

# Minnesota Power Renewable Strategy

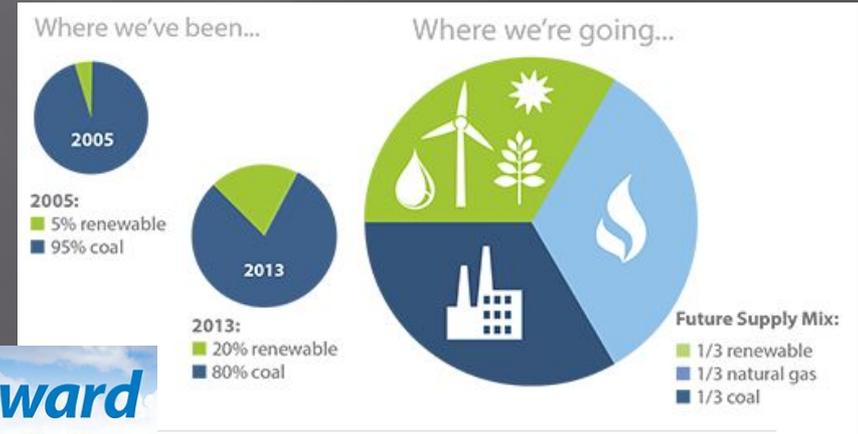
- In 2007 MN Legislature established aggressive Renewable Energy Standards for electric utilities (25% renewable by 2025)
- Requires increasing renewables as % of retail energy sales:
- MP is currently at about 20% with existing fleet
  - expecting to be at 25% by 2015
- Developing more renewable energy.

Currently we have:

Wind: ~317MW

Water: ~116MW

Wood: ~85MW



# MP Strategy for biomass

Why does MP want to be in the biomass generation business?

- ▣ 3 Biomass generation sites
  - Duluth, Rapids, Cloquet Energy Center
- ▣ To help meet Minnesota's renewable mandate
- ▣ To diversify MP's renewable fleet and fuel supply
- ▣ To provide a renewable energy resource to our customers
- ▣ MP has experience successfully operating biomass generation facilities
- ▣ Excellent complement to our Pulp & Paper customers
- ▣ Biomass energy is a diverse renewable fuel source, leveraging our significant existing infrastructure
- ▣ Supports hazardous fuels reduction & healthy forests

# Biomass Sourcing Strategy

- Relationships are key!
- Duluth and Rapids can each consume up to ~1,100 tons of biomass per day if needed
  - Duluth and Rapids combined annual consumption is ~450,000 tons of biomass (~18,000 truck loads)
  - Minnesota Power has ~30 biomass suppliers
- Long-term supply agreements are desirable for MP
  - Ability to reward better suppliers with assurance of a market
  - Incentivize suppliers to invest in equipment
- Additional storage will be necessary for Duluth
  - Berwind Dock or larger on-site storage shed
  - Potential to have supplier stockpile biomass
- Forest-derived fuel markets are underutilized northeast of Duluth
- Capitalize on episodic events (e.g., insect infestations (EAB), fires, blow downs, downturns in traditional markets (balsam) etc.)
- Direct Combustion is lowest cost fuel preparation for co-firing w/biomass into coal boiler

# Hibbard Renewable Energy Center

- ▣ 2 solid fuel boilers
- ▣ 48 MW
- ▣ ~600 tons per day
- ▣ 250 ton mill bark, 250 tons RR ties, 100 tons wood residue
- ▣ ~1 day wood storage on site
- ▣ Steam to NewPage, electricity to the grid



# Rapids Energy Center

- ▣ 2 solid fuel boilers
- ▣ 27 MW
- ▣ ~600 tons/day
- ▣ 220 tons mill bark, 150 tons chips, 230 tons grindings
- ▣ Wood storage capacity of 8-10 days
- ▣ All steam and electricity is used at



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