

# Cook Inlet Gas Supply Study Update

Alaska House of Representatives  
Special Committee on Energy

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By: Petrotechnical Resources of Alaska

# 2009 Cook Inlet Study

- ▶ In 2009, ENSTAR, Chugach Electric and ML&P commissioned PRA to perform a study of Cook Inlet Supply from existing Fields
- ▶ Study allowed Cook Inlet Utilities to better understand their gas supply
  - Impact and drivers of drilling/development activity
  - Further understanding of DNR 2009 CI Gas Report
  - Help predict when gas would need to be imported into the Cook Inlet market
- ▶ In 2012, PRA updated the supply study

# Why Do Utilities Care About Cook Inlet Gas?

## ▶ ENSTAR

- Cook Inlet gas provides 100% of supply
- 2009 consumption: 32.5 Bcf

## ▶ Chugach

- Cook Inlet gas used for 90% of generation
- 2009 consumption: 26 Bcf

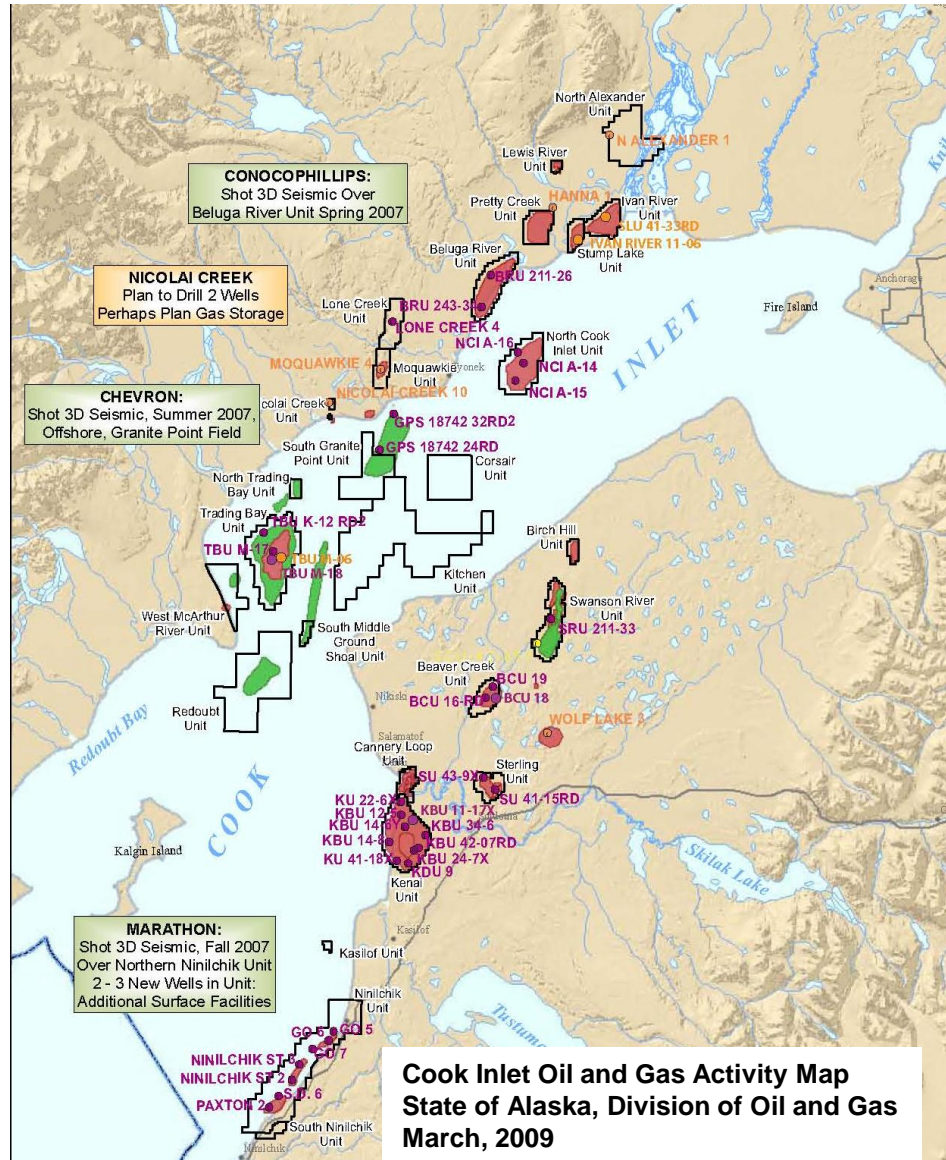
## ▶ ML&P

- Cook Inlet gas used for 88% of generation
- 2009 consumption: 10.8 Bcf

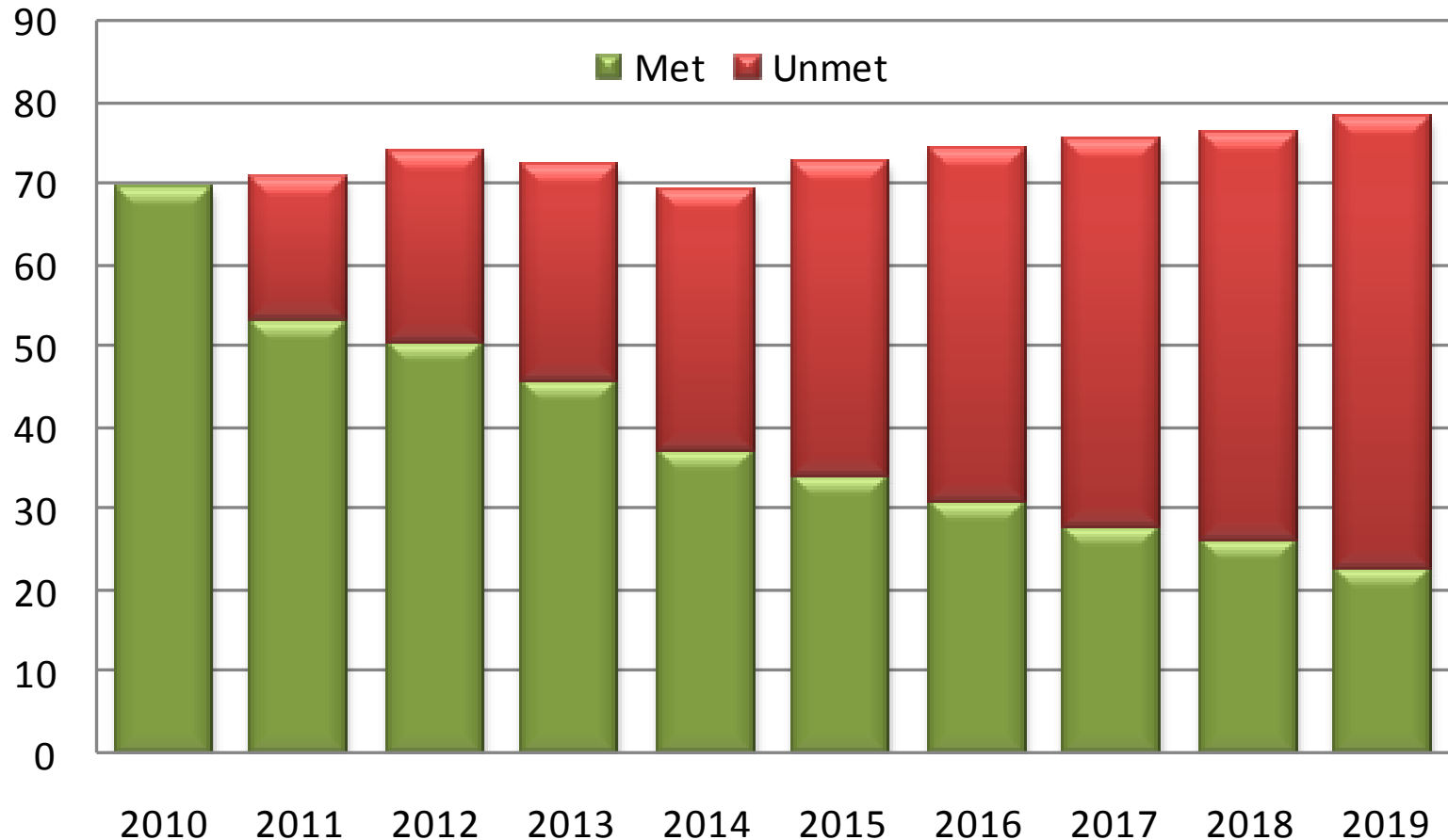
# Cook Inlet Fields

## 2011 Gas Production

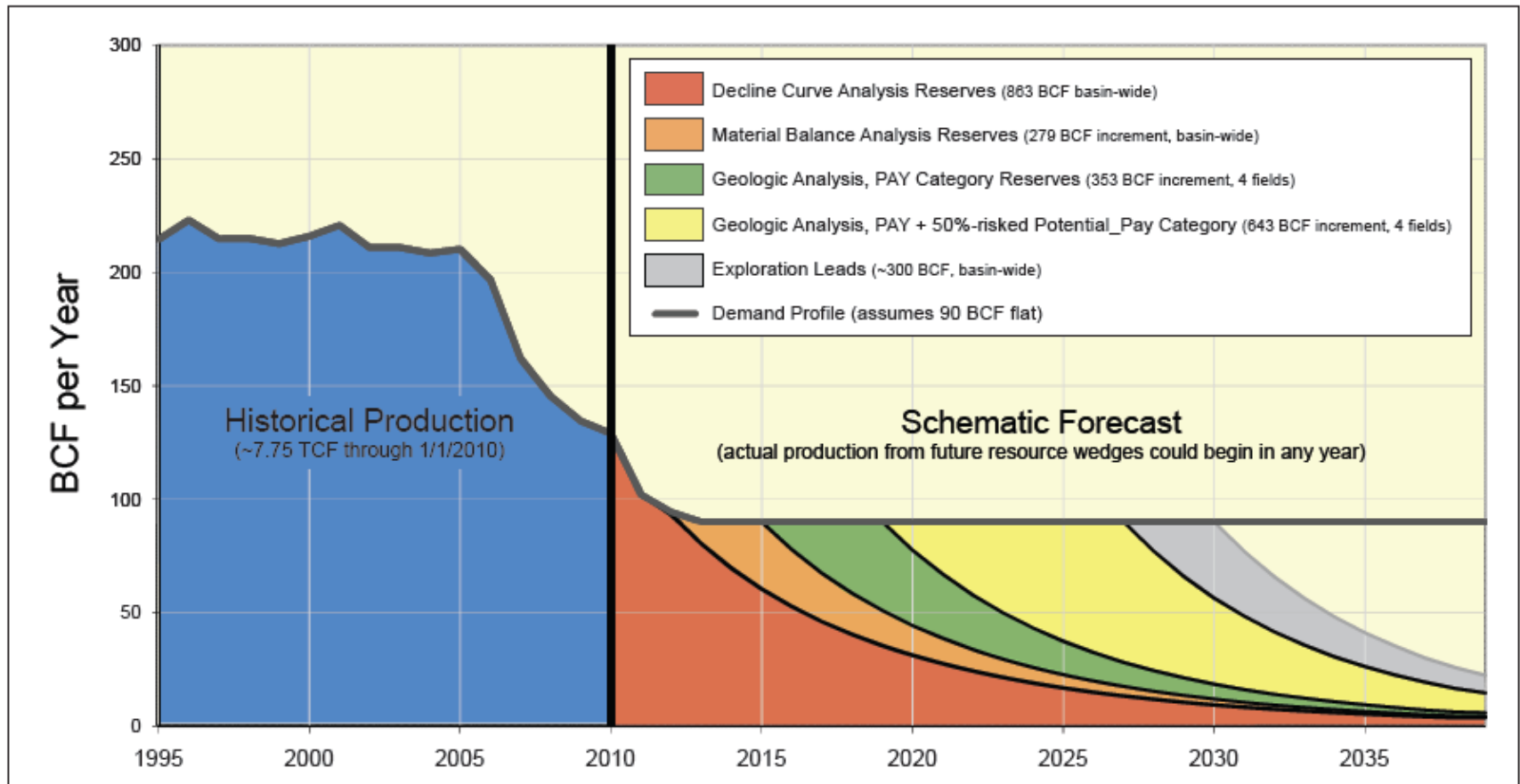
Beluga River Unit	27%
TBU	21%
No. CI	13%
Ninilchik	13%
Kenai Unit	11%
Others	15%



# 2009 Combined Utility Met and Unmet Gas Demand



# Annual Supply – DNR 2009 Report



Source: AK DNR December 2009 Study



# 2009 CI Gas Study for Cook Inlet Utilities by PRA

# Study Objectives

- ▶ Review DNR reserves analysis
- ▶ Review the deliverability of Cook Inlet gas wells drilled from 2001-2009
- ▶ Forecast deliverability of existing and future gas wells
- ▶ Analyze timing required for delivery of non-Cook Inlet gas sources



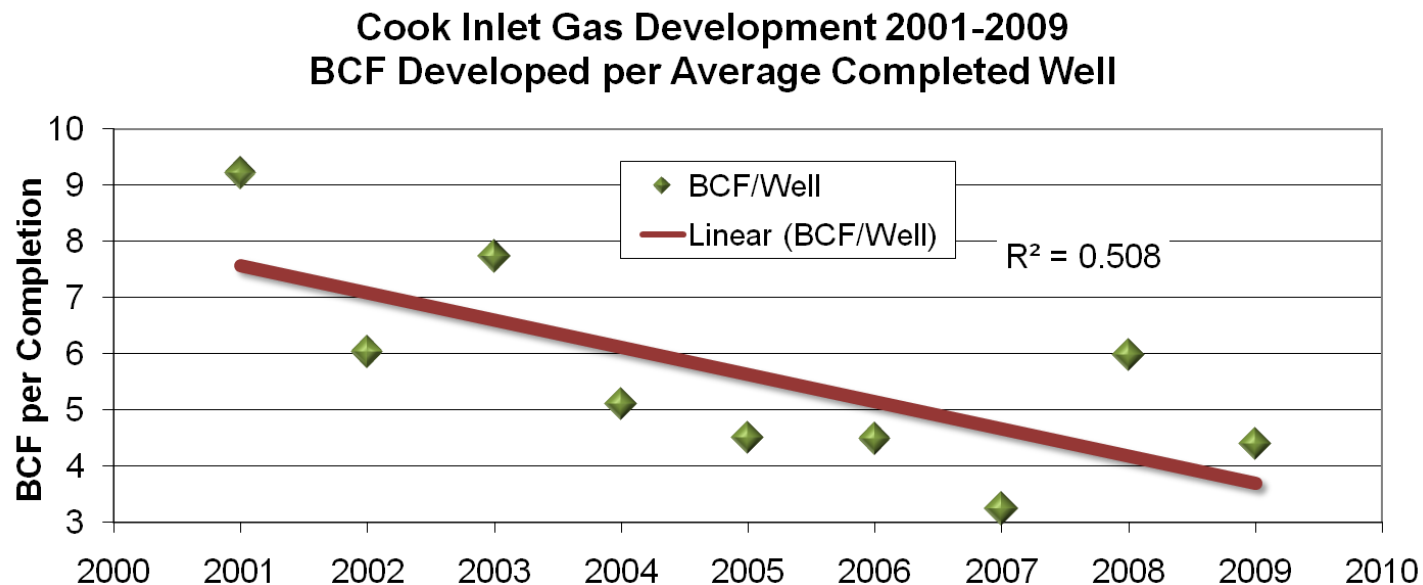
# Study Methodology

- ▶ Field-level decline curve analysis – most fields
- ▶ Individual well decline curve analysis – 5 largest fields: BRU, KU, NCI, NU, TBU
- ▶ New well IP decline through time
- ▶ Calculate activity required to meet future demand
- ▶ POD review
- ▶ Analysis of business drivers

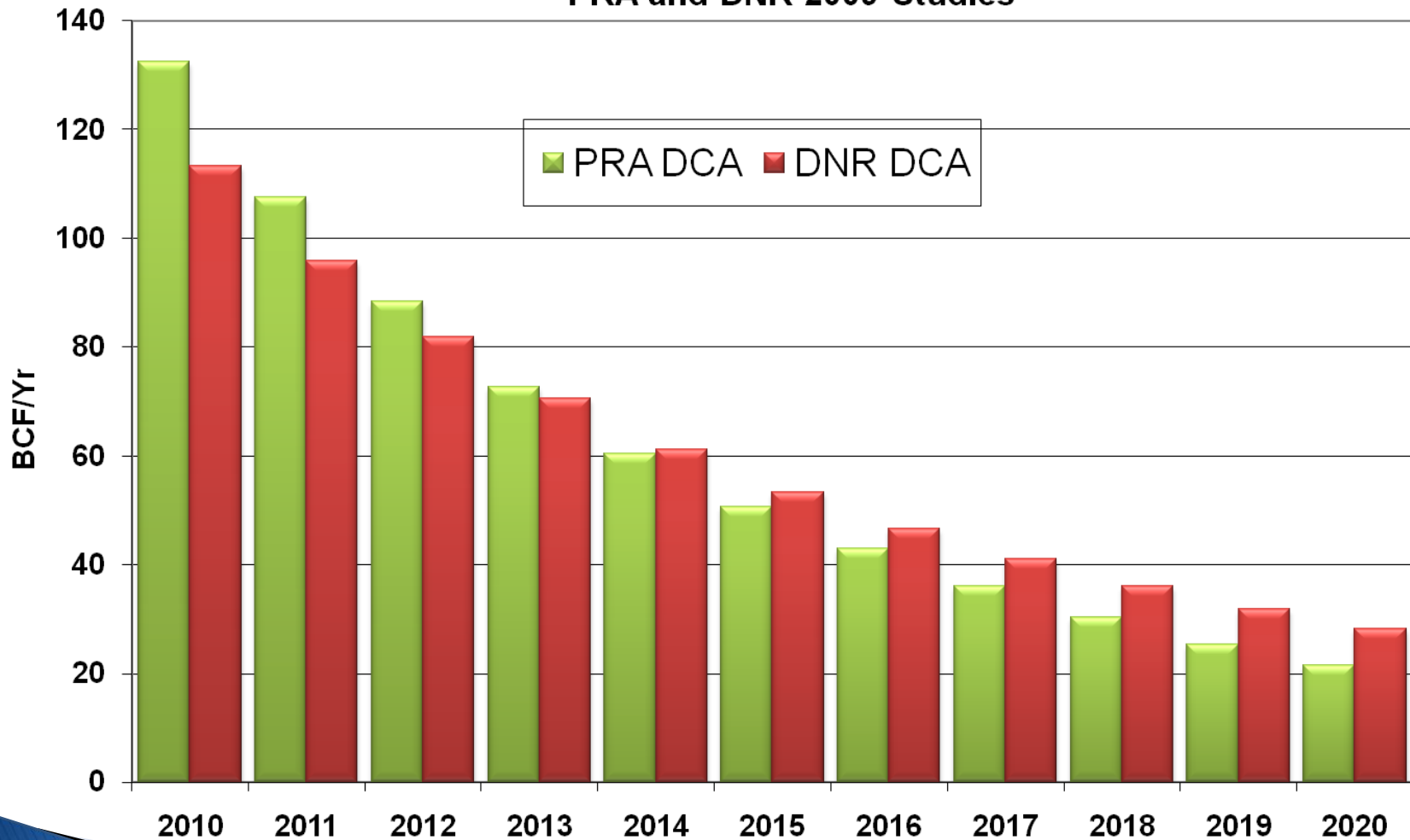
# Cook Inlet Drilling Results

Period	Gas Wells Drilled	Gas Wells Completed	Initial Production (MMCF/day)
2001–2009	128	105	3.6 per well
2007–2009	34	34	3.1 per well

# Cook Inlet Gas Development



**Cook Inlet Gas Production Forecast  
from Decline Curve Analysis  
PRA and DNR 2009 Studies**

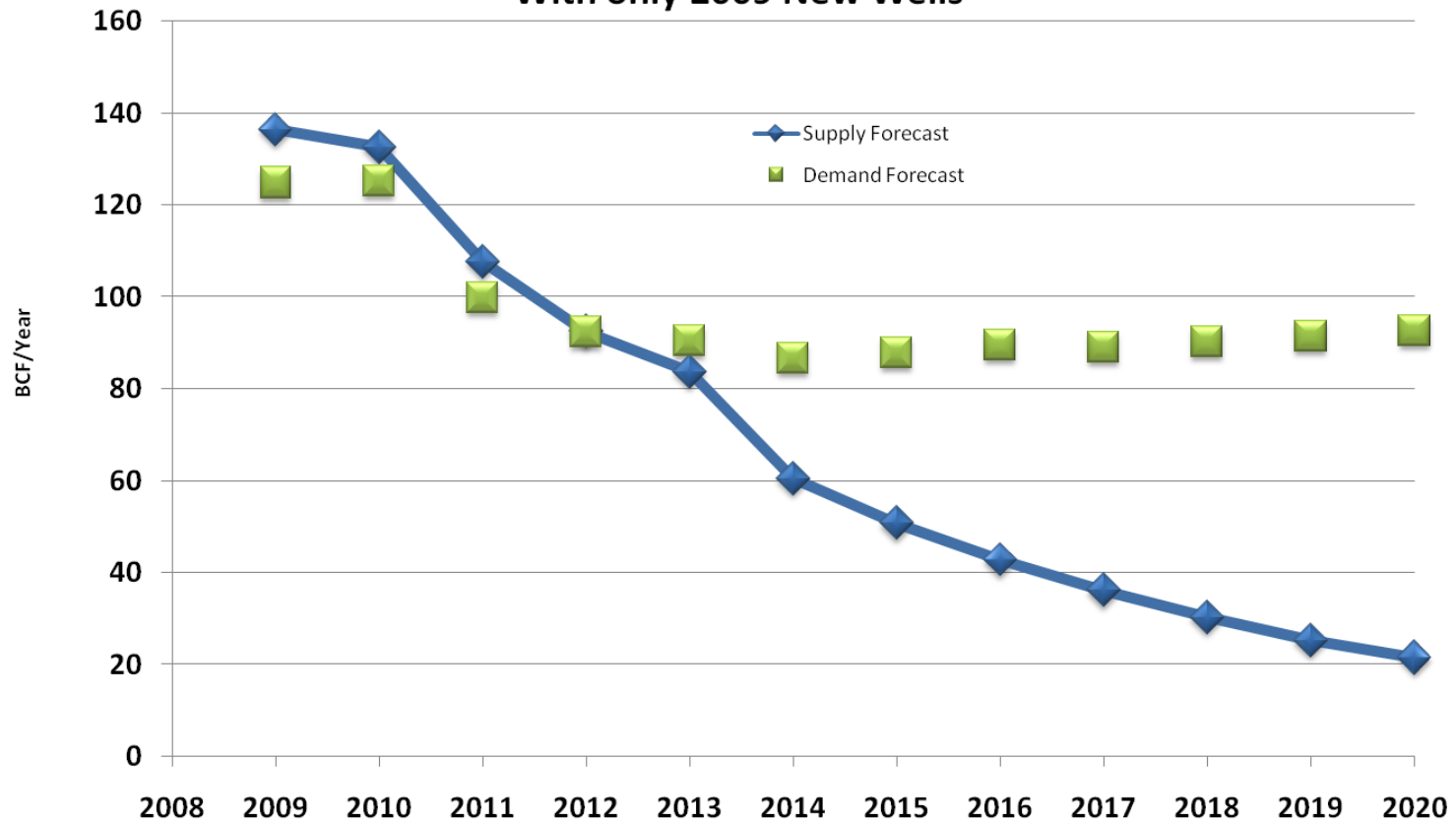


# The Problem – 2009

- ▶ Both PRA and DNR conclude from decline curves we have annual supply problems by 2013 if no new wells are drilled
- ▶ PRA study concludes that significant development activity is required

# Annual Supply and Demand

Cook Inlet Supply and Demand  
PRA Forecast December 2009  
With only 2009 New Wells

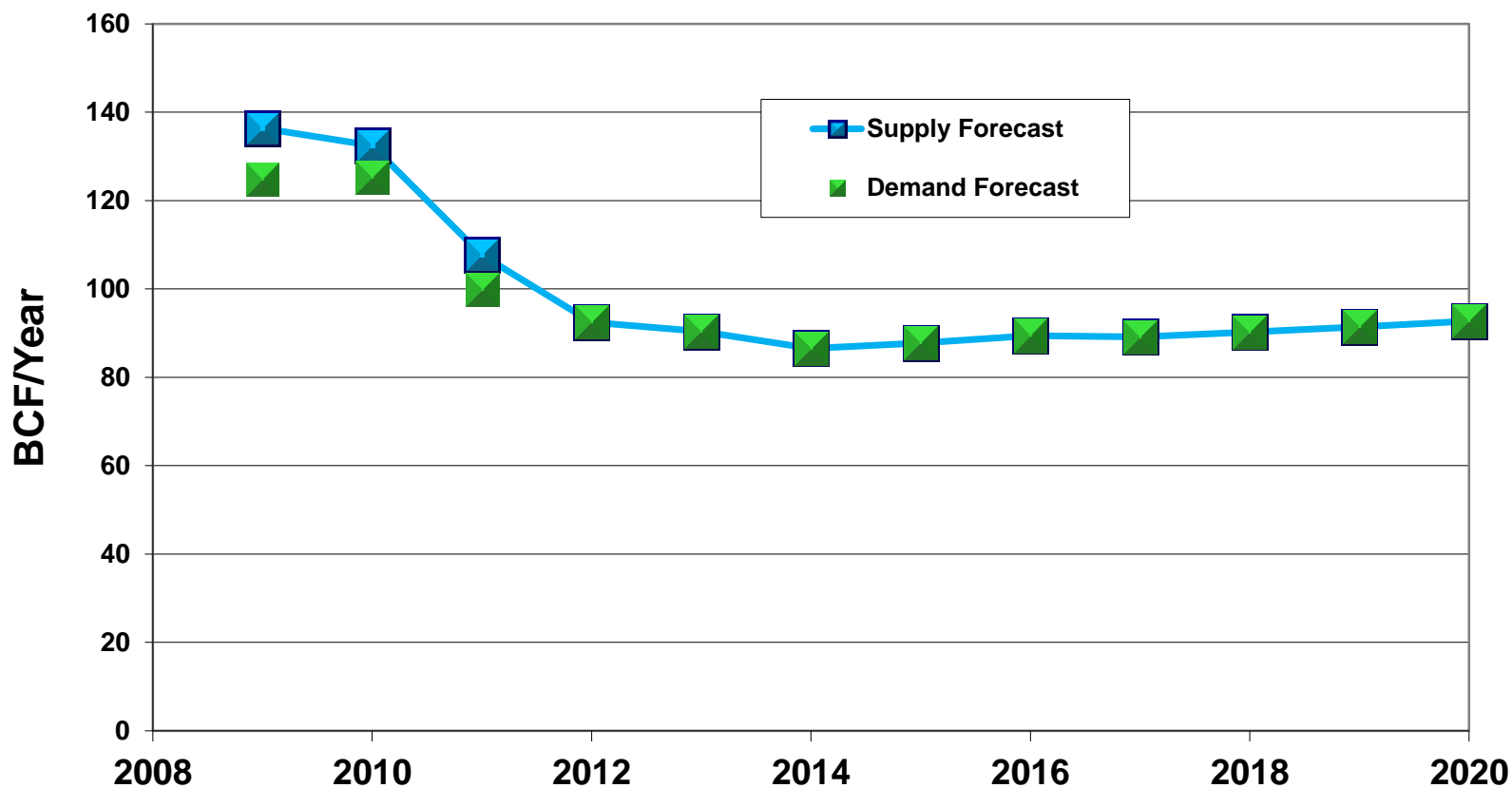


# Scenario in 2009 Study

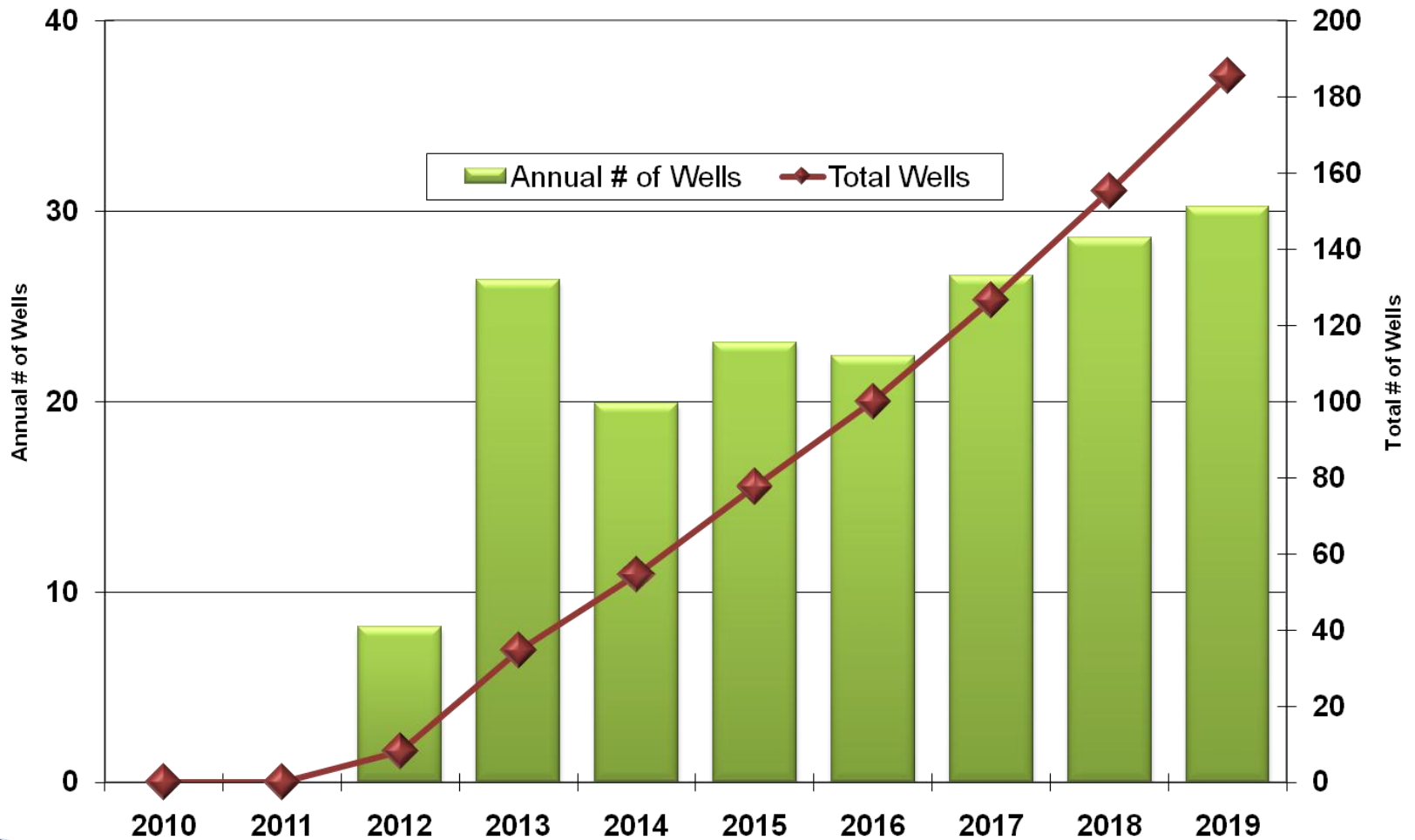
- ▶ If current trends in drilling success rates continue, an estimated 185 new wells must be drilled to meet utility needs between now and 2020



**Cook Inlet Supply and Demand  
PRA Forecast December 2009  
Includes 185 Wells Completed to Meet Demand to 2020**



## 185 Wells Completed 2012 to 2019 Meet Demand Through 2020



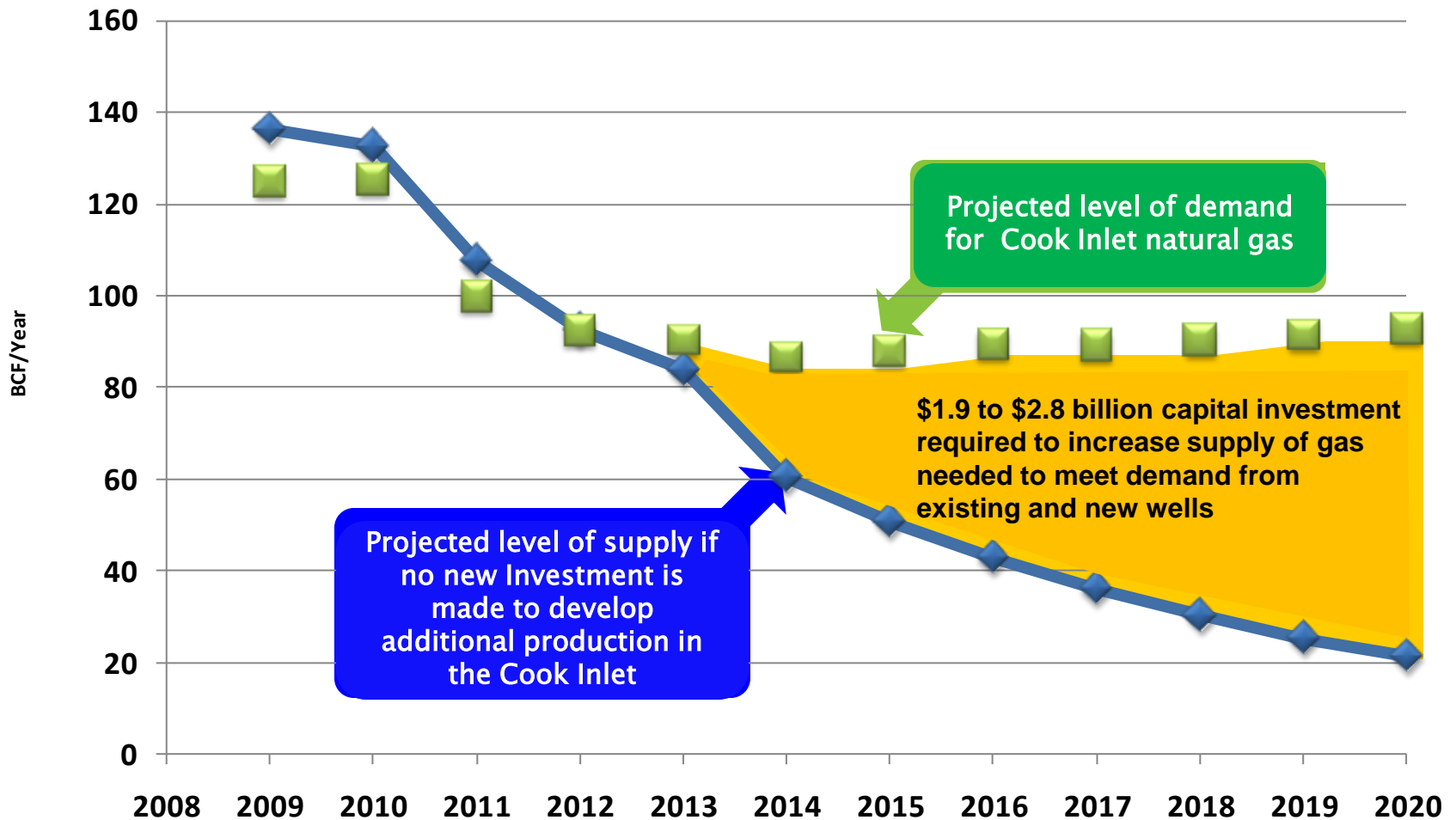
# Gas Development Cost

- ▶ The estimated cost of drilling & development in the past decade was \$1.0 – \$1.2 billion
- ▶ The estimated cost of drilling & development to meet demand in the coming decade is \$1.9 - \$2.8 billion
- ▶ Higher production costs will lead to higher prices for energy

# 2009 Study Findings

- ▶ Near-term drilling **must** be successful or gas resources from outside the Cook Inlet could be required as early as 2013
- ▶ If near-term drilling does not keep pace with demand, **the only viable option is LNG imports;** that option requires immediate action
- ▶ LNG imports could be necessary for several years until an in-state gas line is available

# 2009 Summary



# DNR 2011 CI Gas Cost Study

- ▶ CI Basin, with investment, is capable of meeting needs until 2018-2020 at prices below available alternatives
- ▶ Failure to make investments in lockstep with demand will result in need of alternative sources sooner.

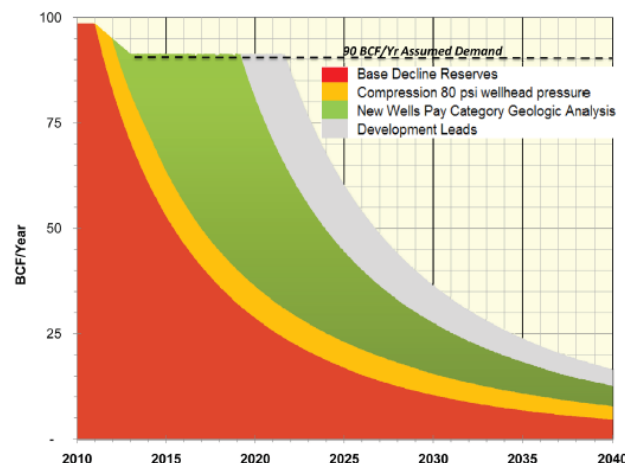


Figure 7. Hypothetical production forecasts resulting from this study for the Cook Inlet basin assuming a constant 90 BCF/Year demand after 2011. Production from future resource wedges could begin in any year. The projected “pay” volumes (green wedge) for this study are greater than that of the 2009 study (Figure 2) due to an error resulting in the understatement of McArthur River Grayling Gas Sands new well pay reserves potential. This error is corrected in this Figure.

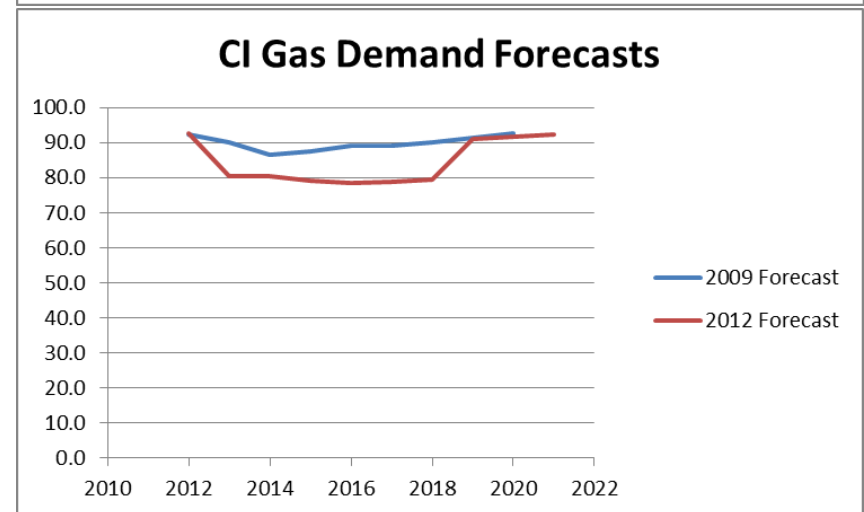
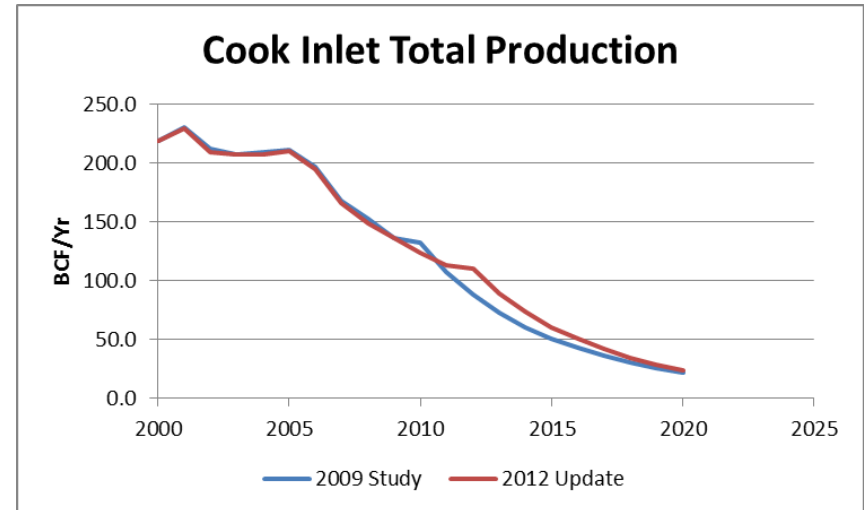
# 2012 Update

- ▶ PRA was asked by CI Utilities to Update the 2009 Study to make a current estimate of supply from existing Cook Inlet Fields for comparison to the current CI Demand Forecast.
- ▶ Due to drilling and compression additions since 2009, the predicted shortfall from existing fields has changed from 2013 to 2014.



# Forecast Changes since 2009 Study

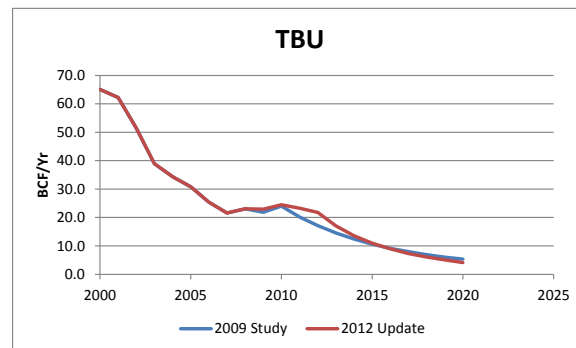
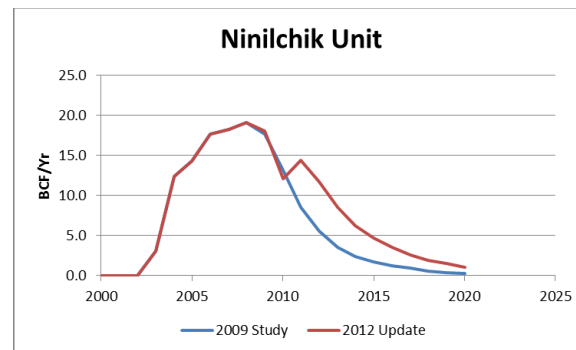
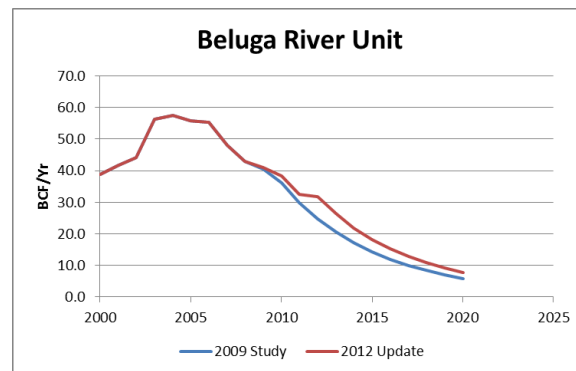
- ▶ Supply Forecast is slightly higher than 2009
  - New wells and field compression added
- ▶ Generally, Demand Forecast is slightly lower than 2009 except
  - LNG Export 2012
  - Donlin Creek in 2019



# Changes in Supply Forecast

Material increases were in performance in wells mainly in the Beluga River, Trading Bay and Ninilchik Units

- Beluga River
  - Compression
  - 2 redrills
- Ninilchik
  - Compression
  - 2 new wells
- TBU
  - 4 new wells

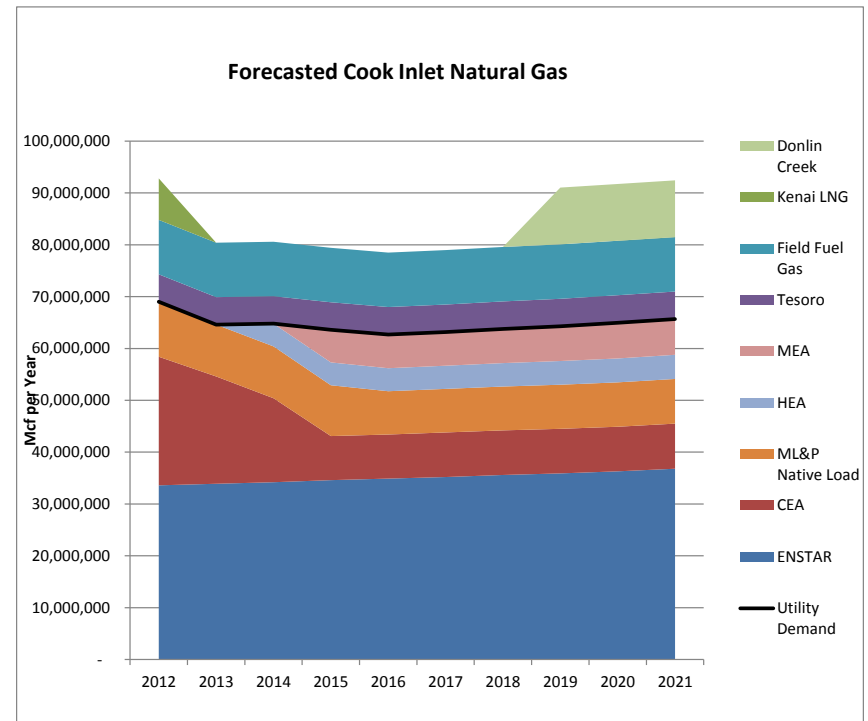


# 2009–2011 Drilling Activity and Production Adds

Period	# New Completions	Production Rate Added MMSCF/D
Nov–09 to Oct–10	5	18.5
Nov–10 to Oct–11	6	9.9

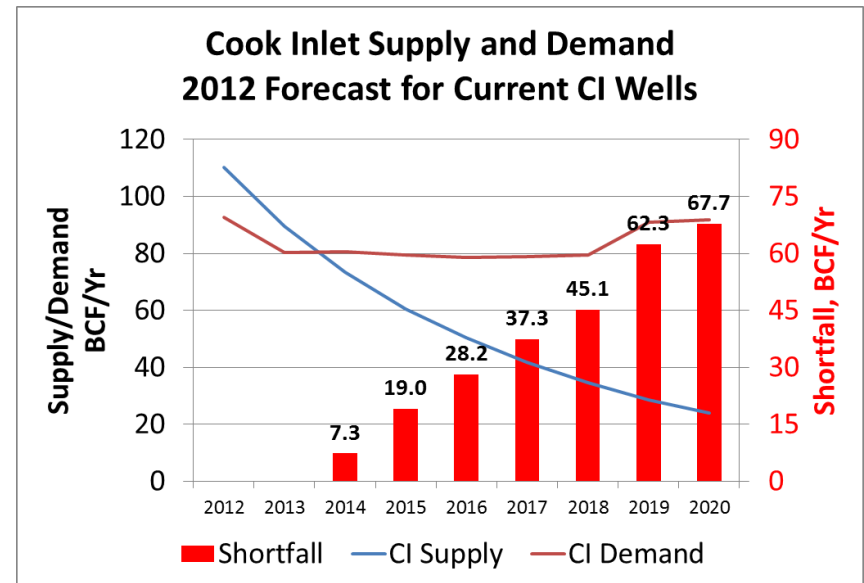
# 2012 Forecasted CI Demand

- ▶ LNG: 3-4 Cargos expected in 2012
- ▶ CEA new plant
- ▶ HEA and MEA will start contracting for needs (formerly under CEA)
- ▶ Field Fuel & Flare 10.5 BCF/year
- ▶ Donlin Creek startup 2019



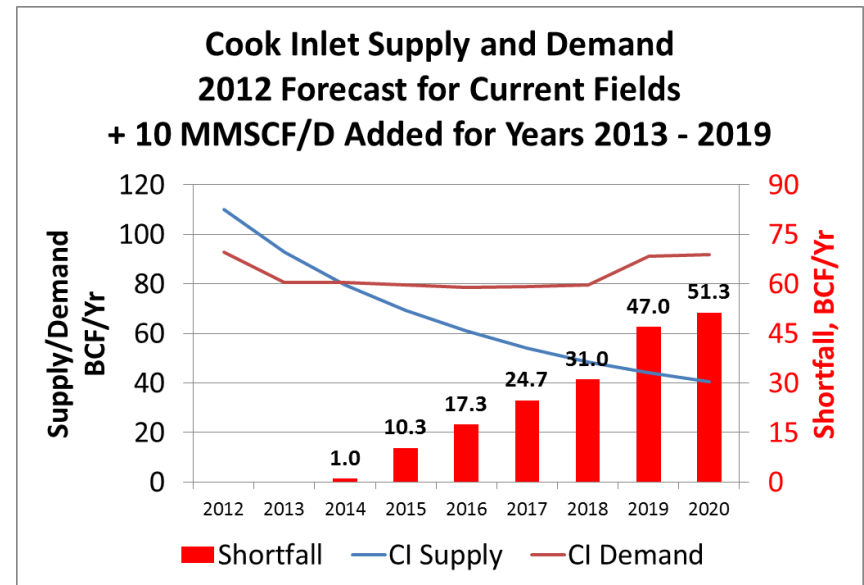
# Supply/Demand and Shortfall

- ▶ With supply forecast from Annual Average production of existing CI wells, shortfall predicted to occur in 2014



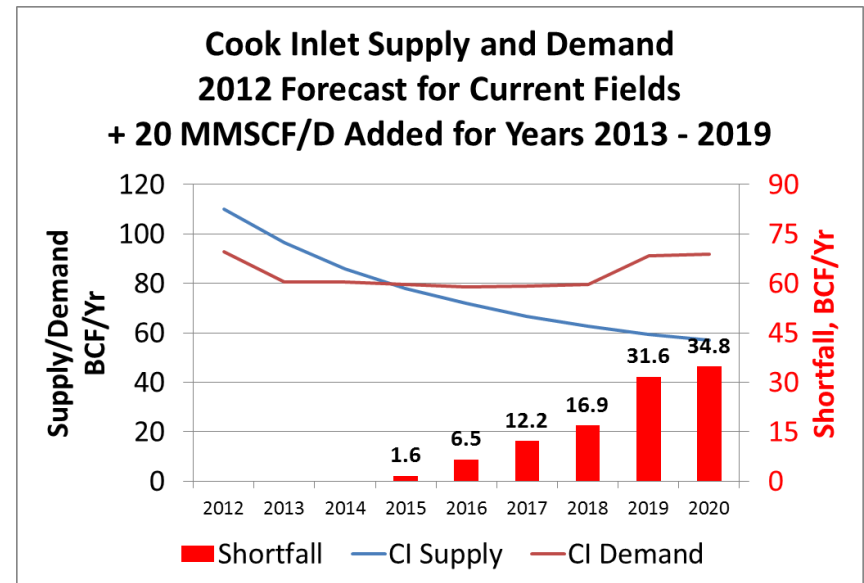
# Sensitivity: Current Fields plus 3-4 New Wells Per year going forward

Assuming 3-4 new wells are drilled each year resulting in 10 MMSCF/D of new production added each year from 2012-2019, there still is a shortfall in supply in 2014



# Sensitivity: Current Fields plus 6–8 New Wells Per year going forward

Assuming 6-8 new wells are drilled each year resulting in 20 MMSCF/D of new production added each year from 2012-2019, the shortfall in supply occurs in 2015





# Summary of CI Shortfall Cases

Case	Initial Year of Shortfall	Initial Year Shortfall Amount, BCF
Existing CI Fields	2014	7.3
Existing Fields + Annual Addition of 10 MMSCF/D Production from New Wells 2013–2019	2014	1.0
Existing Fields + Annual Addition of 20 MMSCF/D Production from New Wells 2013–2019	2015	1.6

# Conclusion

- ▶ Absent major new large discoveries that can be brought online in 1-2 years, the current pace of development will mean a shortfall in Cook Inlet supply to meet demand in 2014 or 2015.

# Questions?