

# GHG

EMA of BC  
2016 May 19

# OUTLINE

## **Carbon Markets topics:**

- Efficient GHG Reporting and Verification
- GHG Opportunities
- LNG in BC

# CONTEXT - RULES

don't have to agree. I just want to avoid bogging down in arguments!

Carbon markets only exist because

- 1) **climate change is:**

# CONTEXT

- 1) **climate change is:**
  - **Mostly caused by people,**
  - **Mostly from fossil fuel combustion, and**
  - **Mostly a bad thing**

# CONTEXT

**Carbon markets only exist because the following are on board:**

- 97% of climate scientists;
- majority of insurers, military leaders, governments (especially China, India, US, EU, UK, and now Canada, even Australia again) and
- industry leaders, including even BP, Shell, Total, Suncor and Exxon and now Saudi Arabia

# CONTEXT

## Carbon markets only exist because

- 3) carbon markets are one of several **necessary** solutions to get to a low carbon economy / society - no one or two ways to get there
- There are already carbon markets: EU, China, CA, AB, BC, QC, ON

# CONTEXT

## **My conclusion:**

- Carbon markets are here
- Likely here to stay
- They will be important to some degree





# **EFFICIENT GHG VERIFICATION**

Reporting and verification are a backbone to Carbon Markets

# WHAT IS VERIFICATION?

- Like financial auditing
- It's is the provision of assurance
- Providing a comfort level
- Protecting the user of information from errors, omissions, misstatements
- Trust based - professional judgement

# BC - TOP 88 GHG EMITTERS

- Report my March 31 via ECACC SWIM reporting system
- Verify - by third party accredited verifier by May 31 - 2 months
- Annually since 2010
- Likely to continue

# TEN POTENTIAL CHALLENGES

- Complexity
- Limited Time
- Errors, omissions and misstatements in assertion
- Not providing supporting data
- Missing supporting data
- Process that lacks transparency - some databases
- Poor cross references to required WCI methodology and/or lack of justification (why? / why not?)
- Slow response time or hard to contact right people
- No one knows the whole process
- Delay to deadline

# POTENTIAL CHALLENGES

- **Complexity**
- Simplification?
- Use same verifier

# POTENTIAL CHALLENGES

- **Limited Time**
- Contracting, planning and site visits in January or February
- Provide all documentation by April 1 or earlier

# POTENTIAL CHALLENGES

- **Errors, omissions and misstatements in assertion**
- Need to check twice
- Increases waiting time - reduces verification time
- Reduces confidence

# POTENTIAL CHALLENGES

- **Not providing supporting data**
- Need to request and wait - reduces verification time
- Can lead to stress



# POTENTIAL CHALLENGES

- **Missing supporting data**
- Need to make assumptions
- Need to find alternatives
- Possibly need to do additional checks
- Sometimes can lead to qualified statement

**RECEIPTS EXAMPLE**

VOLUNTEER NEEDED

# POTENTIAL CHALLENGES

- **Process that lacks transparency - some databases**
- Hard to verification with confidence - reasonable assurance
- Lose confidence
- May need to recalculate

# POTENTIAL CHALLENGES

- **Poor cross references to required WCI methodology and/or lack of justification (why? / why not?)**
- Many sources, many choices of methods, many qualifications
- Clarify what method, why that method and why not others

# POTENTIAL CHALLENGES

- **Slow response time or hard to contact right people**
- Start - stop issue
- Longer the gaps, the more time to recall
- Can run out of time, create stress

# TEN POTENTIAL CHALLENGES

- **No one knows the whole process**
- Need to run around
- Reduces confidence

# POTENTIAL CHALLENGES

- **Delay to deadline**
- Creates stress
- Runs into deadline bottleneck
- Need to use more senior or junior staff, less efficient





# **GHG OPPORTUNITIES**

EMA of BC

# CONTEXT

- COP 21 Agreement
- Global Carbon Markets
- North America
- Canada
- BC and AB

# CONTEXT

- **COP 21 Agreement**
- Drafted and agreed by 195 countries and states
- 175 countries and states have already signed
- Covers nearly the 55% minimum to trigger

# CONTEXT

- **Global Carbon Markets**

- EU et al

- China, Mexico, others

# CONTEXT

- **North America**
- BC, AB, QC, CA,
- ON, MB
- Mexico, Canada?

# CONTEXT

- **Canada**
- BC, AB, QC
- ON, MB
- Federal program?

# CONTEXT

- **Alberta**

- AB has some of top 100 emitters buying from 100-200 offset projects and growing
- 2016 price \$20/tonne; 2017 price \$30/tonne 2018 price?
- Goal for 30% renewables - more offset projects

# CONTEXT

- **British Columbia**
- BC has only government and voluntary buyers
- Mostly forestry projects; Some energy efficiency and fuel switching
- Climate Leadership Plan under review - wait and see





**LNG**

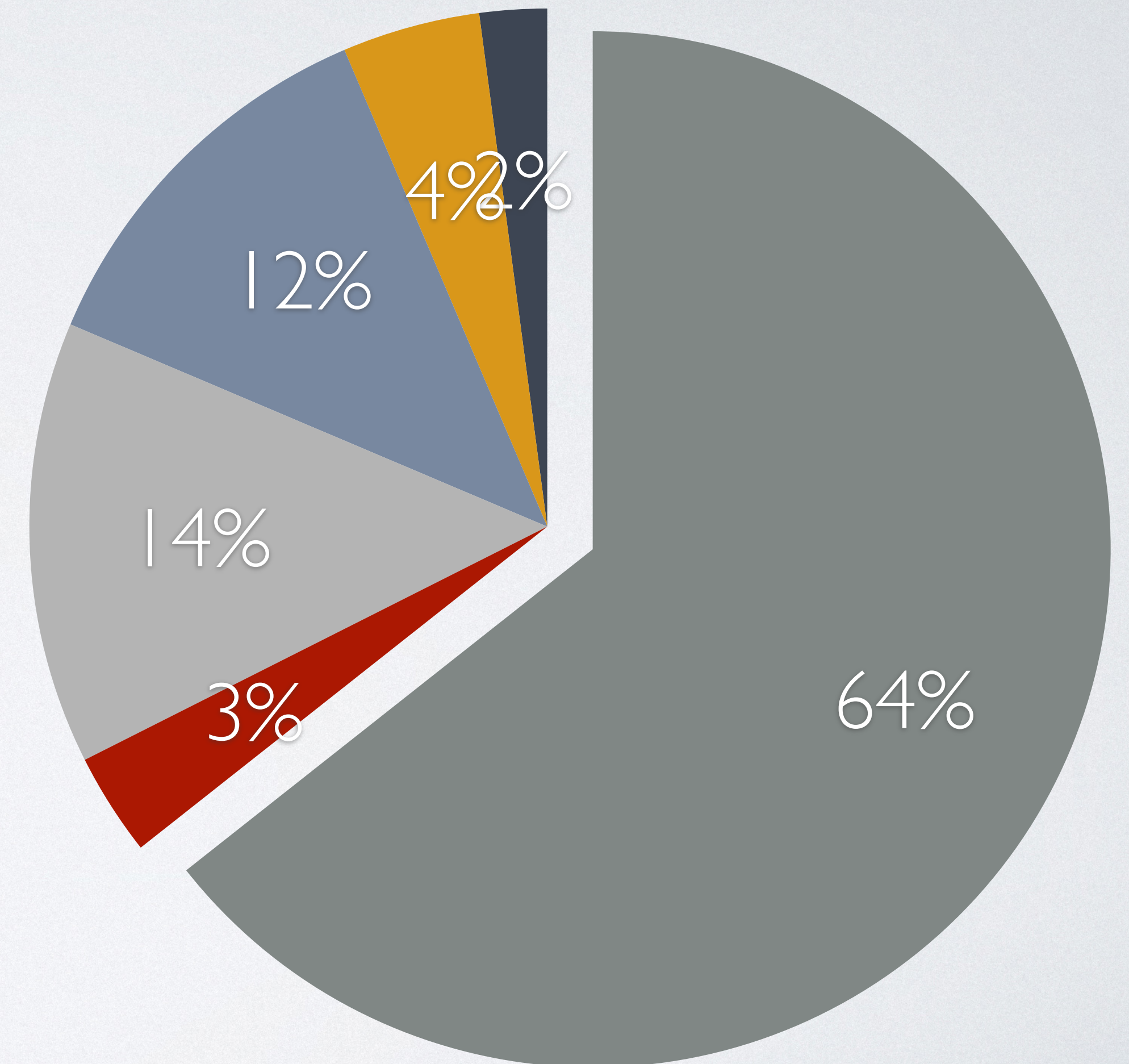
EMA of BC

# GHG EMISSIONS

- World
- Canada
- BC

# GLOBAL ANTHROPOGENIC EMISSION SOURCES

- 2/3 FROM FOSSIL FUELS
- AGRICULTURE 1/7
- FORESTRY AND LAND USE 1/8
- Source: ?

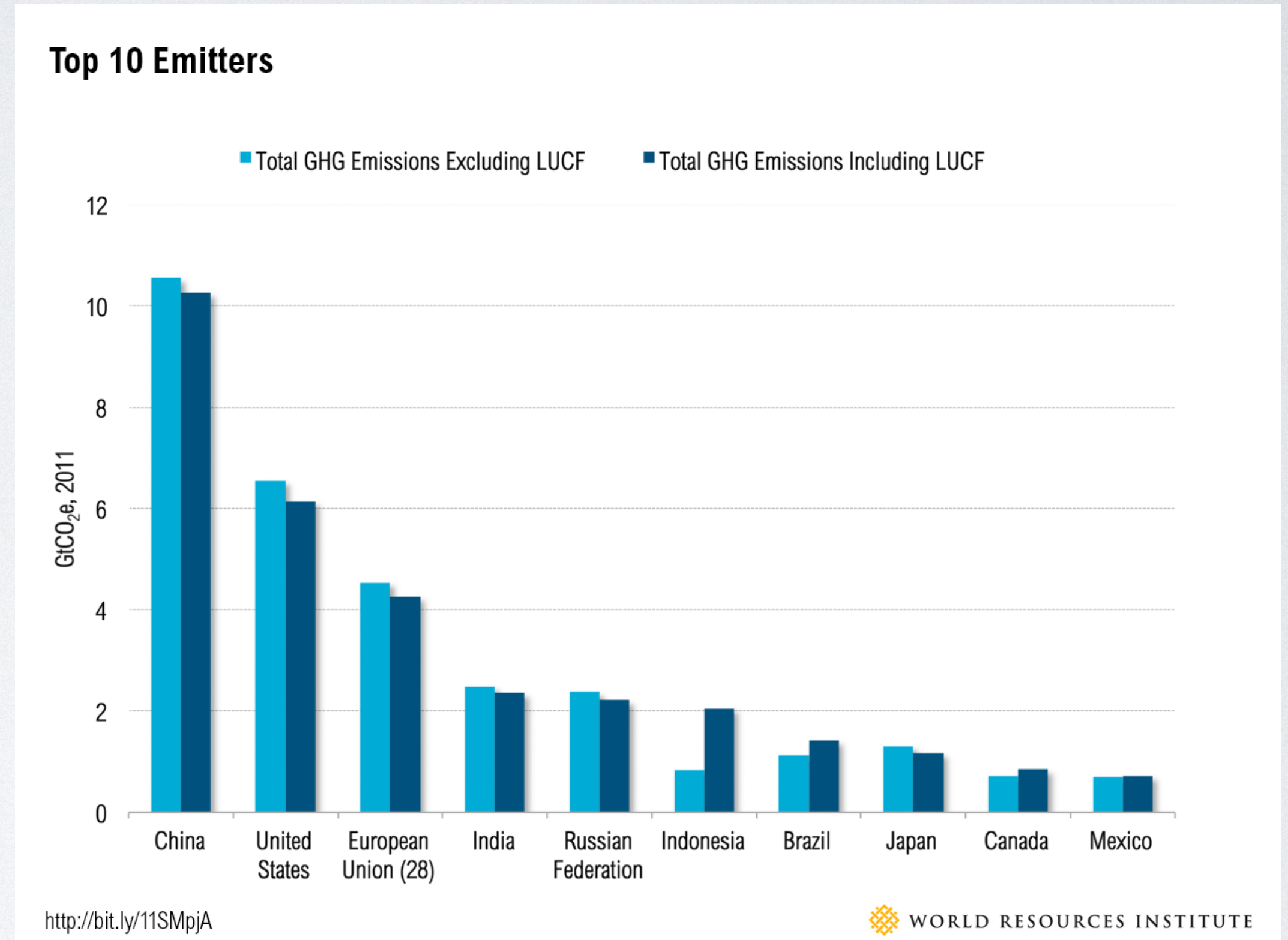


# TOP 10 EMITTERS

## CANADA IS #9

WITH OR WITHOUT LUCF

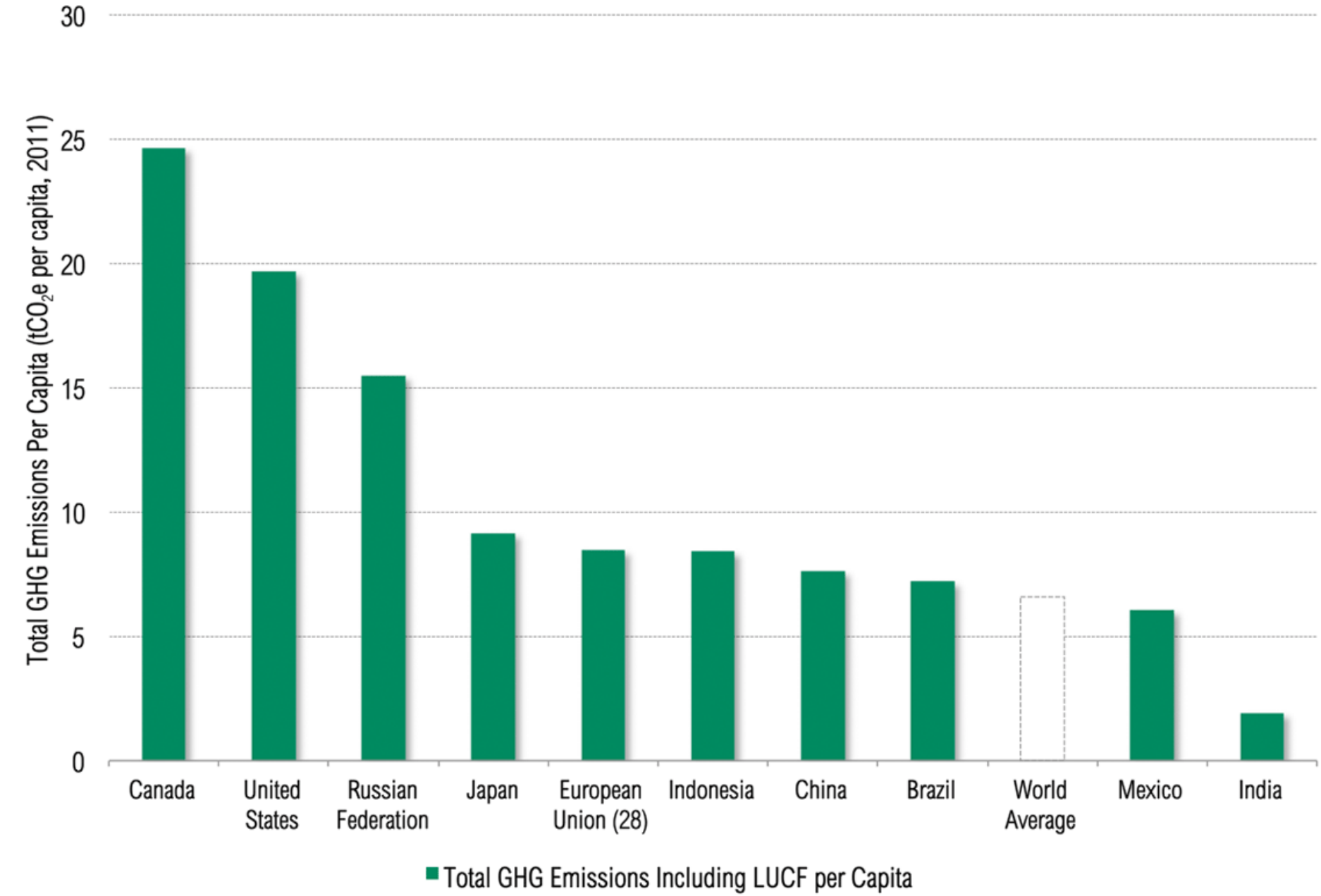
Source: WORLD RESOURCES INSTITUTE



# CANADA HIGHEST PER CAPITA EMISSIONS

4X WORLD AVERAGE  
10X INDIA

Per Capita Emissions for Top 10 Emitters



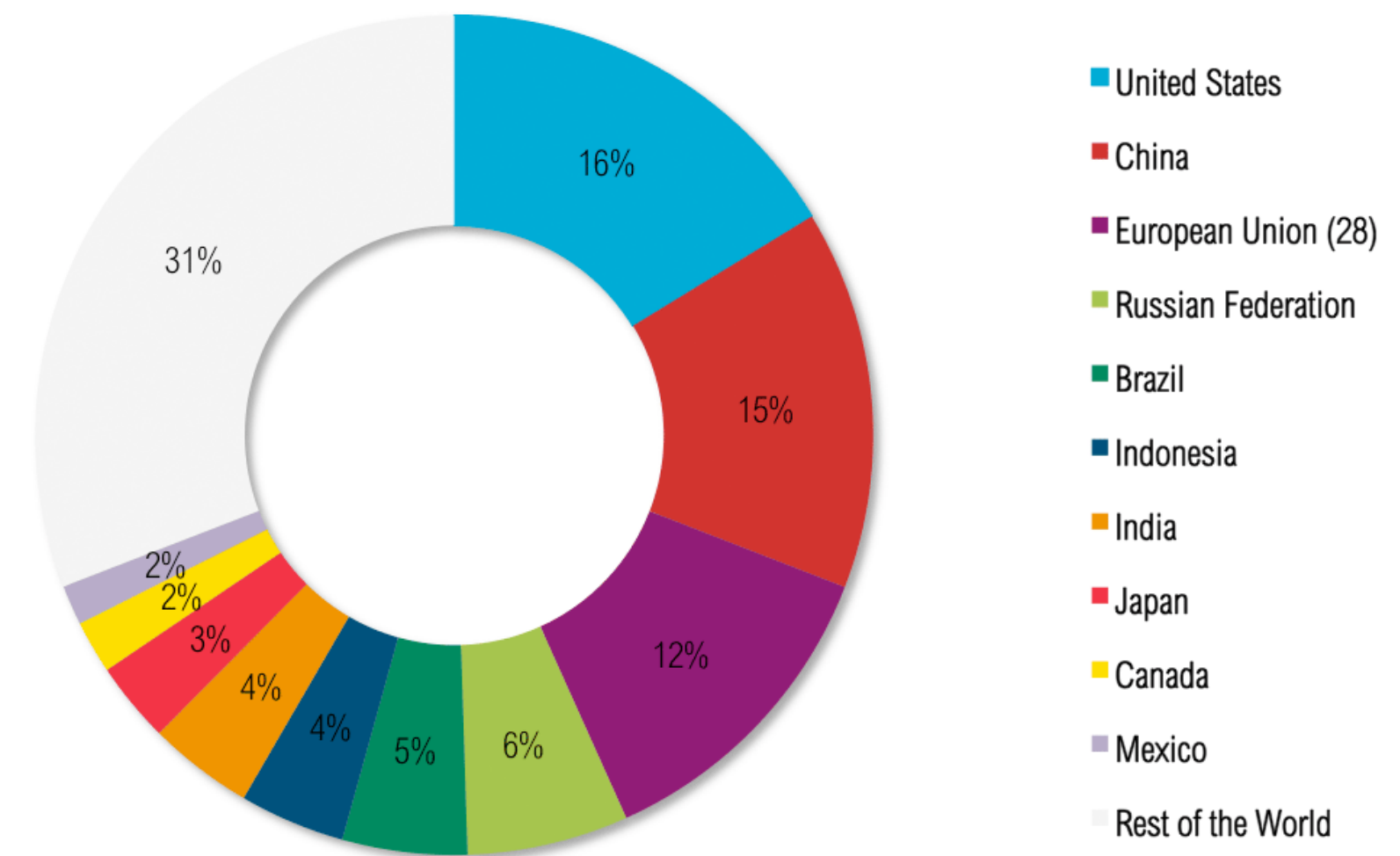
<http://bit.ly/11SMpjA>

Source: WORLD RESOURCES INSTITUTE

# CUMULATIVE CLEARLY NINTH

WORLD RESOURCES INSTITUTE

Cumulative GHG Emissions 1990–2011 (% of World Total)



<http://bit.ly/11SMpjA>

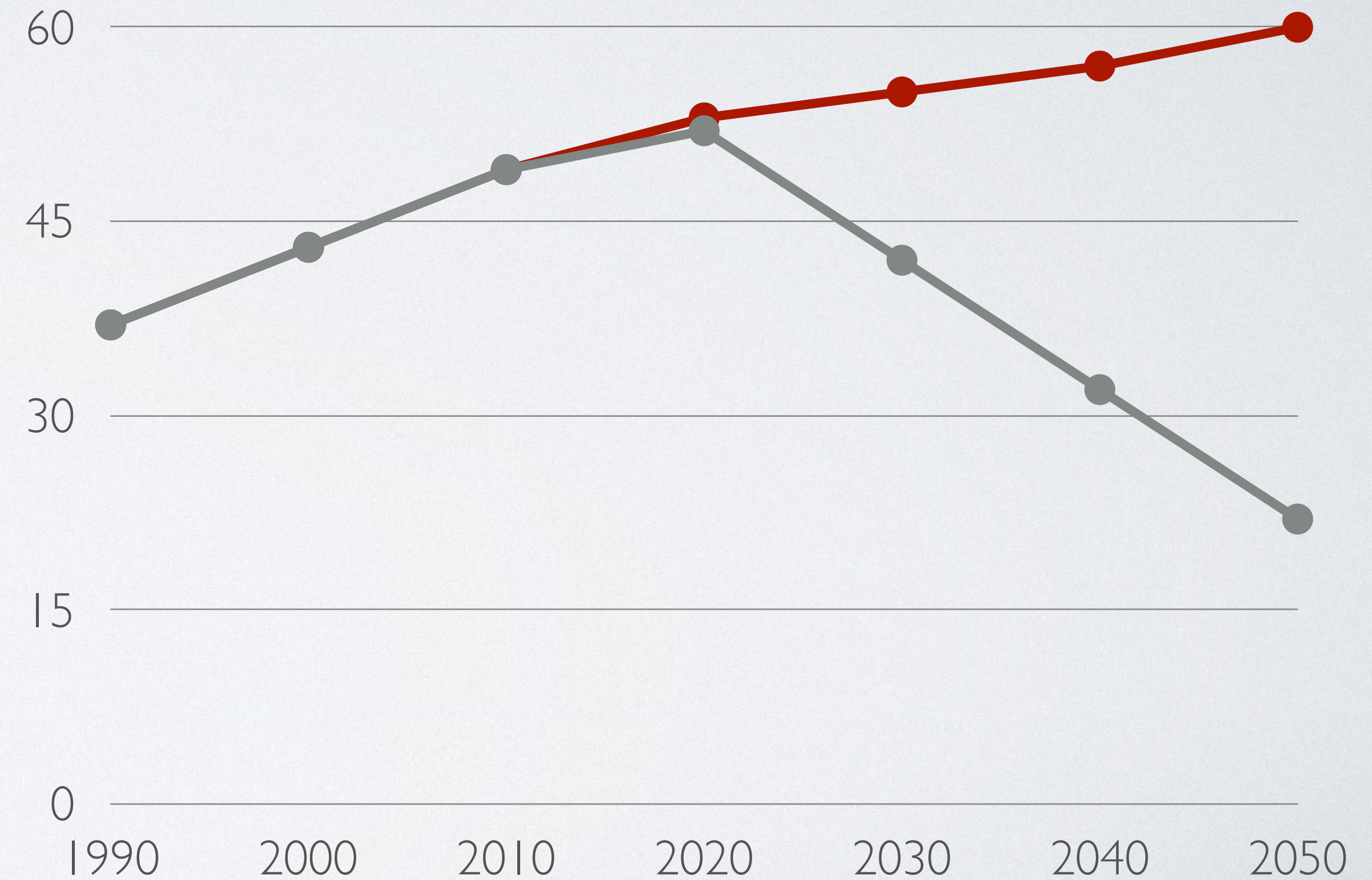
# REDUCTION TARGETS

- World
- Canada
- BC



# GLOBAL EMISSIONS TO ACHIEVE 2 C

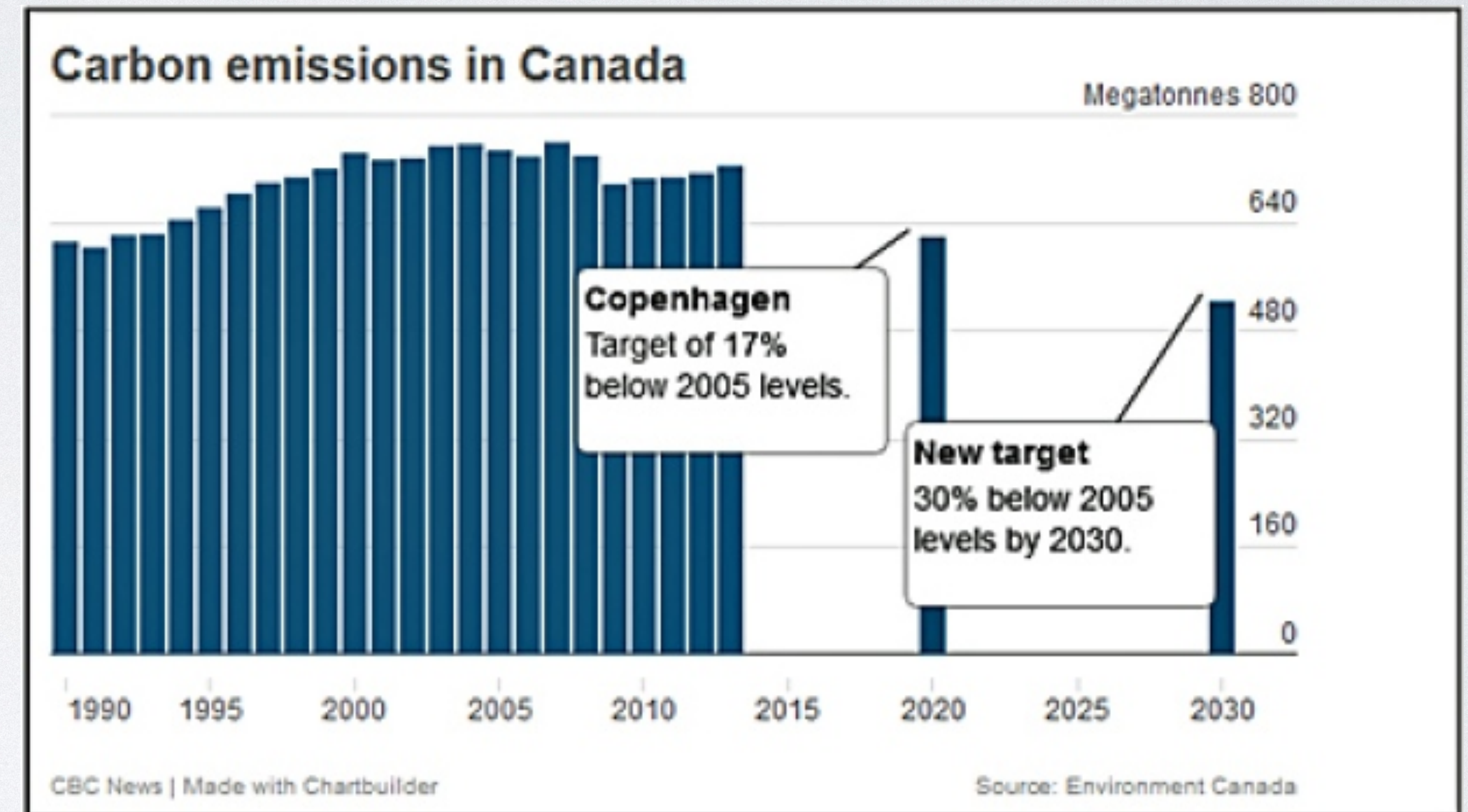
- 66% chance to achieve 2 C



- Source: MEI in the Media

# CANADA

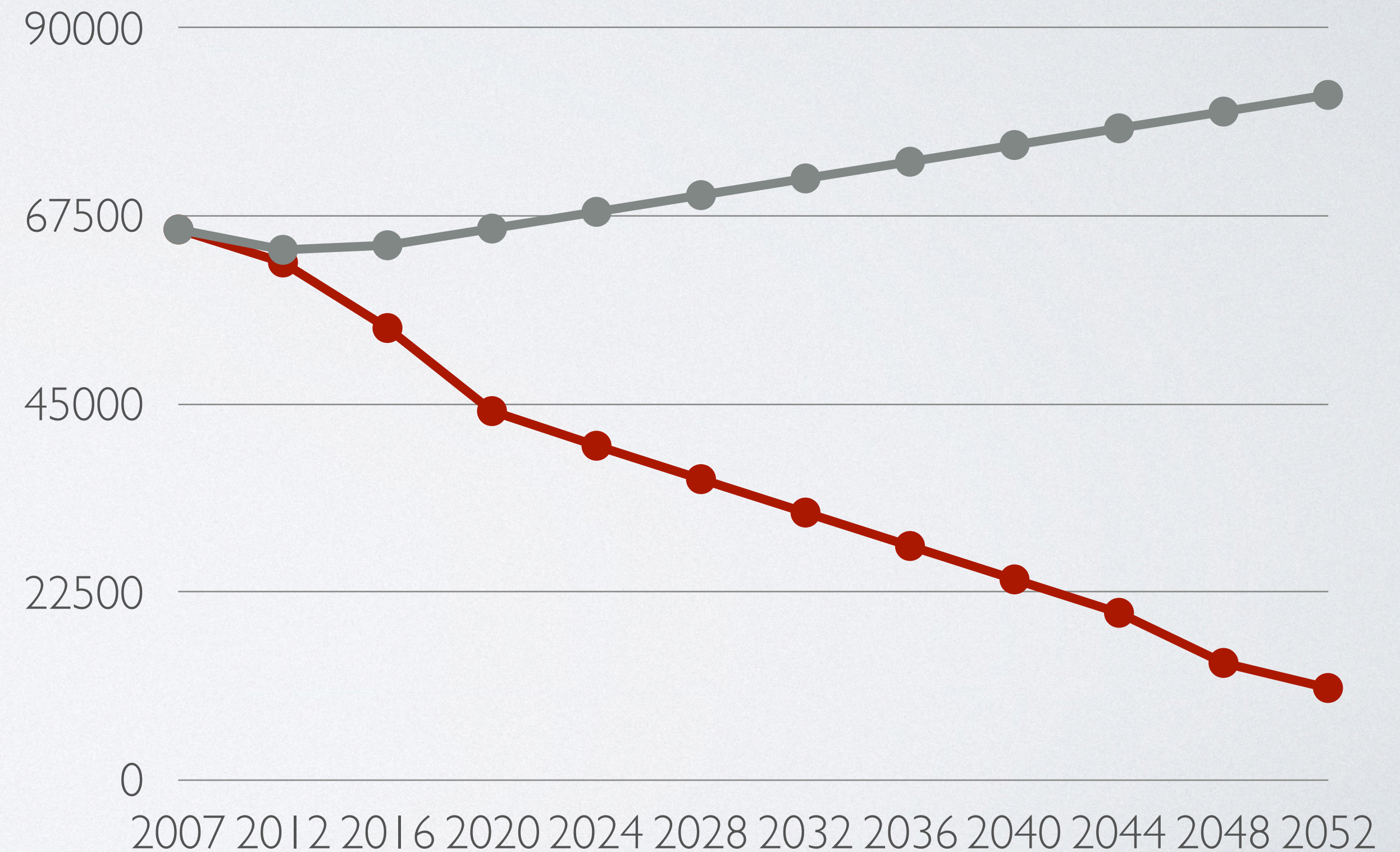
**17% BELOW 2005 BY 2020**  
**30% BELOW 2005 BY 2030**



Source: CBC Margo McDiarmid, environment reporter,  
CBC News Posted: May 15, 2015 11:04 AM ET

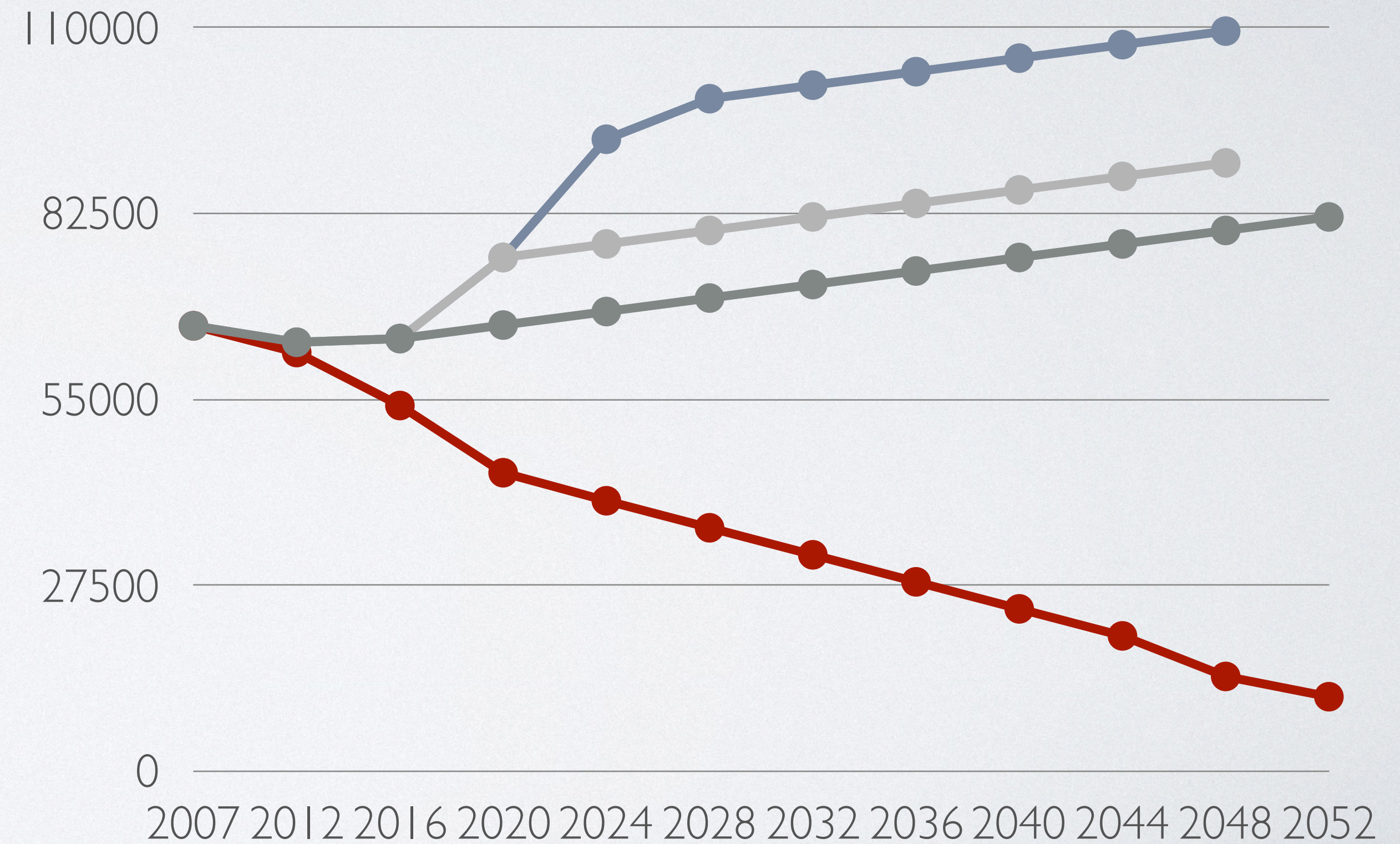
# BC REDUCTIONS

- 6% below 2007 by 2012
- 18% below 2007 by 2016
- **33% below 2007 by 2020**
- **(About 50% by 2030)**
- **80% below 2007 by 2050**



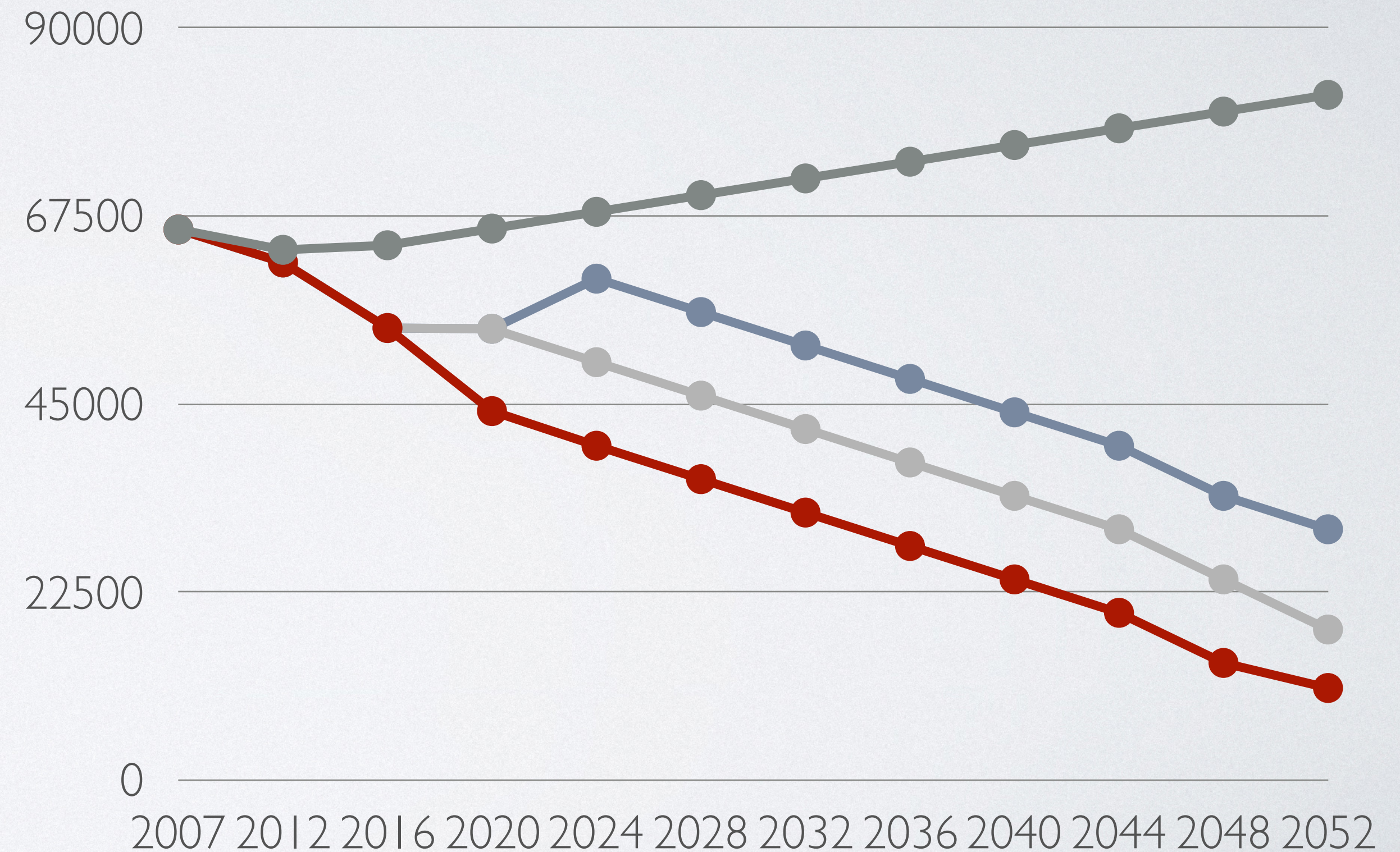
# BC REDUCTIONS [1]

- 6% below 2007 by 2012
- 18% below 2007 by 2016
- **33% below 2007 by 2020**
- **(About 50% by 2030)**
- **80% below 2007 by 2050**



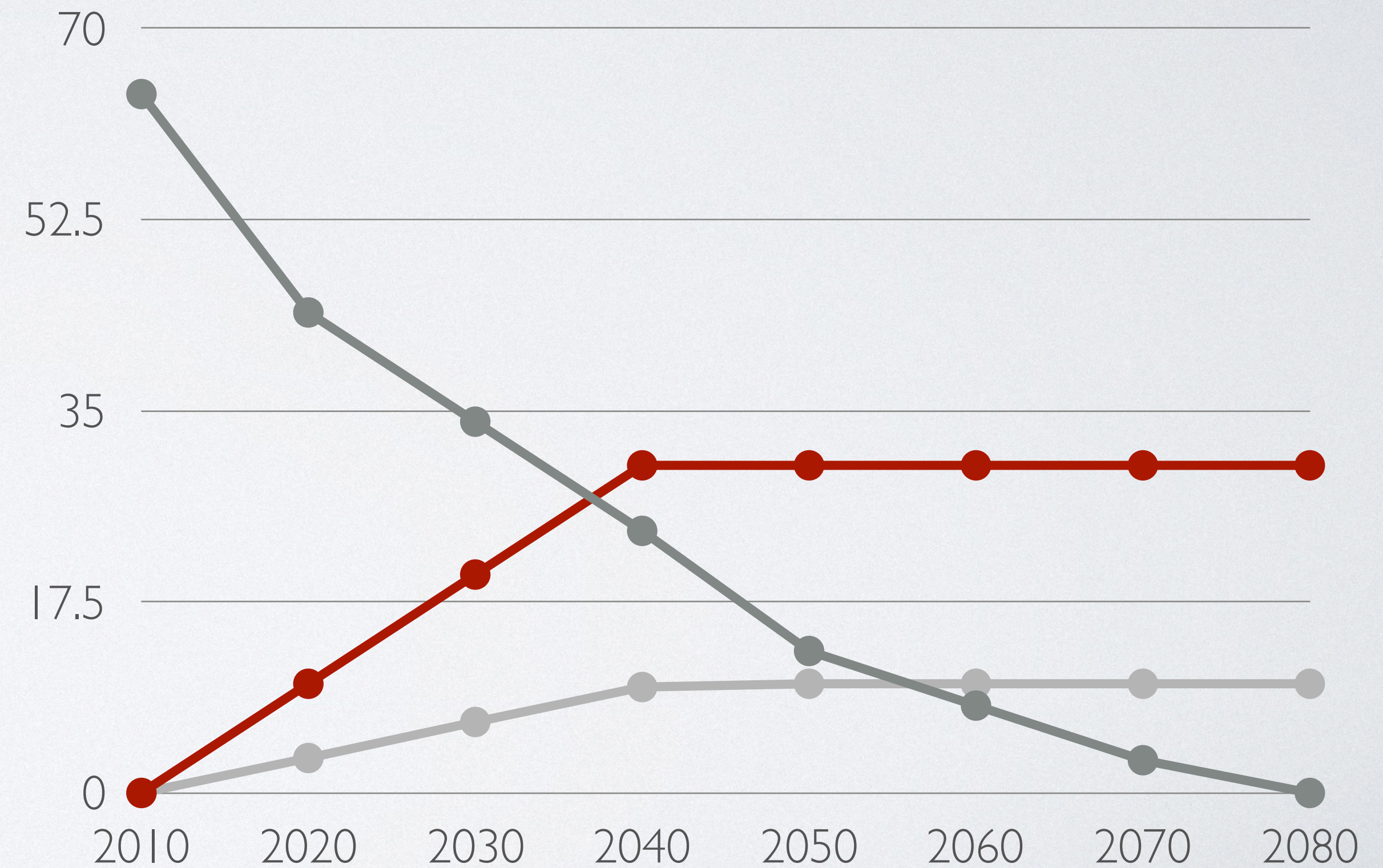
# BC REDUCTIONS [2]

- 6% below 2007 by 2012
- 18% below 2007 by 2016
- **33% below 2007 by 2020**
- **(About 50% by 2030)**
- **80% below 2007 by 2050**



# BC GHG TARGETS VS LNG

- Legislated reduction targets
- LNG plants
- Combined upstream and LNG

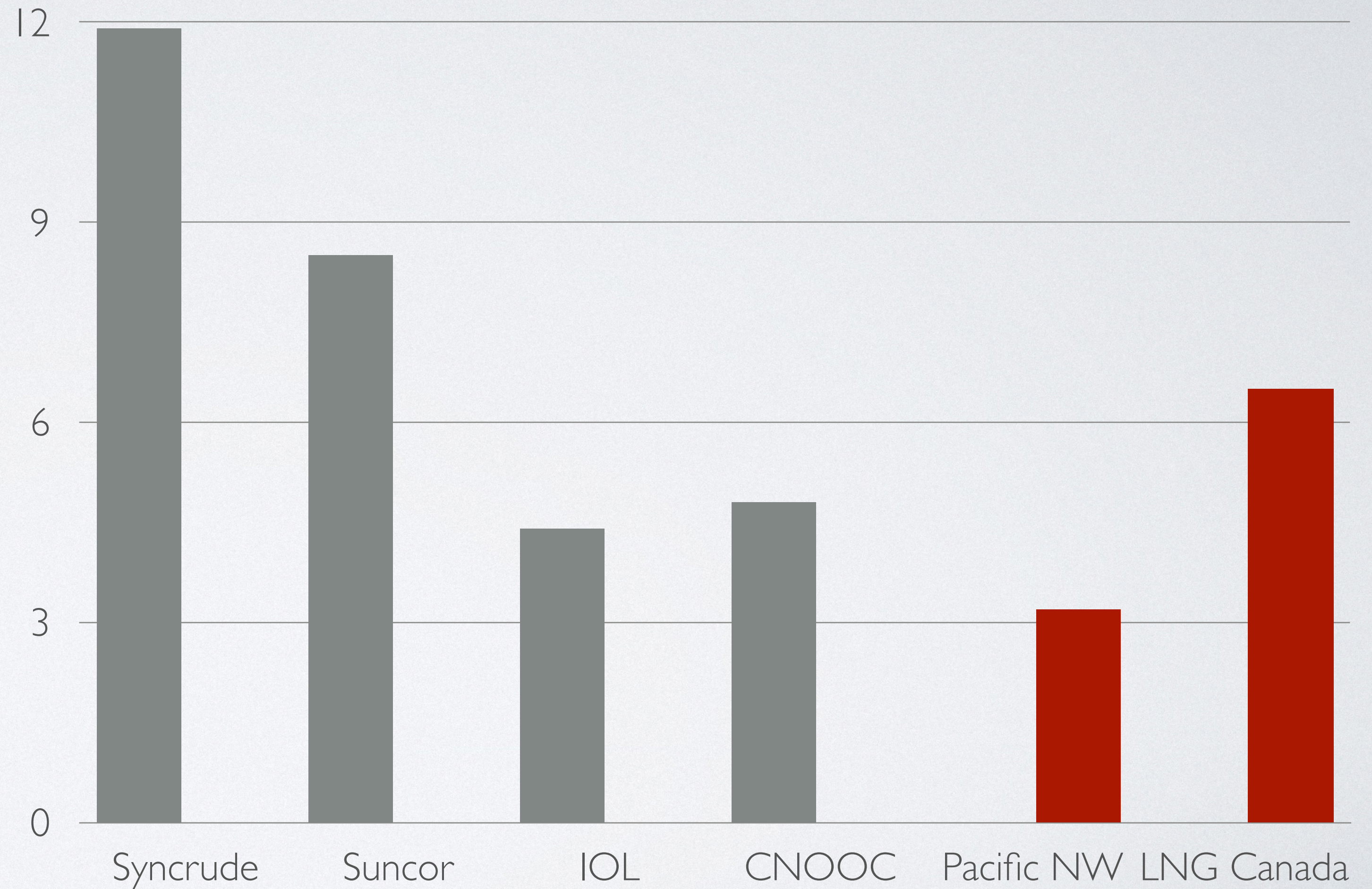


# LNG PLANTS

- 18-20 in the planning stages
- Several are small
- Several are world class
- Here is how they stack up

# LNG VS OIL SANDS

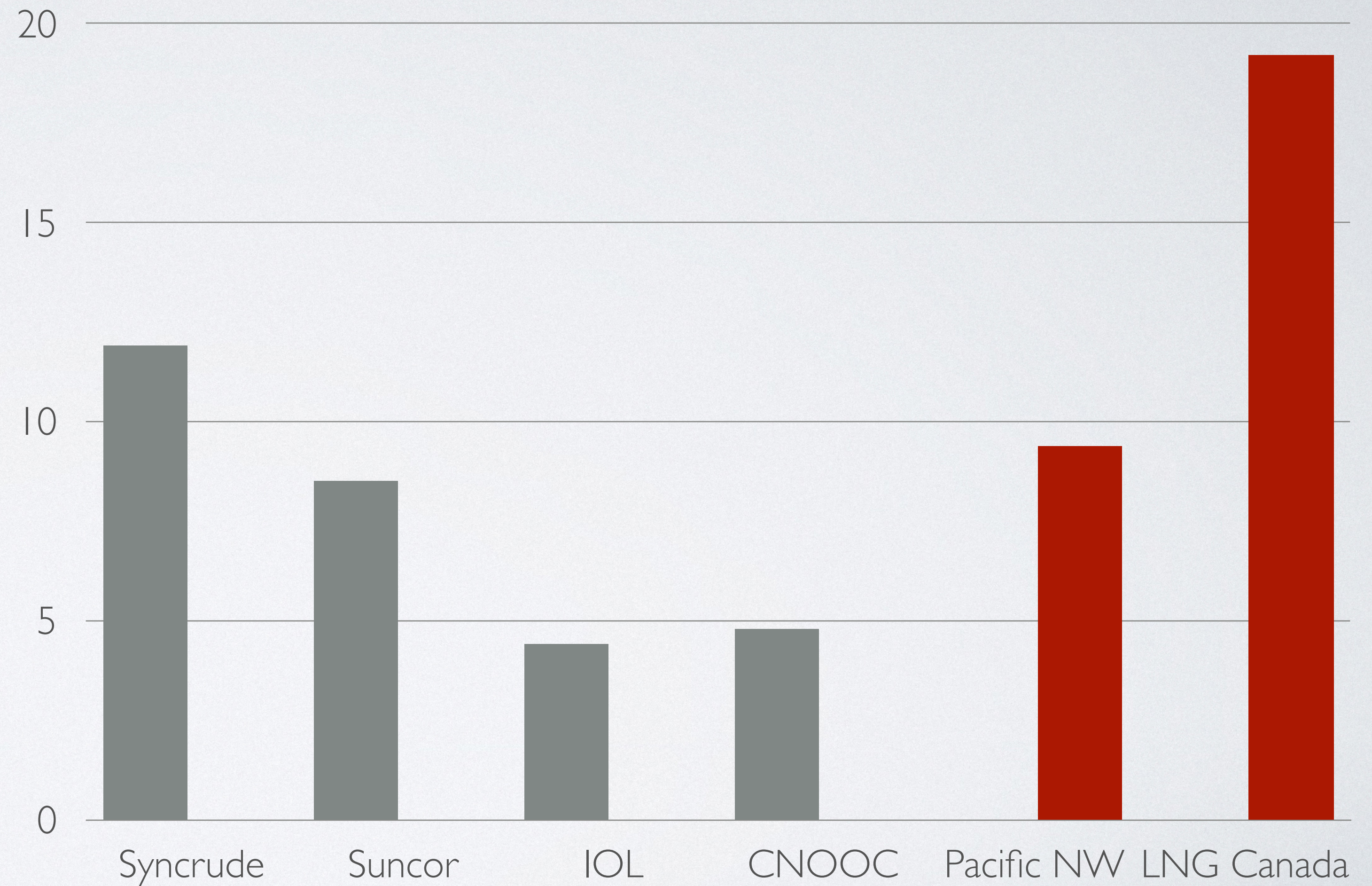
- GHG emissions from LNG plants only
- best performance
- Source: BC LNG





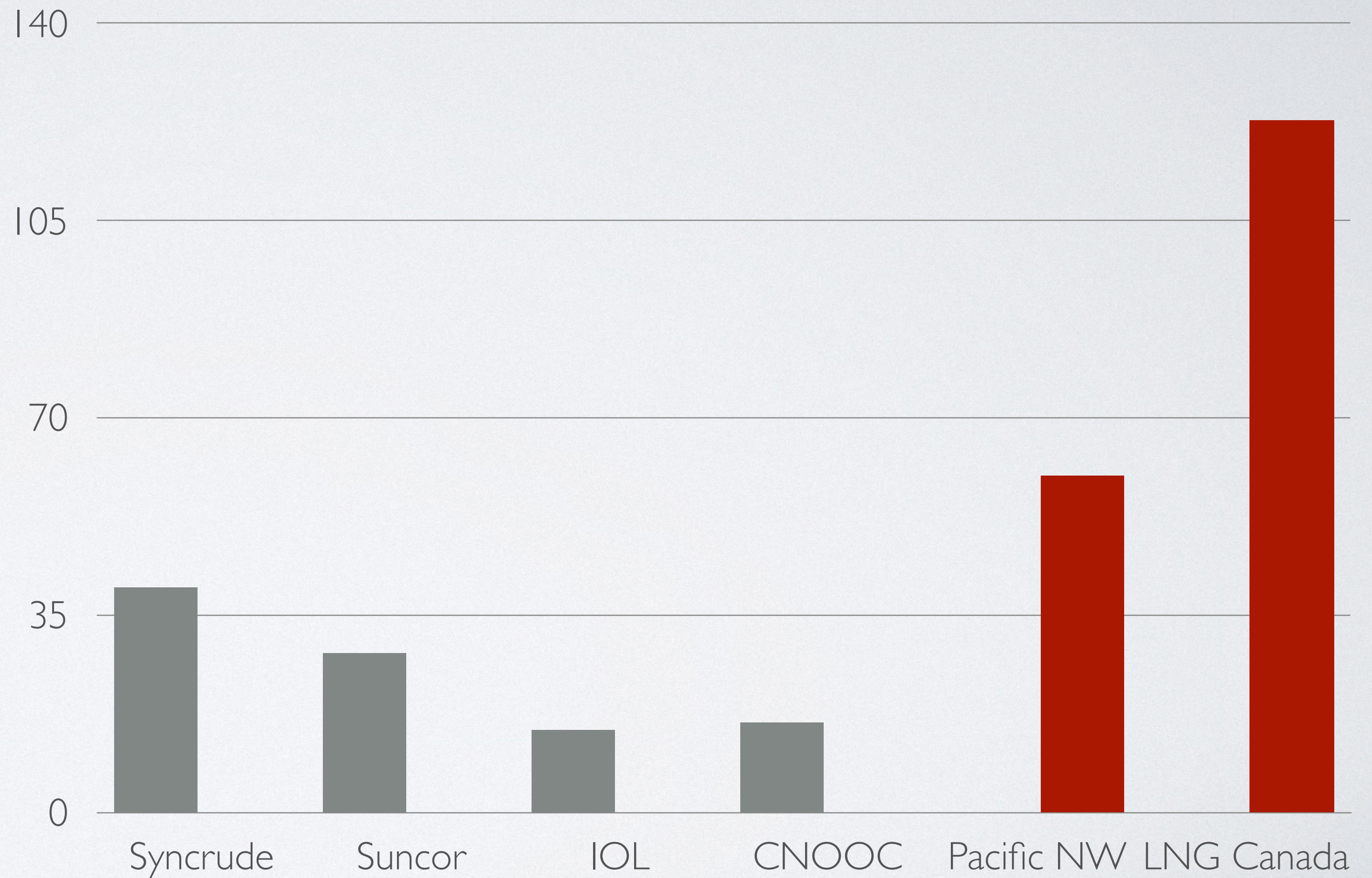
# LNG WITH UPSTREAM VS OIL SANDS

- LNG plants plus
- Upstream
- Best performance
- Source: BC LNG



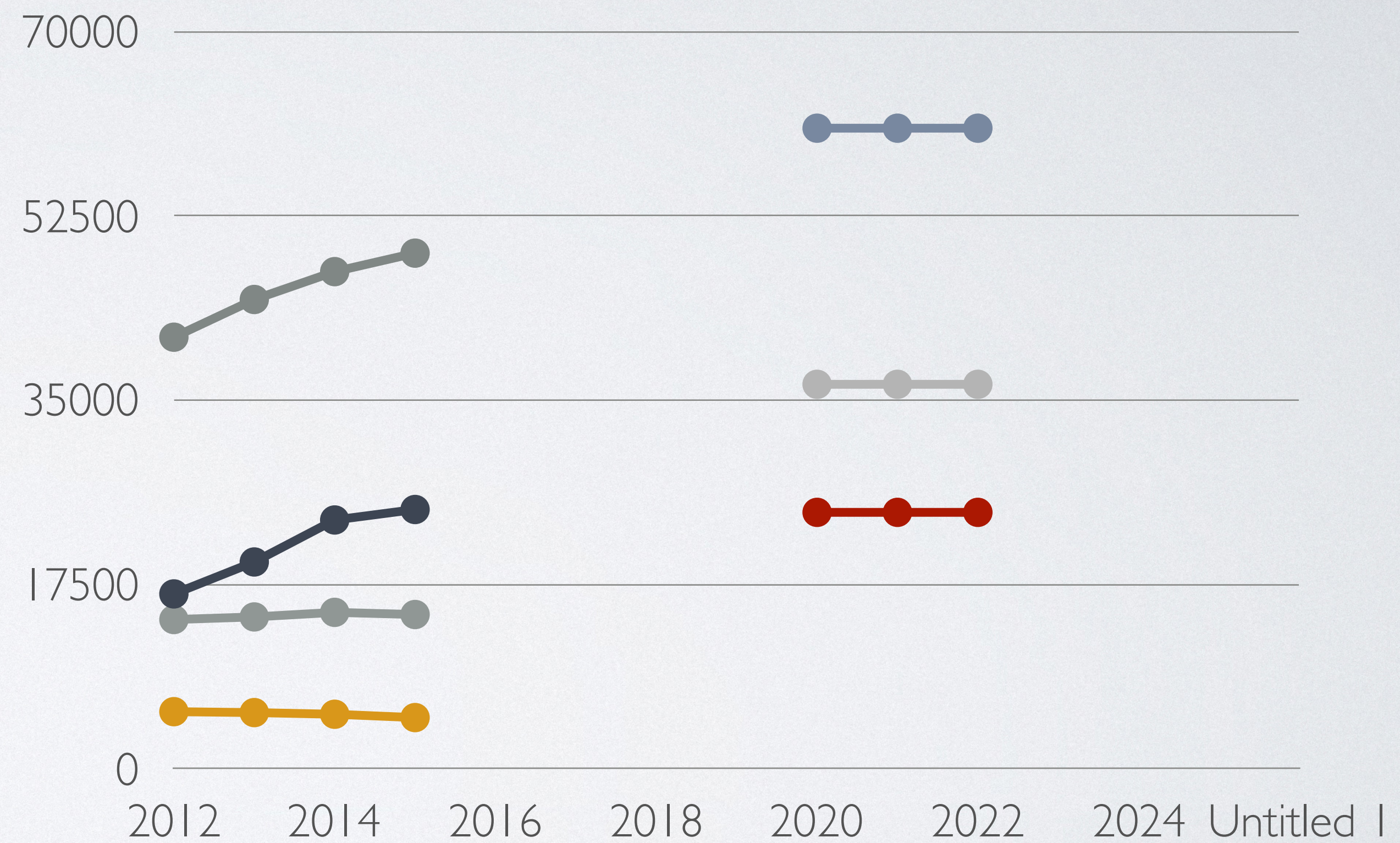
# LNG LIFECYCLE VS OIL SANDS

- LNG lifecycle
- Best performance
- Oil sands lifecycle
- Source: BC LNG



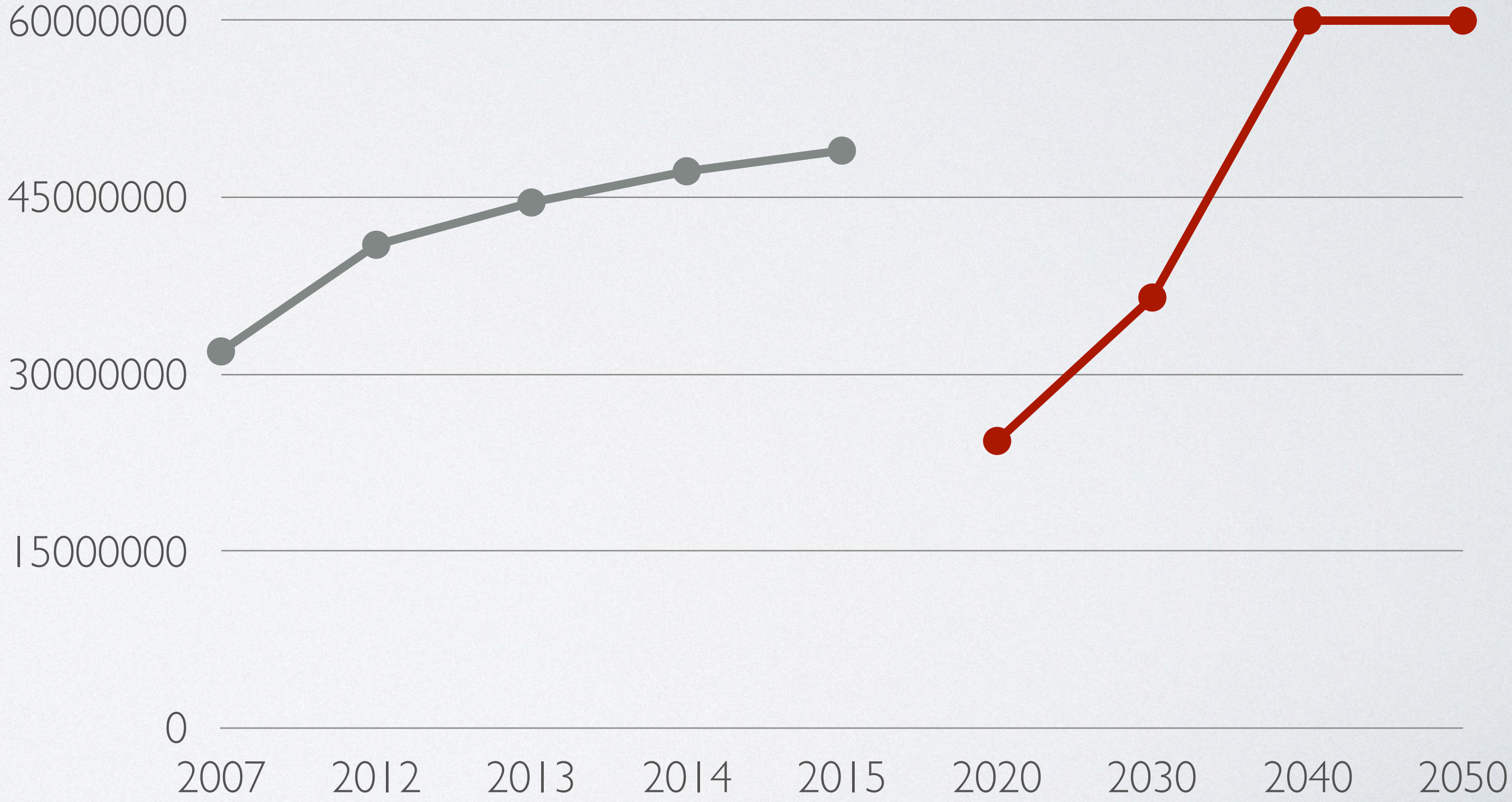
# BC ANNUAL PRODUCTION

- Total BC production
- Alberta demand
- US sales
- BC consumption
- Source: BC MOE



# BC WELLHEAD GAS PRODUCTION

- Annual production in e3m3
- Annual requirement
- Source: BC MOE



# UPSTREAM PRODUCTION

- Current BC wellhead production in 2015 was almost 50 million e3m3
- Pacific NW LNG @ 18 MTA requires 50% of 2015 annual production
- LNG Canada @ 13 MTA requires 25% of 2015 annual production
- LNG Canada @ 37 MTA requires 75% of 2015 annual production
- Together, all full production, they require 125% of 2015 production

# CONCLUSION

- What do you think?

# QUESTIONS

- Does it matter if Canada fails to meet its GHG reduction targets?
- Does it matter if BC fails to meet its GHG reduction targets?
- Are you in favor of BD gas drilling to support LNG sales?