



Cook Inlet Natural Gas Study 2012 Update

Senate Resources Committee

January 16, 2013

Peter J. Stokes, P. E.
Petrotechnical Resources of Alaska

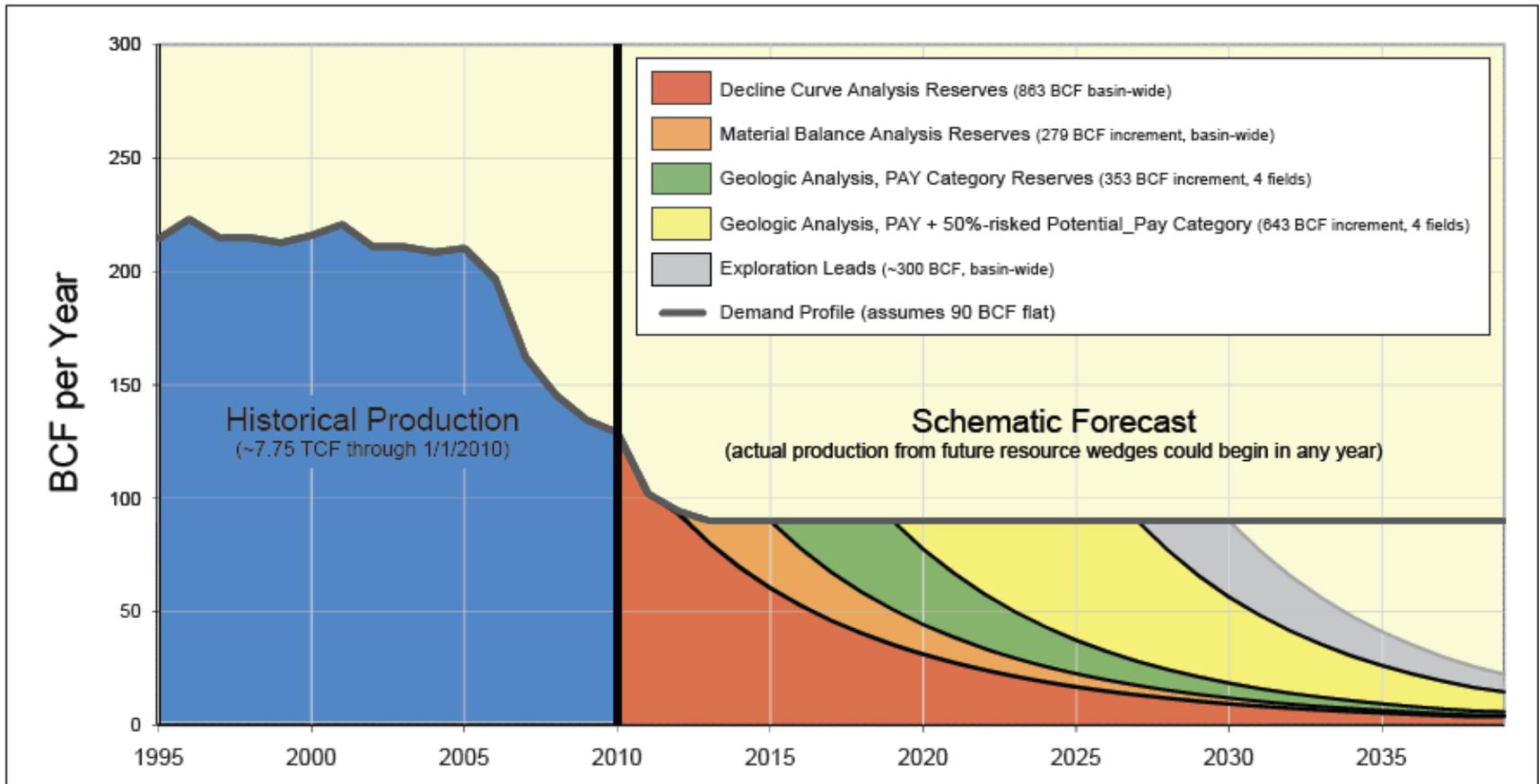
Cook Inlet Natural Gas Study Update – 2012

- ▶ **Southcentral Alaska Gas Supply/Demand 2012-2020**
- ▶ **Possibilities to meet Southcentral Demand**
- ▶ **Impact of the CINGSA gas storage project in mitigating winter peak demand**

2010 PRA Cook Inlet Study

- ▶ ENSTAR, Chugach Electric and ML&P commissioned PRA to perform a study of Cook Inlet Supply from existing Fields
- ▶ 2010 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

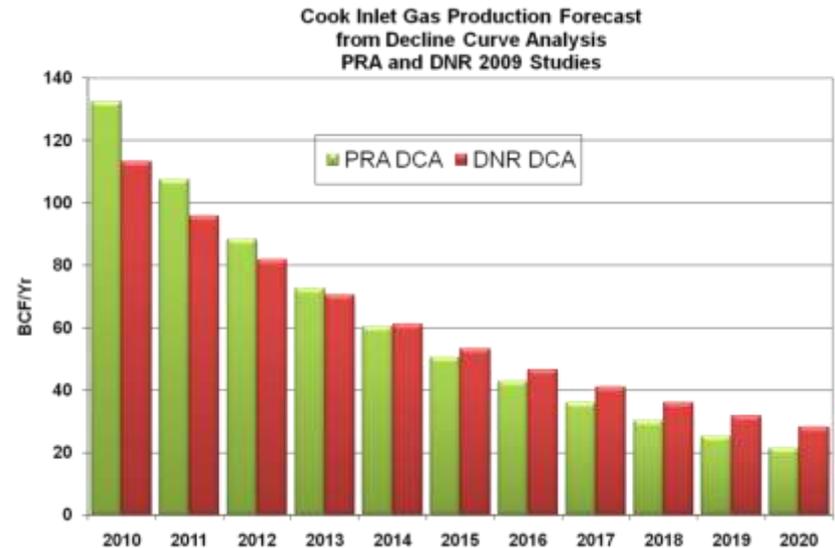
Annual Supply – DNR 2009 Report



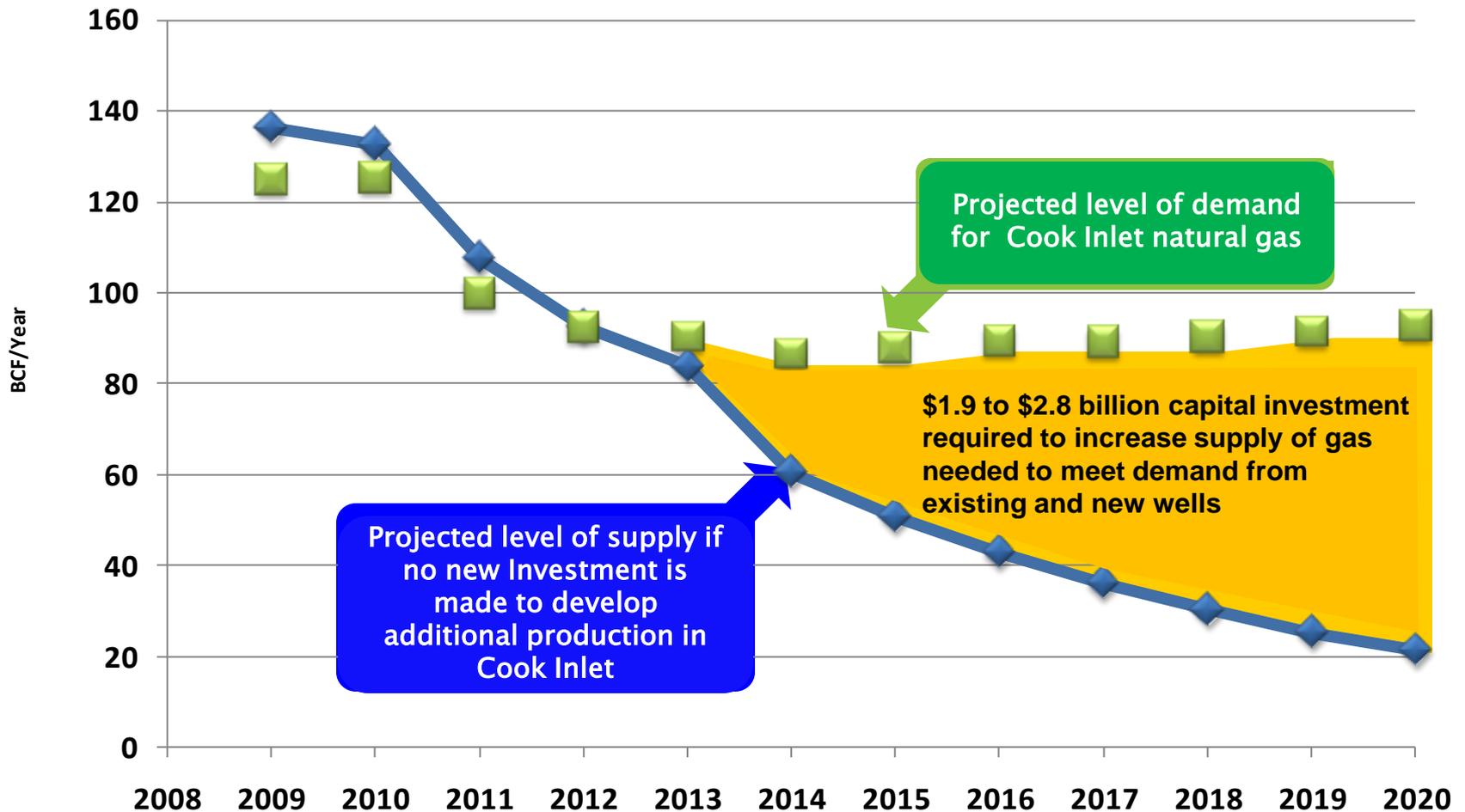
Source: AK DNR December 2009 Study

Comparison of DNR and PRA Decline Curve Analysis (DCA)

- ▶ Cook Inlet declines in 2010 PRA Study compared favorably with DCA in DNR 2009 Study



2010 PRA Study Summary



DNR 2011 CI Gas Cost Study

DNR concluded:

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

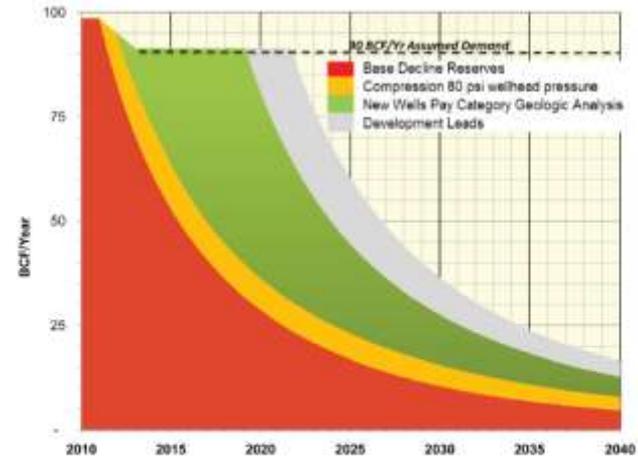


Figure 7. Hypothetical production forecasts resulting from this study for the Cook Inlet basin assuming a constant 90 BCF/Year demand after 2011. Production from future resource wedges could begin in any year. The projected “pay” volumes (green wedge) for this study are greater than that of the 2009 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 the CI Utilities to update the 2010 Study to estimate the current supply from existing Cook Inlet fields for comparison with the current CI Demand Forecast.
- ▶ Due to drilling and compression additions since 2009, the predicted shortfall from existing fields has moved from 2013 to 2014.

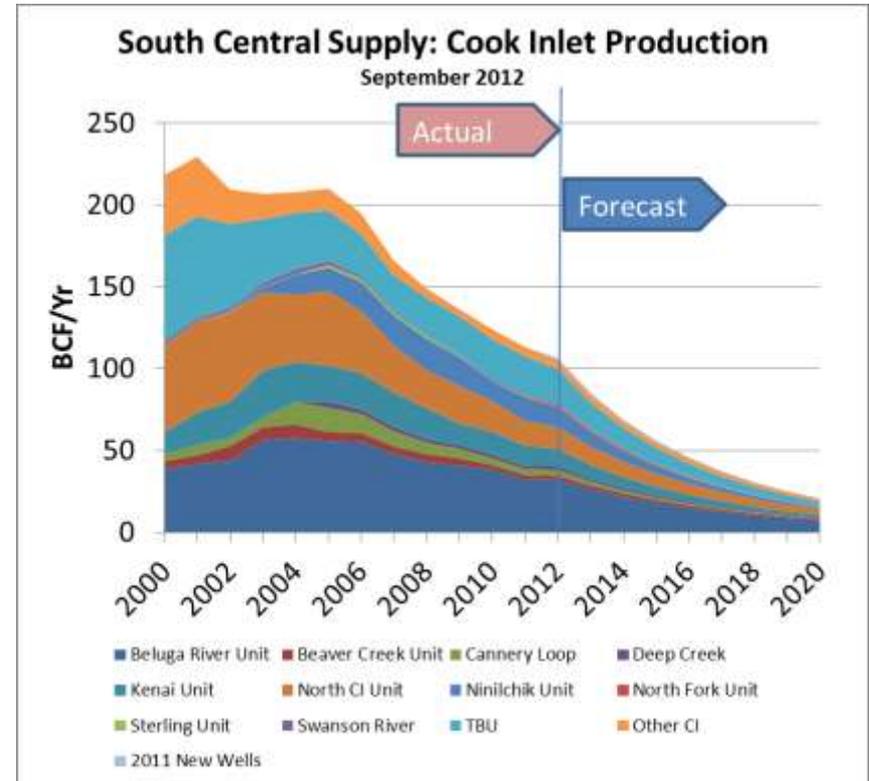
Cook Inlet Production Past and Future

2000-05: High production supported Nikiski plants

- ▶ Agrium Chemical Plant
 - Shut down in 2007
- ▶ LNG Exports continue
 - Future uncertain - License Extension ends March 2013

2014+: Production for

- ▶ Utilities
- ▶ Refinery
- ▶ O&G / Mining Fuel



Why Do Utilities Care About Cook Inlet Gas?

▶ ENSTAR

- Cook Inlet gas provides 100% of supply

▶ Chugach Electric

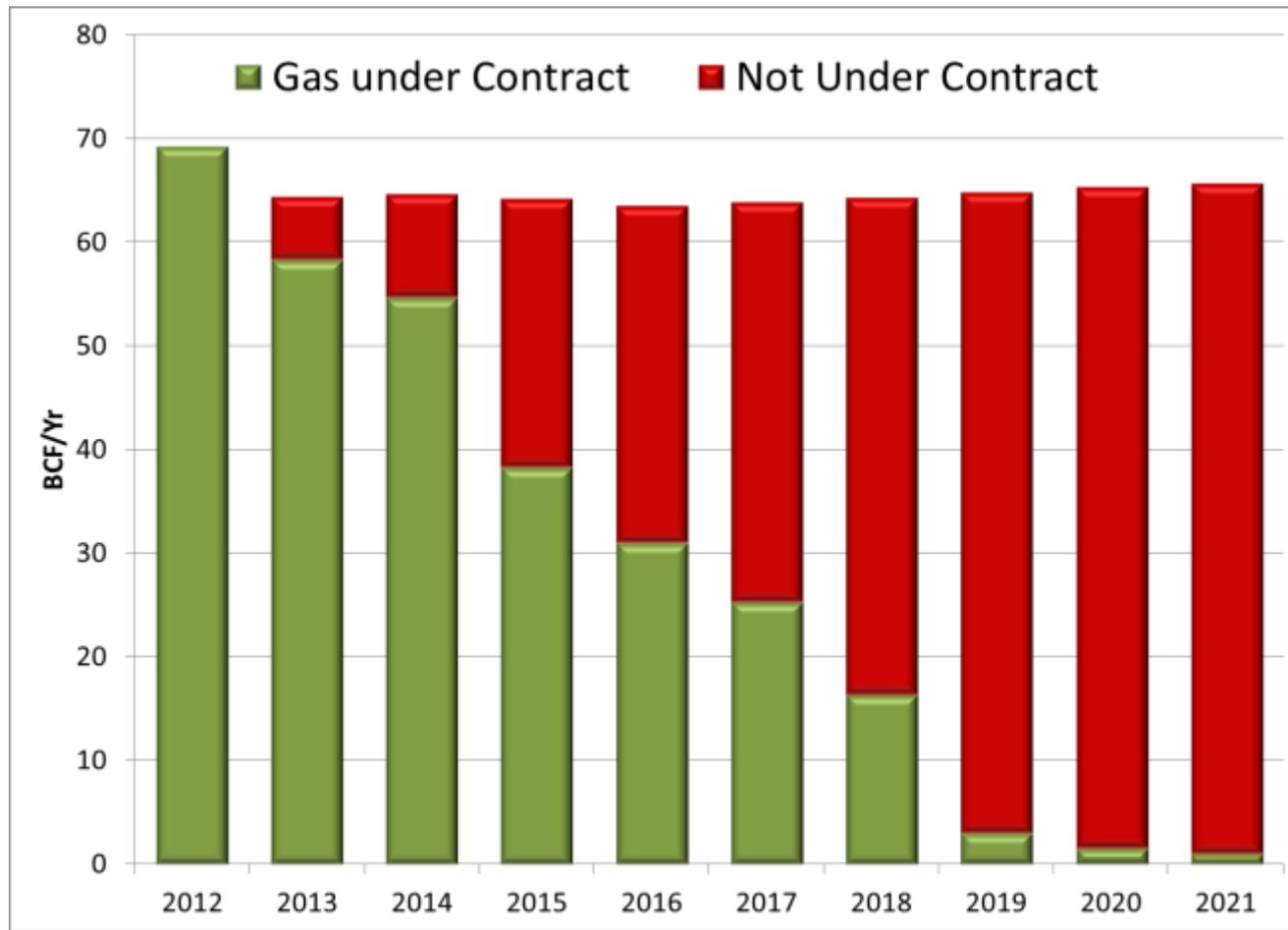
- Cook Inlet gas used for 90% of generation

▶ ML&P

- Cook Inlet gas used for 88% of generation

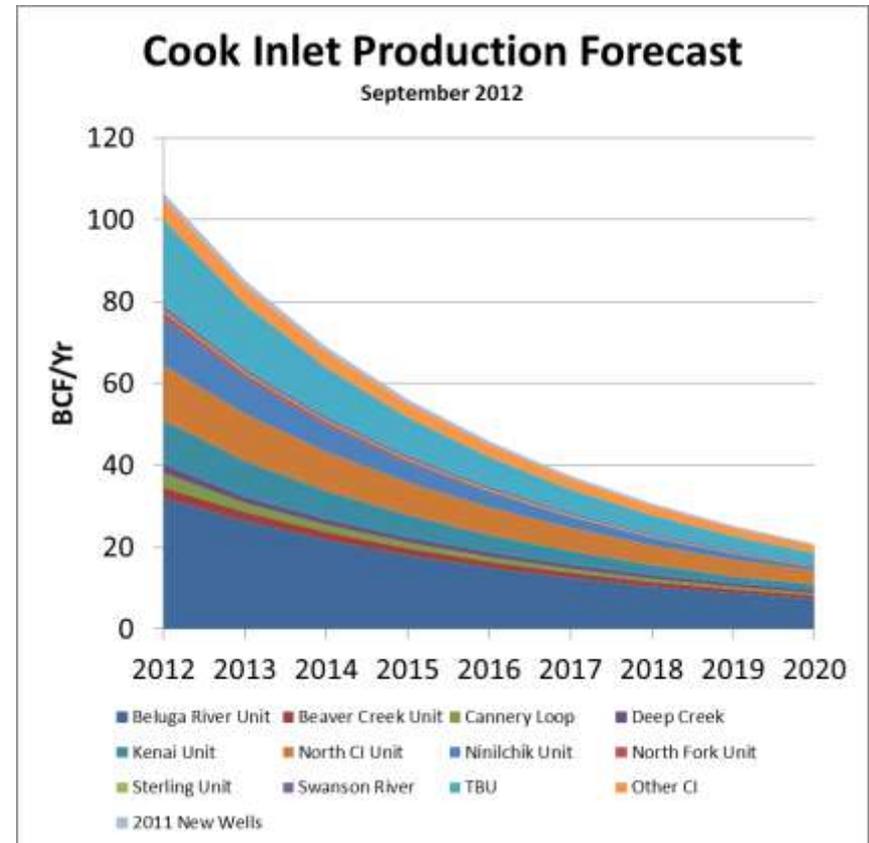
Southcentral Utility	2012 Predicted Consumption, BCF
ENSTAR	33.6
Chugach	25.0
ML&P	10.6

Total Utility Contracted and Not Contracted Gas Demand – 2012



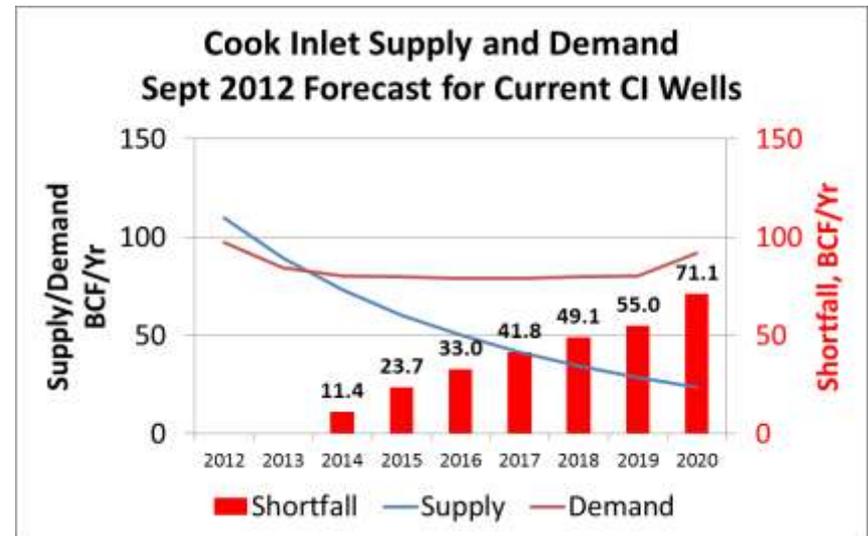
2012 Cook Inlet Supply Prediction

- ▶ PRA Decline Curve Analysis of existing fields and wells
 - 16-17% Annual Decline
- ▶ Does not include future developments or wells



2012 Supply vs. Demand Current Wells

- ▶ Based on current wells only, predicts a shortfall as early as 2014
- ▶ 2010 PRA Study forecasted need of 13-14 new gas completions per year to avoid shortfall
- ▶ Only 5-8 new wells per year were actually completed 2009-2012



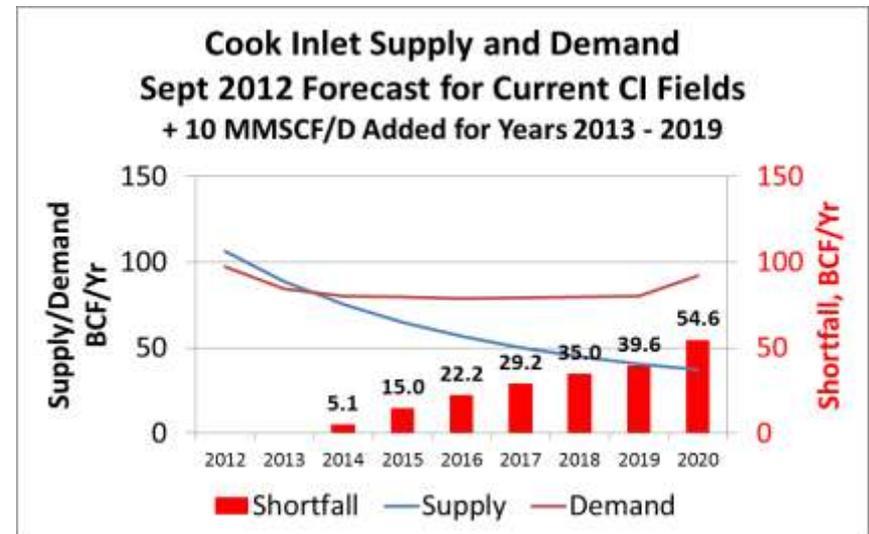
Cook Inlet Drilling Results

Period	Gas Wells Completed	Average Wells per Year	Initial Production (MMCF/day)
2001-2009	105	12.3	3.6 per well
2007-2009	34	13.6	3.1 per well
Nov-09 to Oct-10	5	5	3.7 per well
Nov-10 to Oct-11	6	6	1.7 per well
Nov-11 to Oct-12	8	8	3.6 per well

Supply vs. Demand:

Current Wells + Yearly Add of 10 MMSCF/D

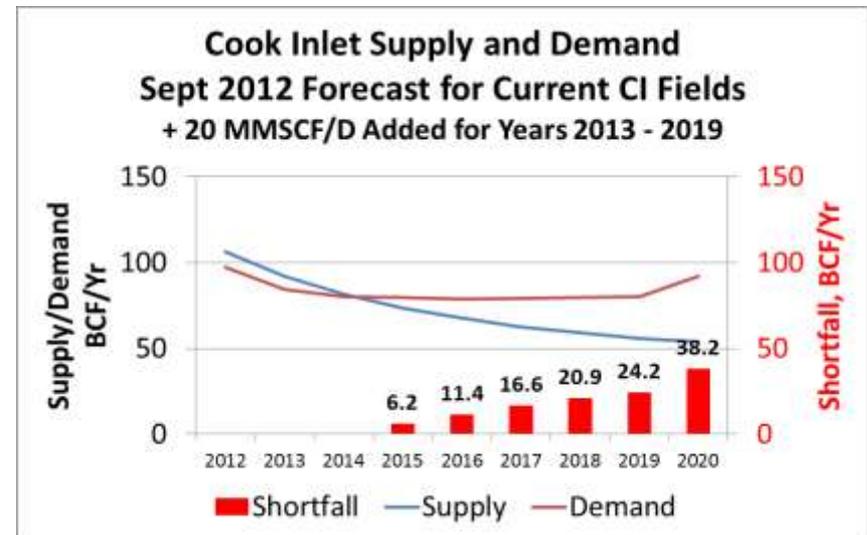
- ▶ This sensitivity assumes 3-4 new gas completions added per year 2013-19.
- ▶ Shortfall still predicted in 2014.



Supply vs. Demand:

Current Wells + Yearly Add of 20 MMSCF/D

- ▶ This assumes 6-8 new gas completions added per year 2013-19.
- ▶ Shortfall predicted in 2015.
- ▶ Could be changed by additional near term infield developments
 - Hilcorp
 - CPAI
 - Buccaneer
 - Armstrong
 - Others



Infield Development

- ▶ Hilcorp has stated that they will spend \$203 million in capital in 2012 to develop oil and gas
 - Will likely spend \$150 million per year over next 2 years
 - This is a marked increase over the activity levels of Chevron and Marathon
 - Red Pad is now producing
- ▶ ConocoPhillips drilled 2 wells at Beluga River
- ▶ Buccaneer is completing Kenai Loop #4
- ▶ Armstrong has permitted 4 wells at North Fork
- ▶ Other infield development include Aurora and CI Energy

Unless more or high rate gas wells are developed, shortfall likely occurs in 2015+ timeframe.

Exploration – Onshore

- ▶ Hilcorp: 3D program at Deep Creek
- ▶ NordAq: Delineating Shadura and Exploring
 - Shadura not to be developed until 2013
 - Exploring at Tiger Eye Prospect in 2012-13
- ▶ Buccaneer exploring near Homer
- ▶ CIE exploring west Cook Inlet
- ▶ Apache shooting large 3D Seismic Program, plans to drill 4th Quarter 2012 near Tyonek

If successful exploration wells are found near current infrastructure and be quickly developed, there can be an impact on timing of shortfall.

Exploration – Offshore

- ▶ Furie is drilling exploration wells with Spartan 151 jack up rig
 - Announced discovery at Kitchen Lights #1; did not complete
 - Drilled and suspended Kitchen Lights #2 and #2A
- ▶ Buccaneer has mobilized Endeavour jack up rig to CI to drill Cook Inlet prospects
 - Plans to drill at Cosmopolitan this winter
- ▶ Apache shooting offshore 3-D Seismic

Timing for first gas production likely to be 3-5 years after discovery due to offshore permitting and construction lead times.

Alaska Stand Alone Gas Pipeline

2011 ASAP Project Plan

- ▶ Estimated to Cost \$7.5 billion (2011\$) +/- 30%
- ▶ Gas to South Central by 2020 at earliest.

ASAP will not solve 2015-2019 shortfalls in Cook Inlet gas supply.



Import Gas to Cook Inlet: LNG or CNG

- ▶ LNG is a commodity that can be contracted for import into Cook Inlet
 - Use of Nikiski Plant or other for regassifying
- ▶ LNG from North Slope
 - Large number of truck deliveries to meet SC shortfall
- ▶ Compressed Natural Gas (CNG) is another option for importing gas
 - Possibly a cheaper option than LNG

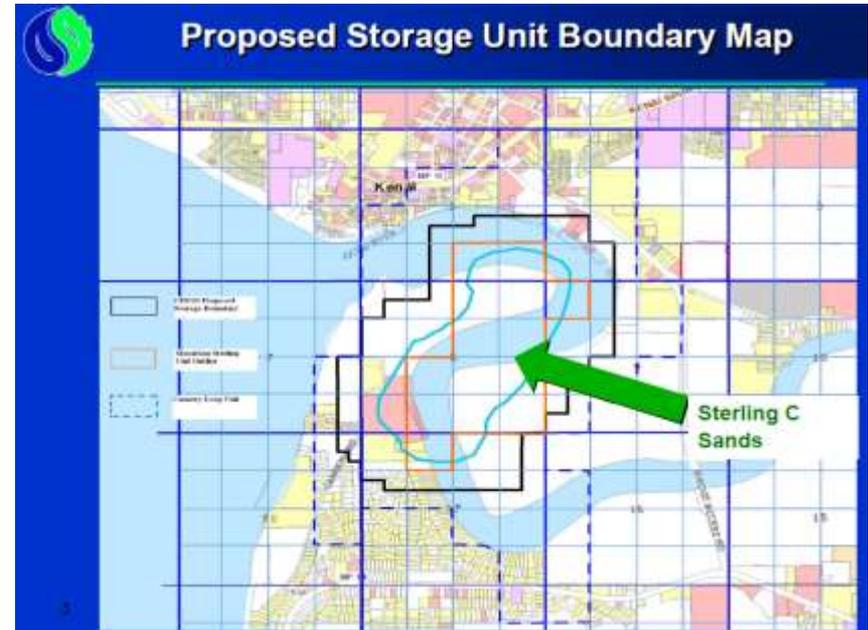
With timely engineering and permitting, LNG or CNG could be imported to fulfill short-term needs.

Summary: Possibilities to Meet 2012–2020 Demand

- ▶ Infield drilling: Recent history of activity level indicates that this will not meet demands past 2015
- ▶ Onshore Exploration: Not proven and if successful would need time for development; could impact timing of shortfall
- ▶ Offshore Exploration: Not proven and 3-5 years from discovery to production
- ▶ Instate Gas Line: Will not be operational until 2020
- ▶ Imported LNG or CNG: Could bridge demand shortfall until exploration and/or instate gas line provide for sufficient supply

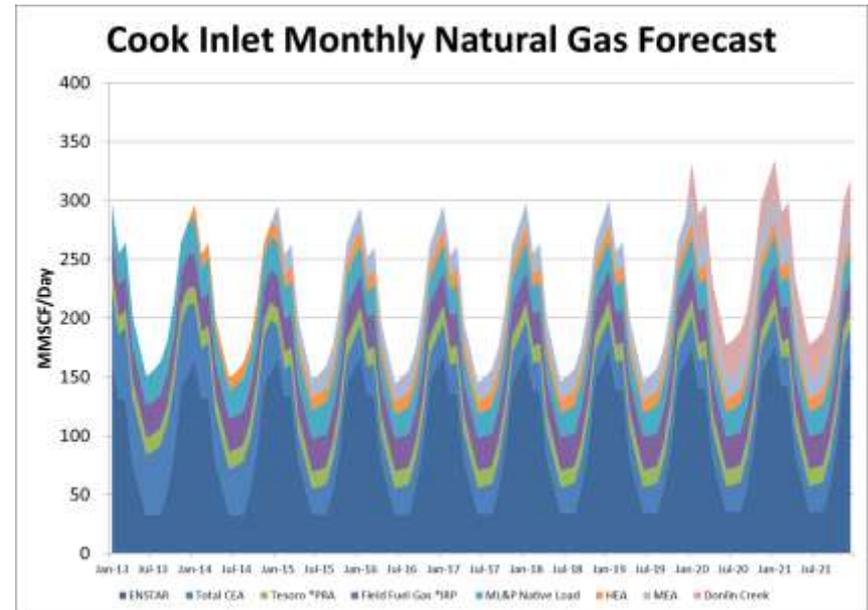
CINGSA Project

- ▶ 5 horizontal wells and compression installed
- ▶ CINGSA Storage Project allows for 11 BCF of active storage
- ▶ Winter peak capacity of 140 MMSCF available from CINGSA storage



CI Peak Gas Demands

- ▶ Large swing between Summer and Winter gas demands
 - Summer: 150 MMSCF/D
 - Winter: 300 MMSCF/D
- ▶ CINGSA gas storage allows injection of CI gas during summer to help meet winter peak demands



Impact of CINGSA

- ▶ Currently allows for storage of 11 BCF/Year.
- ▶ Will allow for meeting 45% of monthly average peak demand in the winter.
- ▶ Allows for purchase and storage of gas during summer season for use during winter peak demands.
- ▶ Available for storage of future imported LNG or CNG.
- ▶ Will help alleviate need of overproducing wells to meet peak daily utility demand.



Source: Alaska Business Monthly
Photo by Robin Barry, ENSTAR

Conclusions

- ▶ Absent major new large discoveries that can be brought online in 1-2 years, the current pace of development could mean a shortfall in Cook Inlet supply to meet demand in 2014 or 2015.
- ▶ LNG or CNG import is only “certain” method to ensure no shortfall.
- ▶ CINGSA storage is capable of storing CI produced gas or imported gas for winter peak demand.

Questions?