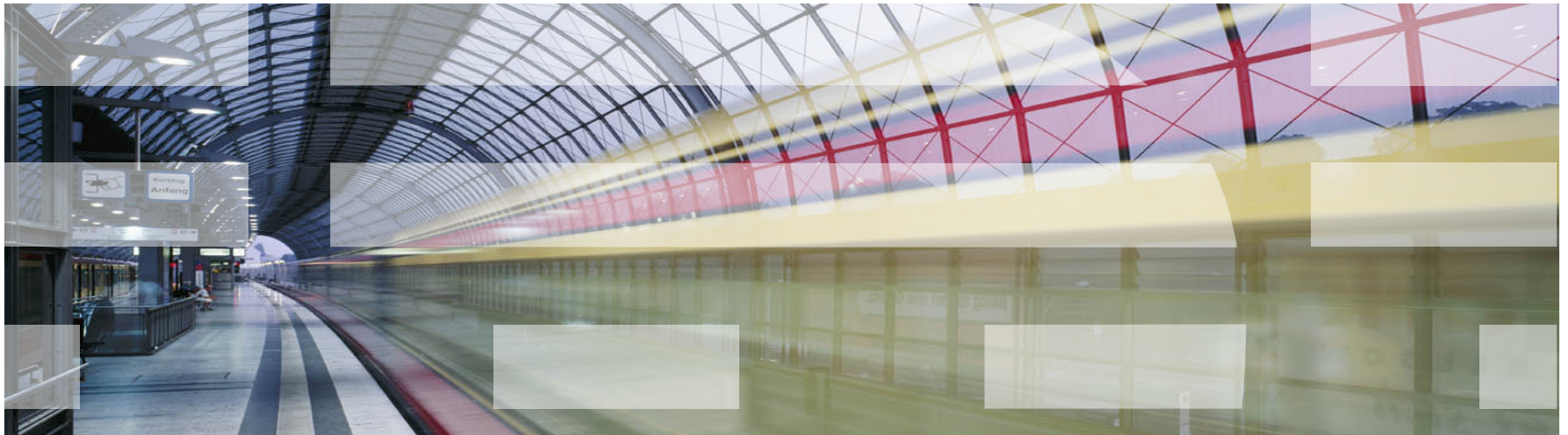


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A Six Sigma Approach to Energy Management

- Improving IBM's Integrated Supply Chain Operations



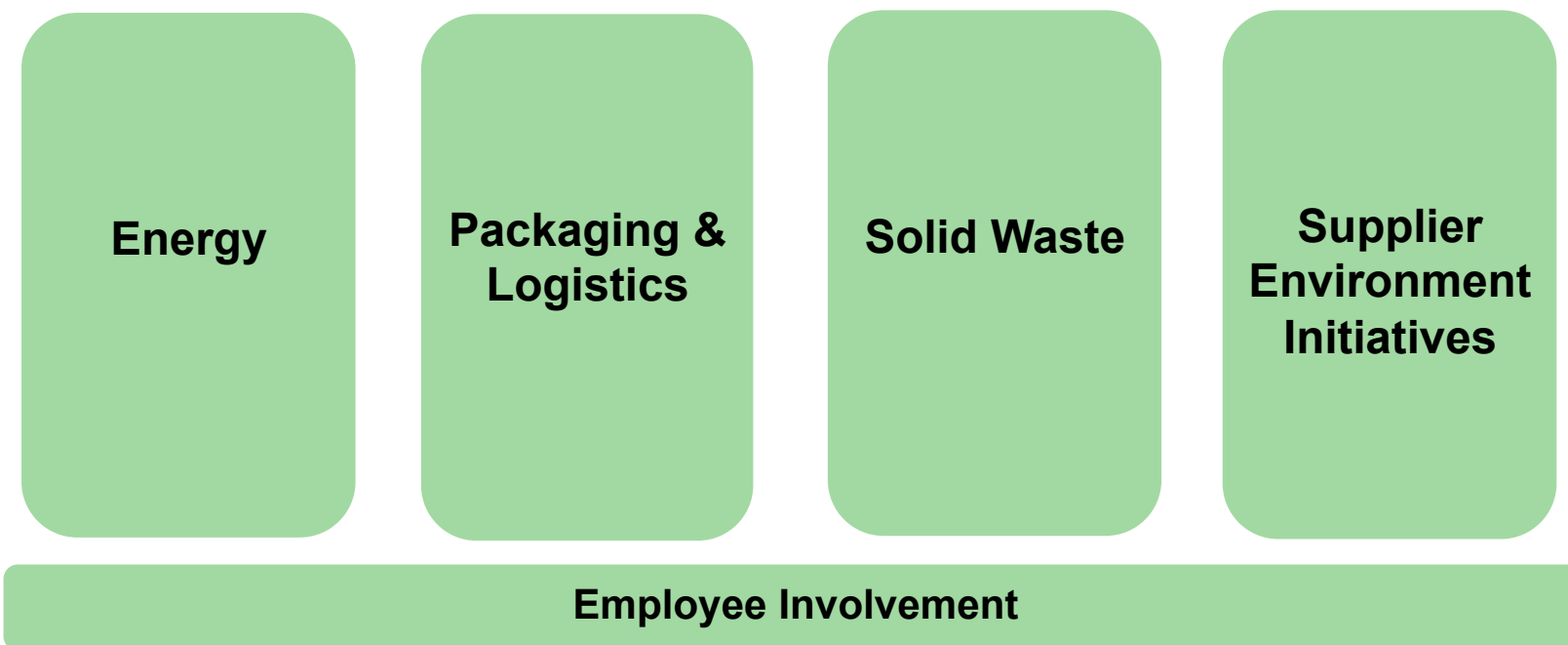
Topics

1. Employee involvement
2. Lean Six Sigma
3. Green Sigma™
4. Results



The challenge:
Improve the environmental profile of IBM's supply chain operations

200+ people volunteer their time and skills



Lean Six Sigma (LSS)

A method for analyzing operations and improving performance:

- Goals
 - Increase quality
 - Reduce costs
- Activities
 - Add, restructure or eliminate activities

Lean: A method to eliminate waste
Gets quick wins

Six Sigma: A data-driven method to optimize processes
Needs to know relationships in the environment for statistical analysis



LSS + Innovation = Green Sigma™

What Green Sigma™ is:

- An enhanced LSS method for environmental issues
- A system to monitor operations against an ideal profile
 - Ensures gains through alerts, gathers data for reporting and analysis

How it differs from LSS

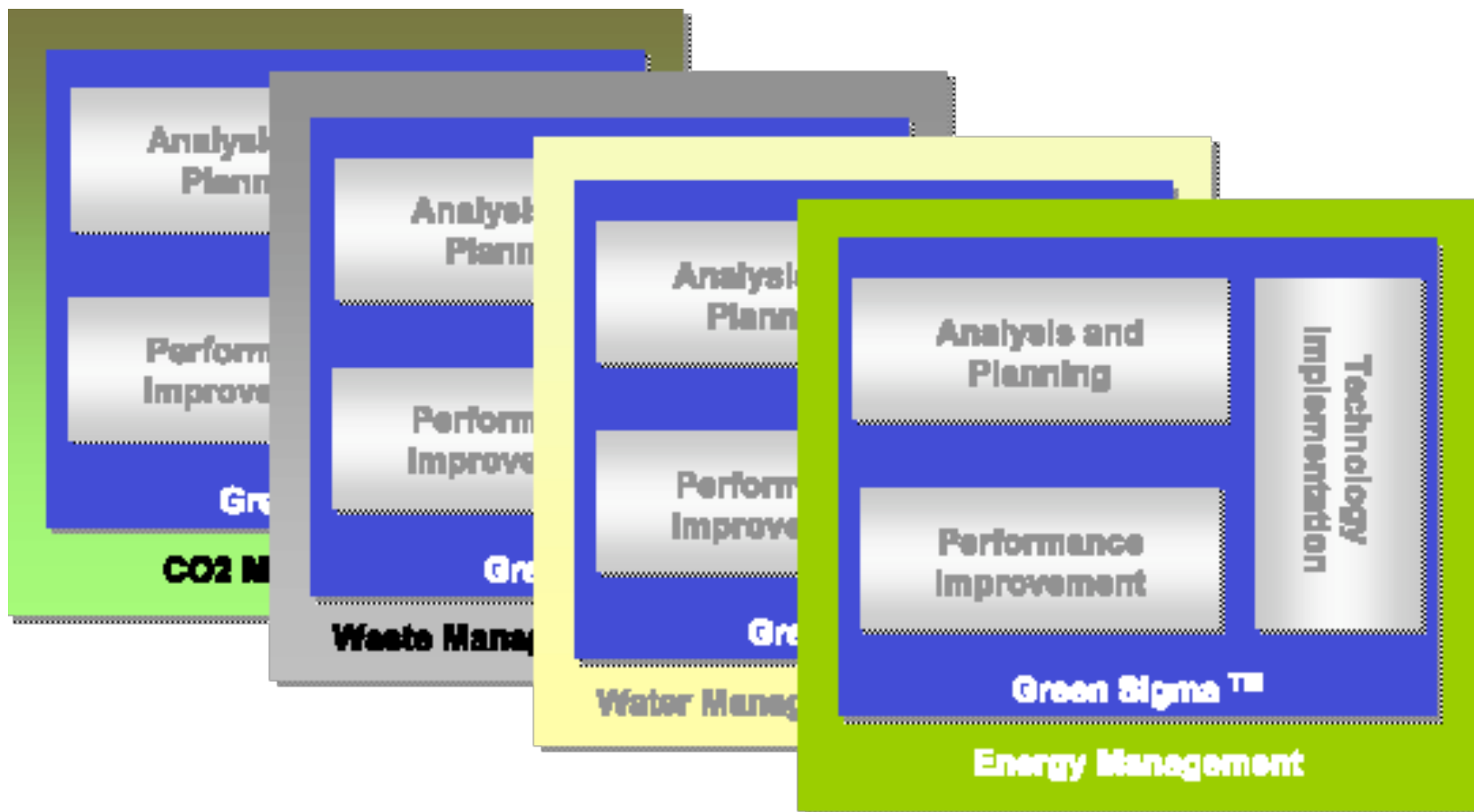
- Environmental goal - energy reduction from all aspects of facility and operational process
- Employs LSS, adds site assessment method, energy user profiles
- Site monitoring system with advanced analytics

How Green Sigma™ started:

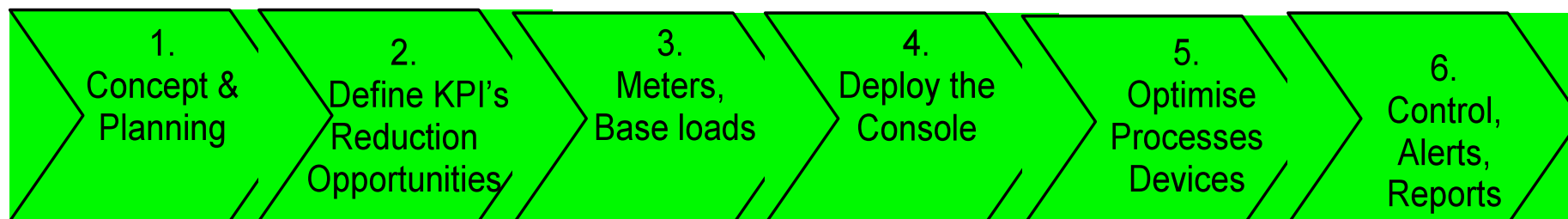
- Watson Research Center - meters and sensors
- A Dublin LSS black belt, IBM's deep environmental focus and "volunteer enthusiasm"



Green Sigma™ addresses Energy, Water, CO2, Waste



The Green Sigma™ Journey



Lean Phase

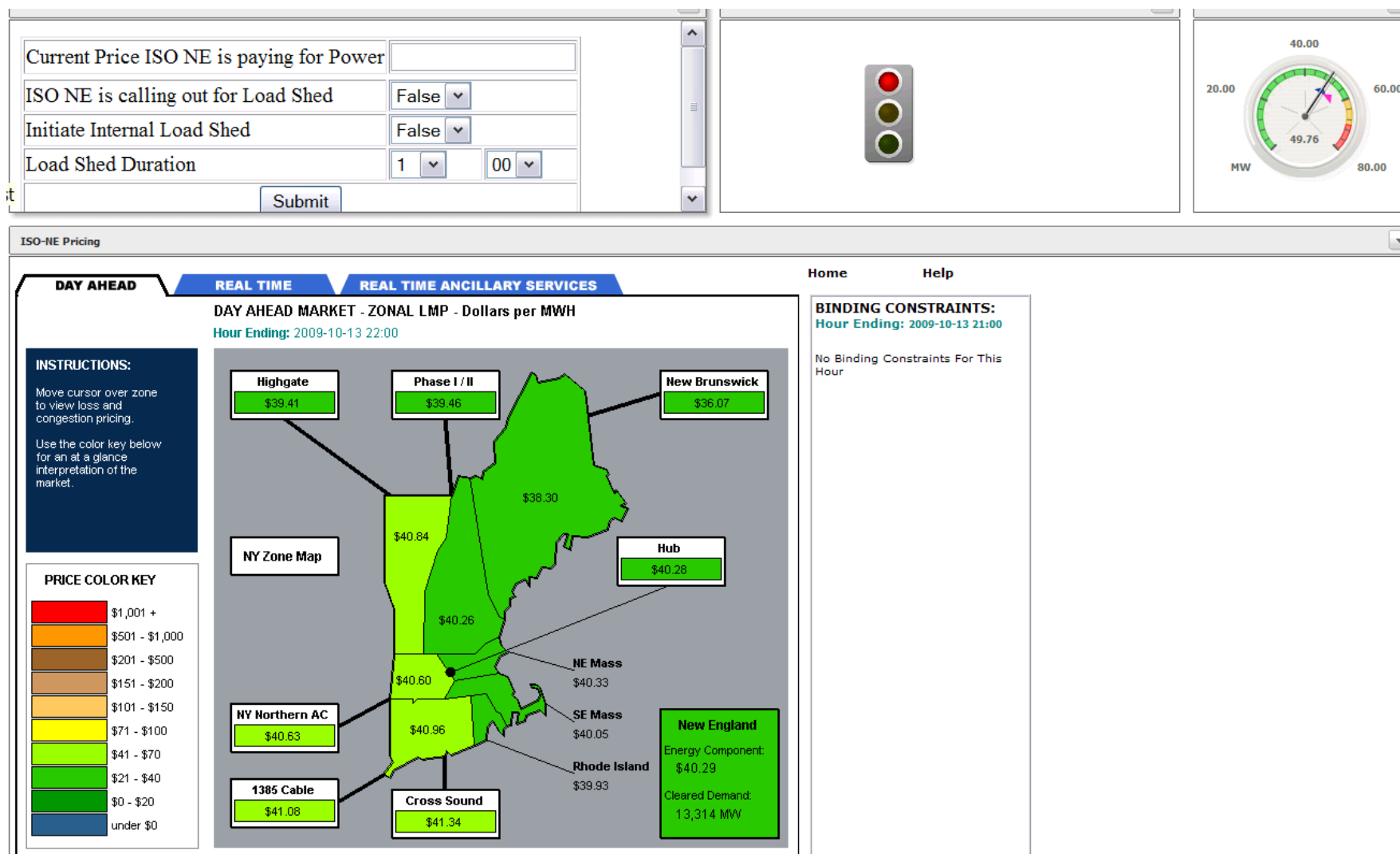
Six Sigma Phase



Green Sigma™ – Energy Dashboard – Site Facilities



Green Sigma™ – Energy Dashboard – Load Shedding



Green Sigma™ benefits to IBM's Integrated Supply Chain

- Quick wins: Over \$1M 2009 energy savings total to date for two sites
- Site managers have a tool and data to better manage energy:
 - Significant energy using devices identified in infrastructure and manufacturing floor
 - Six Sigma analyses bearing fruit
 - Data gives clear view of best ROI
 - Energy console alerts avoid backsliding
- Green Sigma being applied at six more sites by year end
- Supports a culture of continuous improvement & environmental performance innovation

