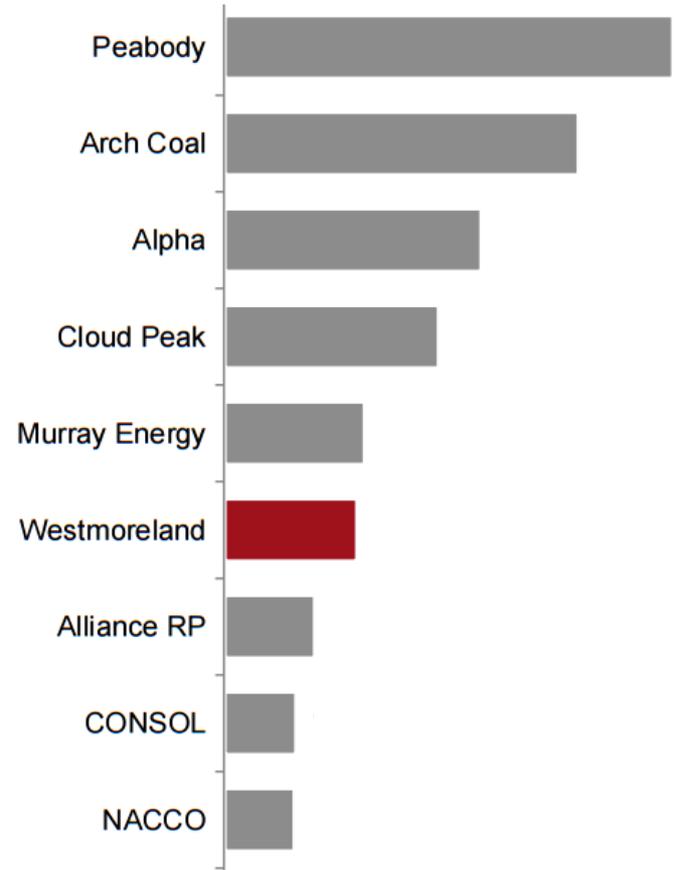
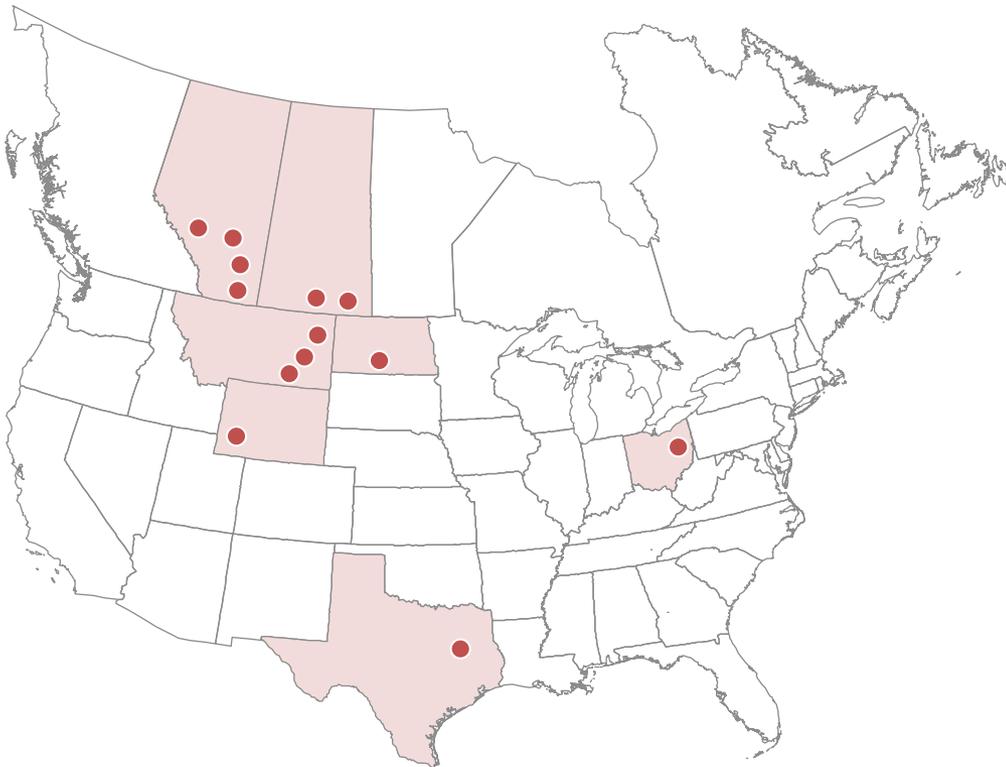
WESTMORELAND COAL COMPANY

COAL'S PERSPECTIVE IN A CCS ENVIRONMENT

John A. Schadan, P.Eng.
President, Canada Operations



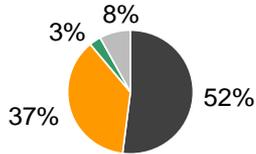
- 6 Largest Coal Producer in North America
- 13 Mining operations in USA & Canada





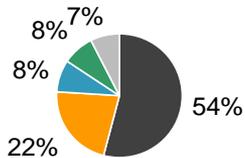
Overall Power Generation by Region

Alberta



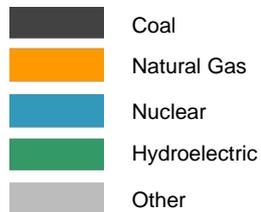
Total: 72,918 GWh

Mountain

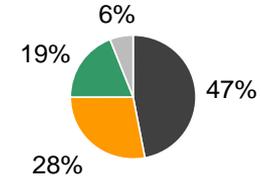


Total: 374,593 GWh

Fuel Source by Region

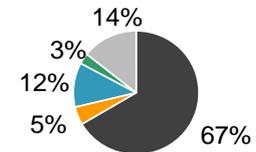


Saskatchewan



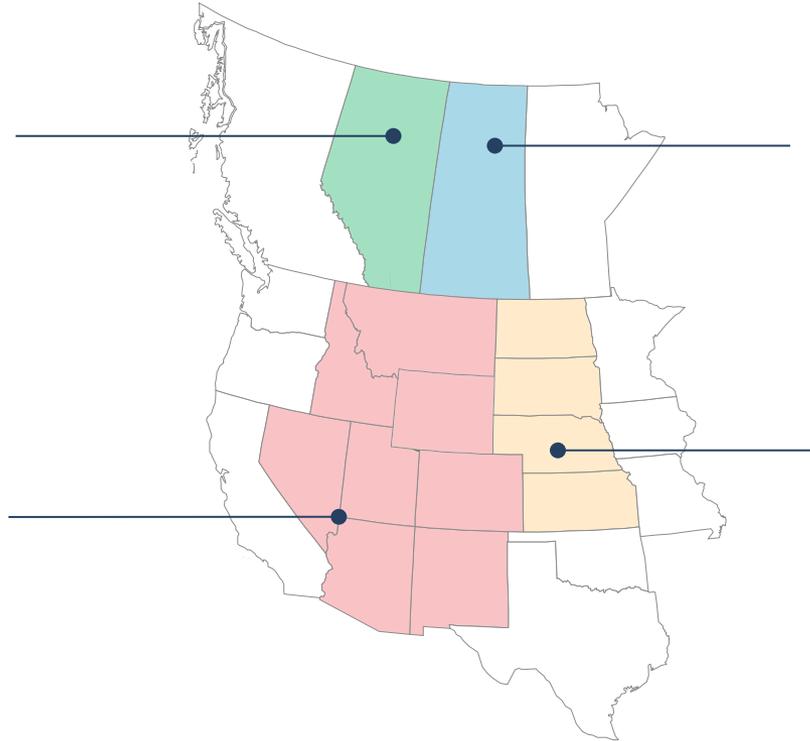
Total: 23,155 GWh

West North Central



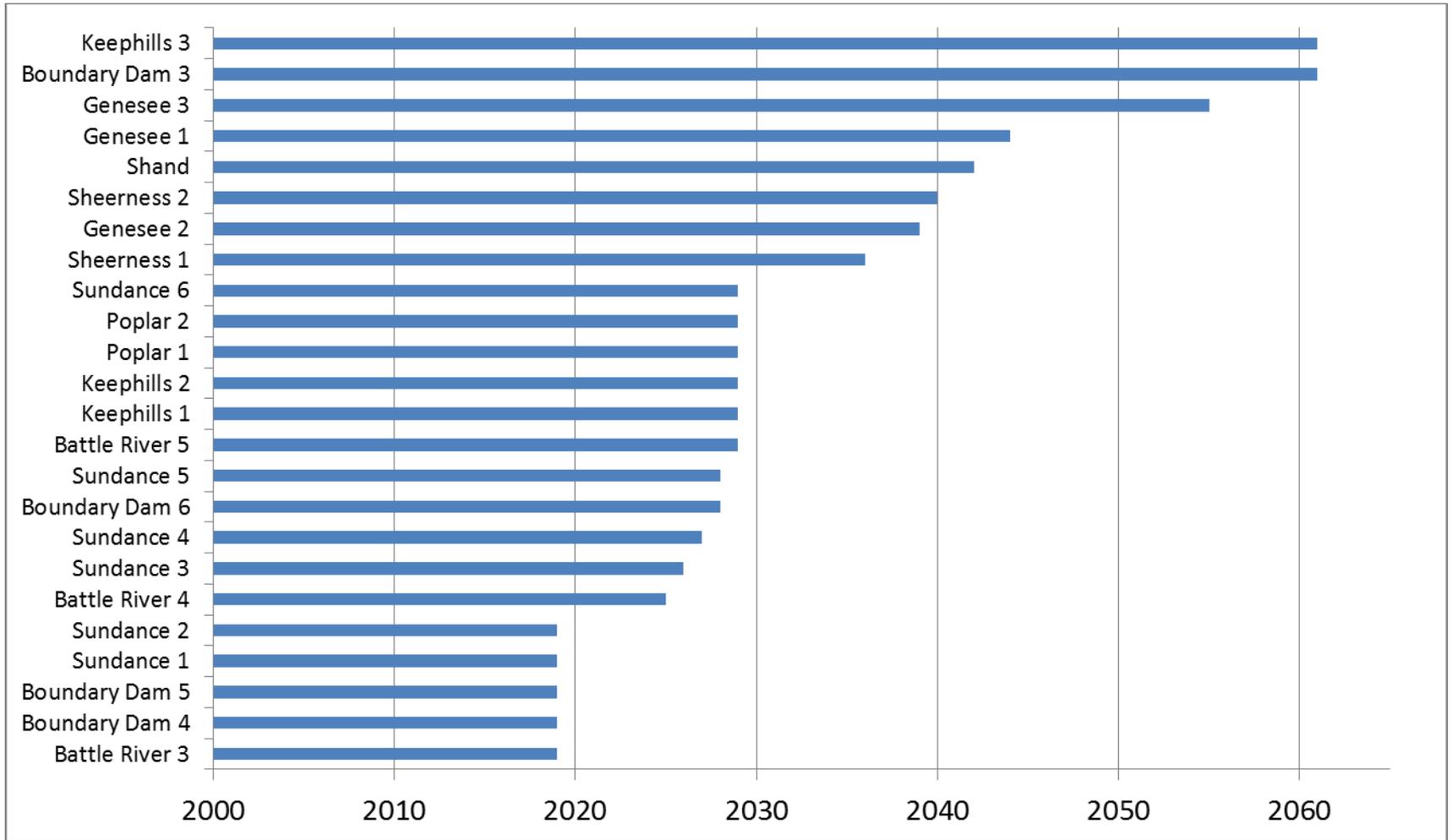
Total: 331,910 GWh

Geographical Regions





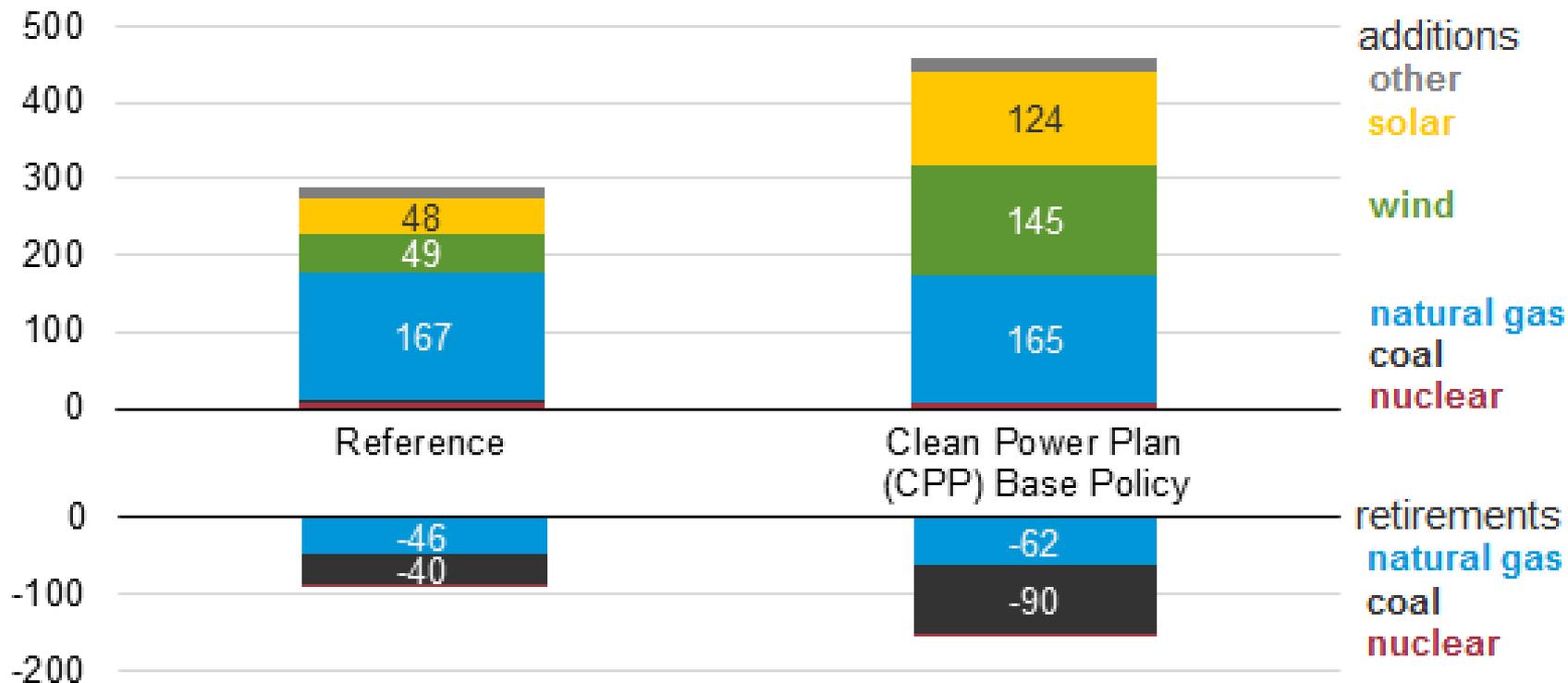
Coal Plant Unit Life (Alberta & Saskatchewan)





EPA's Clean Power Plan in USA

Projected U.S. electric capacity additions and retirements in two cases, 2014-40 gigawatts (cumulative)



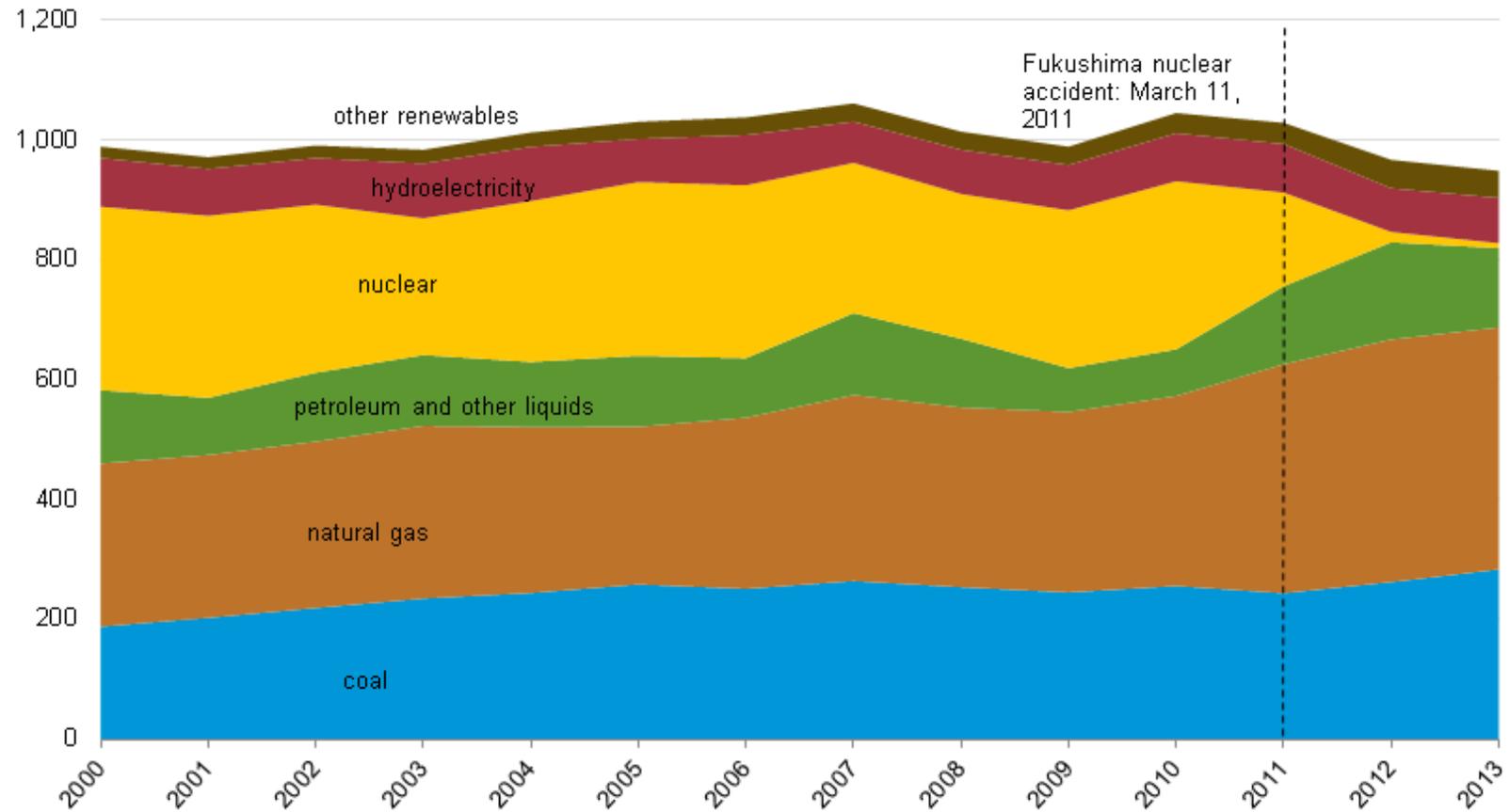
Source: U.S. Energy Information Administration, Analysis of the Impacts of the Clean Power Plan, 2015



A Case Study on Fuel Change

Japan's net electricity generation by fuel, 2000-13

terawatt-hours (TWh)



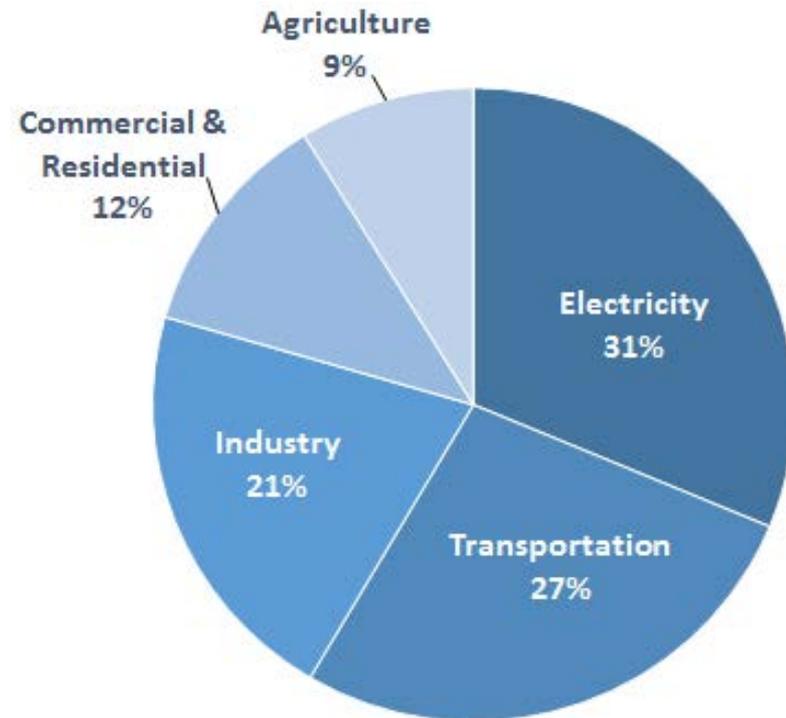
Source: U.S. Energy Information Administration, International Energy Agency, METI



Carbon Capture & Sequestration

- **Meaning for Coal ?**
 - Stability
 - Transition
 - Survival

Total U.S. GHG Emissions by Economic Sector in 2013



EPA, Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013



Recommendations

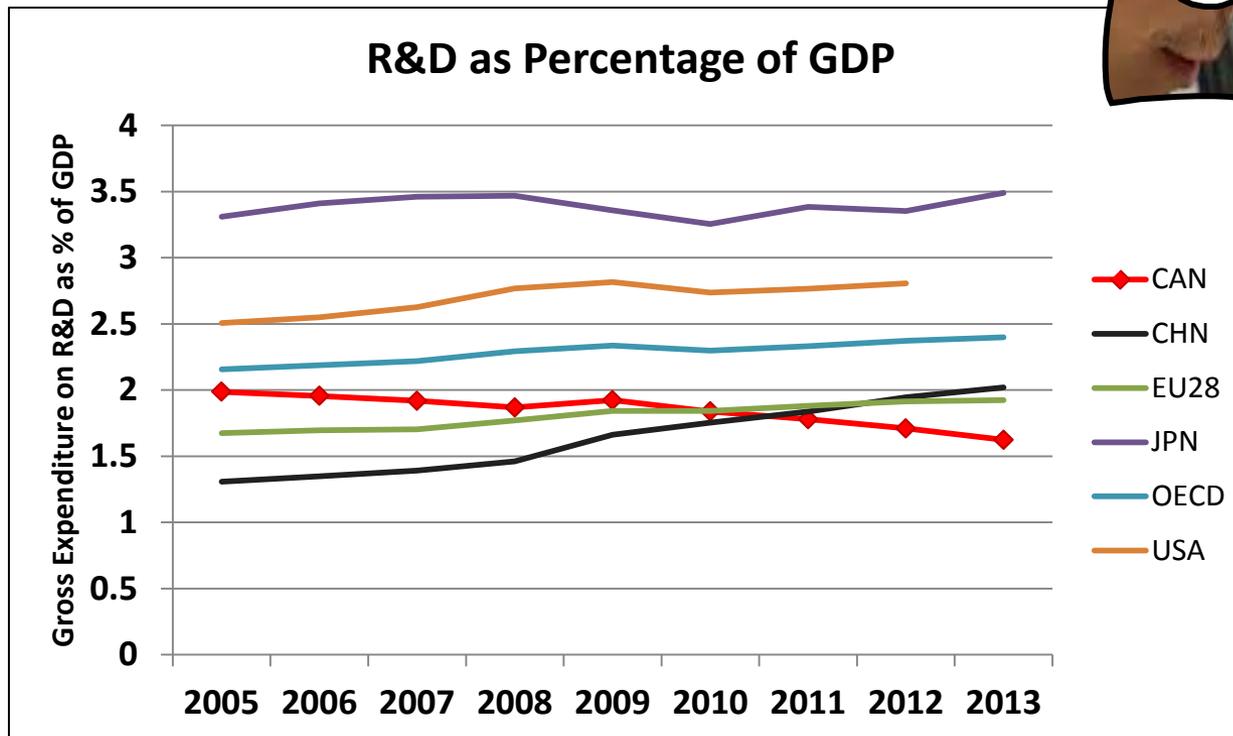
- **We need to change the conversation !**
 - Inclusive Solutions
 - Equal Benefit
 - Global Scale





Recommendations

- **More Canadian support for Research and Development**

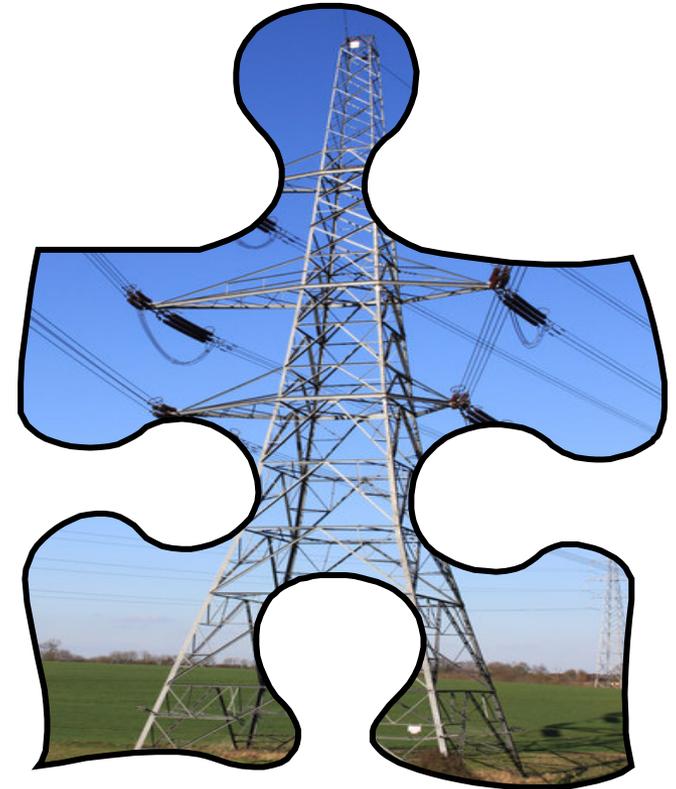


OECD Main Science and Technology Indicators Database, 2015



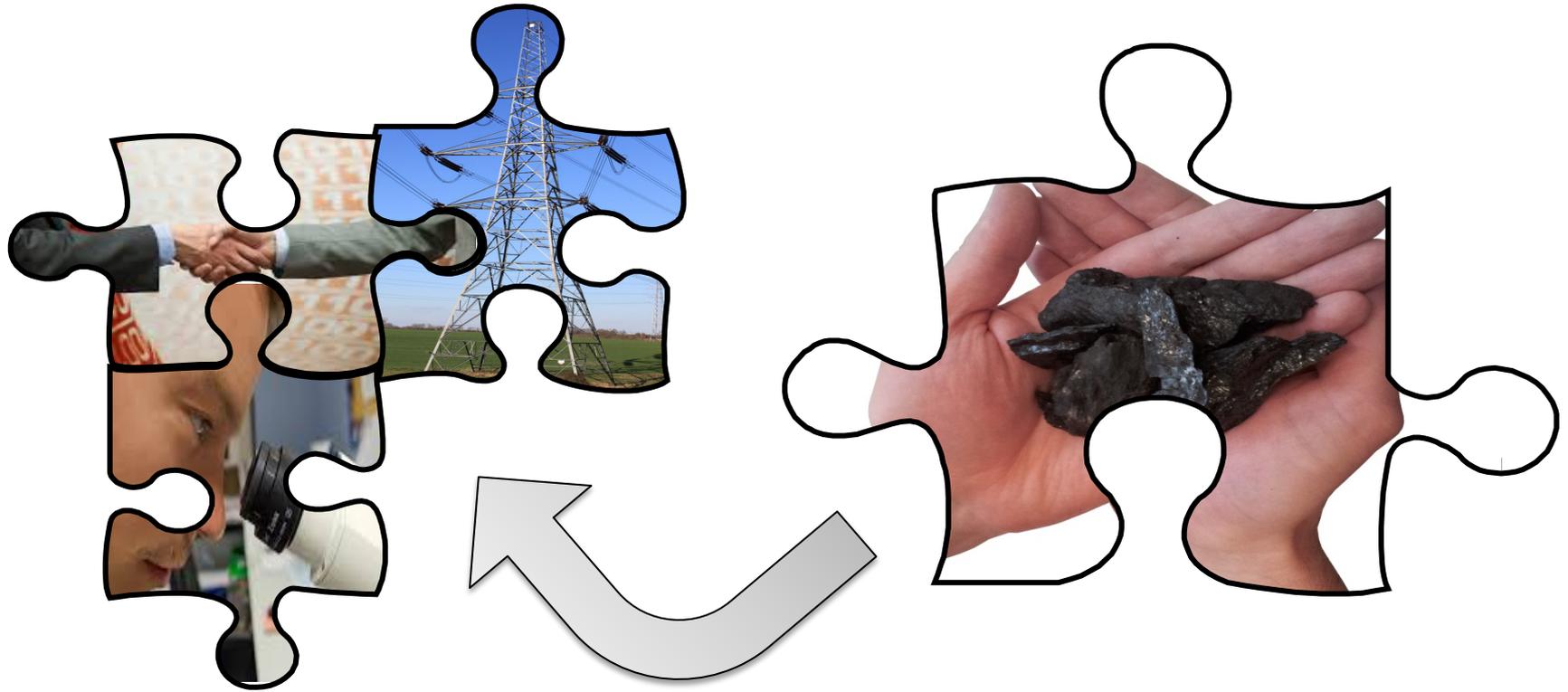
Recommendations

- **Exploratory versus Exploitive Innovation**
 - SaskPower's Boundary Dam
 - CCEMC in Alberta





Results from this Forum





John A. Schadan
President, Canada Operations
Edmonton, AB
jschadan@Westmoreland.com