

# High Value Roll to Roll Workshop

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# B&W MEGTEC Overview

- Babcock & Wilcox MEGTEC De Pere, Wisconsin
  - MEGTEC employs approximately 350 people in the US and approximately 600 globally



365,000 ft<sup>2</sup> manufacturing facility

- De Pere Facility includes:
  - Chemical, Mechanical and Electrical Engineers and Designers
  - 100+ Service, Technical and Support Personnel
  - 100+ Manufacturing Personnel
  - Dedicated R&D and Pilot Laboratory Support Team
  - Oracle ERP, Risk Management Programs

# B&W MEGTEC: Businesses

## ENVIRONMENTAL SOLUTIONS (ES)

## ENGINEERED PRODUCTS (EP)

### Markets

Air Pollution Abatement  
Carbon Management  
Energy Recovery  
Biofuels & Renewable Energy

Energy Storage  
Renewables  
Membranes/Composites  
Printing/Packaging

### Products

Wet & Dry Electrostatic Precipitators  
Wet & Dry Scrubbers  
Pulse Jet Fabric Filters (Baghouses)  
Multiclone® Dust Collectors  
SCR/SNCR Systems  
Evaporative Gas Cooling Systems

Regenerative Thermal Oxidizers (RTOs)  
Solvent Recovery Systems  
Carbon Adsorption Systems  
Distillation Systems  
Heat Recovery Systems

Air Flotation Dryers  
UV Dryers  
IR Dryers  
Coaters  
Material Handling Equipment

### Services

Replacement Parts and Service  
Equipment Rebuilds

Efficiency Upgrades  
Preventive Maintenance

Energy Optimization  
Equipment Relocation

# B&W MEGTEC: Li-Ion Battery & EDLC Electrodes

- Coating Lines; Lab to Mass Production



- NMP Recovery & Purification



# High Value Roll to Roll Manufacturing

- In the short to medium term for Battery Electrode manufacturing:  
Apply lessons learned from other markets / industries
- Reference Industries
  - Chemical Process Industry for slurry preparation
  - Converting Industry for Coating & Drying, Calendaring, Slitting
    - AIMCAL represented here at this workshop.
    - The Association of International Metallizers, Coaters and Laminators

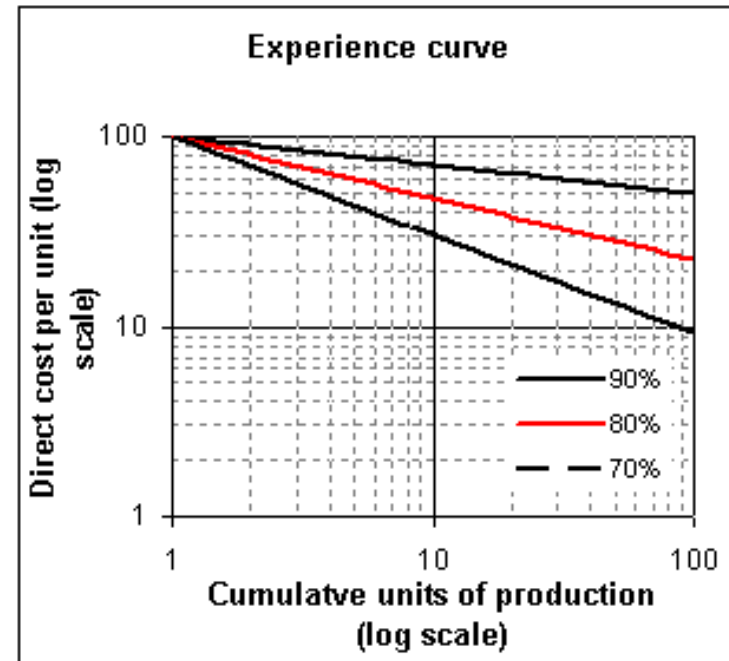
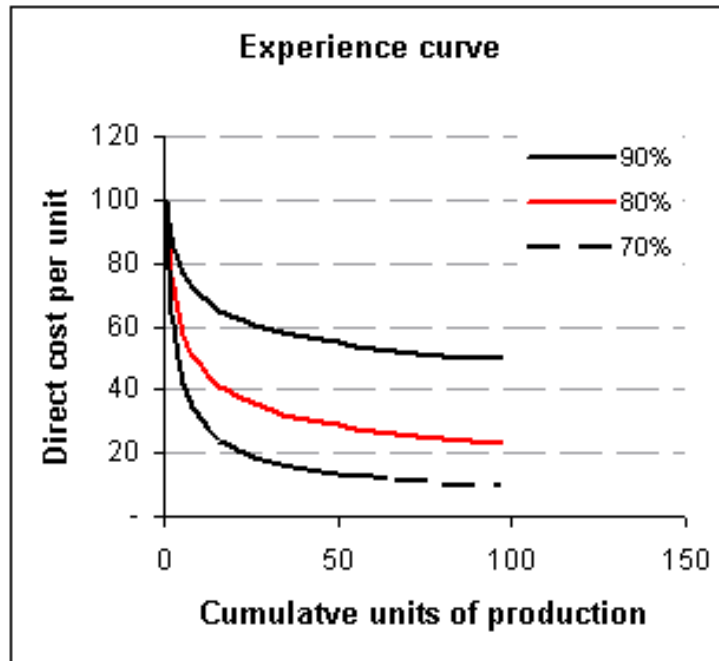
# Chemical Process Industry

- Drive to continuous operation
  - Shift from batch to continuous processes
  - Minimize changeovers
  - Operate at steady state
  - Process models for scale-up from lab to production
- Examples
  - Polyester film manufacturing
  - Oil refining
  - NMP production

# Converting Industry

- Drive toward higher efficiencies and higher yields
  - Push toward wider webs
  - Achieve faster line speeds
  - Grouping / ganging steps
  - Process models for scale-up from lab to production
- Examples
  - Film Industry – several meters wide substrates
  - Paper Industry – calendering & slitting in-line

# Learning Curve



Research by BCG in the 1970s observed experience curve effects for various industries that ranged from 10 to 25 percent. These effects are often expressed graphically. The curve is plotted with cumulative units produced on the horizontal axis and unit cost on the vertical axis. A curve that depicts a 15% cost reduction for every doubling of output is called an “85% experience curve”, indicating that unit costs drop to 85% of their original level.