



Natural Resources  
Canada

Ressources naturelles  
Canada

C E T C

CANMET ENERGY TECHNOLOGY CENTRE

# SaskPower's Clean Coal Power Project

CLEAN ENERGY TECHNOLOGIES

Bill Reynen

CSLF Deployment Workshop

March 27, 2007

Canada 

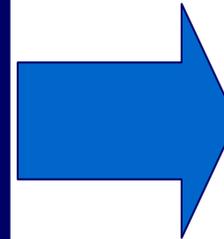




# The Saskatchewan Advantage

es

- Capacity Need
- Legislated Requirement to Serve
- Fuel Availability
- Environmental Stewardship
- Kyoto Protocol
- Proven Sequestration Effectiveness
- Value for CO<sub>2</sub>
- Fed/Prov Cooperation (MOU)
- Work of the PTRC, SRC, ITC
- Technical/Financial Capacity



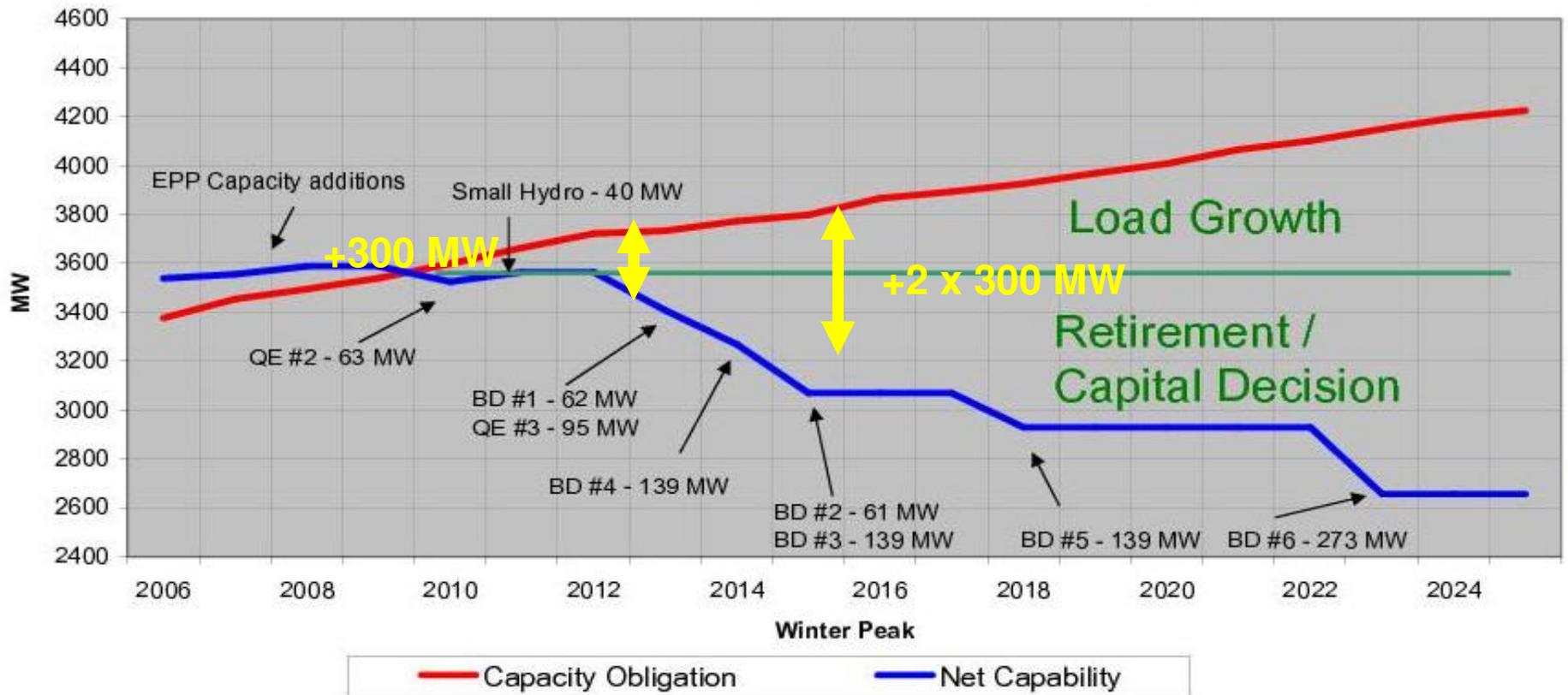
300 MW  
(near) Zero  
Emissions  
Pulverized  
Coal Plant in  
2011?





# SaskPower Capacity Position

## Base



Peaking plants are assumed to be replaced in-kind.

# CONVENTIONAL COAL POWER PLANT

CARBON AS CO<sub>2</sub> (GAS)

(CO<sub>2</sub> released to atmosphere is considered a climate altering greenhouse gas)

ELECTRICITY

CARBON AS COAL

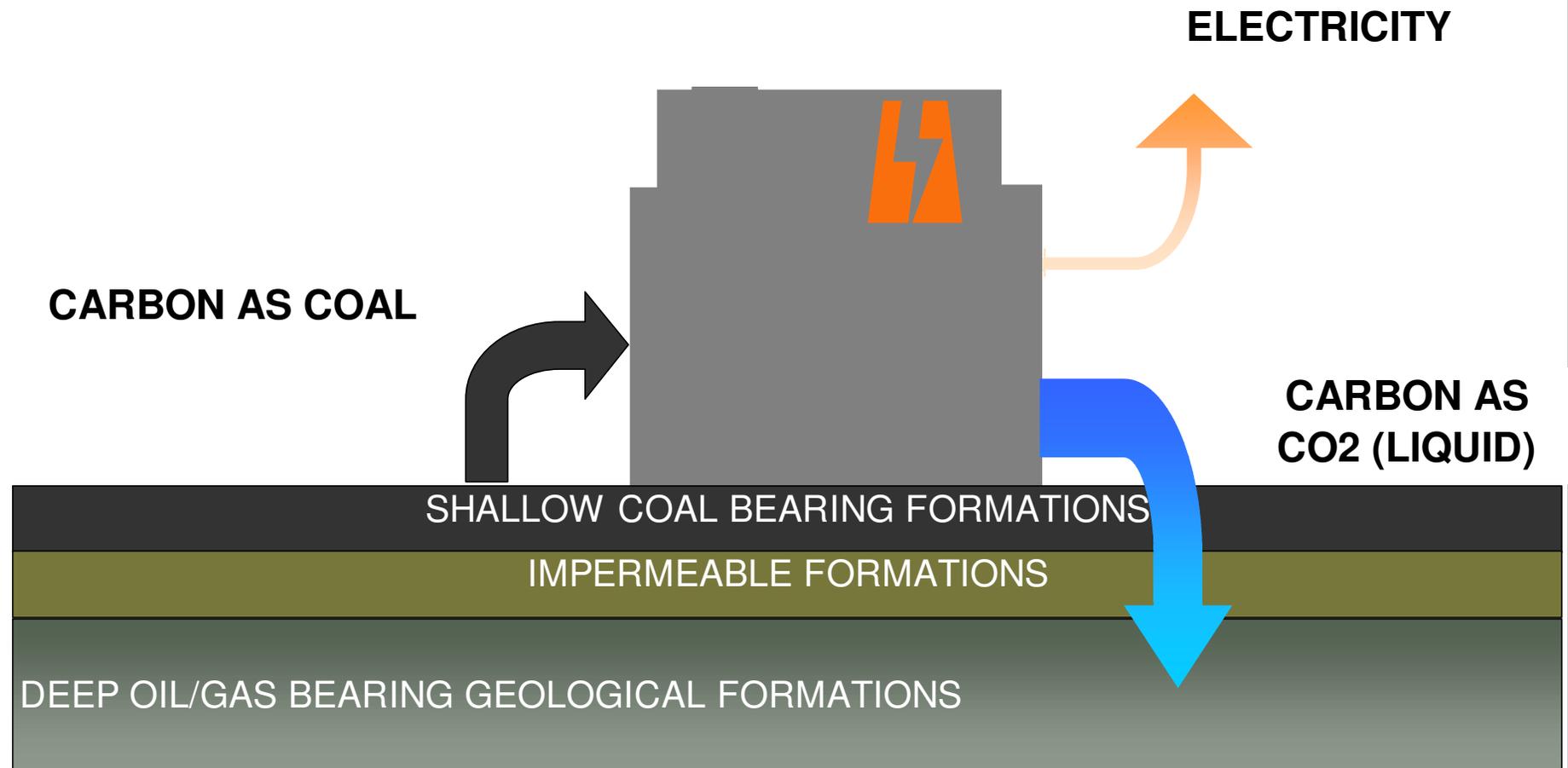


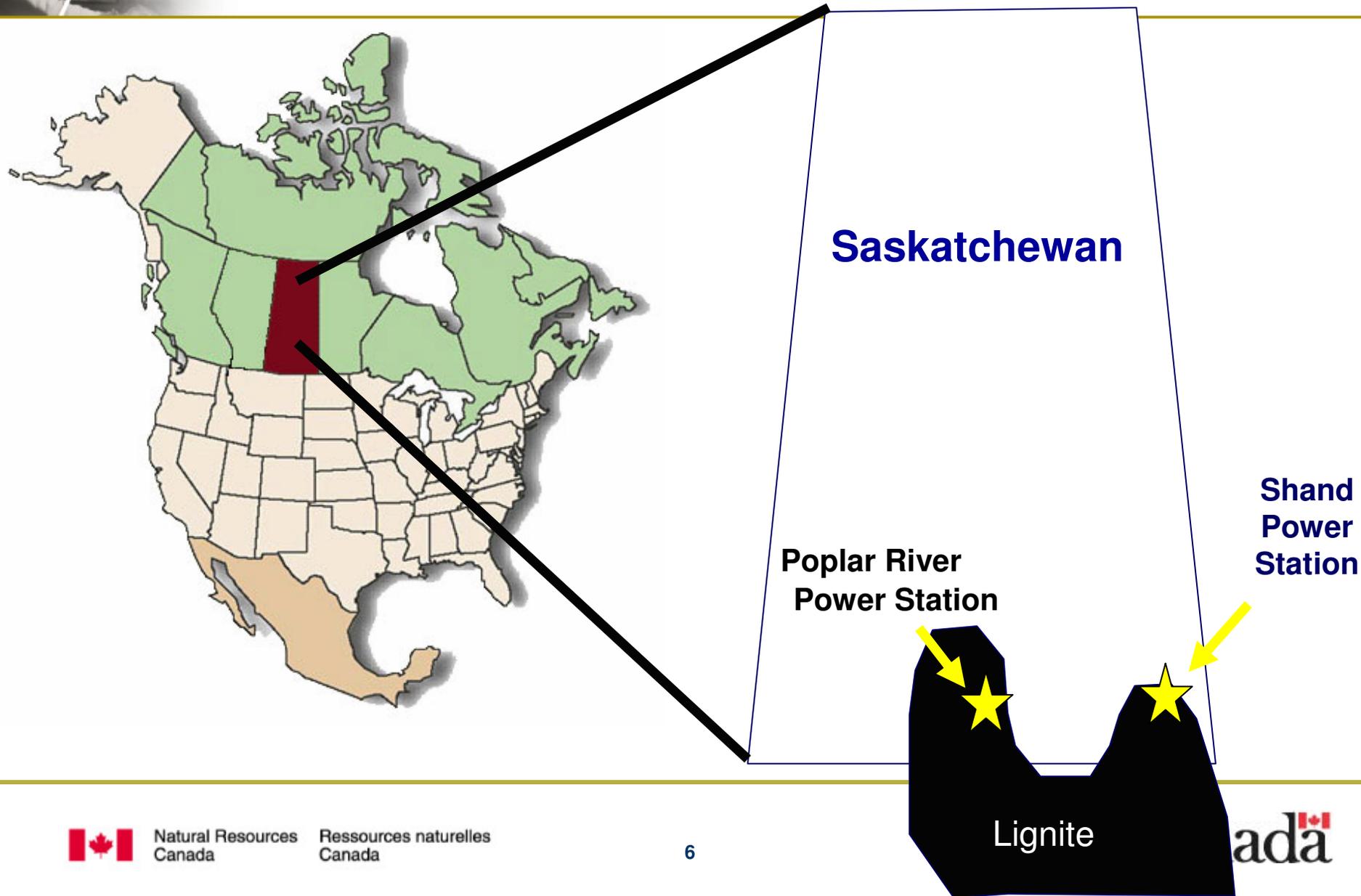
SHALLOW COAL BEARING FORMATIONS

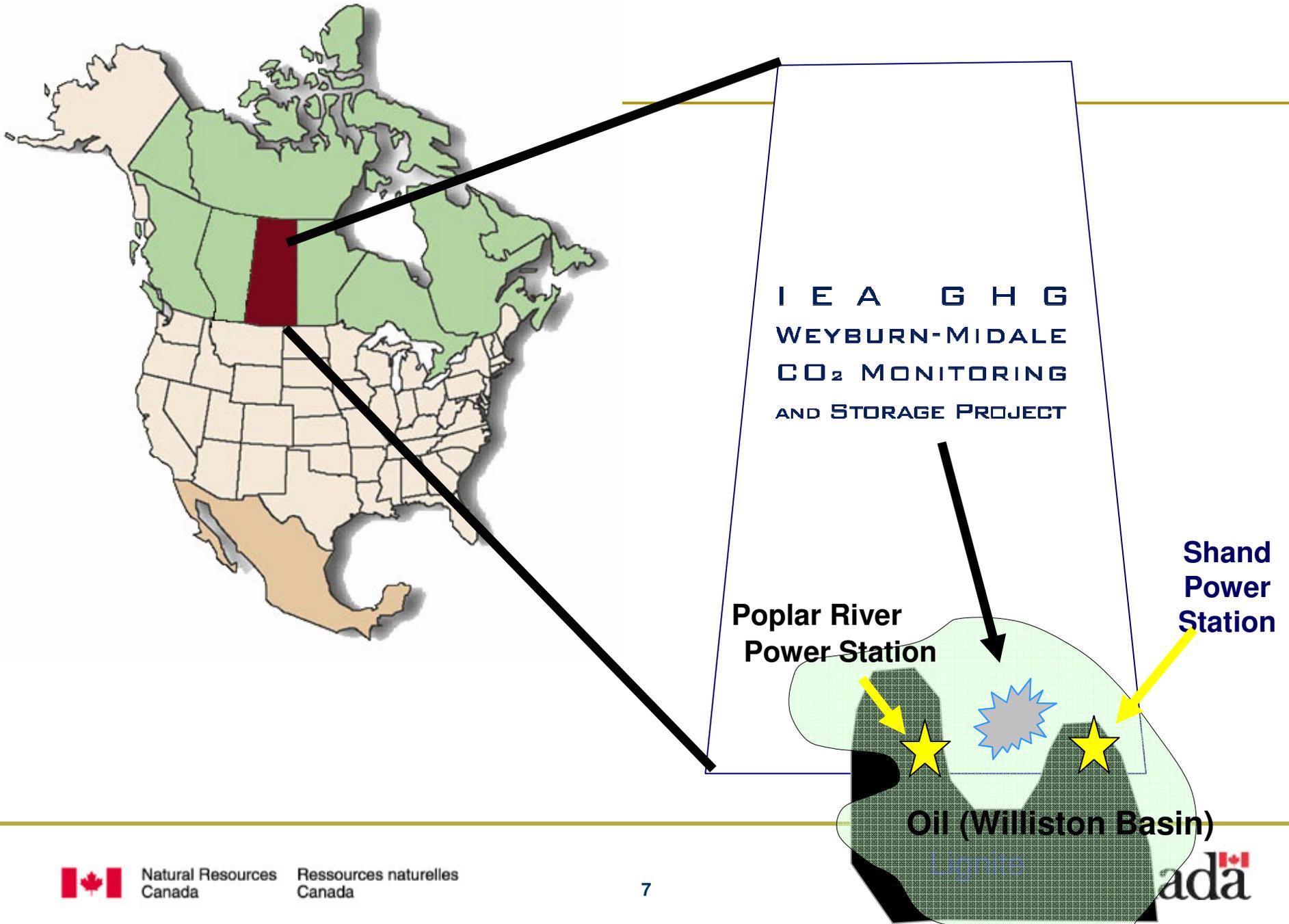
IMPERMEABLE FORMATIONS

DEEP OIL/GAS BEARING GEOLOGICAL FORMATIONS

# SaskPower's CLEAN COAL POWER PLANT









## Overall COAL to OIL Process

**1 Tonne Coal** Produces **0.8 MWh** + **2 to 10 barrels Oil**

ELECTRICITY

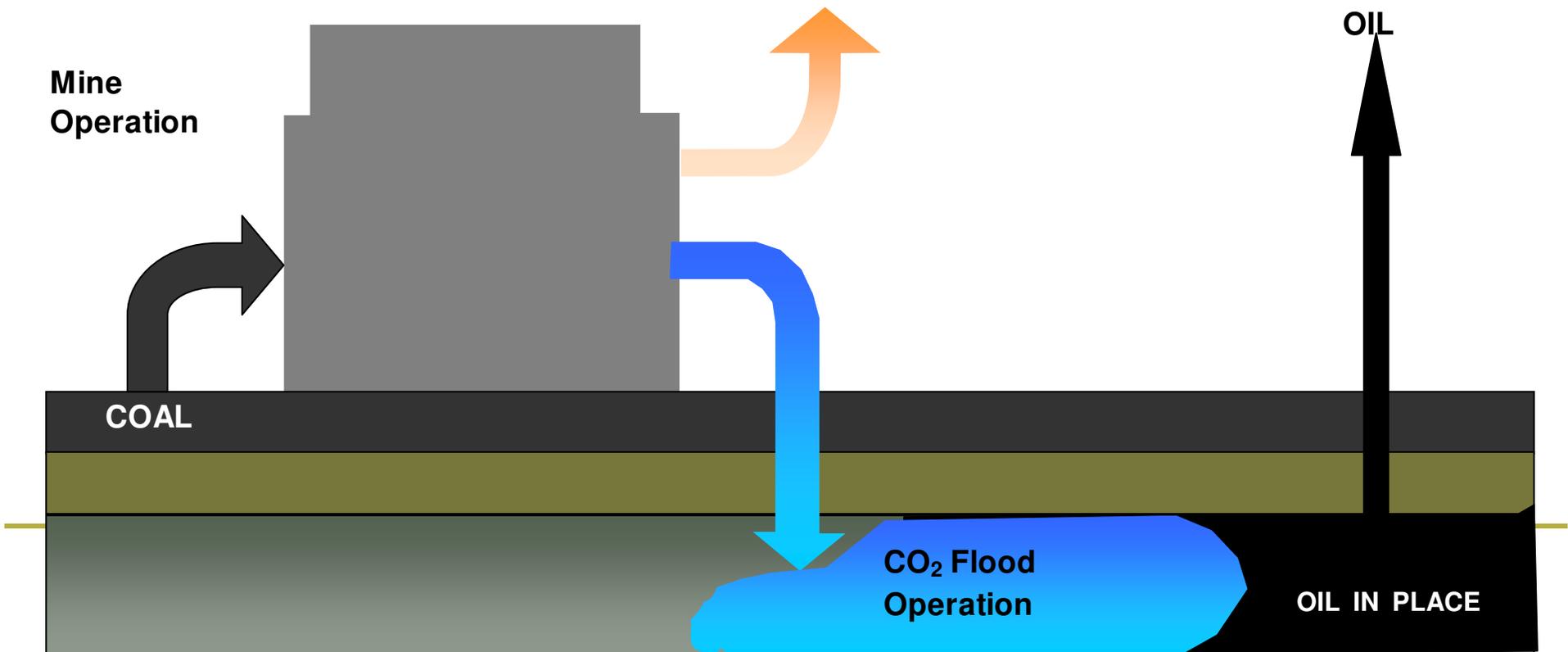
Produced  
OIL

Mine  
Operation

COAL

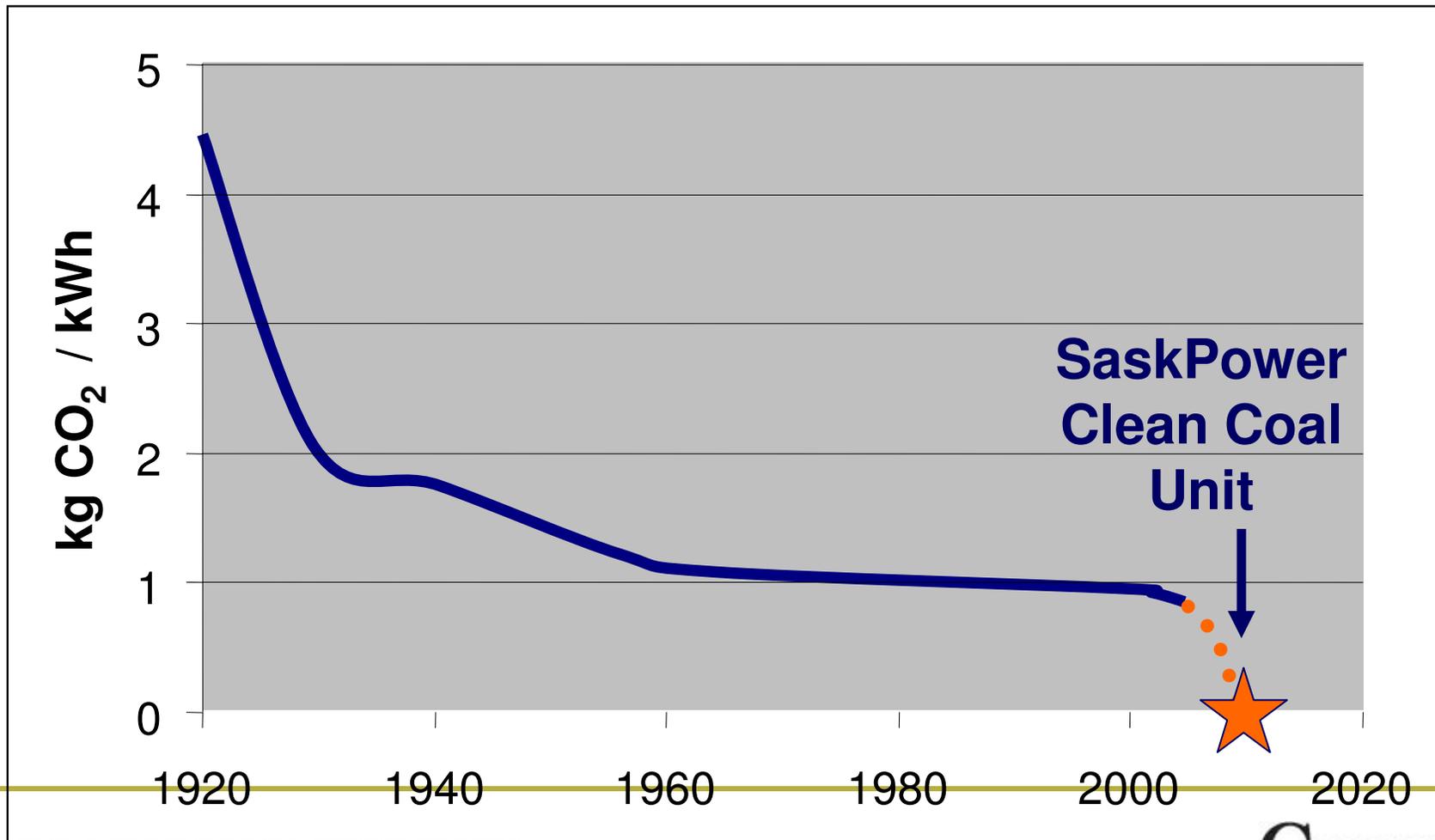
CO<sub>2</sub> Flood  
Operation

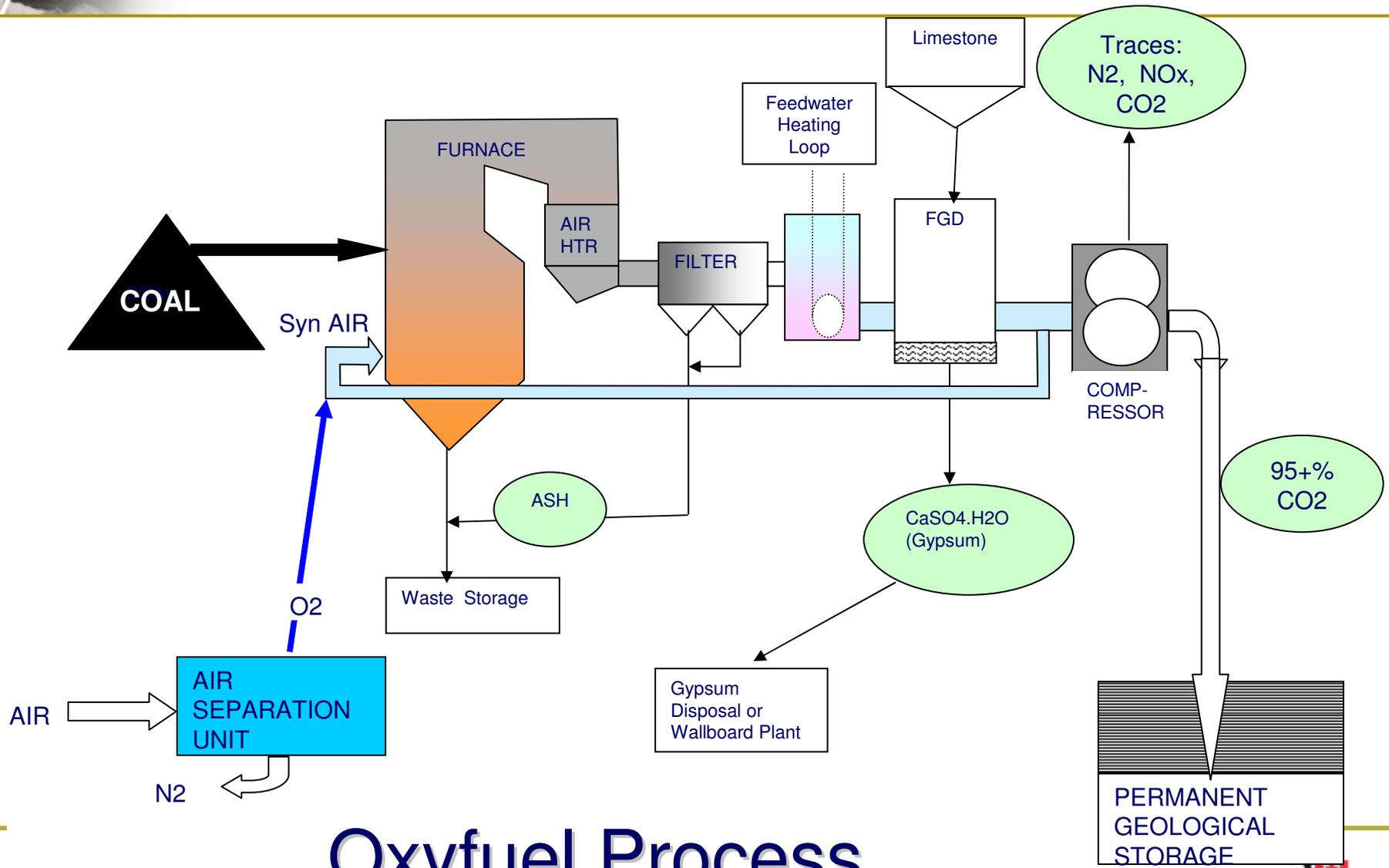
OIL IN PLACE





# 100 Years of Progress in Reducing Emissions Intensity





# Oxyfuel Process



Poplar River Site Rendering



# International Clean Coal Engineering & Technology Center

- Provides provincial opportunity to anchor clean coal technology in Saskatchewan:
  - Direct Jobs in Engineering
  - Direct Jobs in Research
  - Indirect Jobs in Manufacture, Technical Service
  - “Spin off” technologies
- Provides ongoing technical benefits to SaskPower – strong engineering group close at hand
- Provides opportunity to meaningfully engage within SaskPower some of the “best and brightest”
- Brings external perspectives to SaskPower
- Links Research, Engineering, Sales and Service capacity of Vendors to SaskPower and to Saskatchewan



## Available Assets

### Core Technology

Operating Unit

Design, Construct #1

Unit 2

### R&D

Air Liquide

B&W

Hitachi

SRC/PTRC

U of R

CANMET

ECRF

### COMMERCIAL

Hitachi

B&W

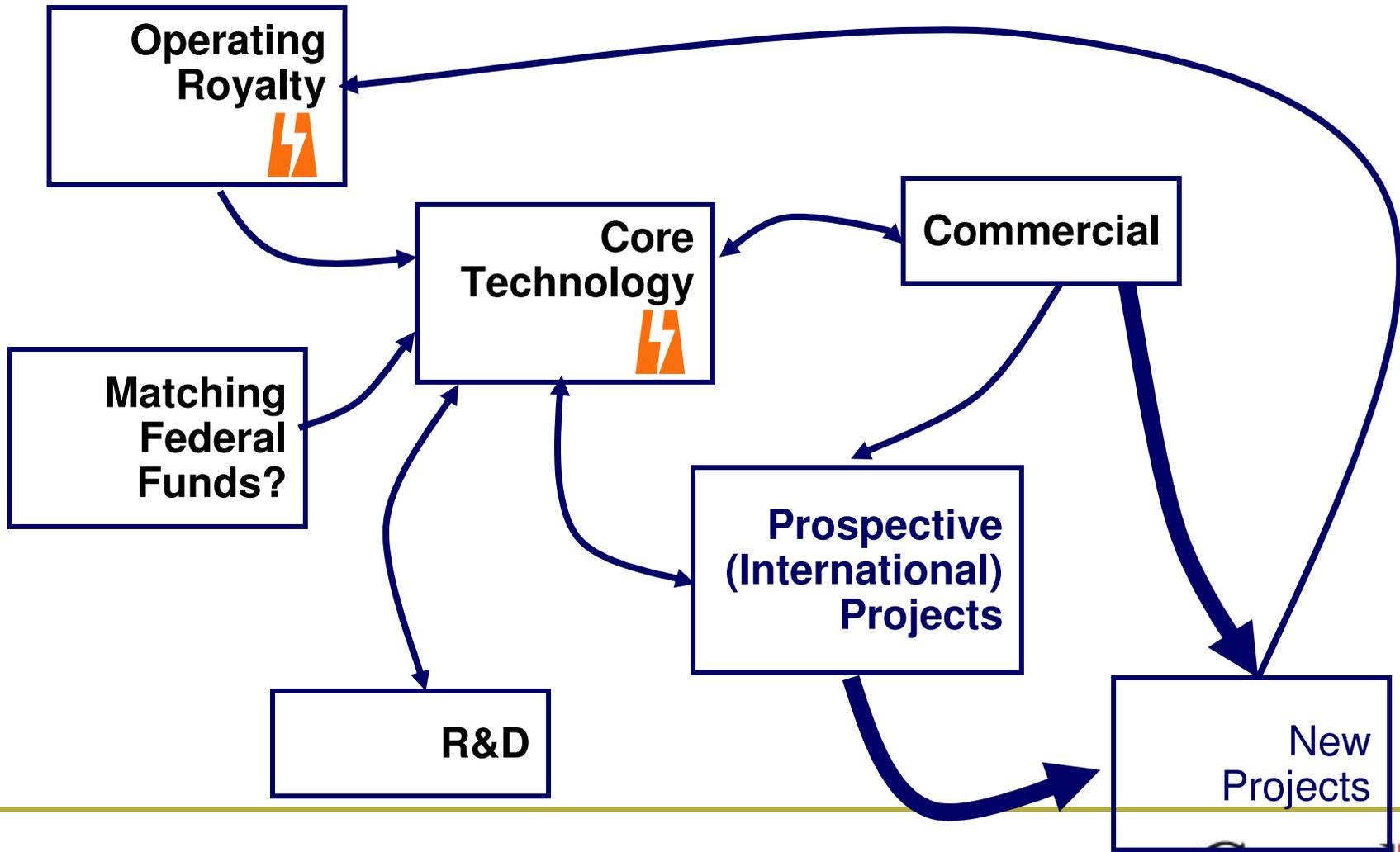
Air Liquide

EpcCo

AirCo



# International Clean Coal Engineering & Technology Center





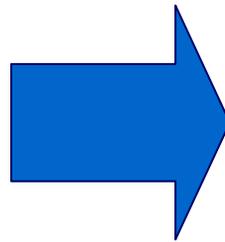
# Project Proposal

- The SaskPower Clean Coal Project Proposal (end June 2007) will include:
  - Business Case Analyses addressing cost, risk and revenue expectations
  - Provisional Equipment and Construction Contracts for immediate acceptance
  - Provisional CO<sub>2</sub> sales agreements for immediate acceptance
  - Project Execution Plan



# The Saskatchewan Opportunity

300 MW  
(near) Zero  
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Pulverized  
Coal Plant in  
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**Environmentally and  
Economically Sustainable  
Electricity Supply**

**Enhanced Oil Production**

**On-going and Enhanced Coal  
Royalties**

**Leading Edge Clean Coal Technologies  
to a Huge World Market**

**International Clean Coal Engineering  
& Technology Center**

**Expansion of In-Province  
Manufacturing Commitment**

**Economic Spin-offs from Project  
Construction**





# Challenges

## Technical Design

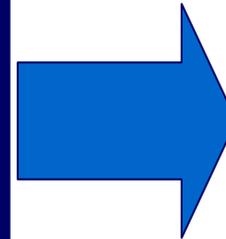
## Equipment Vendor Engineering & Manufacturing Capacity

## Engineering Resources

## Construction Labour

## Future CO<sub>2</sub> Market:

- Emissions Regulation vs CO<sub>2</sub> Regulation
- Perceived Value for Emissions Reduction Credits
- International Recognition for Credits
- Perceived Long Term Liability



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