Cook Inlet Natural Gas: The Way Forward

Study conducted by

Petrotechnical Resources of Alaska

Sponsored by:

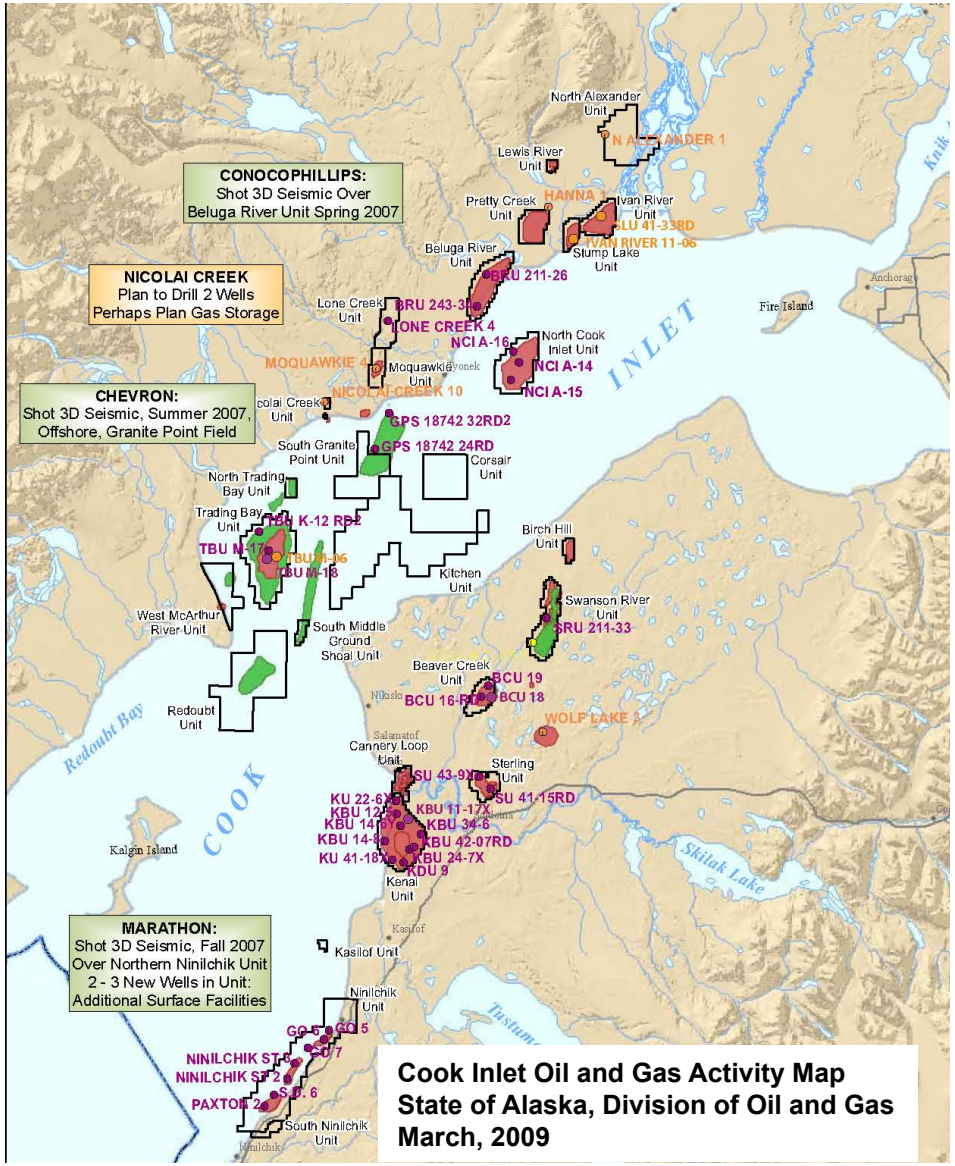
ENSTAR Natural Gas
Chugach Electric Association
Municipal Light & Power

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

BRU 27% of 2010 production
TBU 18%
NCI 16%
Kenai and Ninilchik ~10% each



Cook Inlet Oil and Gas Activity Map
State of Alaska, Division of Oil and Gas
March, 2009

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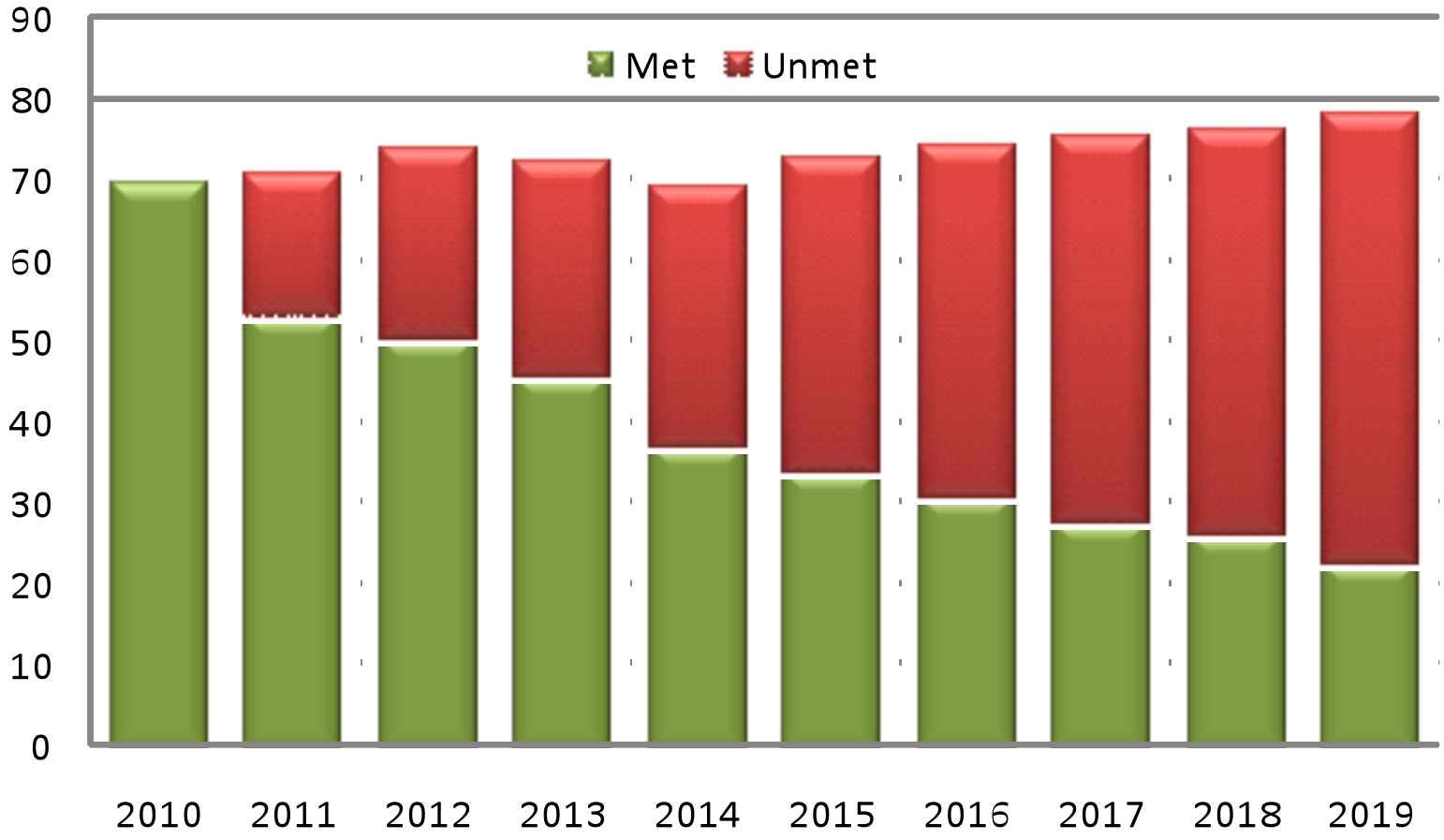
Gas Under Contract/Ownership

- ENSTAR
  - 100% of needs met through 2010
  - Approximately 25% unmet needs beginning 2011
- Chugach
  - 100% of needs met to spring 2011
  - 50% met through 2014; 60% in 2015; 29% in 2016
- ML&P
  - Share of Beluga field estimated to meet majority of needs through 2015

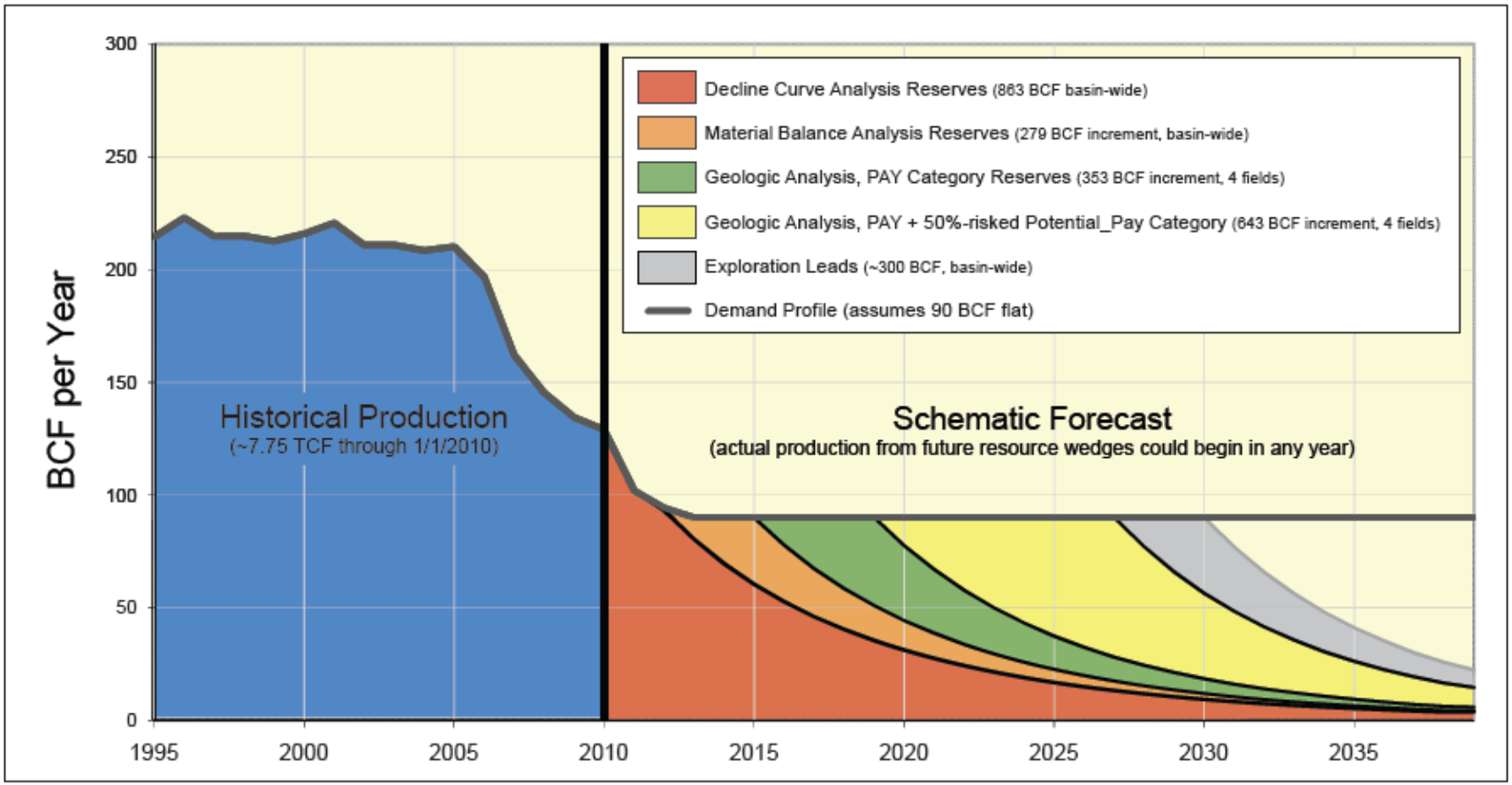
Combined Utility Met and Unmet Gas Demand



Supply Concepts

- Reserves
  - Proven
  - Probable
  - Possible
- Annual supply
- Deliverability (seasonal demand)
  - Storage
    - Needed by winter 2011-2012
    - Agreement in progress

Annual Supply



Source: AK DNR December 2009 Study

Cook Inlet Gas Study

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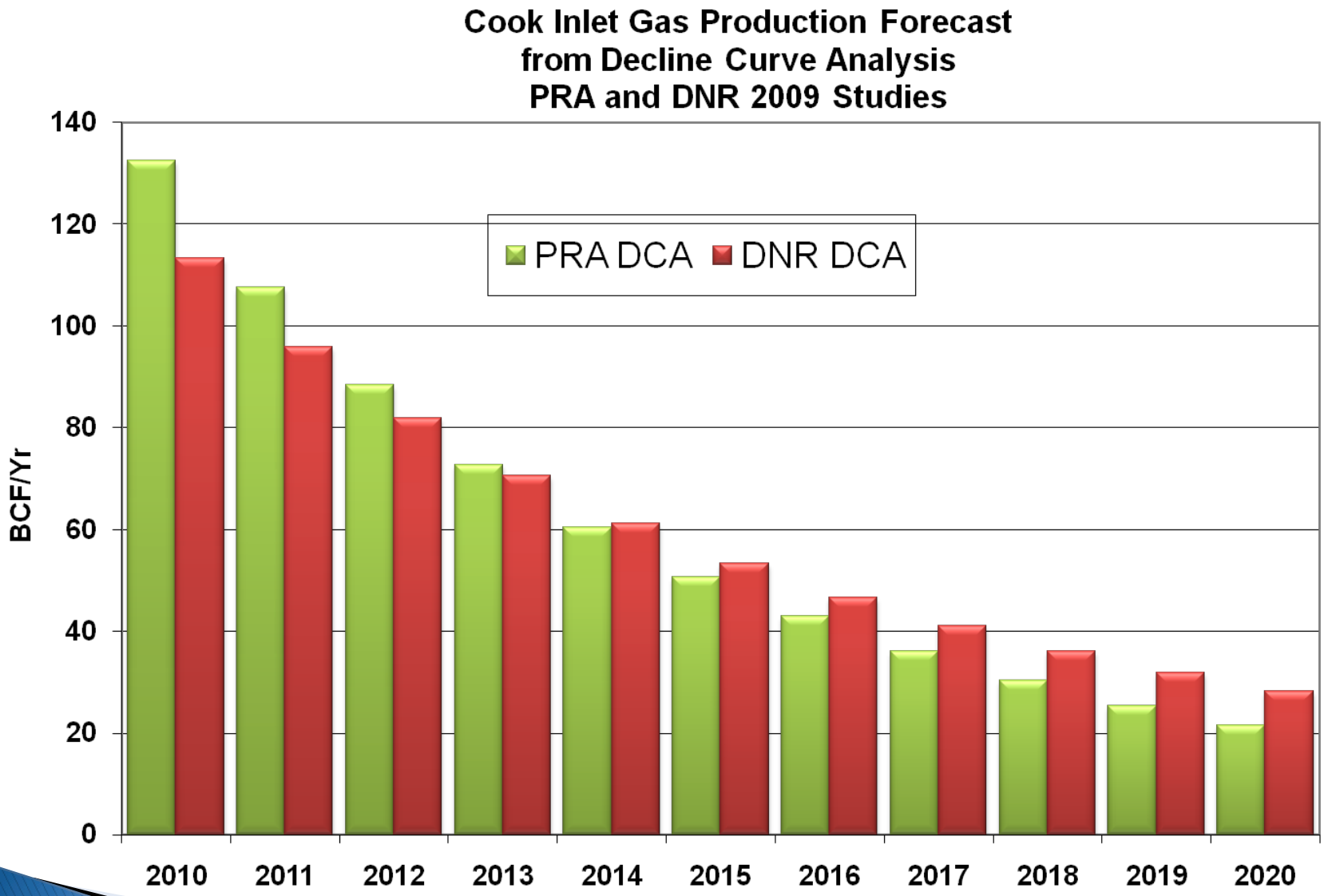
The Study

- Commissioned by ENSTAR, Chugach and ML&P
- Performed by PRA
- Completed March 2010

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


Cook Inlet Gas Production Forecast
from Decline Curve Analysis
PRA and DNR 2009 Studies
BCF/Yr
140
120
100
80
60
40
20
0
PRA DCA
DNR DCA
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020

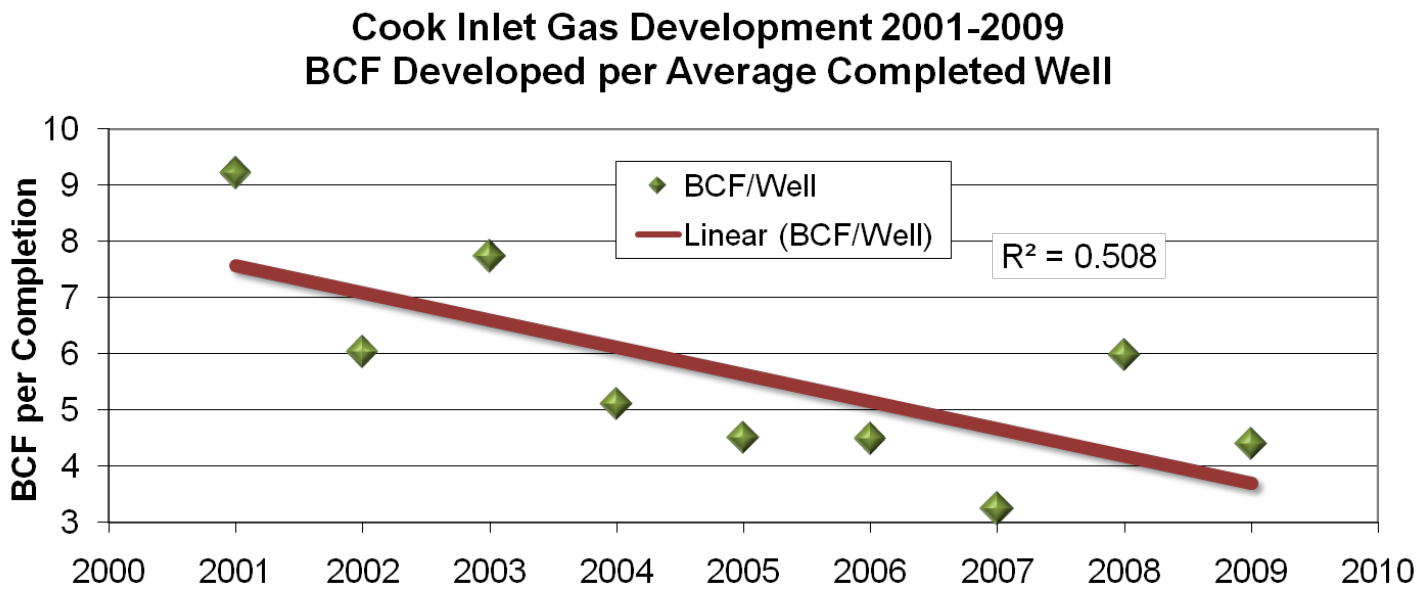
Methodology

- Field-level decline curve analysis
- Individual well decline curve analysis
  - Initial Production
  - Production profile
- IP progression through time
- Calculate activity required to meet 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

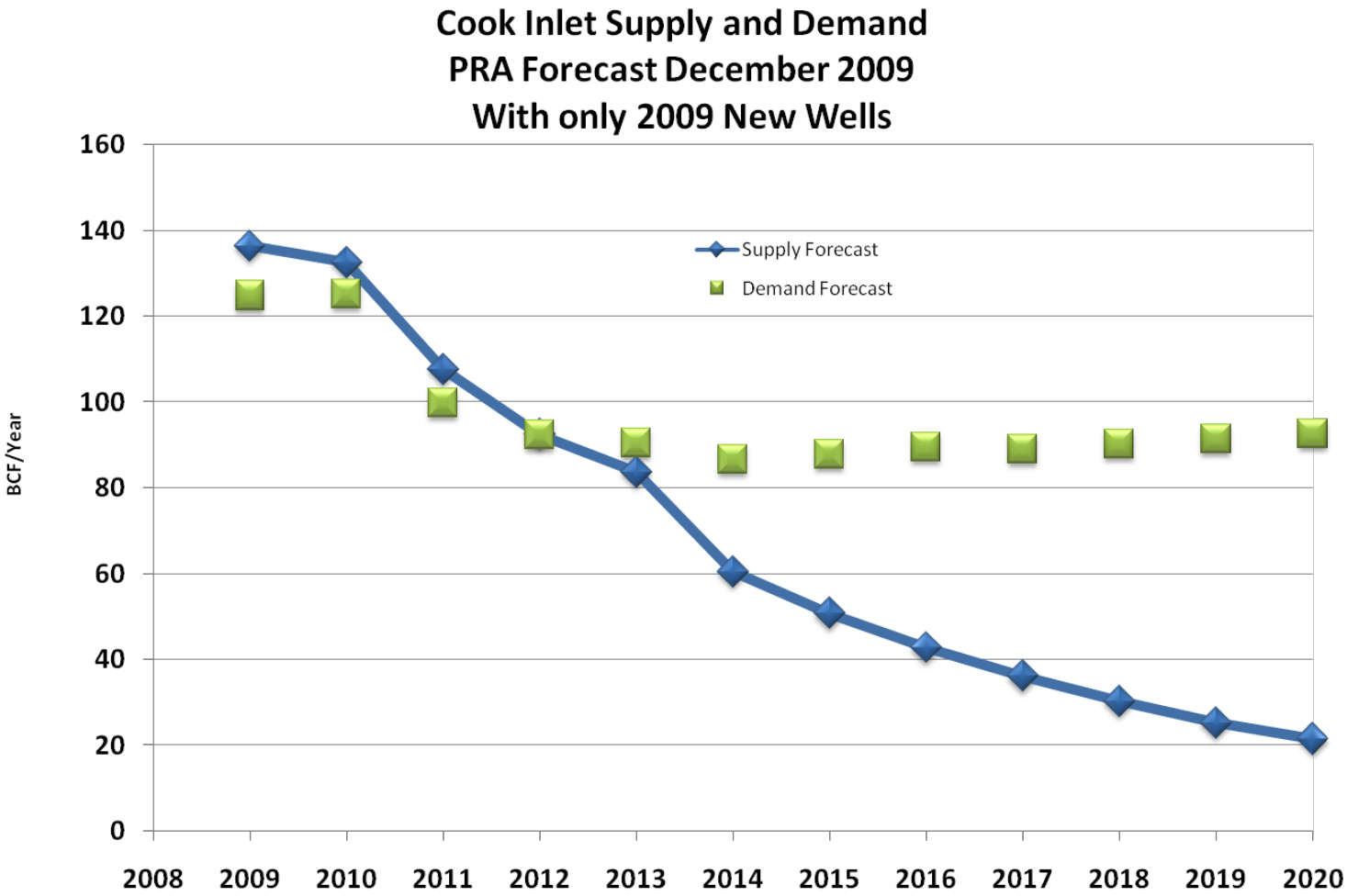
Cook Inlet Gas Development



The Problem

- 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

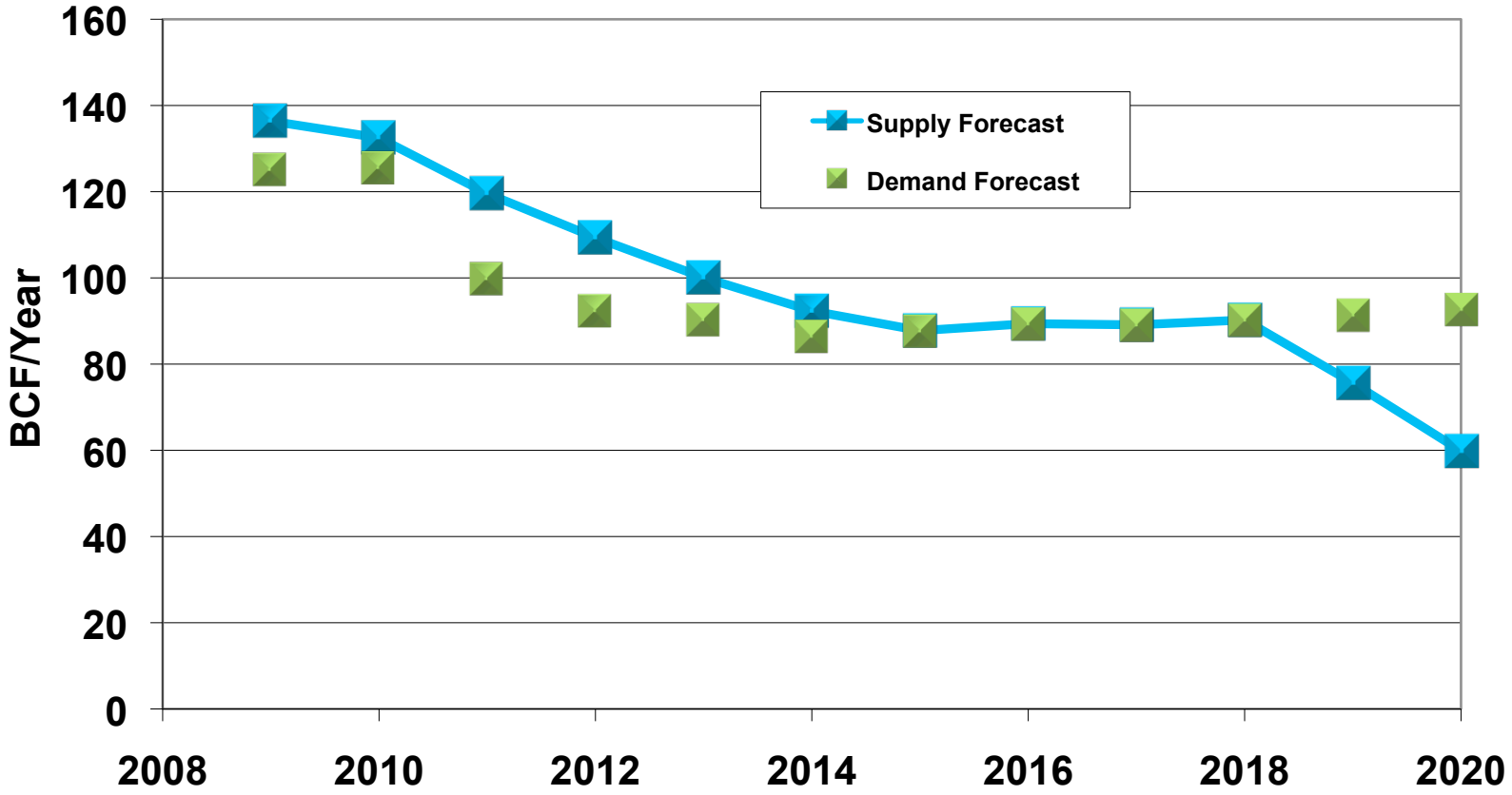
Annual Supply



Scenarios

- With development drilling continuing at the same pace as in 2007-2009, supply is sufficient to meet demand until 2018, assumes 136 new wells being drilled

Cook Inlet Supply and Demand
PRA Forecast December 2009
Assumes 2007-09 Drilling Activity of 13.6 Completions/Yr 2010 to 2019



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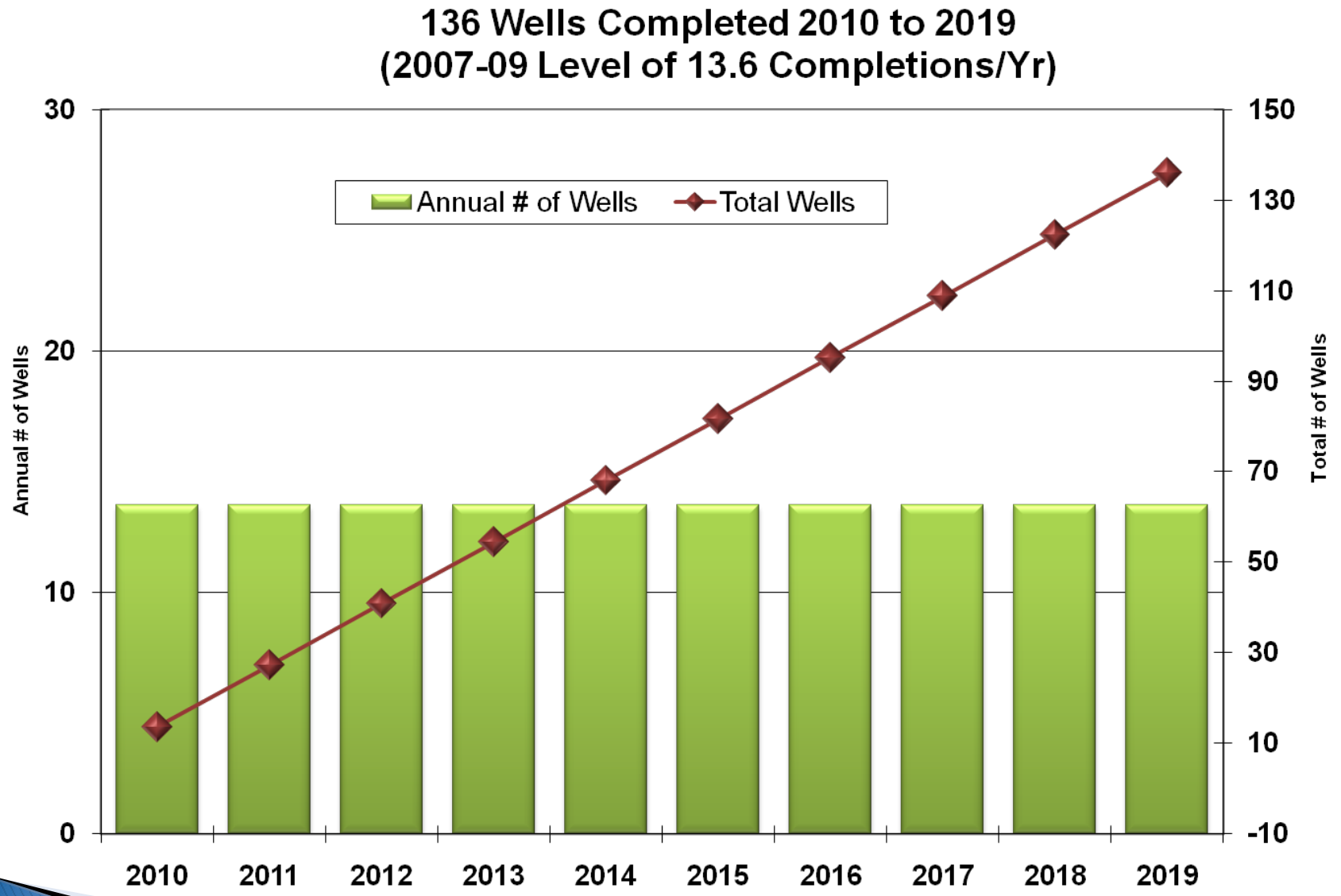
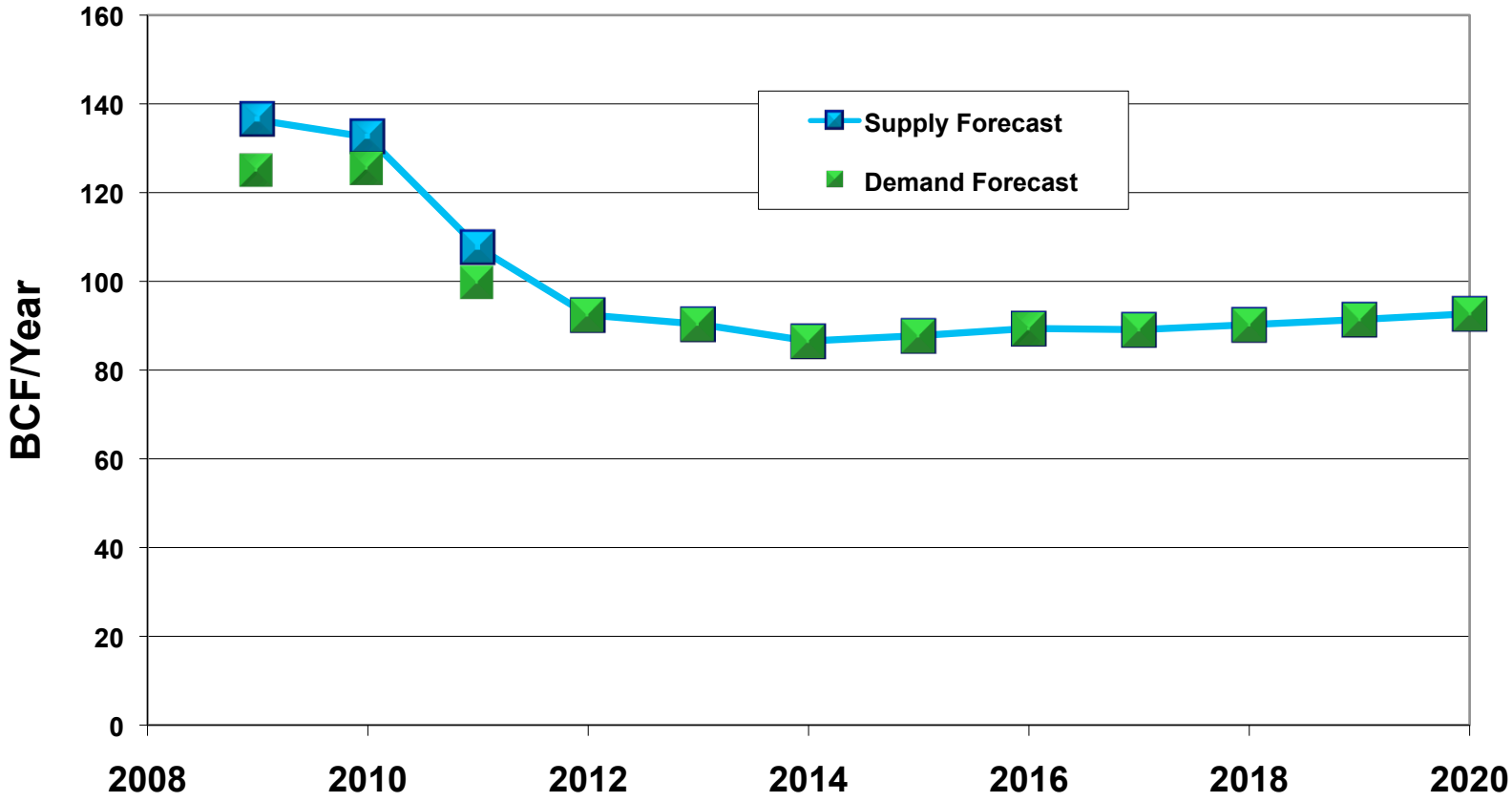

136 Wells Completed 2010 to 2019
(2007-09 Level of 13.6 Completions/Yr)
Annual # of Wells
Total Wells
Annual # of Wells
Total # of Wells
30
20
10
0
150
130
110
90
70
50
30
10
-10
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019

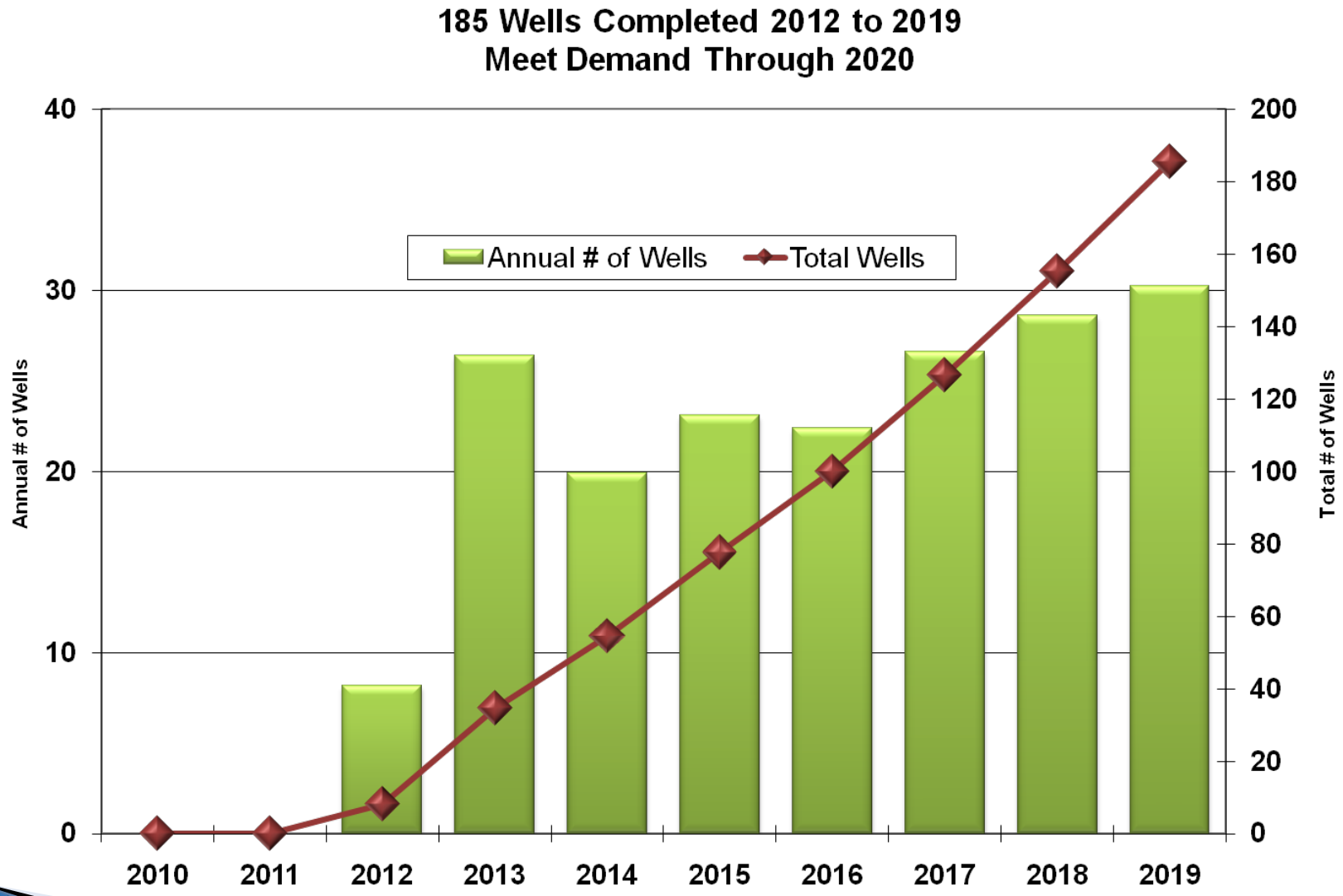
Scenarios

- 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



Petrotechnical Resources Alaska


185 Wells Completed 2012 to 2019
Meet Demand Through 2020
Annual # of Wells
Total Wells
Annual # of Wells
Total # of Wells
40
30
20
10
0
200
180
160
140
120
100
80
60
40
20
0
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019

The Cost

- The estimated cost of drilling & development in the past decade was $1 – $1.2 billion
- The estimated cost of drilling & development in the coming decade is $1.9 - $2.8 billion
- Higher production costs will lead to higher prices for energy

Caveats

- 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

Where Must We Go From Here?

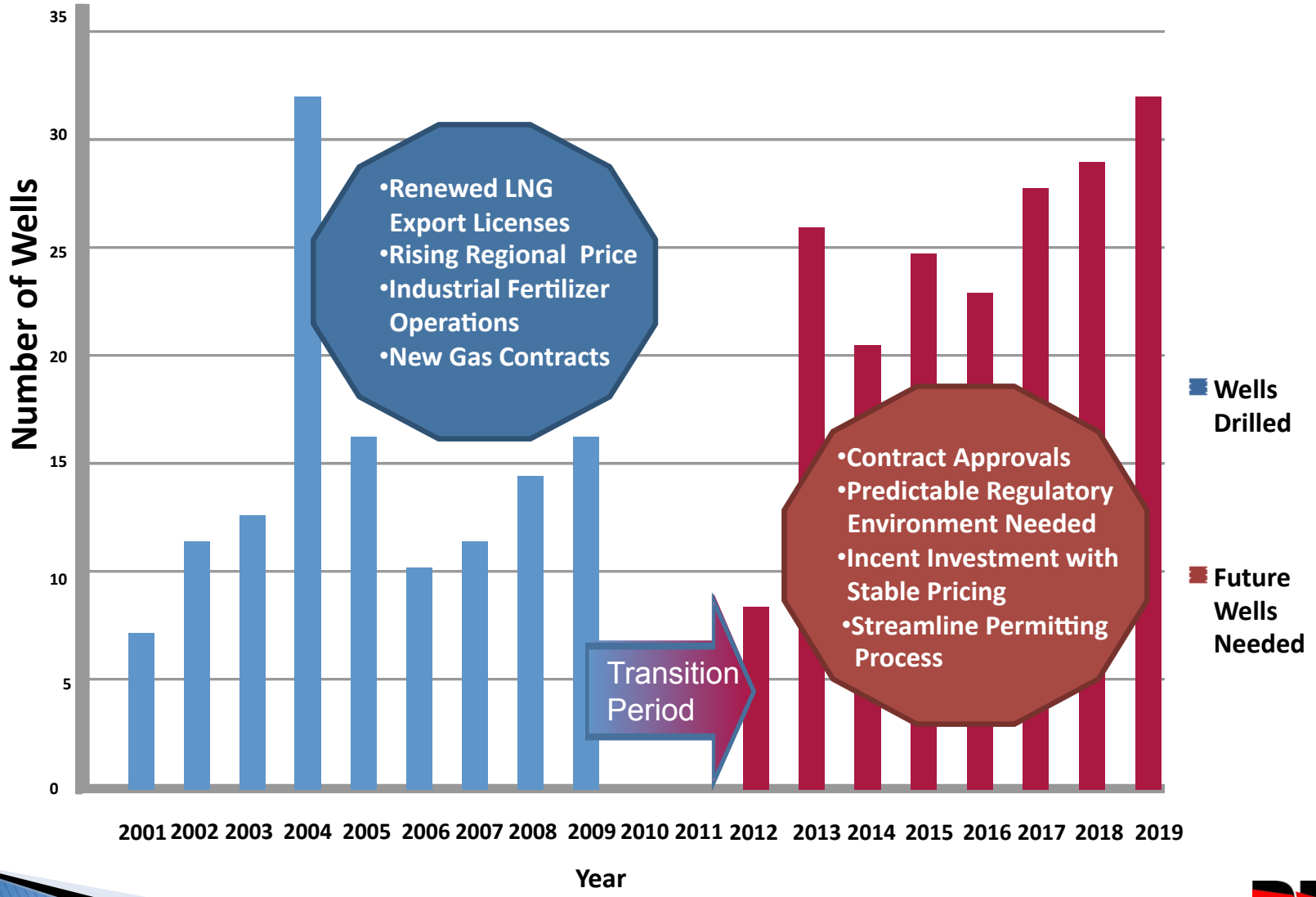
Immediate Actions Needed

- New gas supply agreements between Cook Inlet Utilities and producers
- Predictable timelines and standards for RCA approval of agreements
- Utilities must secure storage
- Continue customer awareness, conservation and curtailment plans

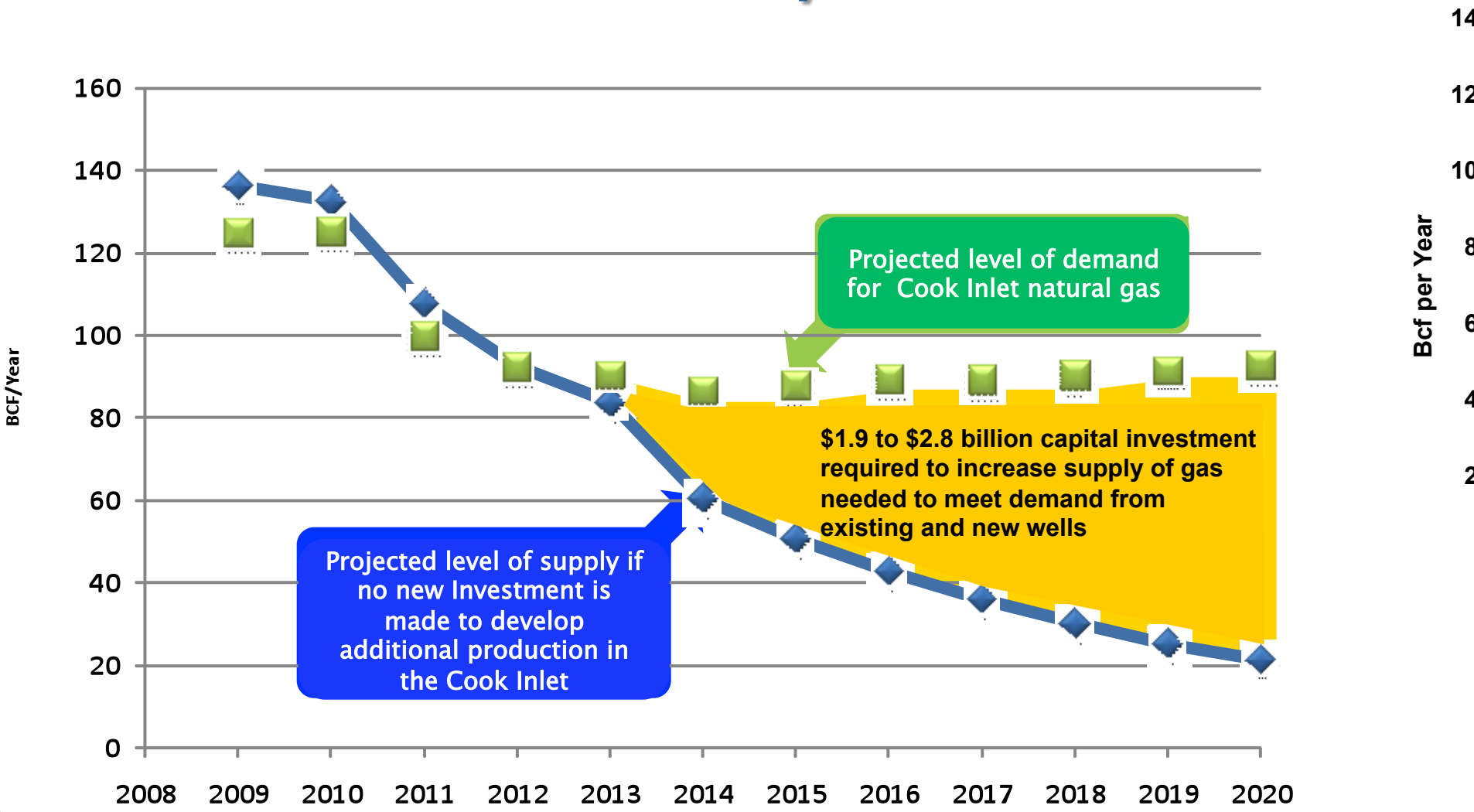
Immediate Actions Needed (cont.)

- Land management processes must be streamlined
- Determine how gas will come to the region to meet long-term needs of consumers
- Attract exploration & development companies

Wells Drilled, Wells Required & Influencing Factors



Summary


BCF/Year
160
140
120
100
80
60
40
20
0
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
Projected level of demand for Cook Inlet natural gas
$1.9 to $2.8 billion capital investment required to increase supply of gas needed to meet demand from existing and new wells
Projected level of supply if no new Investment is made to develop additional production in the Cook Inlet
Bcf per Year
14
12
10
8
6
4
2

The Way Forward

- Increase drilling in Cook Inlet
  - Streamline resource development processes
  - Timely contract approval to incent drilling
- Facilitate natural gas storage
- To backstop drilling program, develop LNG import options for 2013
- In-state gas line offers long term solutions

Example Decline Curve (BRU)