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The Framework: Beneficial Electrification

Electrify Minnesota Policy Panel

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History lesson

5th Avenue, NYC
Easter Parade, 1900
See any automobiles?

Source: Tony Seba
How fast does transformation happen?

Park Avenue, NYC
Easter, ???
See any horses?

How much energy infrastructure will we strand in the next “13 years”?

Source: Tony Seba
Disruptive Forces Transforming Electricity

Source: Chandu Visweswariah, Utopus Insights Inc.
What Makes for Beneficial Electrification (BE)?

*Three Explicit Criteria: Achieve at Least One Without Adversely Impacting Achievement of the Others*

1. Saves Customers Money Long-Term; New Services
2. Reduces Environmental Impacts
3. Enables Better Grid Management
BE Principle 1. Put Efficiency First
BE Principle 2: Recognize the Value of Flexible Load for Grid Operations
BE Principle 3: Understand the Emissions Effects of Changes in Load
BE Principle 4: Use *Emissions Efficiency* as One Measure of Beneficial Electrification

![Diagram showing emissions associated with different types of water heaters over time.](image-url)
BE Principle 5: Measure Life Matters
BE Principle 6: Design Rates to Encourage Beneficial Electrification

Typical Rate Design VS. Time-of-Use Electric Rates
Obstacles to BE include:

• Whose job is electrification anyway?
  - PUCs? Utilities? Building Codes?

• Obsolete regulatory policies
  - Prohibitions against utility *fuel-switching* efforts
  - Prohibitions against utility *load-building* efforts
  - Poor access, valuation, and compensation for DERs

• Need to reimagine EE
  - Most EERS, RPS discourage beneficial electrification
  - Avoid DSM approach (“Death-by-program”)
  - Analytics and “Pay for Performance” (P4P) vs. EM&V