

2012 Heating the Midwest Conference and Expo
April 26, 2012



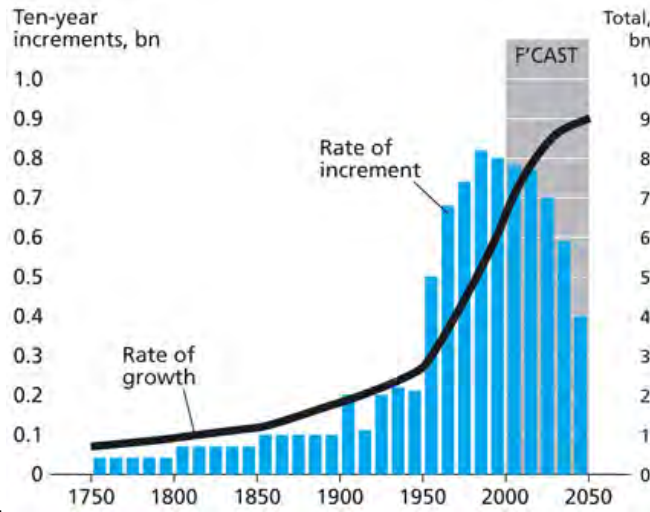
DISTRICT ENERGY
ST. PAUL™

*Setting a Big Vision
for Regional Biomass Heating Systems*

*Drivers of the Current
Energy System*



Global Population Growth



Source: UN

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PRESS RELEASE

March 26, 2012, 9:00 a.m. EDT

Growth in Urban Population Outpaces Rest of Nation, Census Bureau Reports



WASHINGTON, March 26, 2012 /PRNewswire via COMTEX/ – The nation's urban population increased by 12.1 percent from 2000 to 2010, outpacing the nation's overall growth rate of 9.7 percent for the same period, according to the U.S. Census Bureau. The Census Bureau released the new list of urban areas today based on 2010 Census results.



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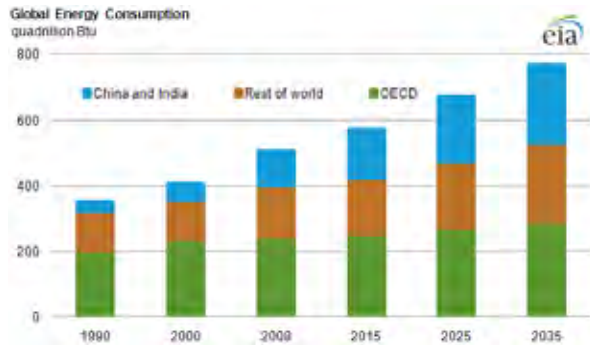
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Projected Global Energy Demand



Global energy demand is projected to nearly double between 2000 and 2035

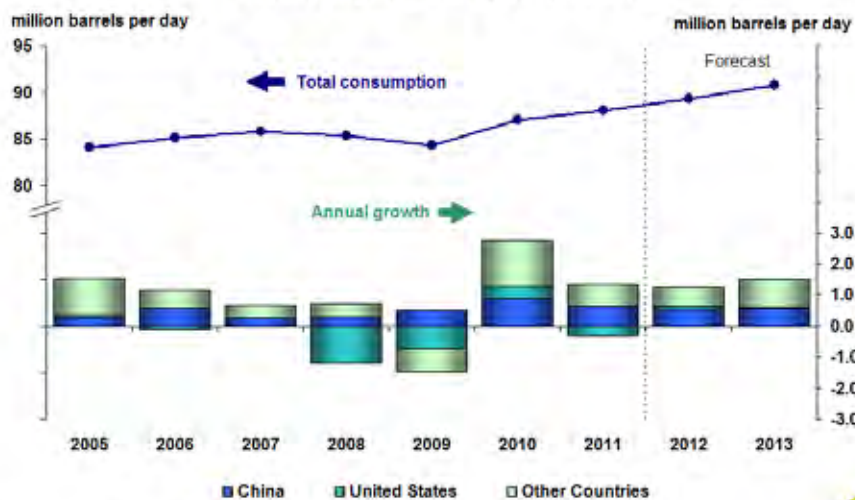


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World Liquid Fuels Consumption



Source: Short-Term Energy Outlook, January 2012

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Imagine a World Without Oil

Time Left With Current Reserves At Current Consumption



41
Years

Source: EIA, University of MN
http://www.environment.umn.edu/momentum/issue/3.3f11/feature_worldwithoutoil.html

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Figure 5. Average annual world oil prices in three cases, 1980-2035 (real 2010 dollars per barrel)



Source: EIA Energy Outlook 2012

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Global Natural Gas Trends

Trends in natural gas spot prices at major global markets
U.S. dollars per million British thermal units (MMBtu)



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U.S. OKs Sabine Pass natural gas export plant

CNNMoney

comments

By Steve Margolis @CNNMoney April 18, 2012 11:20 AM ET

Recommend 137 Tweet 1 Share 1



Cheniere Energy has received government approval to build the first natural gas export facility in the lower 48 states. Critics fear fracking fallout and price spikes.

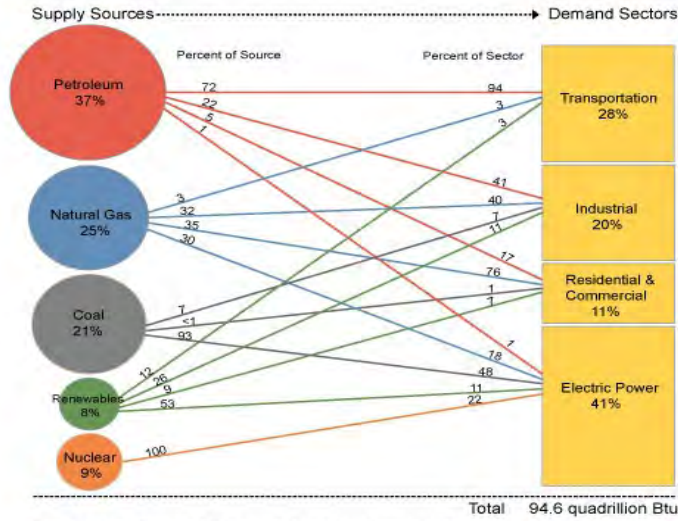
“Natural gas can command five times the U.S. price in Asia or Europe.”

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U.S. Energy Sources & Demand Sectors



Source: Energy Information Administration, Annual Energy Review 2009

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Biomass is an age-old energy resource...



...with a renewed interest today.

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Woody Biomass – A Fuel Source for Schools and Communities



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Opportunity: Integrated Energy Systems

“If the heating, cooling and electricity needs of a larger collection of buildings can be linked together in an integrated system without major distribution losses, then significant savings in primary energy use are possible – beyond what can be achieved by optimizing the design of a single building. Community-scale energy systems also offer significant new opportunities for the use of renewable energy.”

Intergovernmental Panel on Climate Change

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Saint Paul's Integrated Energy System

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Saint Paul's Community Energy System

- Serving **Saint Paul** customers since 1983
- **North America's** largest hot water district energy system
- **Minnesota's** leading biomass, renewable energy system
- **A model** for integration of renewable energy, combined heat and power and a district energy system



Biomass Fired CHP in Downtown Saint Paul

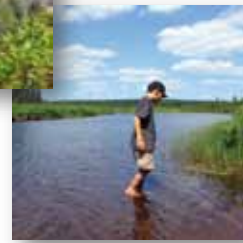
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Our Mission

“Be the preferred provider of community energy services that benefit our customers, the community and the environment.”

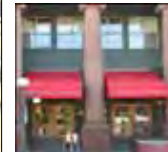


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Heating and Cooling Saint Paul

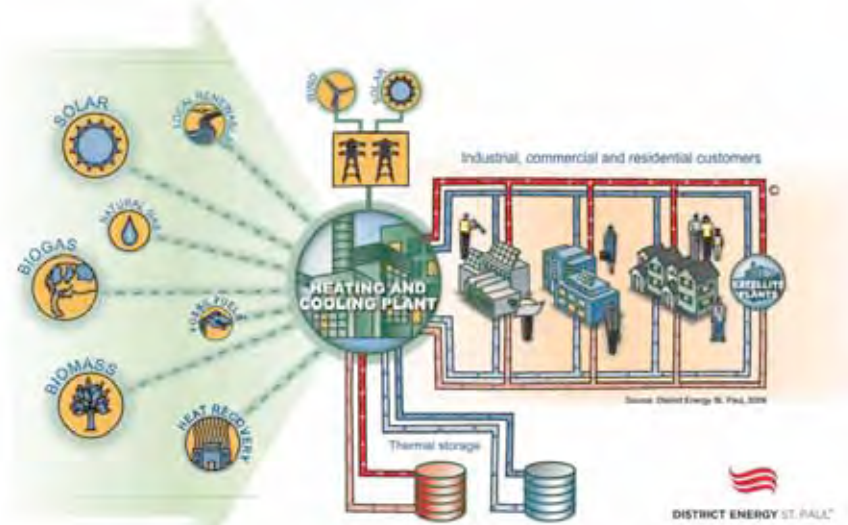


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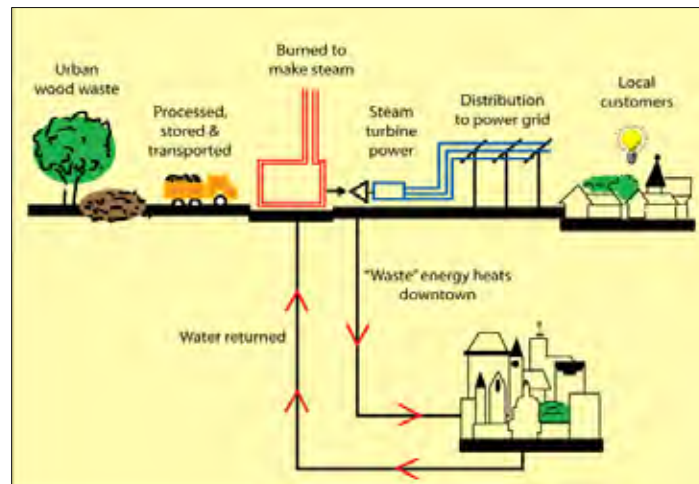
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Community Integrated Energy System



Integration of Biomass-Fueled CHP



St. Paul Cogeneration – Combined Heat & Power



- 25 MW of electricity
- Renewable, clean, urban wood residue
- Greenhouse gas CO₂ reduced up to 280,000 tons per year

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Integration of Biomass



- Up to 300,000 tons/year
- Clean wood waste diverted from landfills
- Created new industry for collecting and processing wood
- Up to \$12 million annually put into local economy

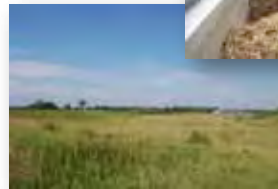
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Biomass – Where does it come from?

- Wood residuals from manufacturing processes
- Construction waste/clean dimensional lumber
- Urban and park tree trimmings
- Storm and disease damaged trees
- Trees removed as part of a timber management plan/restoration



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Solar Thermal Startup - 2011

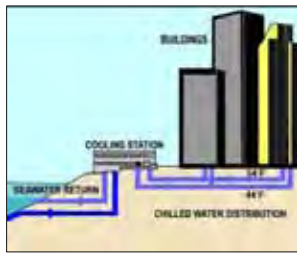
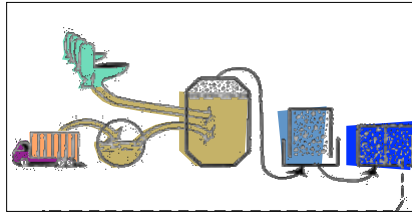


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Community Infrastructure Enables Integration of Diverse Local Energy Sources

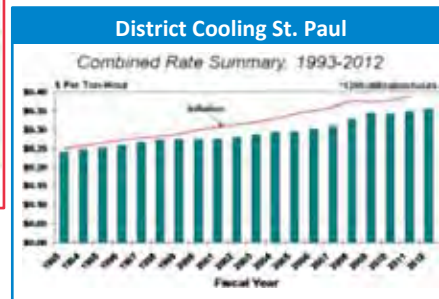
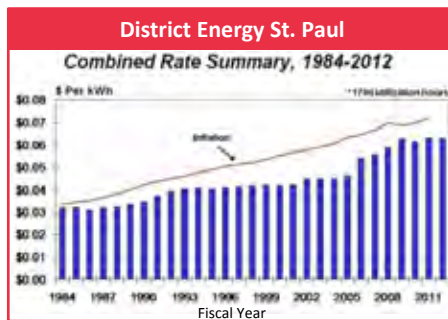


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Stable Rates



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Satisfied Customers

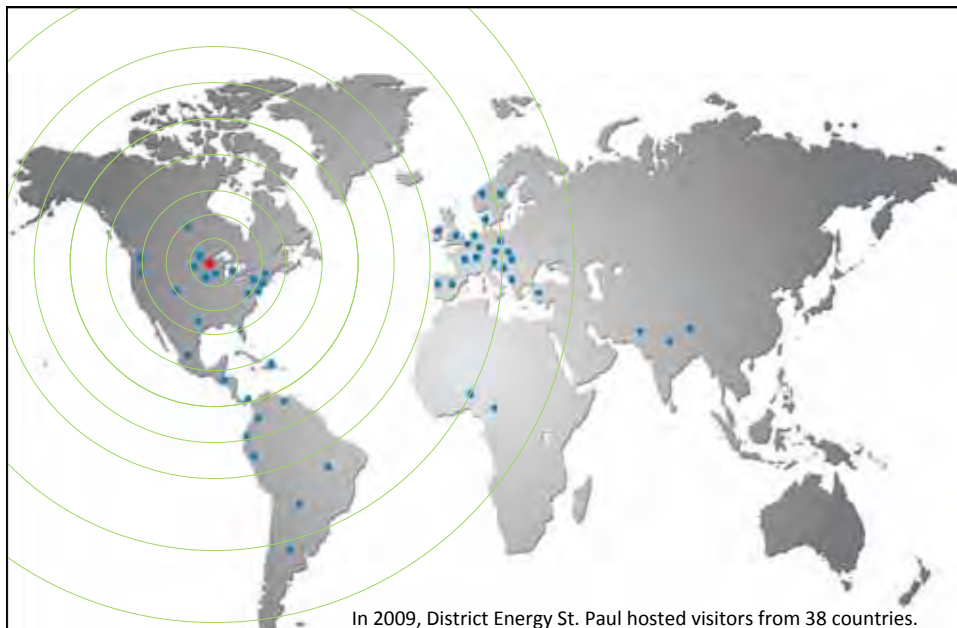
"District Energy St. Paul's founding principles--energy efficiency, environmental stewardship, stable rates, reliability and customer service--and the company's track record of meeting them day in and day out, allow Travelers to locate many people here in Saint Paul. Because of District Energy's reliability, we can also locate vital information technology equipment operations in downtown Saint Paul where a unique setup allows us to meet our business needs in the most cost-efficient manner."

Jim Scannell, Senior Vice President
Administrative Services
Travelers



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In 2009, District Energy St. Paul hosted visitors from 38 countries.

District Energy St. Paul

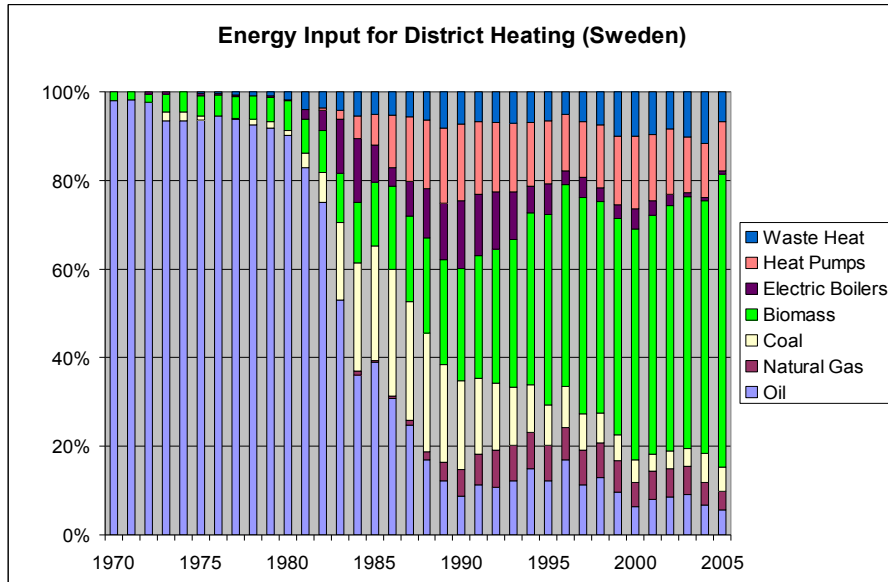
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What is possible?

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~ 55 TWh of load in 2005

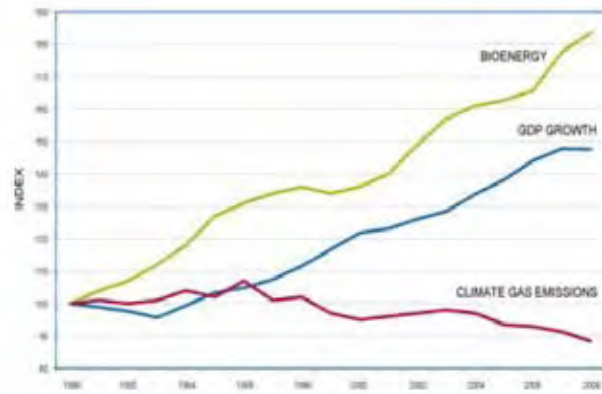
Source: Swedish Energy Agency

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Economic Growth & Carbon Reduction



SVEBIO

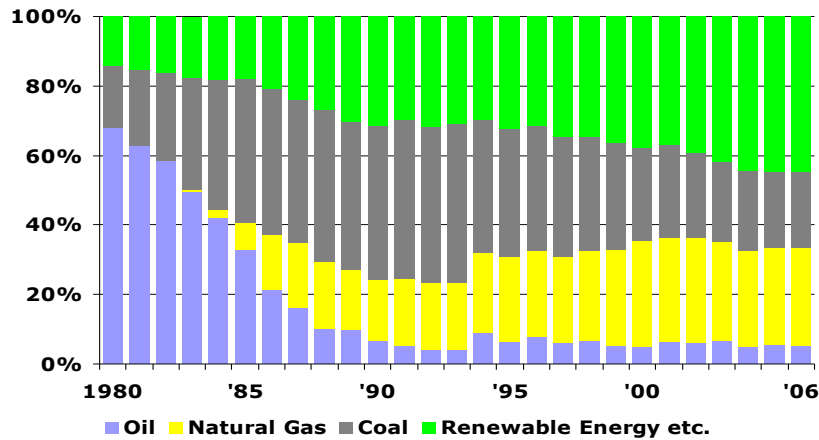
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Denmark

Composition of Fuels for District Heating Production

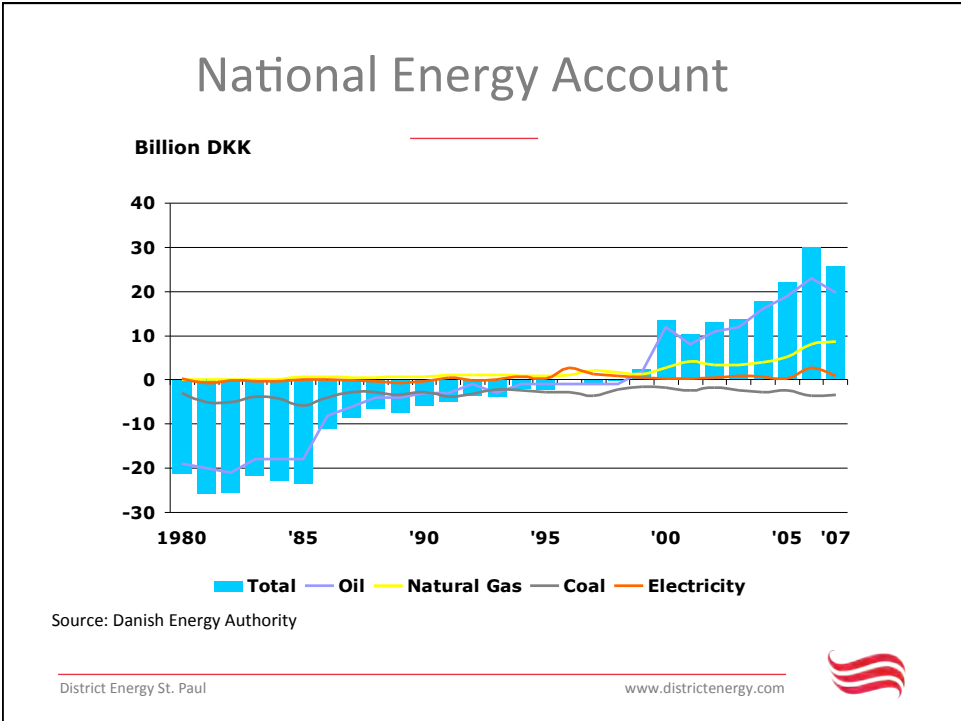


Source: Danish Energy Authority

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District Energy: Empowers Communities for the 21st Century

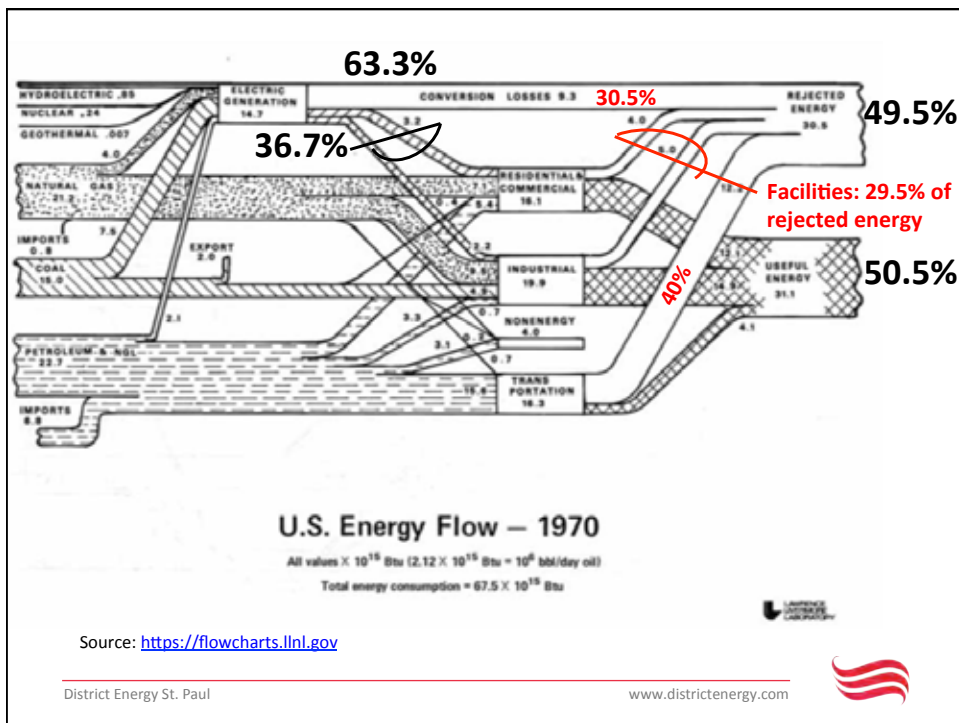
- Unlocks efficiency gains
- Enables integration of local resources
- Improves security and reliability
- Stable and economical rates
- Reduce GHG emissions
- Solution for today with flexibility for tomorrow

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Why is community based infrastructure and the integration of local energy sources so important to securing our energy future?

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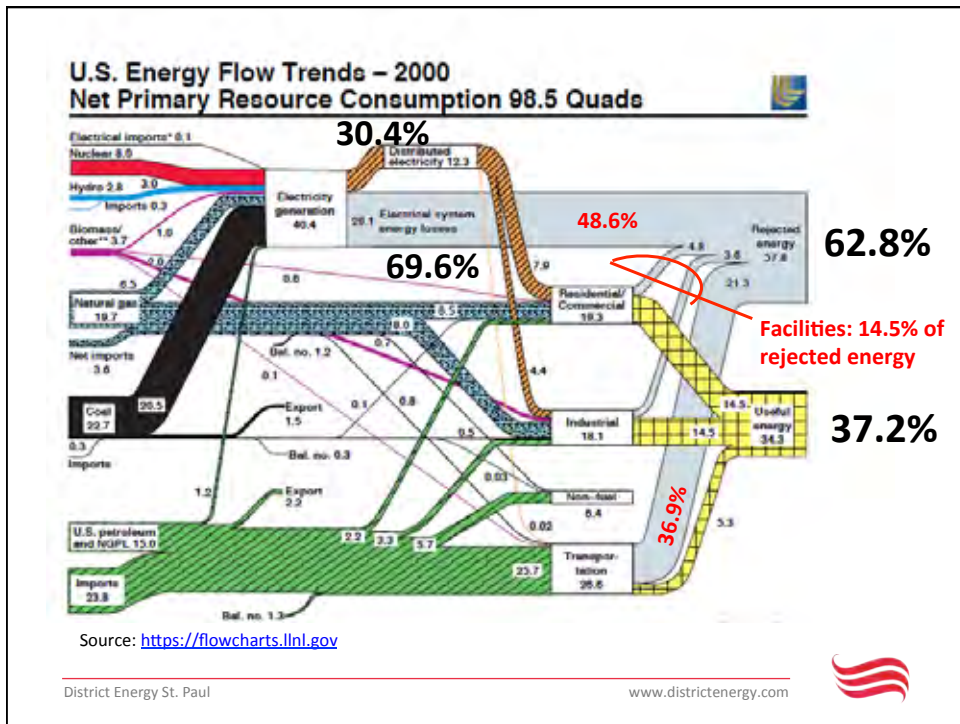
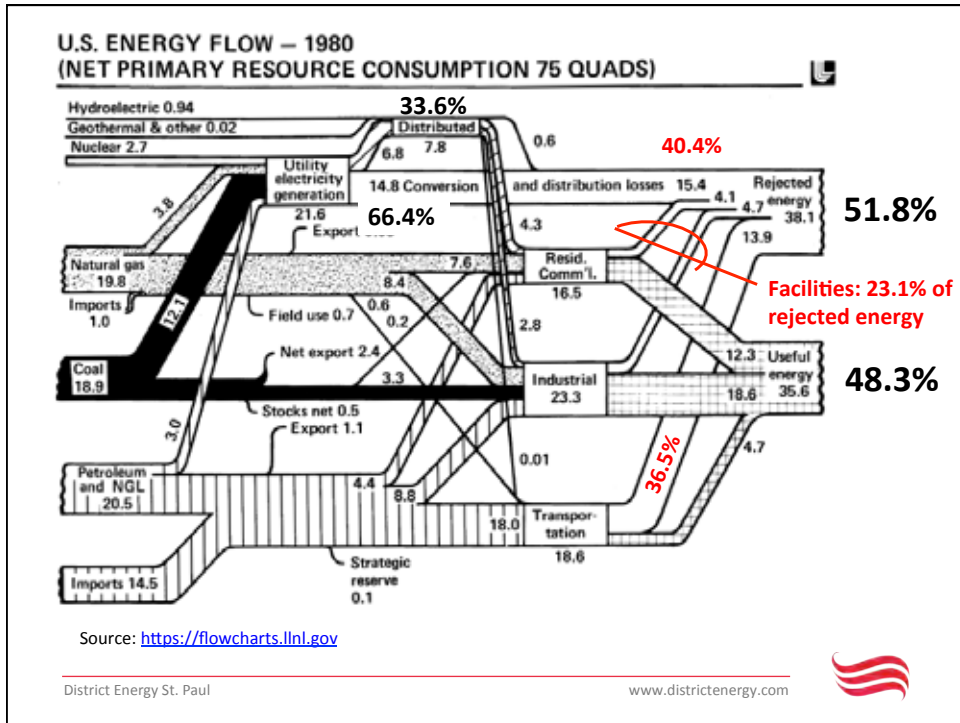
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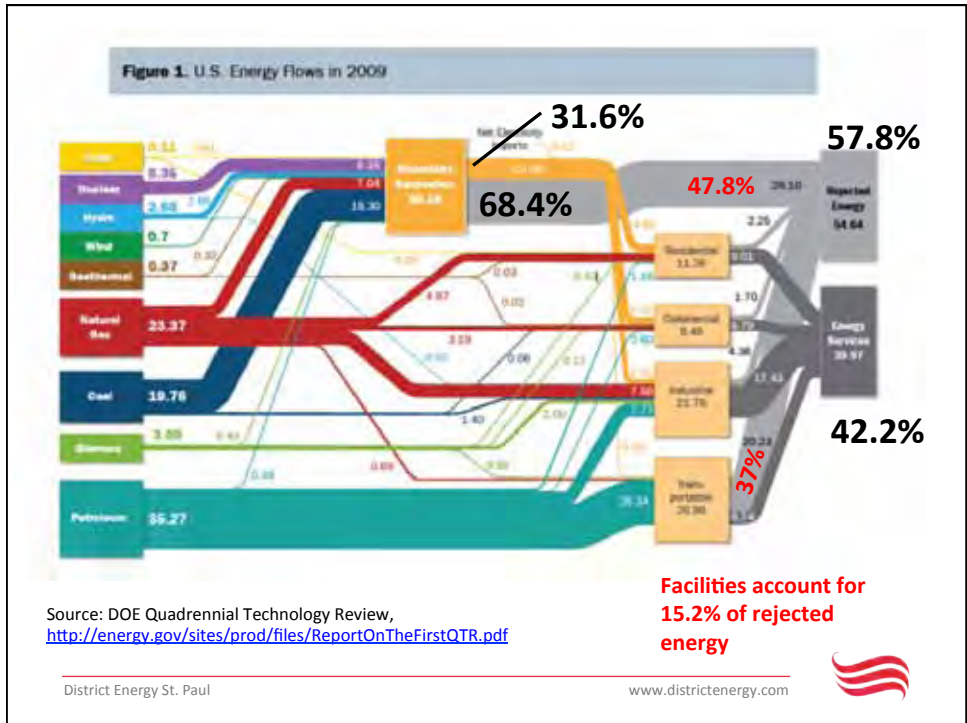


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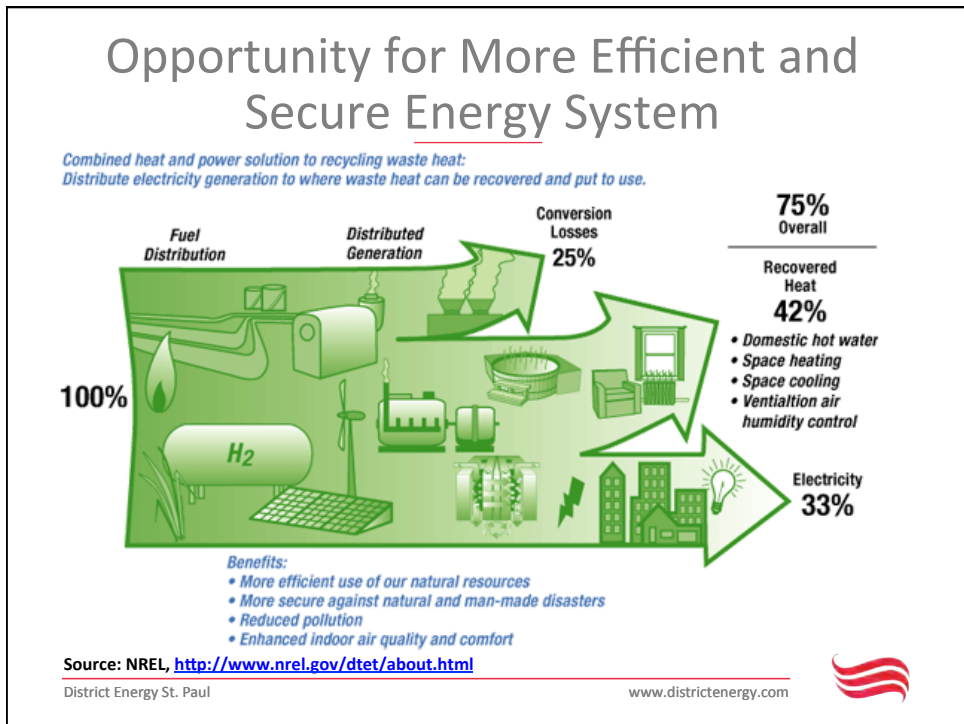
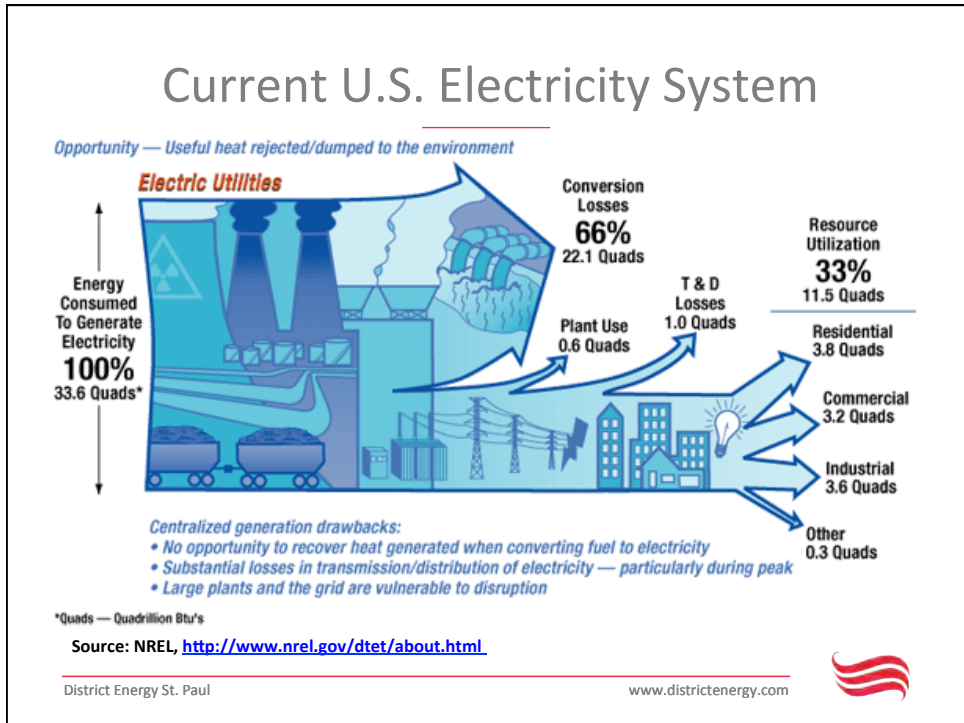






“If you always do what you've always done, you'll always get what you've always got”

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“Here's to the crazy ones. The misfits. The rebels. The troublemakers. The round pegs in the square holes. The ones who see things differently. They're not fond of rules. And they have no respect for the status quo. You can quote them, disagree with them, glorify or vilify them. About the only thing you can't do is ignore them. Because they change things. They push the human race forward. And while some may see them as the crazy ones, we see genius. Because the people who are crazy enough to think they can change the world, are the ones who do.”

- Steve Jobs

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Thank You!



DISTRICT ENERGY
ST. PAUL™

Ken Smith, President and CEO

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