



# DENALI COMMISSION

Commonwealth North Study Group

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The Denali Commission is an independent federal agency, created in 1998 to provide critical infrastructure improvements in rural Alaska.

## Programs

- Energy Program
- Health Facilities Program
- Transportation Program
- Training Program
- Economic Development
- Government Coordination



Denali Commission  
Federal Fiscal Year 2011  
Work Plan



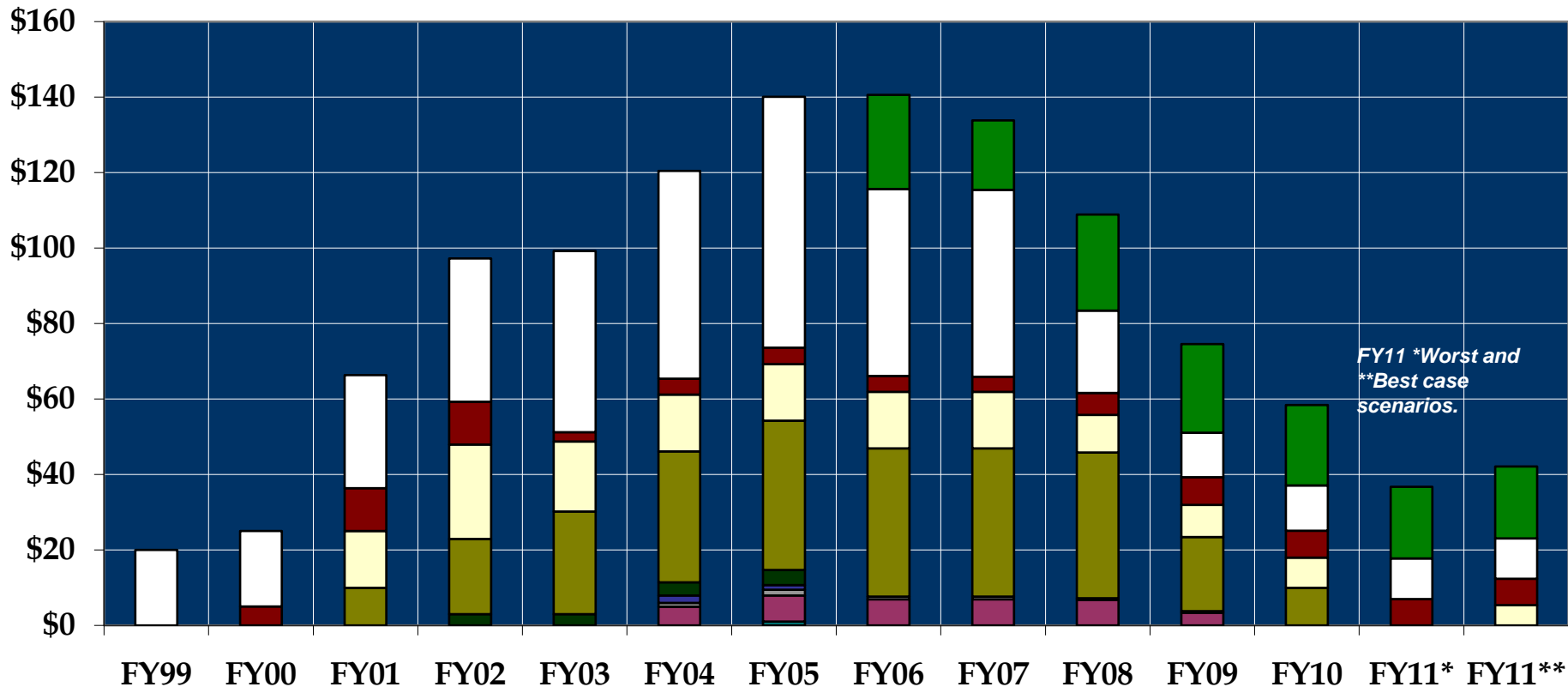
Public Comment Needed  
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[www.denali.gov](http://www.denali.gov)

*We welcome your input.*



### Denali Commission Funding Sources FY99 - FY11

(in millions)



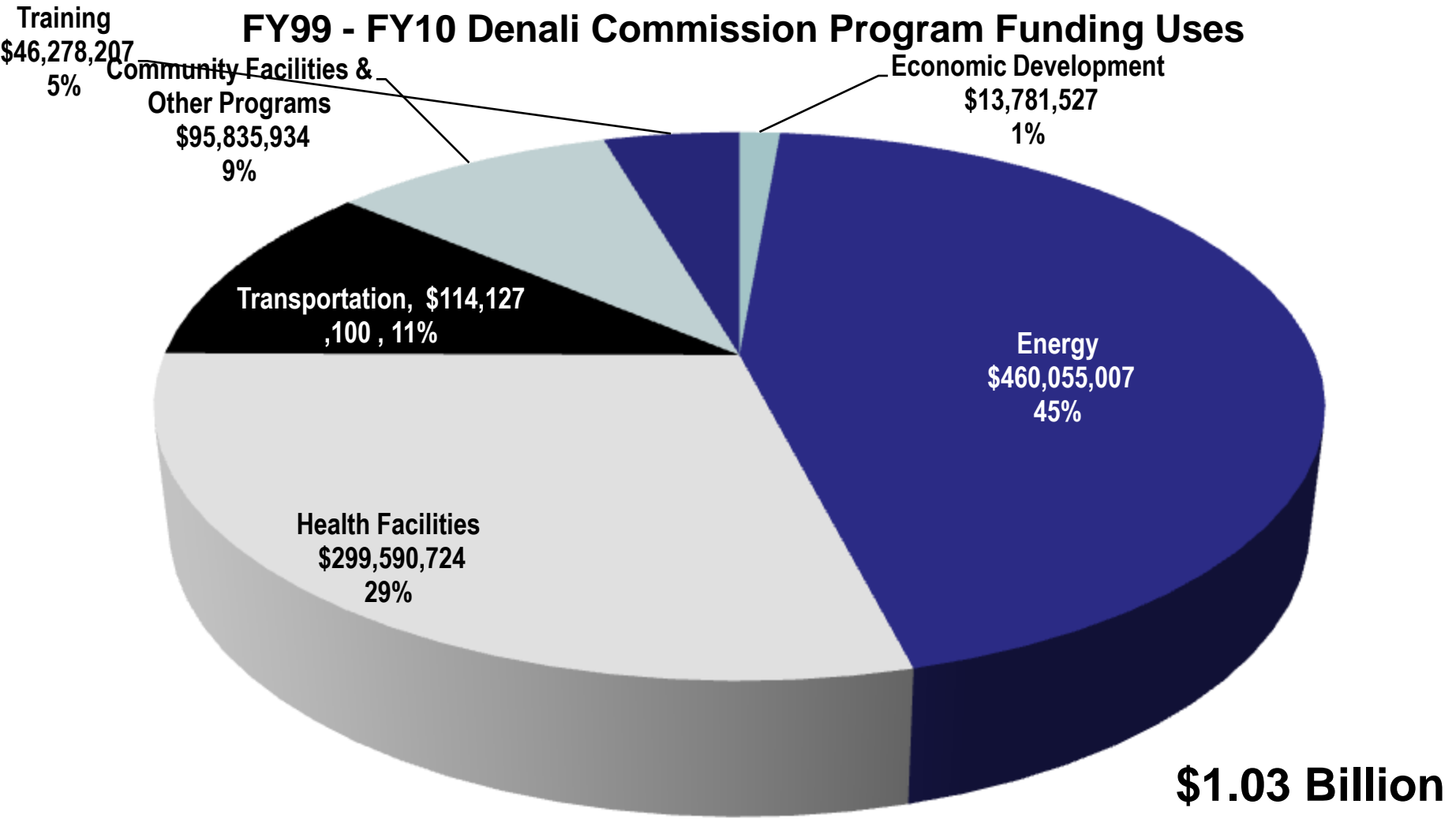
FY11 \*Worst and \*\*Best case scenarios.

- Department of Transportation (FTA & FHWA)
- Energy & Water Appropriation
- Trans-Alaska Pipeline Liability Fund
- USDA Rural Utilities Service
- Health & Human Services
- Environmental Protection Agency
- Housing & Urban Development
- USDA Solid Waste
- Department of Labor
- Department of the Interior





### FY99 - FY10 Denali Commission Program Funding Uses



# Energy Program

## Types of projects funded:

- Bulk Fuel Storage
- Rural Power System Upgrades (RPSU)
- Distribution/Interties
- Energy Cost Reduction Projects
- Renewable, Alternative and Emerging Energy Technologies



Pilot Point RPSU

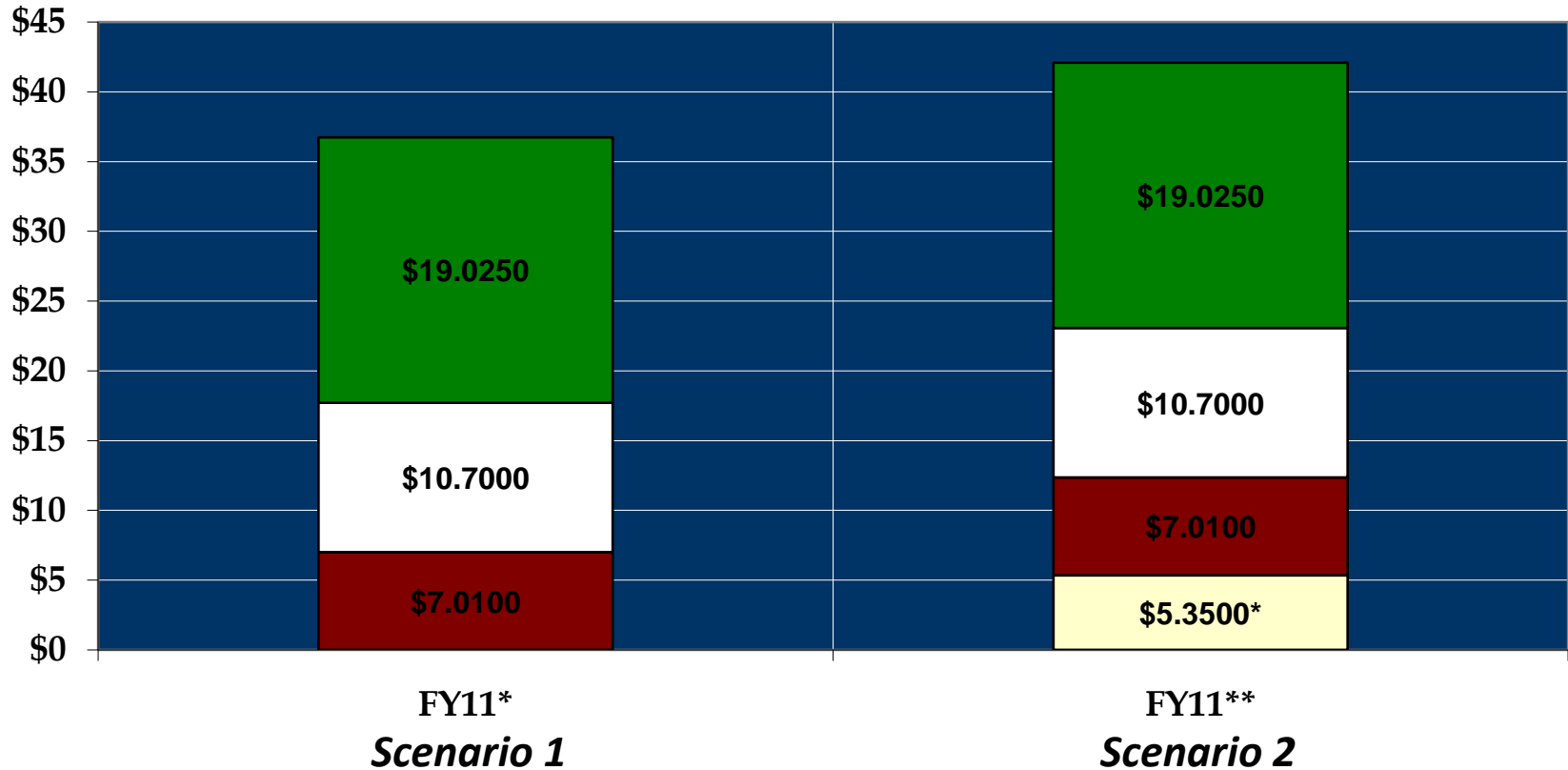


Buckland Bulk Fuel



### Denali Commission Funding Sources FY11

(in millions)



■ Department of Transportation (FTA & FHWA)

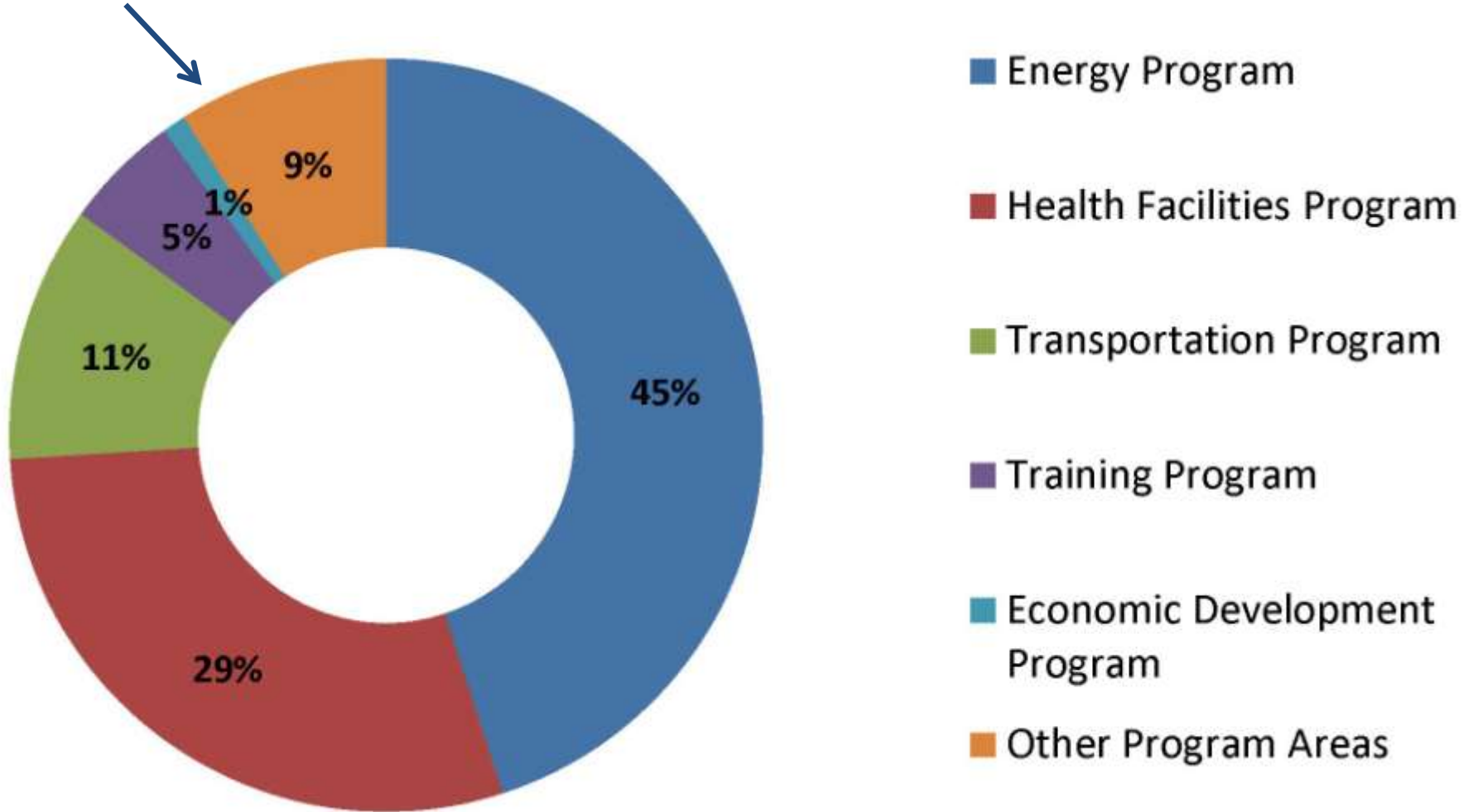
□ Energy & Water Appropriation

■ Trans-Alaska Pipeline Liability Fund

□ USDA Rural Utilities Service



**Historical Funding Levels**      **Historical Program Funding = \$1.03 billion.**

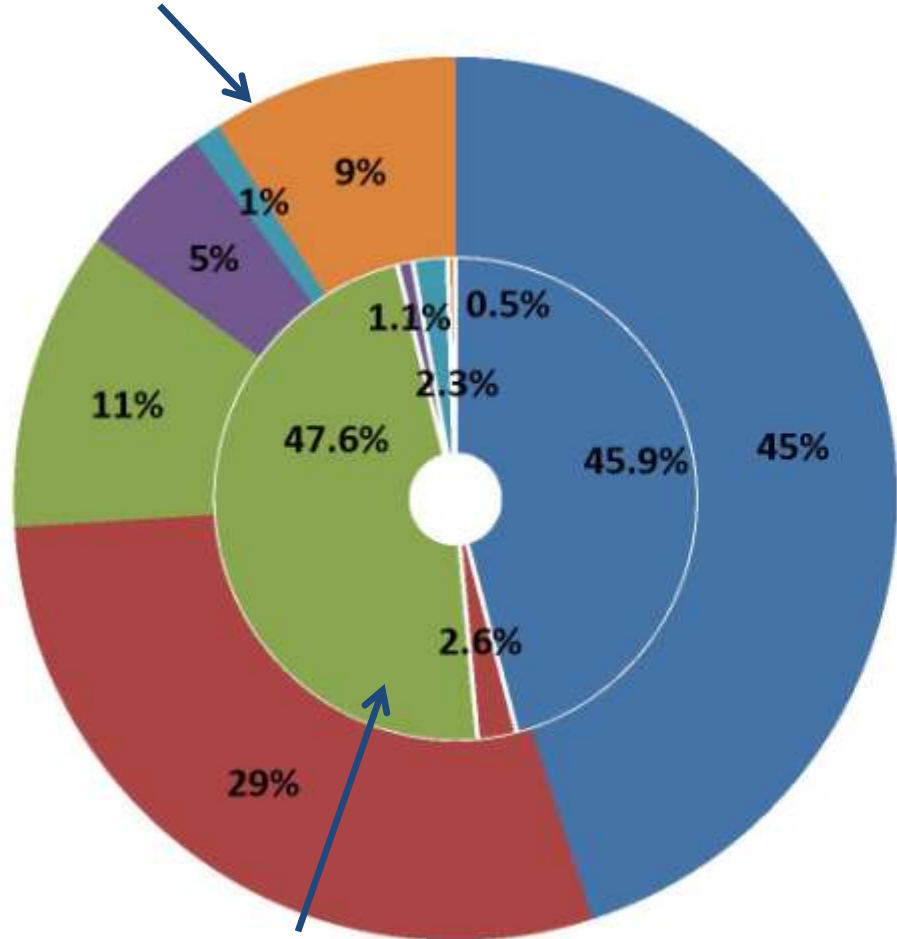






Historical Funding and FY11 Funding by Program.

*Historical Funding Levels*

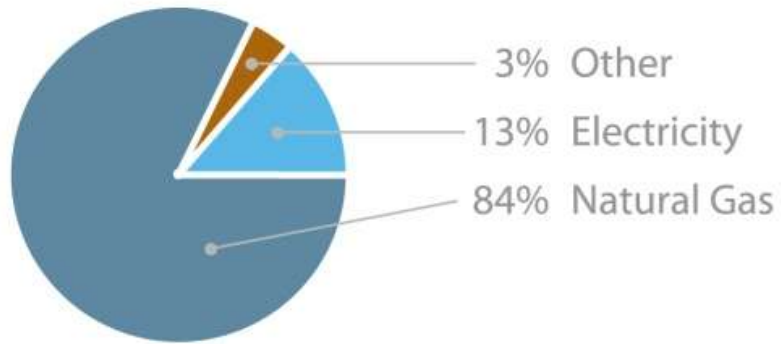


- Energy Program
- Health Facilities Program
- Transportation Program
- Training Program
- Economic Development Program
- Other Program Areas

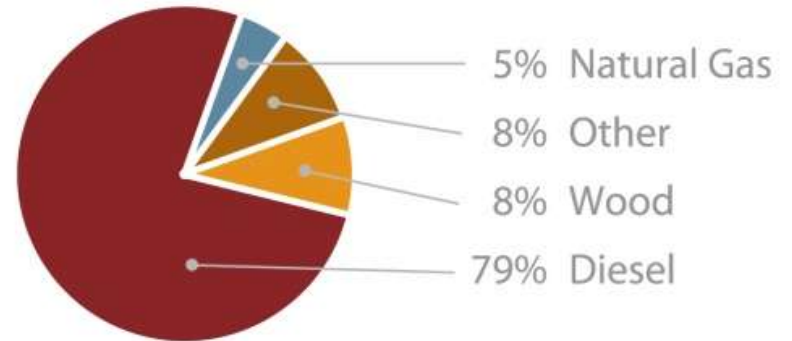
*FY11 Funding Levels*



## How Alaska Households Heat Their Homes Using Various Energy Sources



Anchorage



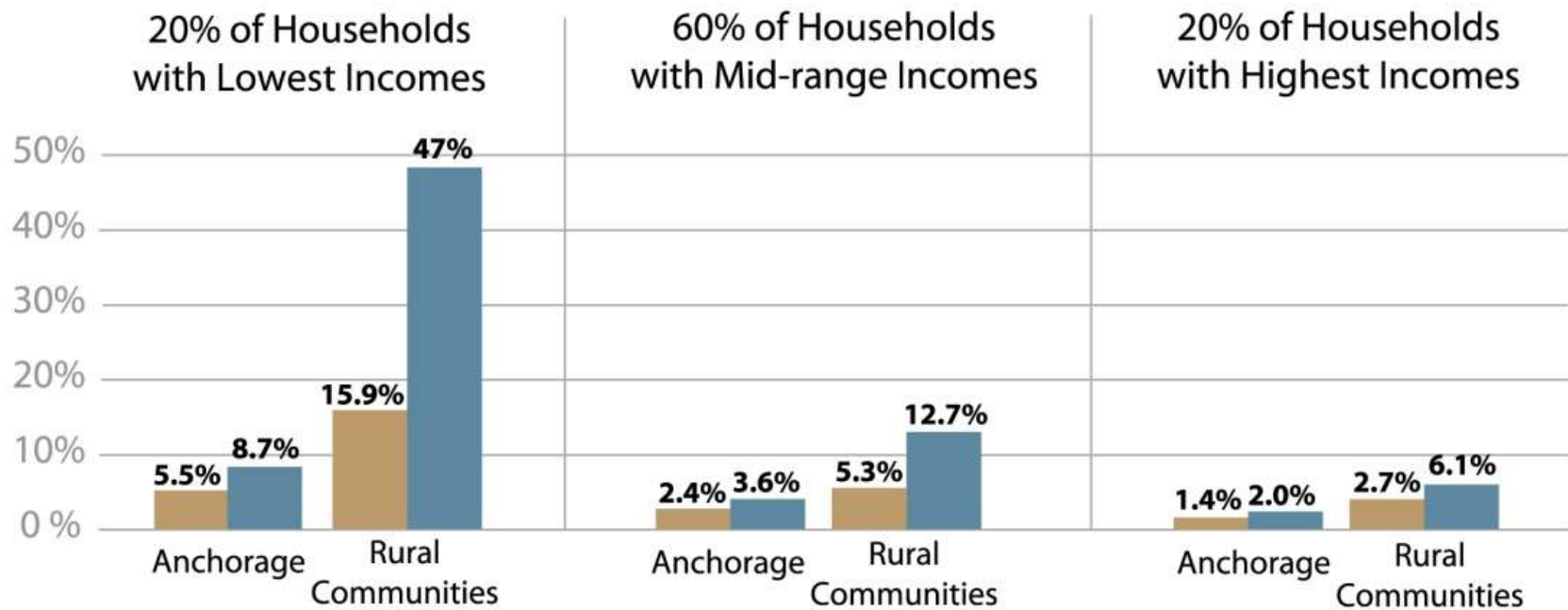
Rural Communities

Source: *Estimated Household Costs for Home Energy Use, May 2008* a report by ISER



## Estimated Median Share of Income Alaska Households Spend for Home Energy Use

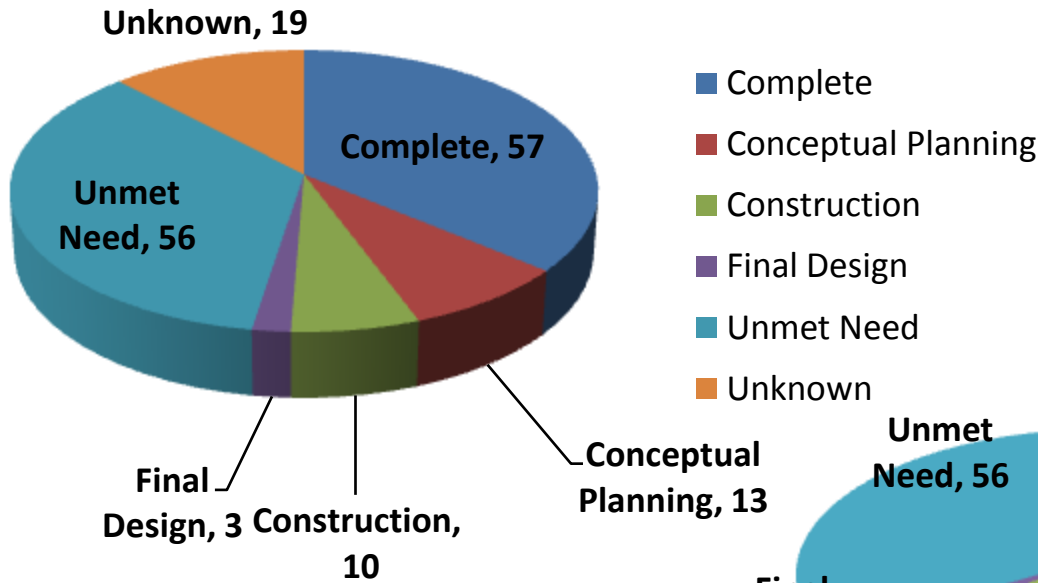
■ 2000 ■ 2008



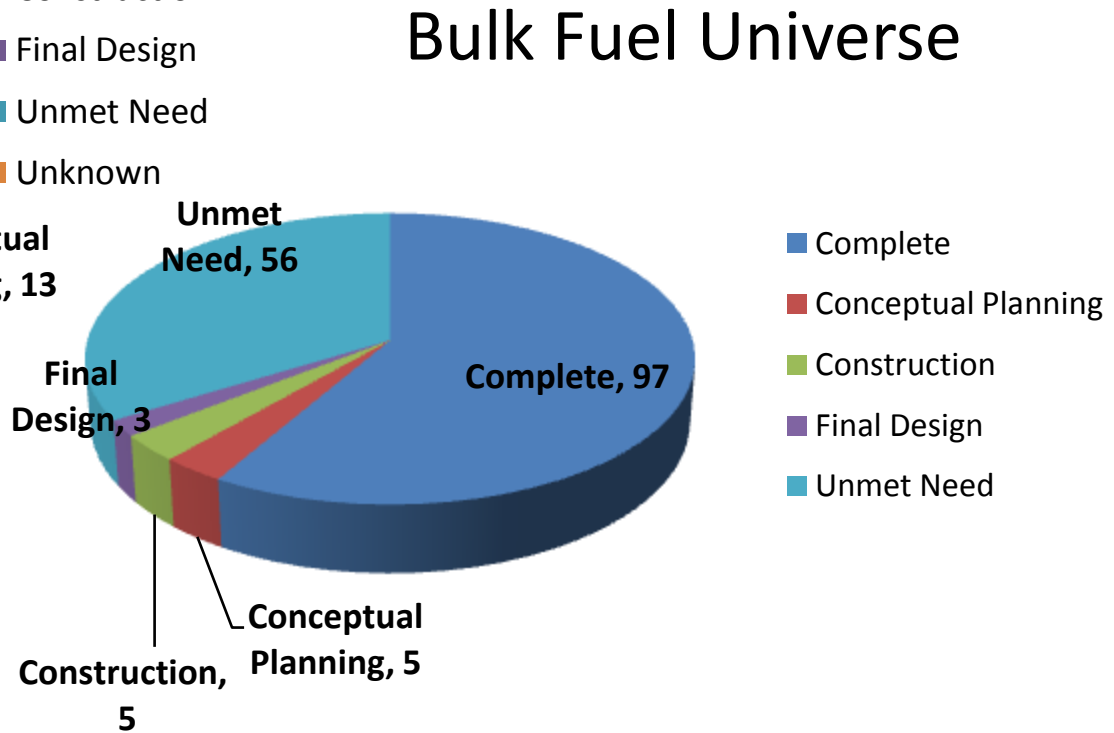
Source: *Estimated Household Costs for Home Energy Use, May 2008* a report by ISER



# Universe of Need



RPSU Universe



Bulk Fuel Universe

# Alternative and Renewable Energy

- Wind-diesel
- Hydroelectric
- Hydrokinetic
- Woody Biomass
- Heat Pump
- Heat Recovery



Toksook Bay

Eagle



## Emerging Technologies

- Seawater Heat Pump
- Psychrophiles for Generating Heating Gas
- Feasibility of Solar Hot Water Systems
- Flow Battery Energy Storage Systems
- Diesel-Off High Penetration Wind System
- Commercial Scale Wood Pellet Fired Boiler
- Organic Rankine Cycle Heat Recovery System
- High Penetration Hybrid Power System
- High Voltage Direct Current
- Hydrokinetic Turbine

## Solar Hot Water Heating System

- Assess the feasibility of solar hot water heating systems and air source heat pumps.
- If the technology proves feasible, above the Arctic Circle, these systems will be installed in elder homes throughout the region and serve as a model for alternative methods to heat homes without the use of fossil fuels.





## Battery Energy Storage

- Procure, install, and demonstrate three different energy storage systems in a medium, soon to be high, penetration wind-diesel system.



## Commercial Scale Wood Pellet Fired Boiler

- Wood pellet fired boiler as a signature project designed to demonstrate that wood heat can be cost effective and feasible for large commercial, industrial, and municipal buildings.



Burn Chamber



Wood Pellet Boiler





# Inverter Evaluation for Diesel-Off Operation in Wind-Diesel Systems

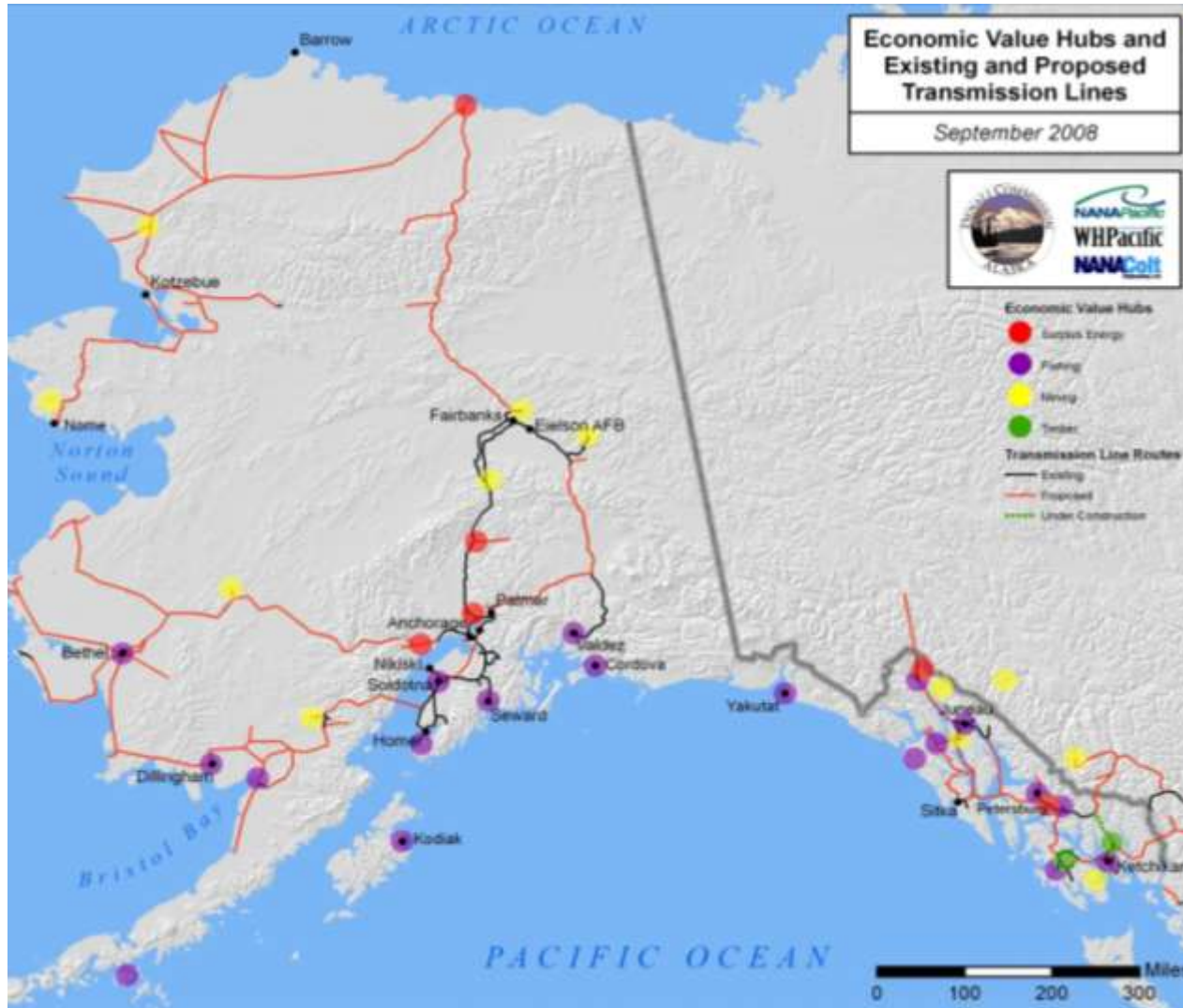
- Analyze state of the art inverters and test the ability of the Northwind 100 inverter to control the system in a diesel-off mode.







# Statewide Intertie





# Policy Questions

- Sustainability of Rural Infrastructure
- Phase II Intertie Study
- Reliance on Diesel
- Remaining Rural Energy Infrastructure
- Emerging Technology Focus
- Regional Planning/Technical Assistance



# Questions and Comments

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