



TRANSMISSION 102

LUNCH & LEARN

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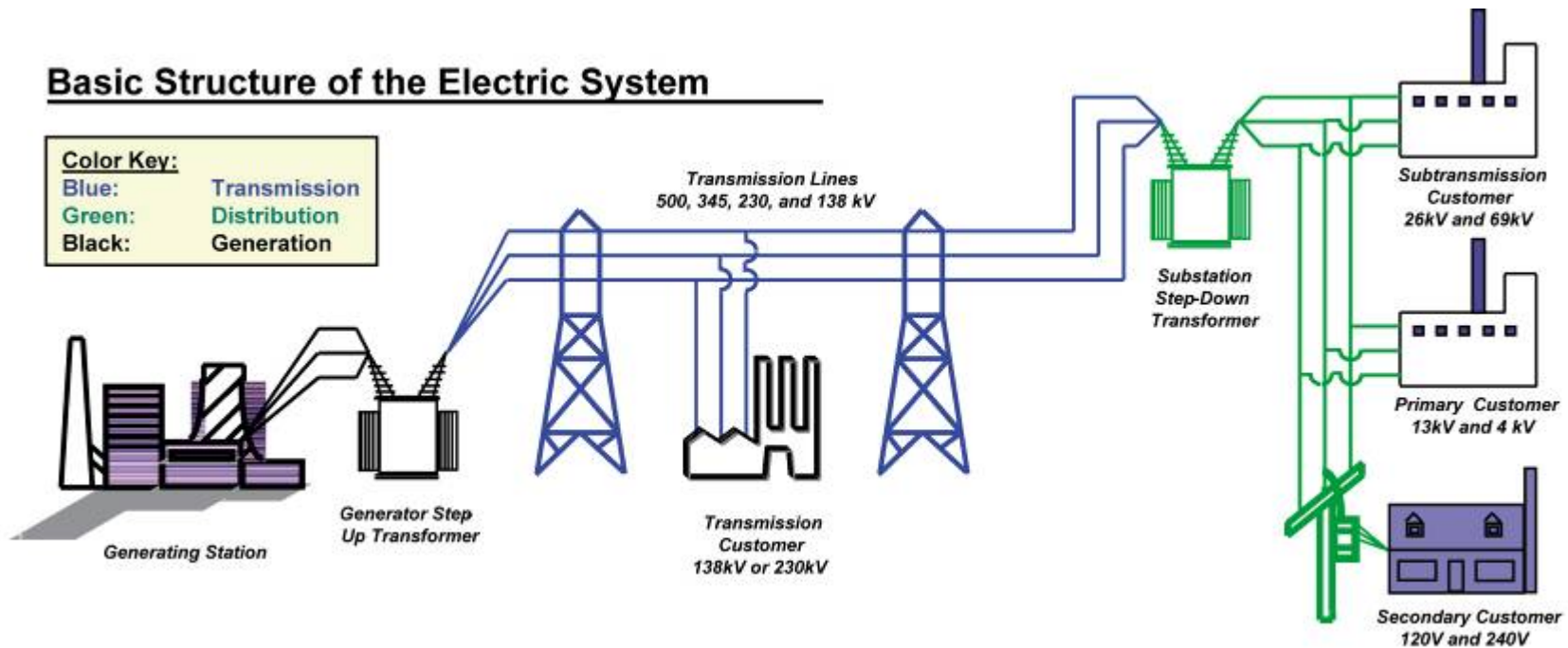


QUICK RECAP FROM
TRANSMISSION 101

COMPONENTS OF THE GRID



Basic Structure of the Electric System



Source: www.nerc.com

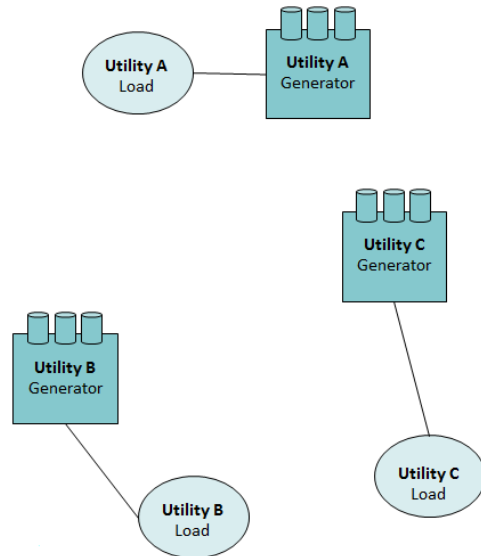
- The “grid” can be broken down into four main components: Generation, Transmission, Distribution, and Load Customers

TRANSMISSION ENABLES COST SAVINGS

BASIC ECONOMIC DISPATCH EXAMPLE



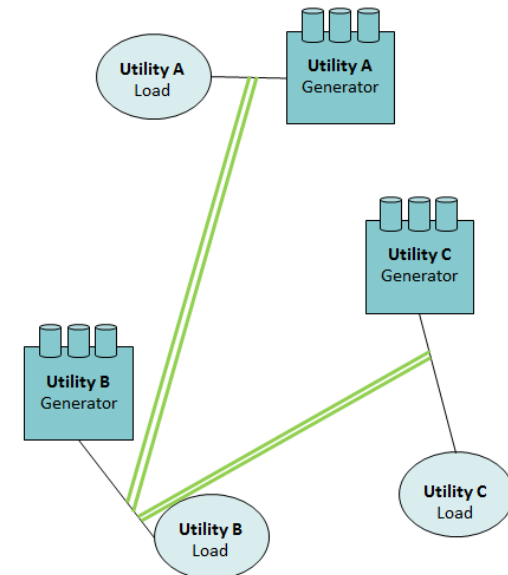
Without Economic Dispatch



	Customer Load	Generation Capacity	Dispatched Generation	\$/MW	Total \$
Utility A	20 MW	25 MW	20 MW	\$90	\$1,800
Utility B	10 MW	15 MW	10 MW	\$70	\$700
Utility C	10 MW	30 MW	10 MW	\$60	\$600
Total	40 MW	70 MW	40 MW		\$3,100

Each utility and their customers have access to only their generation

With Economic Dispatch



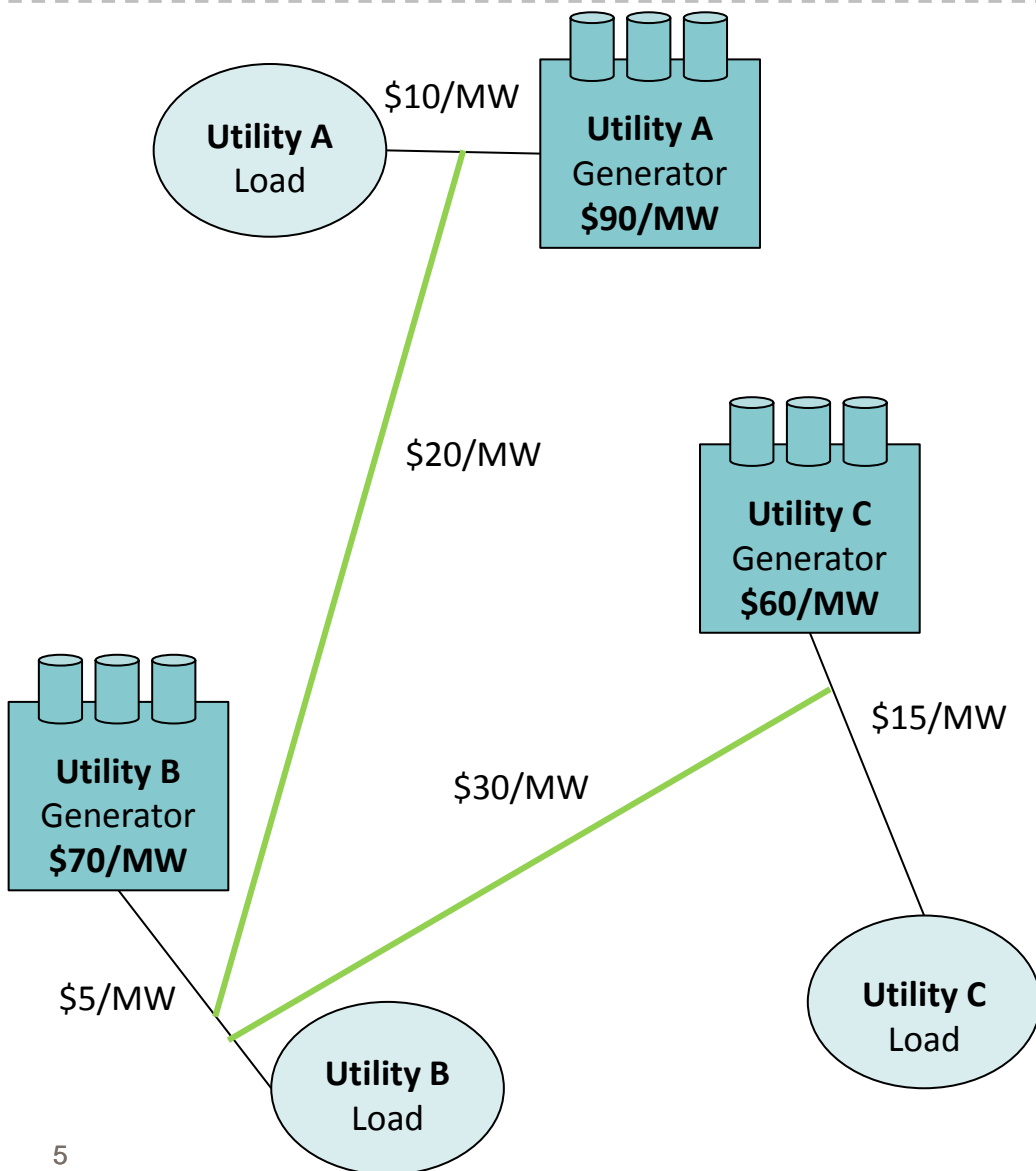
	Customer Load	Generation MW	Dispatched Generation	\$/MW	Total \$
Utility A	20 MW	25 MW		\$90	\$0
Utility B	10 MW	15 MW	10 MW	\$70	\$700
Utility C	10 MW	30 MW	30 MW	\$60	\$1,800
Total	40 MW	70 MW	40 MW		\$2,500

Each utility and their customers have access to the lowest cost generation



CURRENT RECOVERY OF TRANSMISSION COSTS IN ALASKA

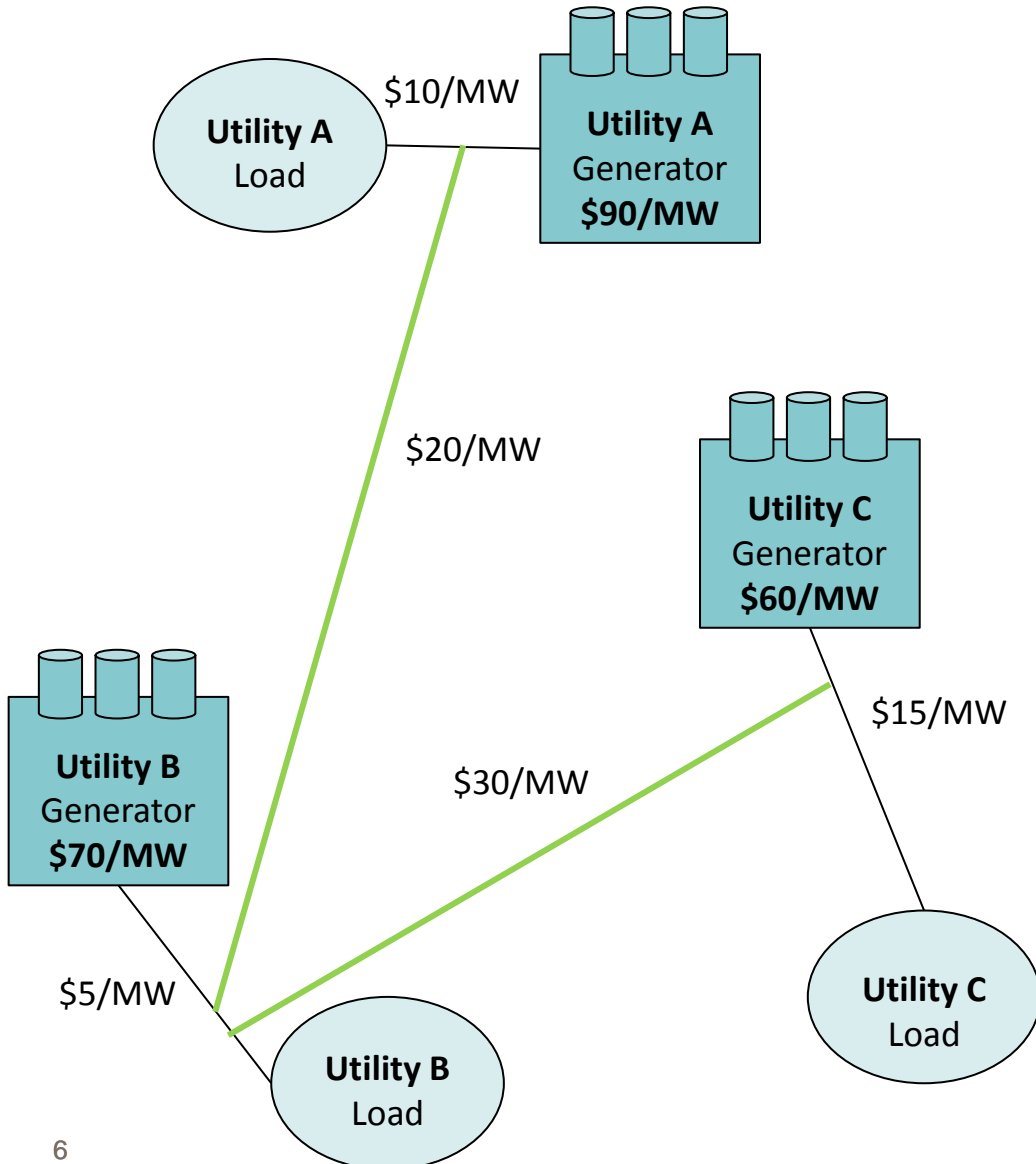
ALASKA TRANSMISSION RATES DRIVEN INDIVIDUALLY BY UTILITIES



- Each utility and state owned transmission asset has individual rates set by the Regulatory Commission of Alaska (RCA)
- Creates an environment where it is difficult to transfer energy in an economically efficient manner
- Wheeling charges (cost to move power through another utility's system) leads to rate pancaking (stacked costs)

ALASKA TRANSMISSION RATES

PANCAKE RATE EXAMPLE

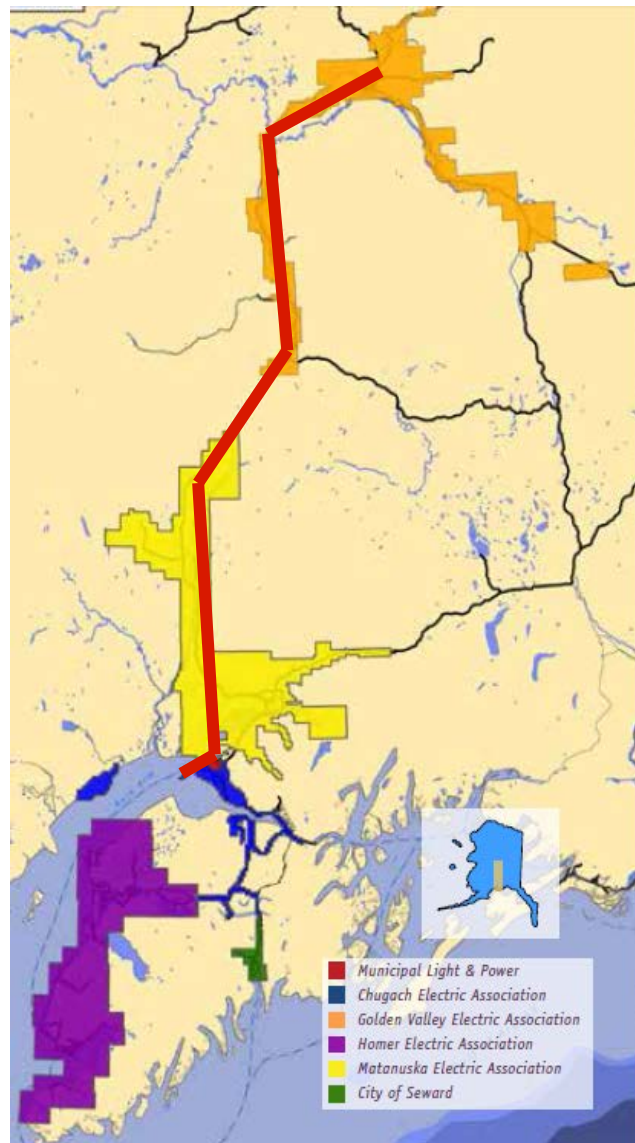


- Utility C generator wants to sell to Utility A
- Utility C generator energy cost is \$60/MW, which is desirable to Utility A
- Must deliver through multiple transmission facilities, each with their own rate
- This makes the total cost of energy \$140/MW**

	Generation Rate	Transmission Rate	Total Rate
Generator C	\$60		\$60
Utility C		\$15	\$15
Utility C-B Tie		\$30	\$30
Utility B		\$5	\$5
Utility B-A Tie		\$20	\$20
Utility A		\$10	\$10
Total	\$60	\$80	\$140

ALASKA TRANSMISSION RATES

FIRE ISLAND PANCAKE EXAMPLE



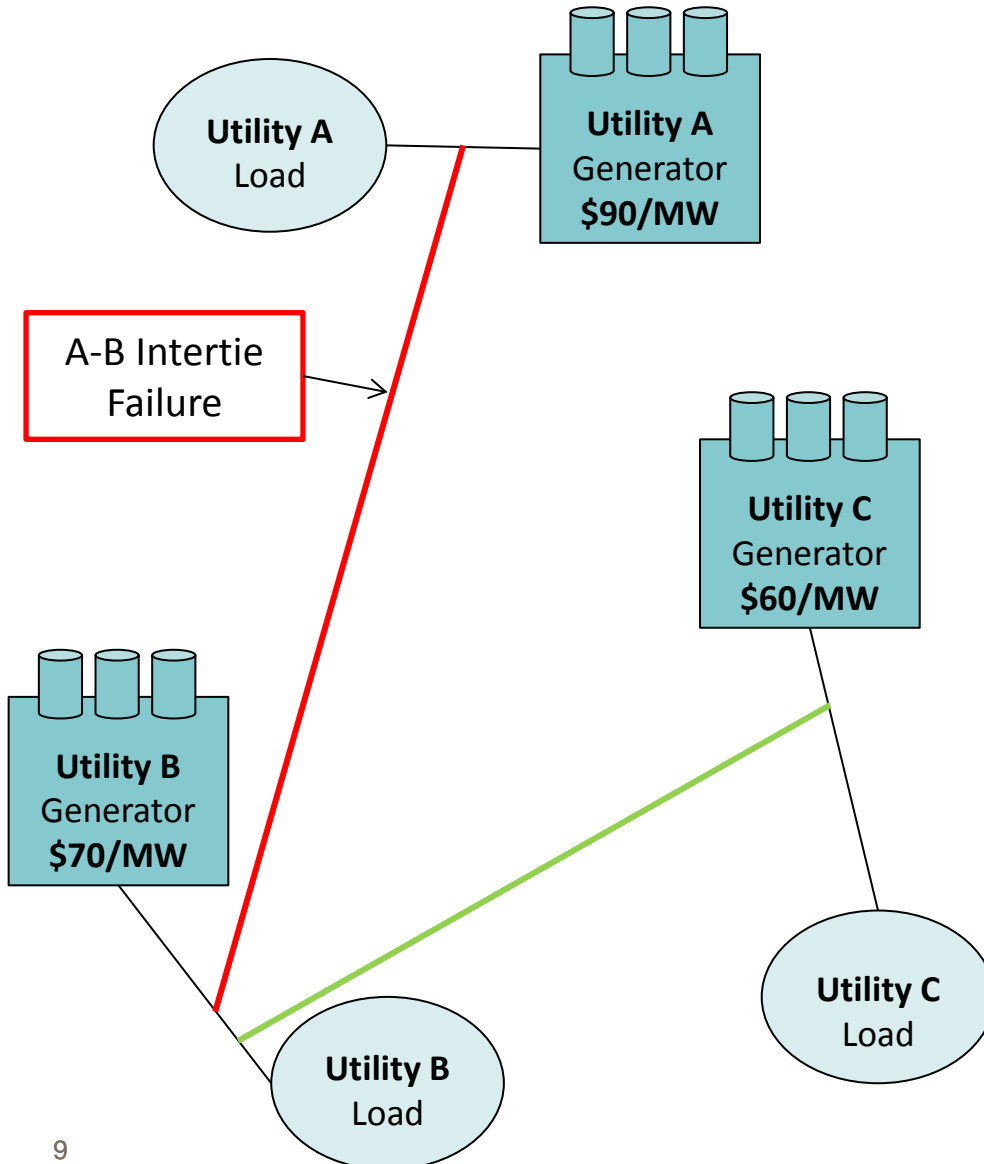
- The Railbelt region currently experiences similar pancake rate issues
- Golden Valley Electric Association was very interested in purchasing wind power from the Fire Island project, but was unable due to the high transmission rates caused by pancaking
- This rate pancaking makes it especially difficult for alternative generation to interconnect



UNLOCKING THE BENEFITS
OF TRANSMISSION FOR
ALASKA

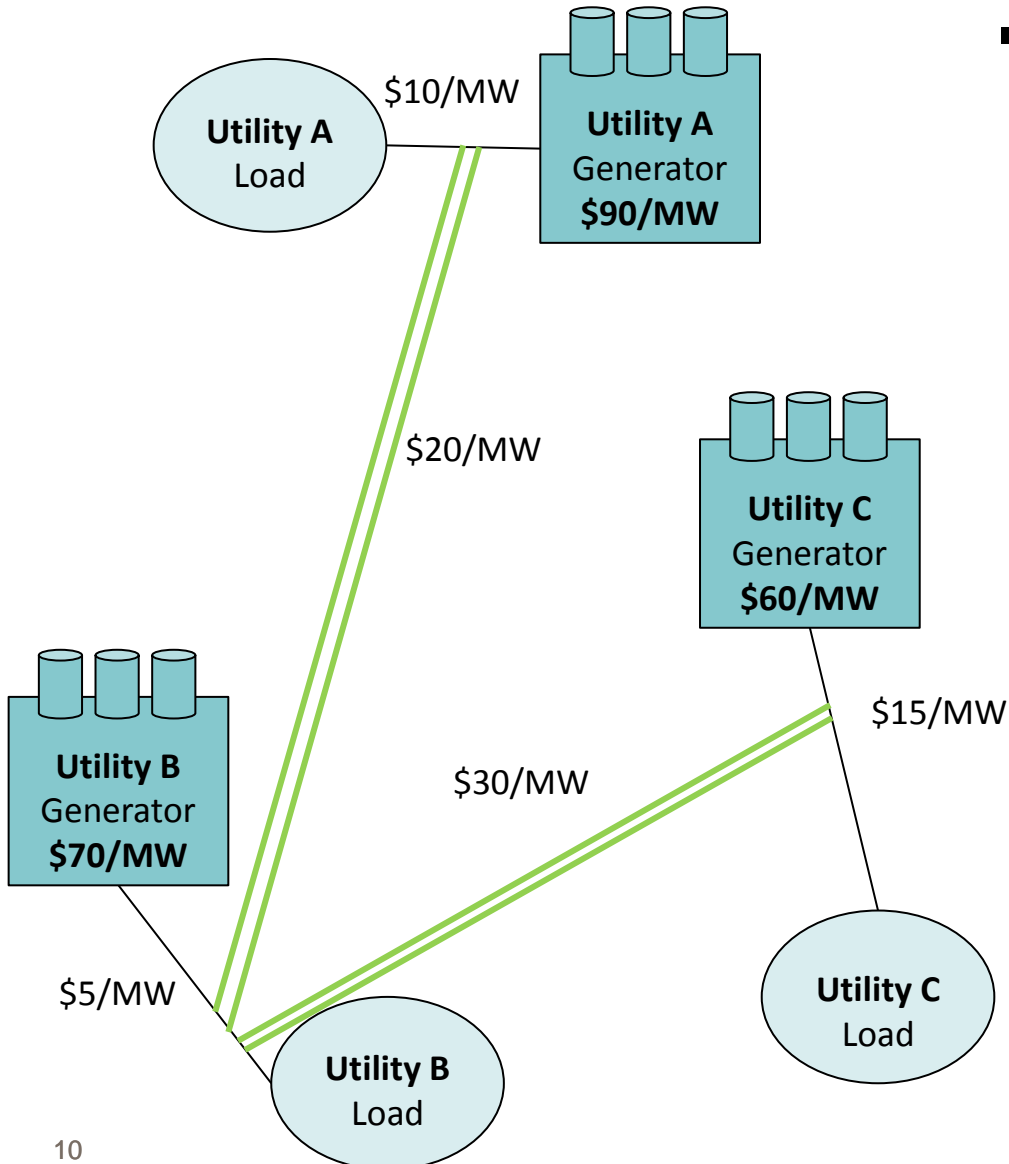
LIMITATIONS OF CURRENT SYSTEM

RESERVE GENERATION STILL REQUIRED



- Without a N-1 transmission system, utilities are required to build their own generation to meet their customer load and reserves
- In this example, Utility A would like to exclusively buy its energy from Utility C, but still needs to have its own expensive generator in the event the A-B intertie was not operational
- This creates unnecessary levels of generation investment in the region

UNIFIED TRANSMISSION FULLY UNLOCKS ECONOMIC DISPATCH



- A N-1 transmission system and unified tariff would fully unlock economic dispatch within Alaska

Example w/ Illustrative Pancake Rates

Utility C Wants to Sell to Utility A

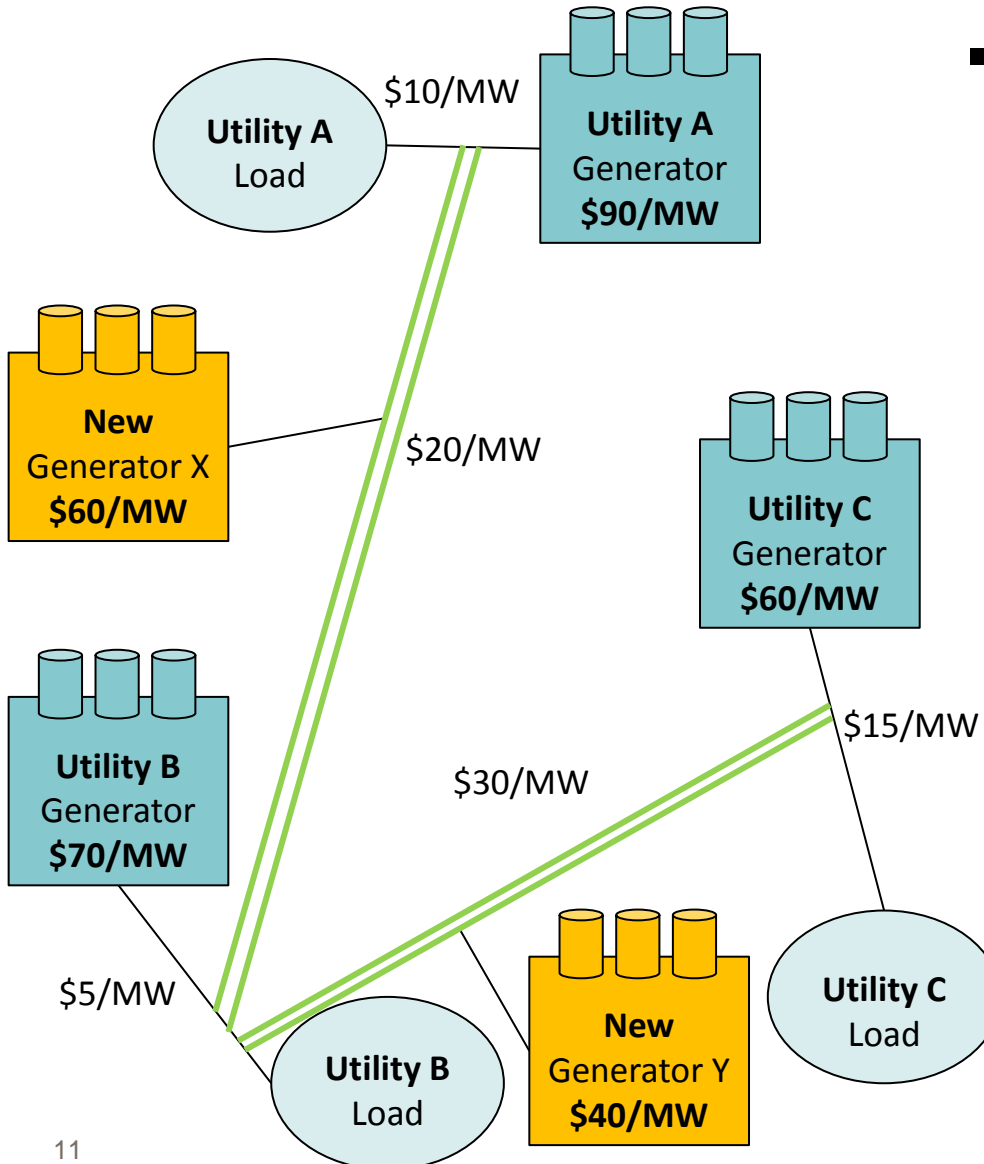
	Generation Rate	Transmission Rate	Total Rate
Generator C	\$60		\$60
Utility C		\$15	\$15
Utility C-B Tie		\$30	\$30
Utility B		\$5	\$5
Utility B-A Tie		\$20	\$20
Utility A		\$10	\$10
Total	\$60	\$80	\$140

Example w/ Illustrative Tariff

Utility C Wants to Sell to Utility A

	Generation Rate	Transmission Rate	Total Rate
Generator C	\$60		\$60
Unified Tariff		\$25	\$25
Total	\$60	\$25	\$85

BENEFITS OF UNIFIED TRANSMISSION LEVEL PLAYING FIELD FOR NEW GENERATION



- Unified tariff would eliminate the geographic constraints of pancake rates and level the playing field for new generation

Example w/ Illustrative Pancake Rates

Generator X to Utility A			Generator Y to Utility A		
Gen Rate	Pancake Trans. Rate	Total Rate	Gen Rate	Pancake Trans. Rate	Total Rate
Generator	\$60	\$60	\$40		\$40
Utility C-B Tie		\$0		\$30	\$30
Utility B		\$0		\$5	\$5
Utility B-A Tie	\$20	\$20		\$20	\$20
Utility A	\$10	\$10		\$10	\$10
Total	\$60	\$90	\$40	\$65	\$105

Example w/ Illustrative Tariff

Generator X to Utility A			Generator Y to Utility A		
Gen Rate	Tariff	Total Rate	Gen Rate	Tariff	Total Rate
Generator	\$60	\$60	\$40		\$40
Unified Tariff	\$25	\$25		\$25	\$25
Total	\$60	\$85	\$40	\$25	\$65

BENEFITS OF UNIFIED TRANSMISSION

CO-OP BENEFITS

A large, solid green arrow points downwards from the top left towards the bottom center of the slide. Inside the arrow, the text 'Lower Electricity Costs to Co-Ops & their Members' is written in white, bold, sans-serif font.

**Lower
Electricity
Costs to Co-
Ops & their
Members**

- With a reliable transmission system Alaska could use firm contracts to replace duplicative generation
- Transmission could also be used to reduce spinning reserves, which would lower operational costs



IMPROVED
ENVIRONMENT FOR
ECONOMIC
DEVELOPMENT

BENEFITS OF UNIFIED TRANSMISSION BUSINESS DEVELOPMENT



- Development areas are not geographically limited due to lack of local generation resources
- Large loads can be served more effectively (mining, gas, oil, etc.)
- Allows Alaska to process and manufacture resources within the state (vs. exporting natural resources to areas with lower cost or more reliable electricity)



THANK YOU

