

The Energy Utility of the Future:

How Long Can

“The Heaviness of Existing Reality”

Hold Off

“The Promise of Distributed Generation” ?

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“Heaviness” of Existing (Utility) Reality

- Central-Station Generation
- Bottle-neck Transmission
- Monopoly Distribution System
- Aggregated marketing, billing, service.
- 33 Year Avg. Asset Lives, 3% Depreciation
- A Decade of Low/Flat/Declining Demand
- Extreme Fear of Stranded Costs and Revenue Erosion

Status Quo Has Three Huge Supports

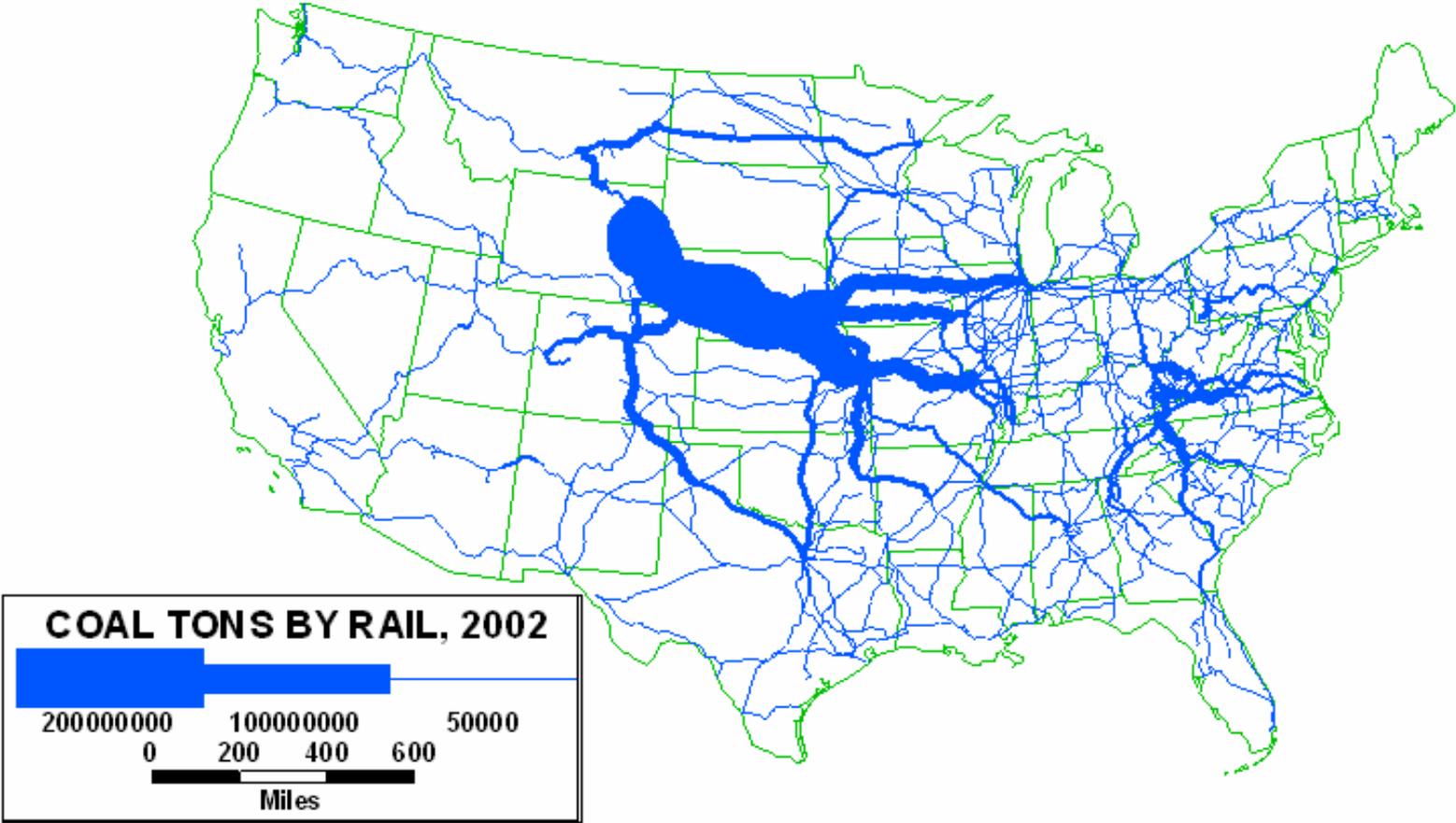
Extraordinary Regulatory System with Franchise and Eminent Domain

Extraordinary Financing System Provides Tens Of Billion \$ To Central-Station Plants and Wires at Half the Capital Cost of Venture Capital Technology Start Ups – often under 10% per year.

Extraordinary Physical Infrastructure Supports Bringing Fuel to Central-Station Power Plants

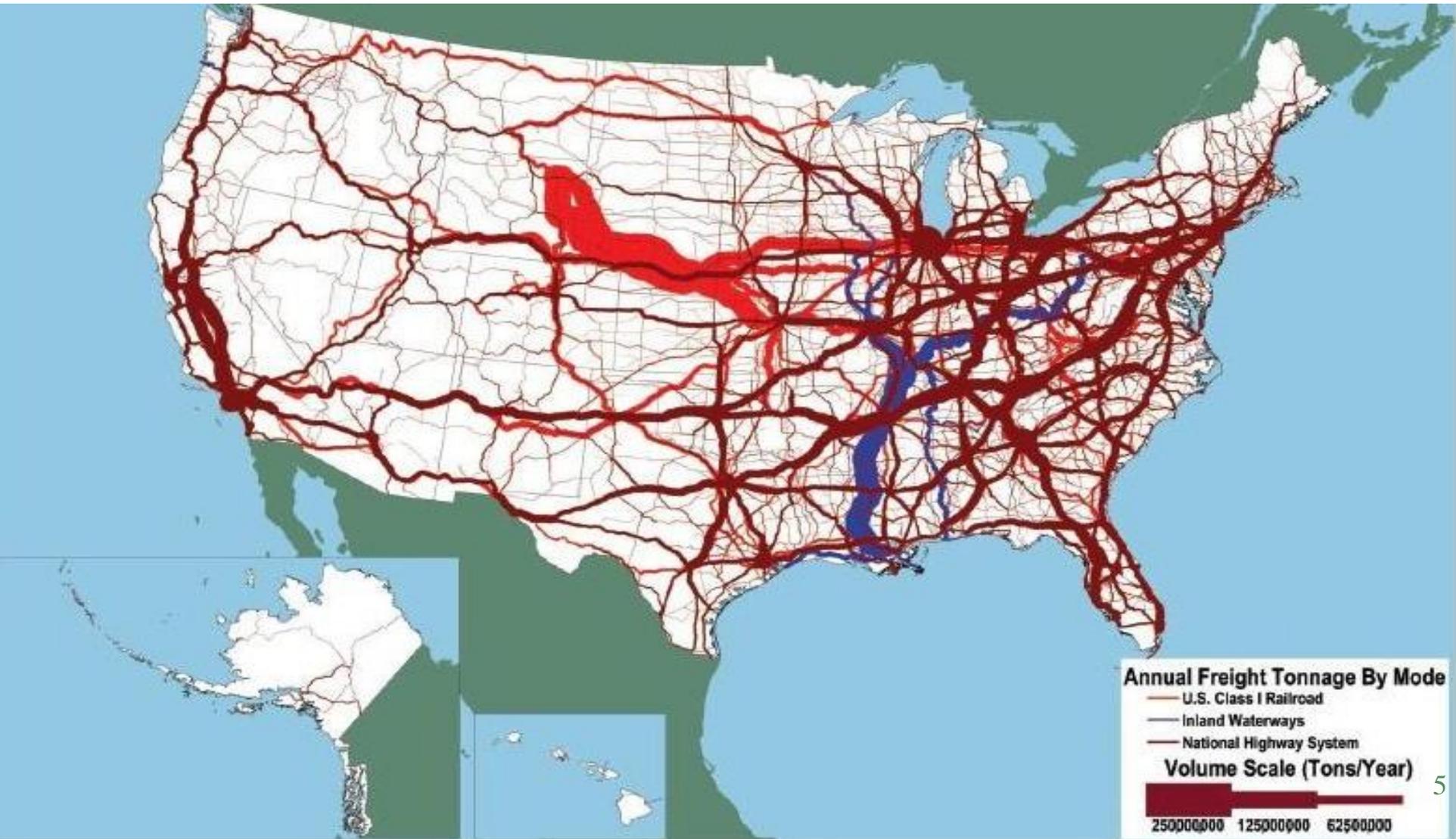
(Next Two Slides Show This for Coal, similar is true for Natural gas and petroleum)

Coal Transportation by Rail



From Jeane Fox, President & Staff NJ BPU. Source: National Research Council of the National Academies, Committee on Coal Research, Technology, and Resource Assessments to Inform Energy Policy, "Coal Research and Development to Inform National Energy Policy," June 2007

Coal for Power, Largest User of Freight Tonnage



Sources: Highways: U.S. Department of Transportation, Federal Highway Administration, Freight Analysis Framework, Version 2.2, 2007. Rail: Based on Surface Transportation Board, Annual Carload Waybill Sample and rail freight flow assignments done by Oak Ridge National Laboratory. Inland Waterways: U.S. Army Corps of Engineers (USACE), Annual Vessel Operating Activity and Lock Performance Monitoring System data, as processed for USACE by the Tennessee Valley Authority; and USACE Institute for Water Resources, Waterborne Foreign Trade Data, Water flow assignments done by Oak Ridge National Laboratory.

How Is Utility of Today Doing With Those Supports ?

- The Trilemma Score Card:
 - Operational Reliability
 - Financial Affordability
 - Environmental Sustainability

Grading – The Trilemma

Operational Reliability

A -/ B+

8766 hours per year, 8758 avg hours service

Financial Affordability

A-

2-4% of GDP

Environmental Sustainability

F

Conventional Pollutants C- GHG--F

What's Next? DG Replacing Central-Station ?

Is There Generation that Does not Need Utilities?

The Utility Investor Fear: Stranded Costs, unrecovered investment

The Public Fear: Low Investment impairs service.

The Public Hope: Islanding Enhancing Reliability

The DG Investor Hope: Economies of Scale Fade

The Green Horizon Q: Does off-grid = low emissions

Black and White, or Spectrum of Grey?

- One Extreme: Central-Station Status Quo Beats Off Erosion of its Franchise.
- One Extreme: Revenue Erosion Tips Central-Station Utilities into Death Spiral
- Happy Answer: End-User Generation Eases Strains on Utilities
- Next Gen Answer: Utilities Become the Back-up For End-Users

Ask Our Panel This --

- Your preferences
- Your predictions
- Who just accepts the future
- Who shapes it?
- How?