

Cogeneration & Embedded Generation

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Drivers for Cogeneration

- Post Maui opportunities
 - Multiple energy sources
 - Increased energy costs
- Integrated energy solutions
 - Paradigm shifts in thinking about energy
- Requirements for heat
 - Growth in wood processing
 - Waste disposal costs
 - Heat first
- High spot market prices



Drivers for Embedded Generation

- Distributed generation
 - Reliability and security of supply
 - Reduction in electricity network connection costs
- Renewable energy opportunities
 - Bioenergy
 - Small wind
 - Small hydro
 - Solar hot water
- Sized to avoid electricity network costs
- Clusters – economies of scale



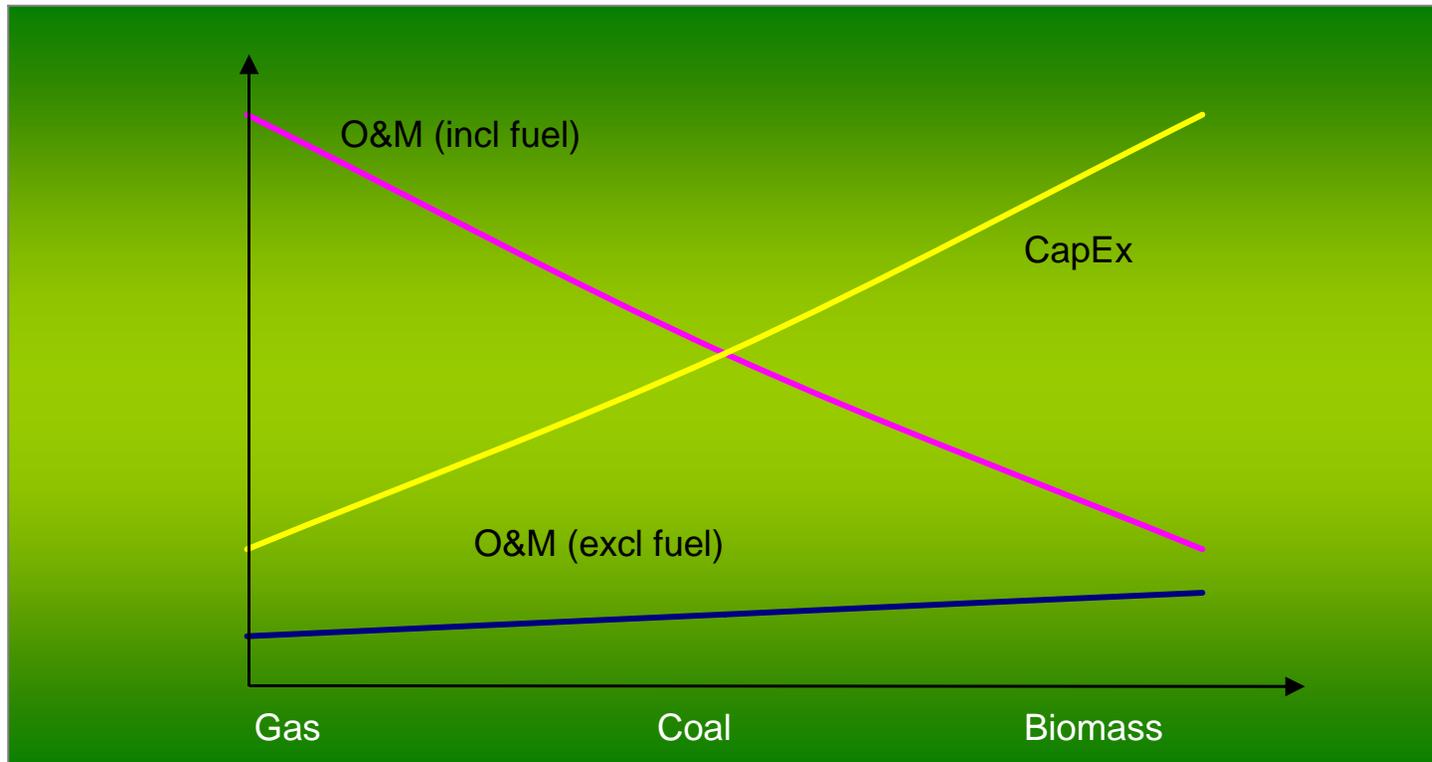
Barriers to Cogeneration

- Small industrial market - lack of opportunities
- Relative low cost of wholesale electricity
- Still thinking electricity rather than energy
- Not responding to price signals
- Lack of experience of energy markets
- Difficulties with electricity sales contracts



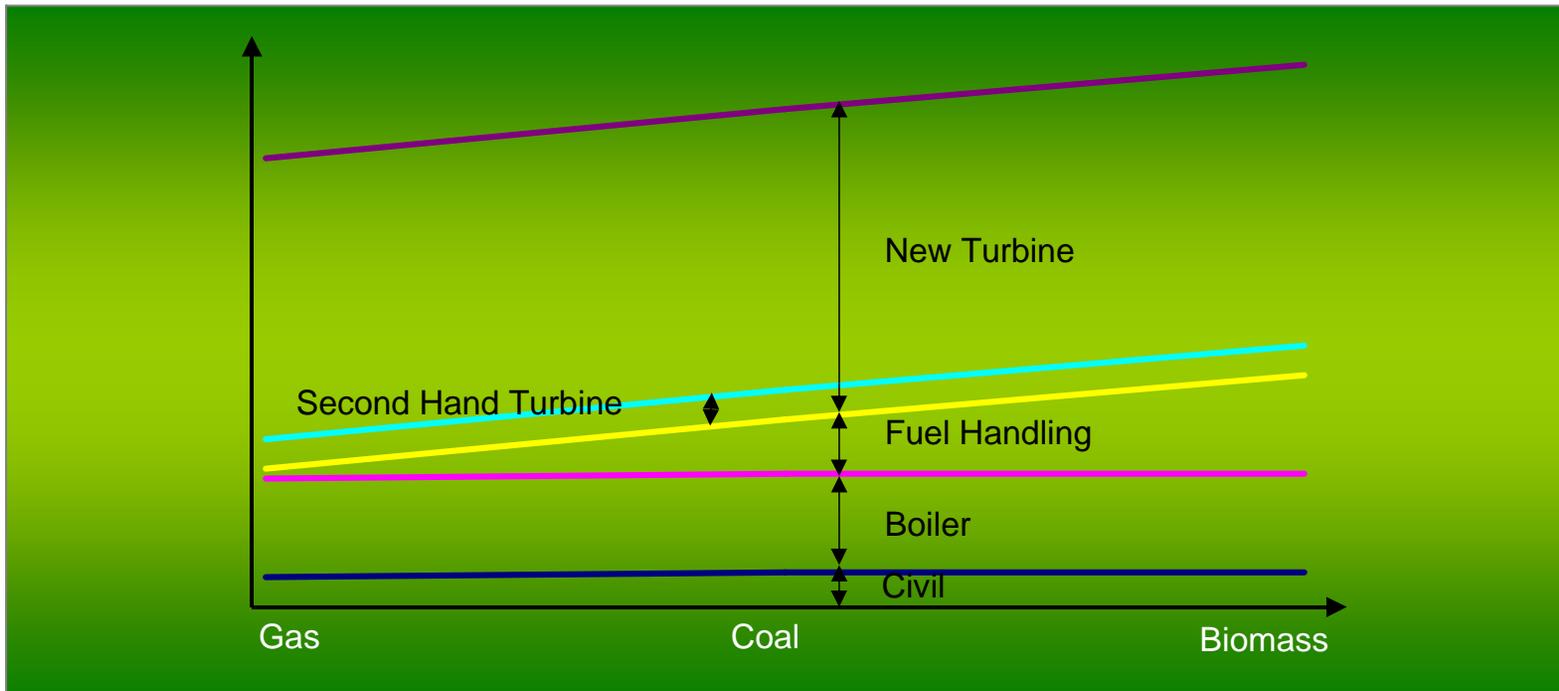
Capital Cost vs Fuel cost

Relationship Between Costs and Fuel Type



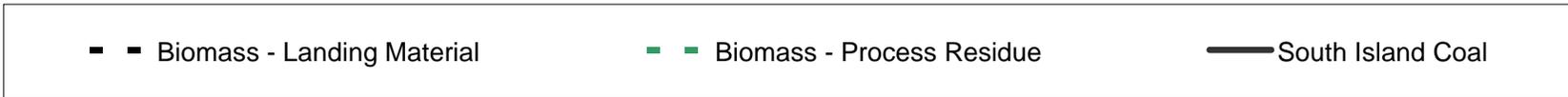
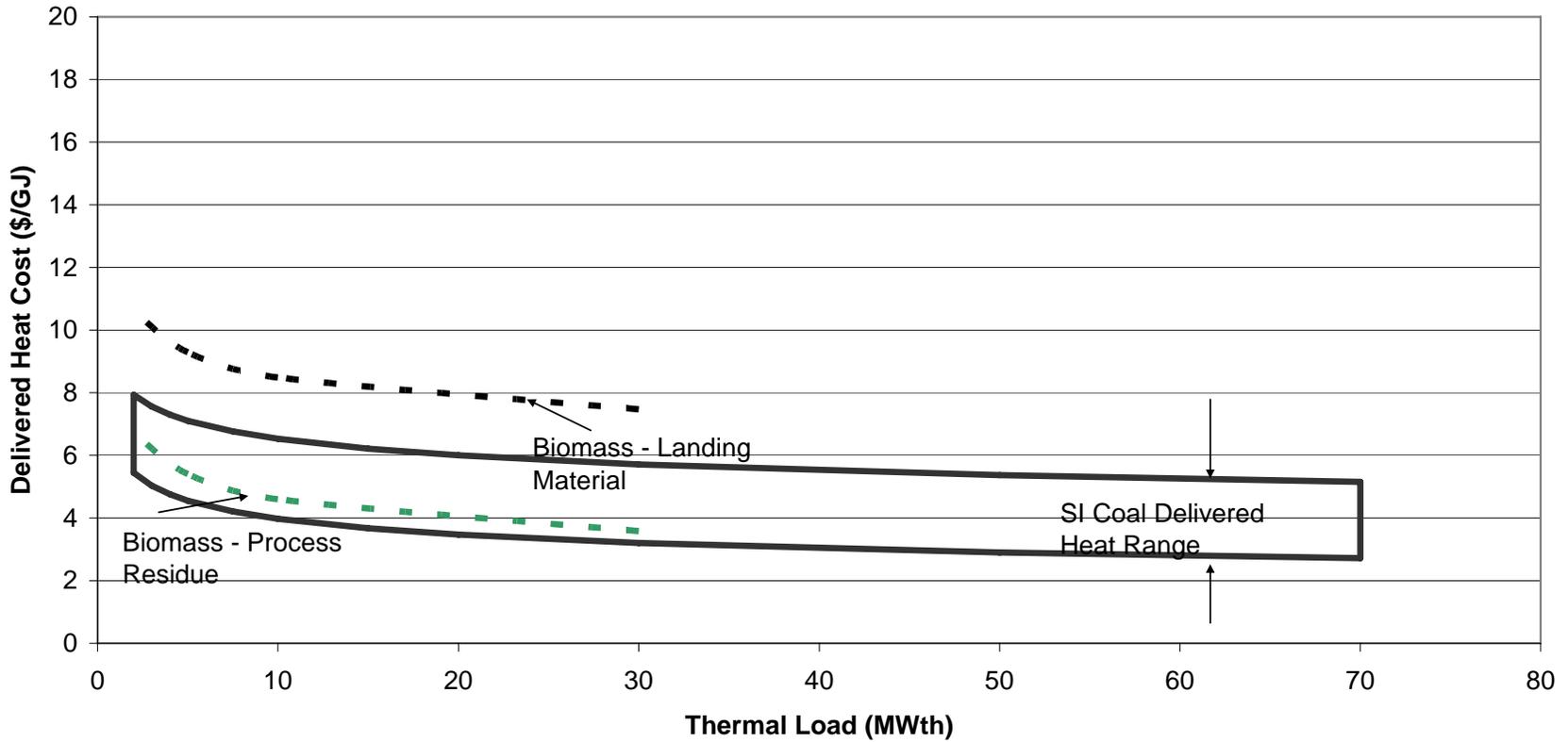
Cost of Cogeneration Plant

Approximate Split of Capital Costs



Heat Cost

Heating Costs, No Price Increases or Carbon Charge

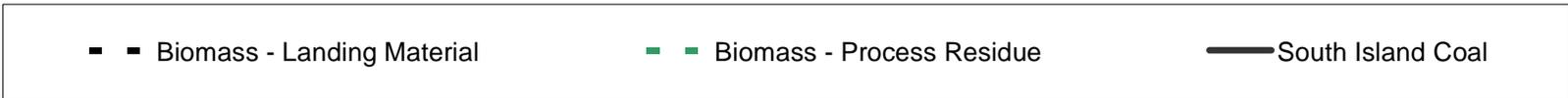
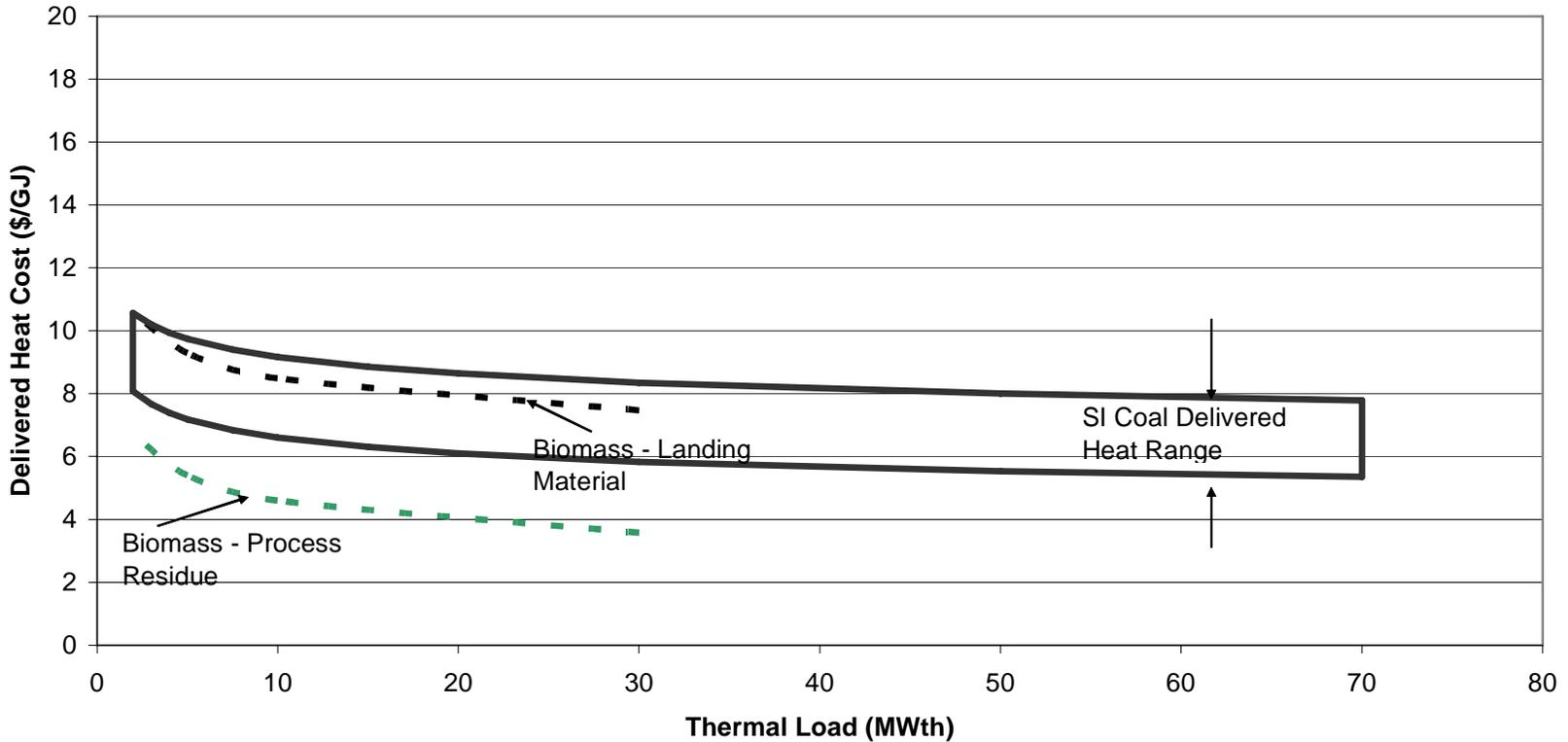


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Heat Cost (post 2007)

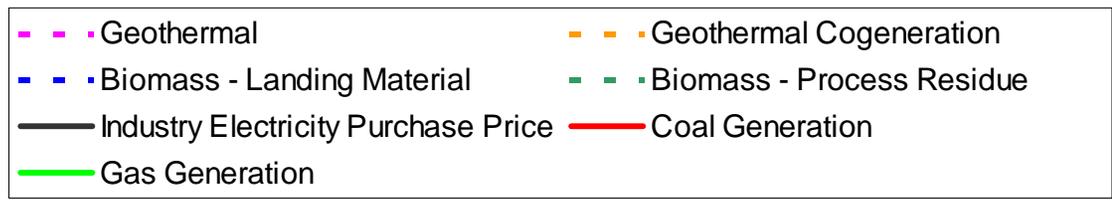
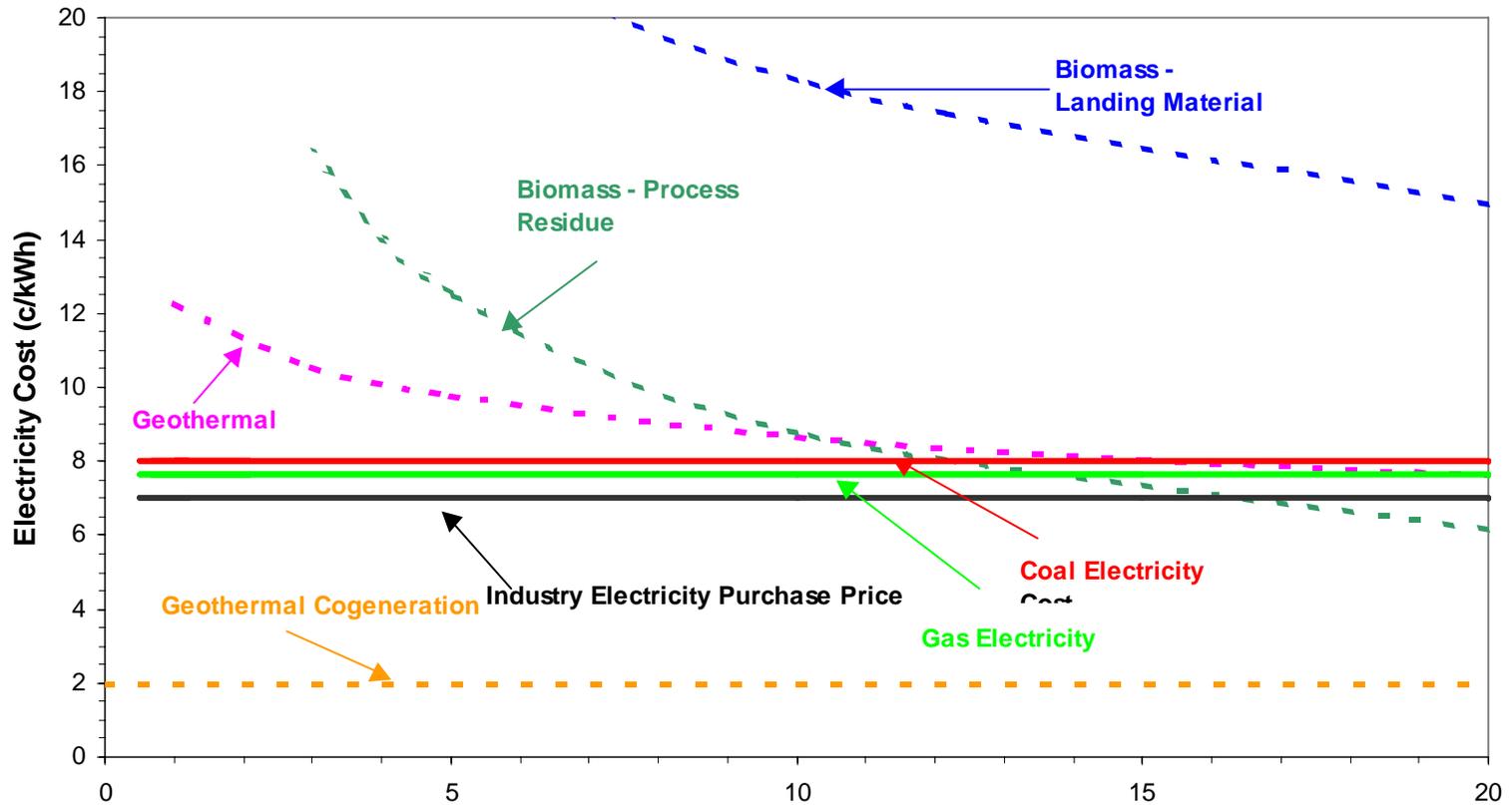
Heating Costs with Price Increases and \$10/t Carbon Dioxide Charge



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Future Electricity Cost (post 2007)



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Distributed Generation Opportunities for Cogeneration

- Can meet supply requirements
- Can provide security and reliability
- Controllable
- Can assist reduce network connection costs
- Can be part of an energy price risk strategy
- Assisted by real time monitoring and control
- Integrated with demand management
- Requires attitudinal changes



Regulatory and Market Issues

- Difficulty in establishing sales contracts
- Need to share benefits with network companies
- Not recognised in network security
- Not recognised in network company asset values
- Nodal price benefits shared with others



Cogeneration needs to be part of total integrated energy solutions

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