The Impact of MLC Manufacturing on Fuel Cell Commercialization

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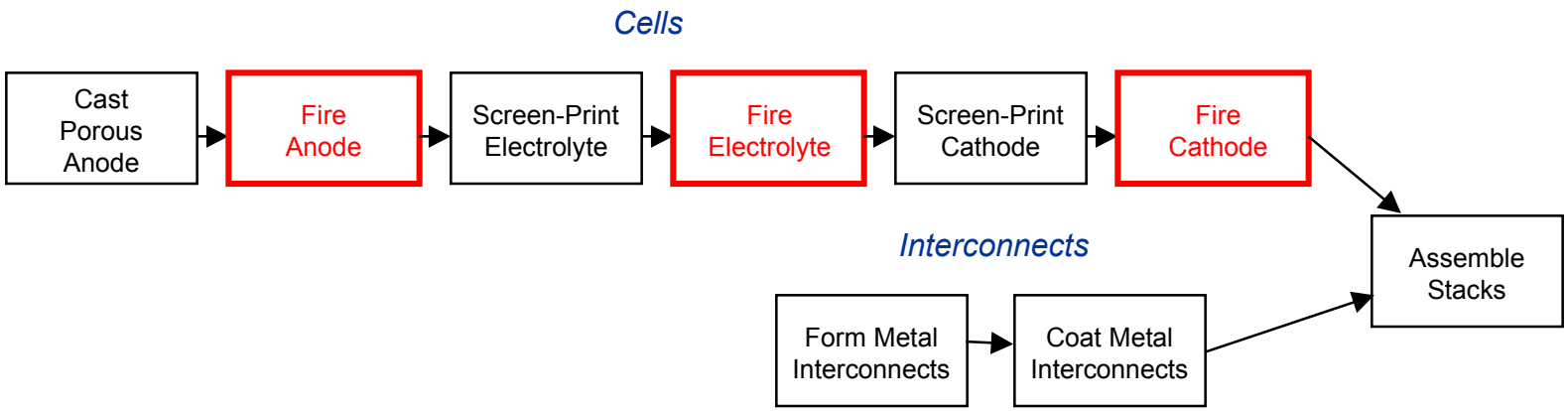
Traditional Methods vs. MLC

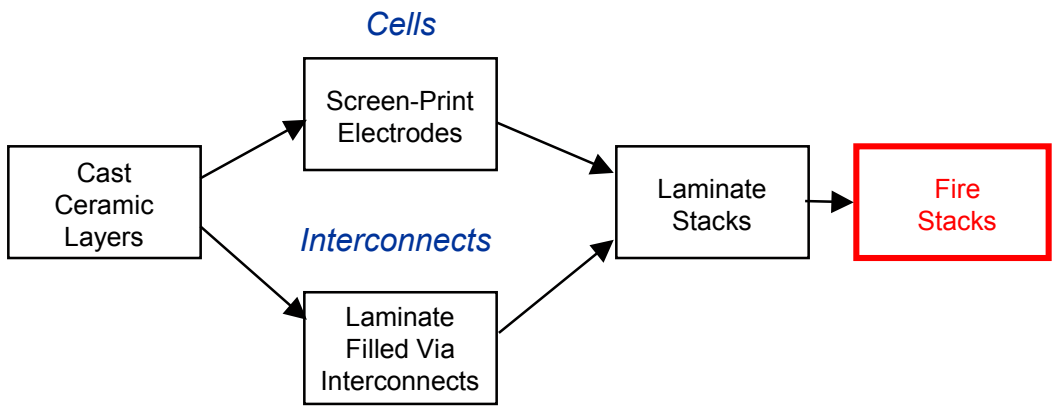
- Traditional Methods
  - Electrolyte or electrode supported with subsequent application of additional cell layers
  - Multiple firings
  - Metal interconnects
  - Labor intensive stack assembly
- MLC Method
  - Co-fired repeat units consisting of anode, cathode, electrolyte and interconnects
  - Single firing step
  - 3rd generation ceramic interconnects
  - Limited stack assembly required

Traditional Methods vs. MLC

Traditional Process



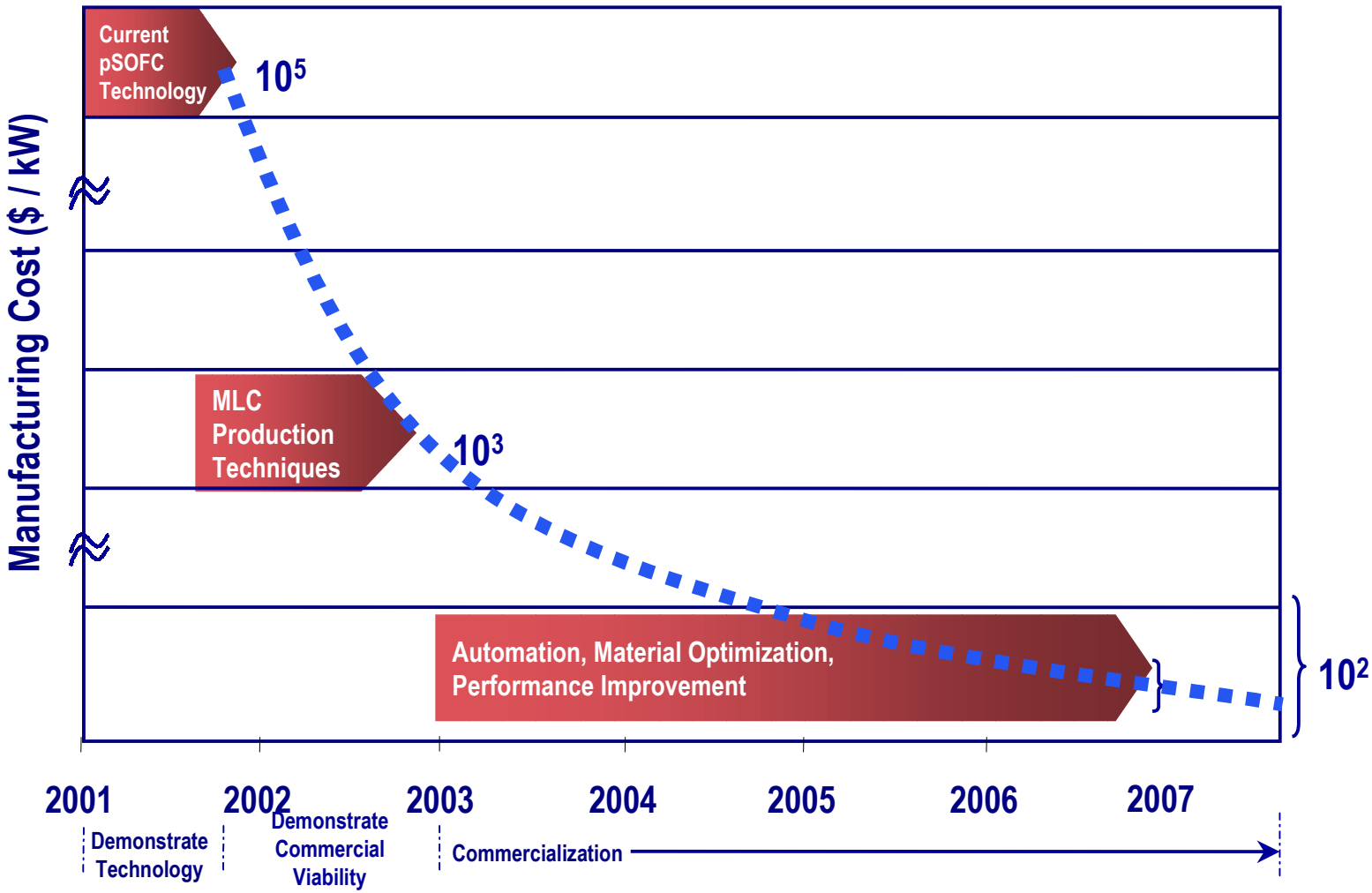
MLC Process



Advantages of MLC Co-fired Approach

- Process time savings
  - Single firing step
  - Reduced stack assembly
- Performance Gains
  - Intimate electrode contact - low polarization losses & contact resistance between interconnects
  - Improved seals
  - Minimizes thermal mismatch & corrosion
- Established high-volume, low-cost, high-quality production methods

Cost Reduction Roadmap



Buffalo Manufacturing Facility