

Preliminary Economic Analysis of North Slope Propane and Review of June Alaska Propane Opportunities Conference

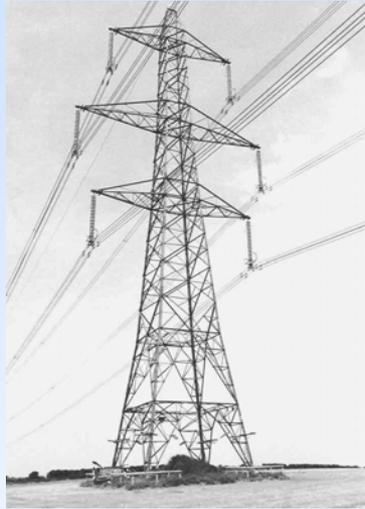
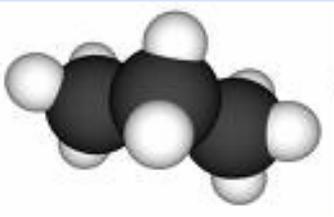
Nick Szymoniak
Scott Goldsmith
Institute of Social and
Economic Research

ANGDA
The North Slope Propane Opportunity
Consortium Meetings
September 24, 2009

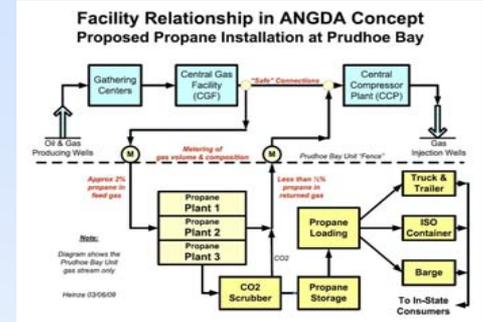
June Conference Review

Who could use propane?

What is propane?



Who is going to operate this?



How will it be financed?

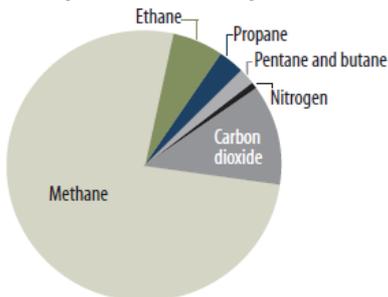


How will it get there?



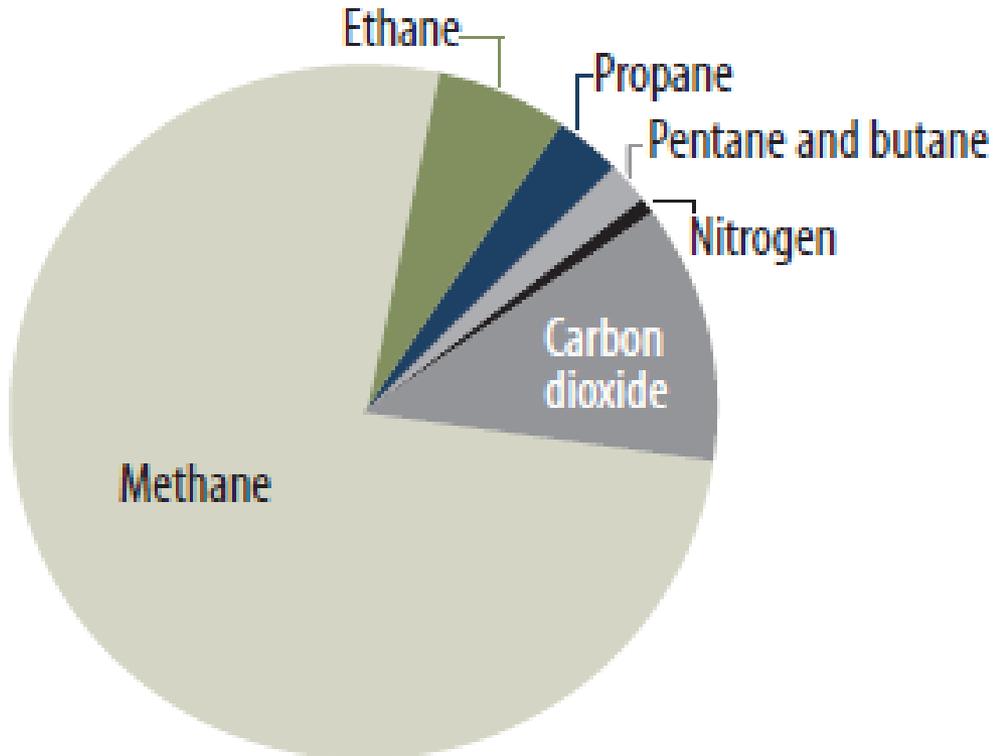
What is the resource?

Estimated Composition of North Slope Natural Gas*



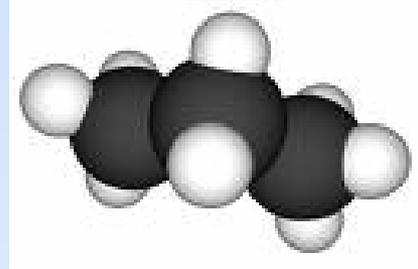
What is the Resource?

Estimated Composition of North Slope Natural Gas*



Magic Formula:
**Price of Crude Oil
per Barrel
x 5%**
Equals
**Price of Propane
per mcf**

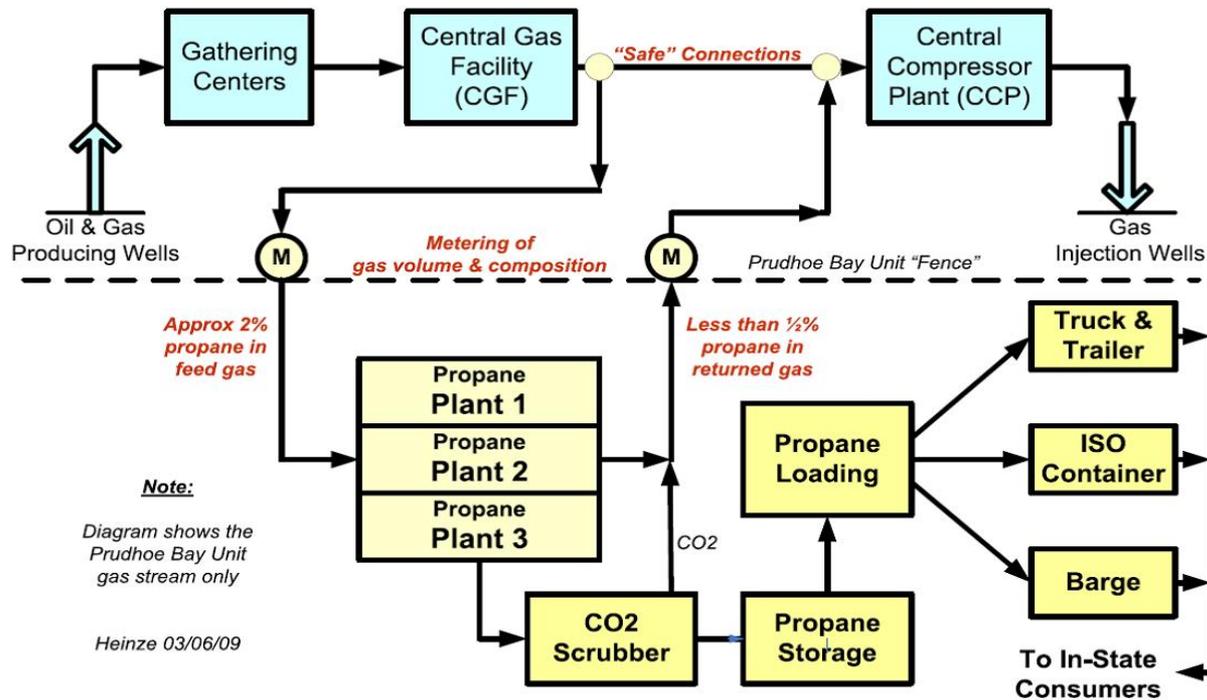
What is propane?



	Energy Density by Weight (Btu/lb)	Energy Density by Volume (Btu/gal)	Energy Density by Volume (btu/ccf)	Emissions (lbs of CO2/mmBtu)
Propane (gas)	21,485	---	249,476	139
Propane (liquid)	21,485	91,200	---	139
Natural Gas	23,204	---	104,619	117
LNG	23,204	78,884	---	117
Fuel Oil	19,766	132,669	---	161
Naptha	20,239	127,500	---	161

Who is Going to Operate This?

Facility Relationship in ANGDA Concept Proposed Propane Installation at Prudhoe Bay



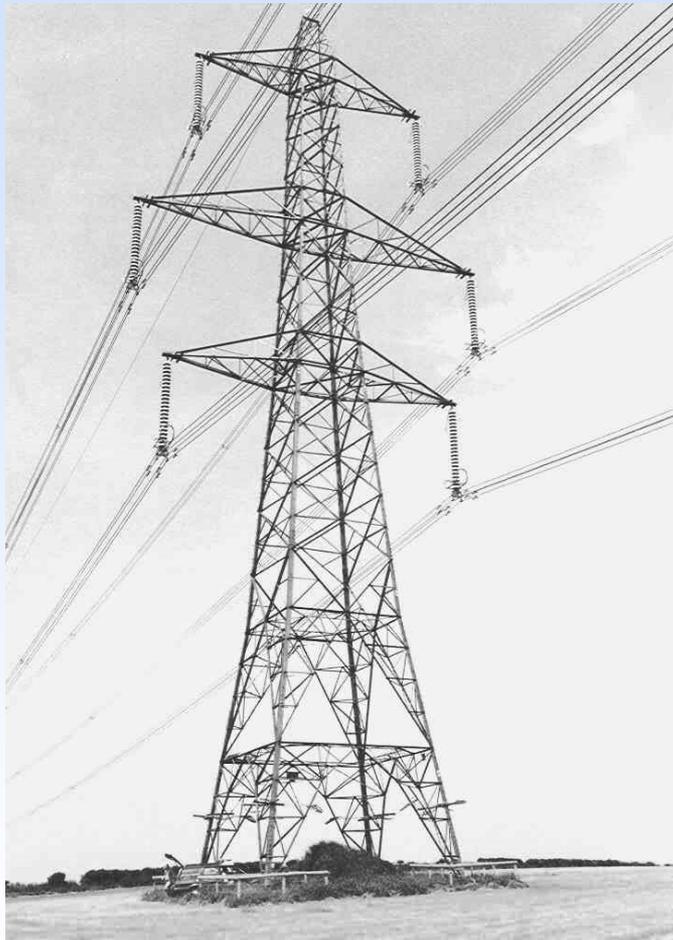
How Will it be Financed?



How Will it Get There?



Who Could Use Propane?



Assumptions Used in ISER's Preliminary Economic Analysis

7,661 mmBtu of propane (2,000 barrels) per day

Propane price per mmBtu = 5% of crude oil price per barrel

Capital Cost = \$74,090,000

6% interest rate

10 year amortization

Annual Cost of Capital = \$10,066,457

Total Annual Operating Cost = \$16,220,000

Fuel Cost for Trucks @ \$64 = \$880,000

Fuel Cost for Extraction Plant @ \$64 = \$360,000

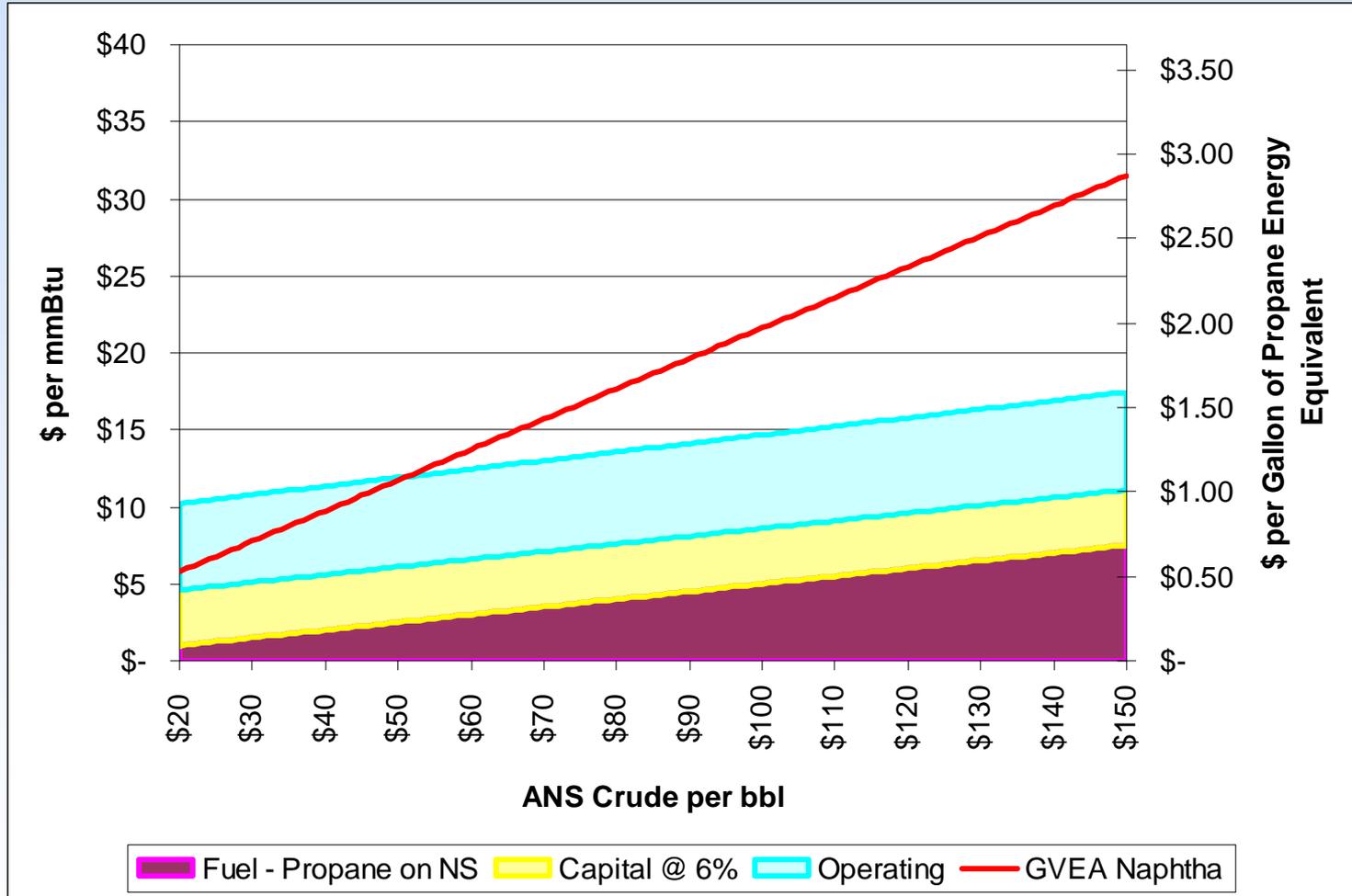
Other Operating Costs = \$14,980,000

Avoided Fuel

Naphtha used for power generation by GVEA

Wholesale heating fuel in Fairbanks

North Slope Propane vs. GVEA Naphtha

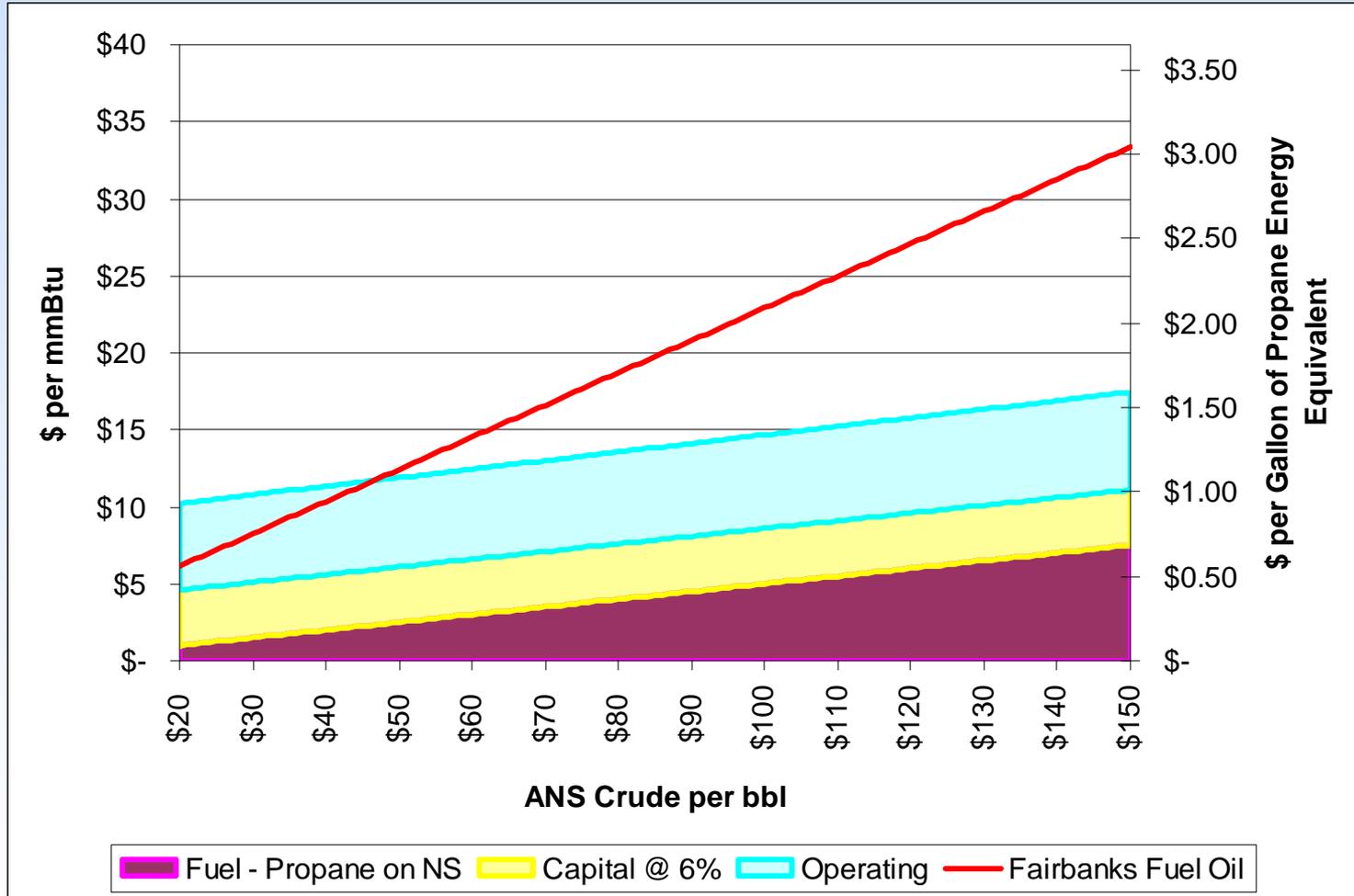


North Slope Propane vs. GVEA Naphtha

Displaced Naphtha Savings @ \$64 ANS

	Gallon	mmBtu
Propane into Extraction Plant	\$ 0.29	\$ 3.20
Propane in Fairbanks	\$ 1.16	\$ 12.68
Naphtha	\$ 1.85	\$ 14.51
Propane Savings per unit	---	\$ 1.83
Daily Saving	---	\$ 14,054
Annual Saving	---	\$ 5,129,534

North Slope Propane vs. Fairbanks Fuel Oil



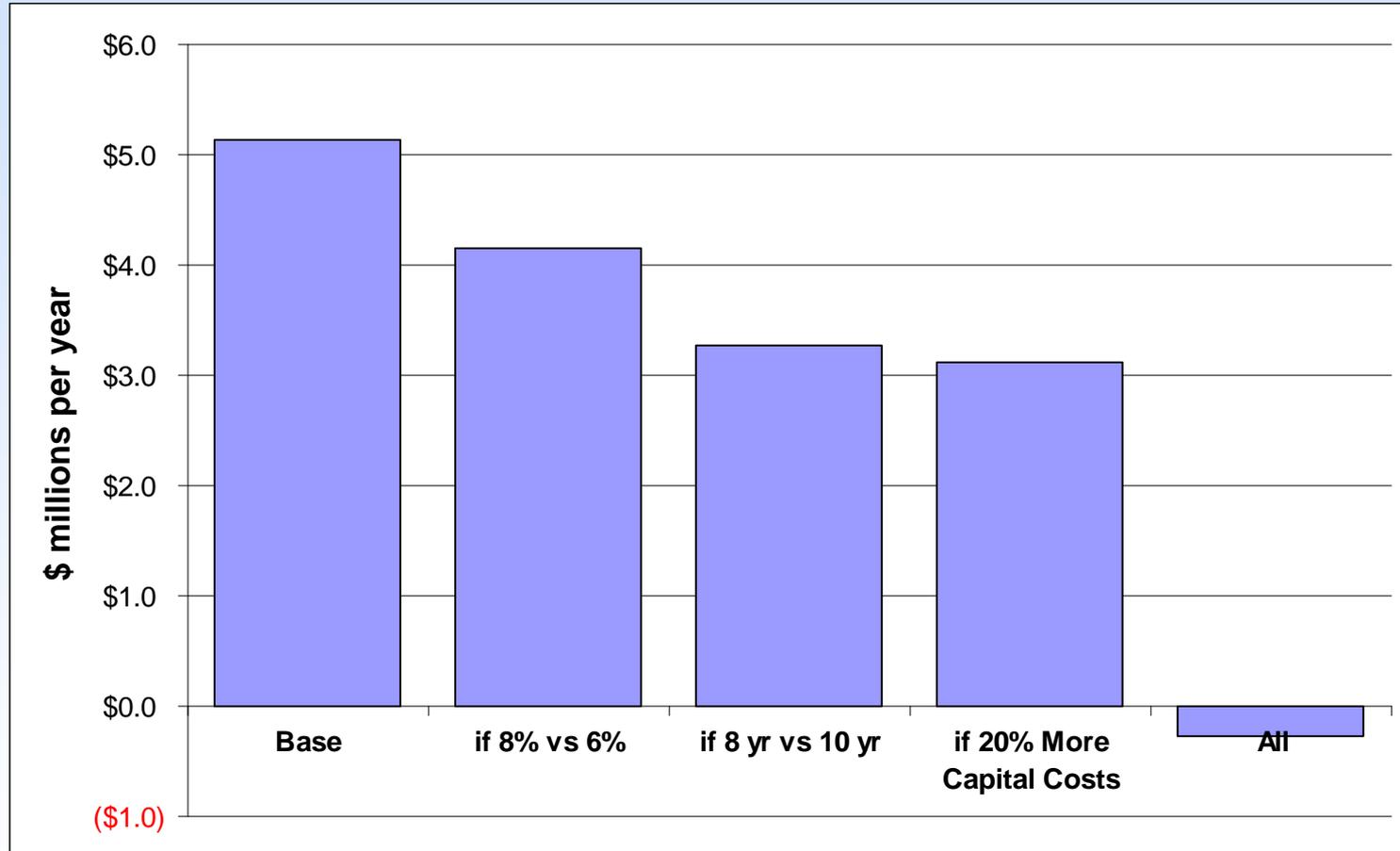
North Slope Propane vs. Fairbanks Fuel Oil

Displaced Fuel Oil Savings @ \$64 ANS

	Gallon	mmBtu
Propane into Extraction Plant	\$ 0.29	\$ 3.20
Propane in Fairbanks	\$ 1.16	\$ 12.68
Fuel Oil	\$ 2.13	\$ 15.38
Propane Savings per unit	---	\$ 2.70
Daily Saving	---	\$ 20,682
Annual Saving	---	\$ 7,548,930

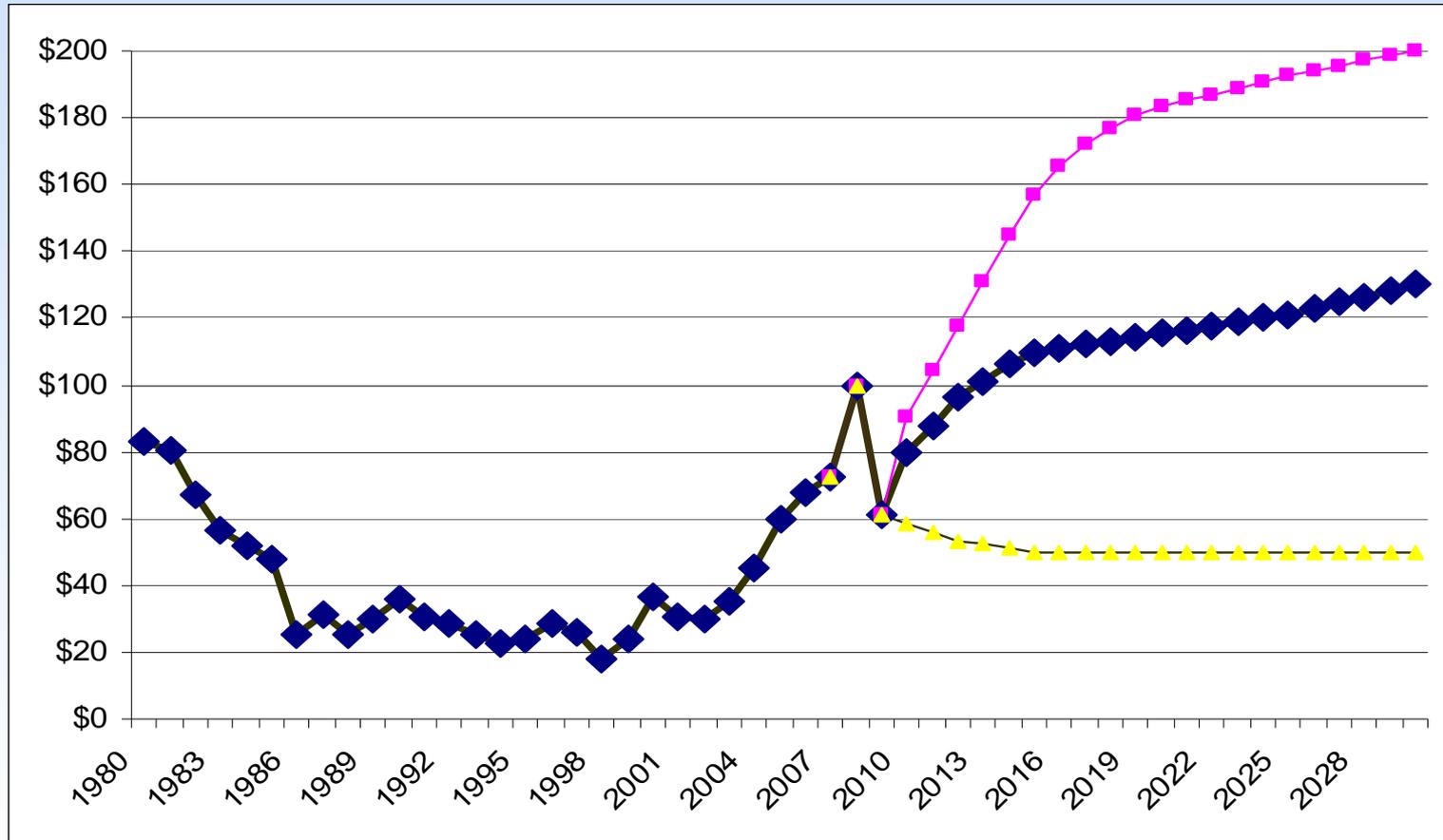
Sensitivity Analysis – Naphtha

Annual Benefits of Propane Displacing Naphtha



Sensitivity Analysis – Naphtha

Real Oil Price: History and Projection



Sensitivity Analysis – Naphtha

Break Even Oil Cost

		O&M							
		-20%	-10%	0%	10%	20%	30%	40%	50%
Capital	-20%	\$ 38	\$ 42	\$ 46	\$ 50	\$ 54	\$ 58	\$ 63	\$ 67
	-10%	\$ 41	\$ 45	\$ 49	\$ 53	\$ 57	\$ 61	\$ 65	\$ 69
	0%	\$ 43	\$ 47	\$ 51	\$ 55	\$ 59	\$ 63	\$ 68	\$ 72
	10%	\$ 46	\$ 50	\$ 54	\$ 58	\$ 62	\$ 66	\$ 70	\$ 74
	20%	\$ 48	\$ 52	\$ 56	\$ 60	\$ 64	\$ 69	\$ 73	\$ 77
	30%	\$ 51	\$ 55	\$ 59	\$ 63	\$ 67	\$ 71	\$ 75	\$ 80
	40%	\$ 53	\$ 57	\$ 61	\$ 65	\$ 70	\$ 74	\$ 78	\$ 82
	50%	\$ 56	\$ 60	\$ 64	\$ 68	\$ 72	\$ 76	\$ 81	\$ 85

Conclusions

- Uncertainty and volatility of crude price
- Propane price stability
- Propane can displace “base load” naphtha under reasonable project assumptions
- Propane inroads into the fuel oil market would increase project benefits substantially

Preliminary Economic Analysis of North Slope Propane and Review of June Alaska Propane Opportunities Conference

Nick Szymoniak
Scott Goldsmith
Institute of Social and
Economic Research

ANGDA
The North Slope Propane Opportunity
Consortium Meetings
September 24, 2009