



Integrated Benchmarking and Carbon Management in Industry



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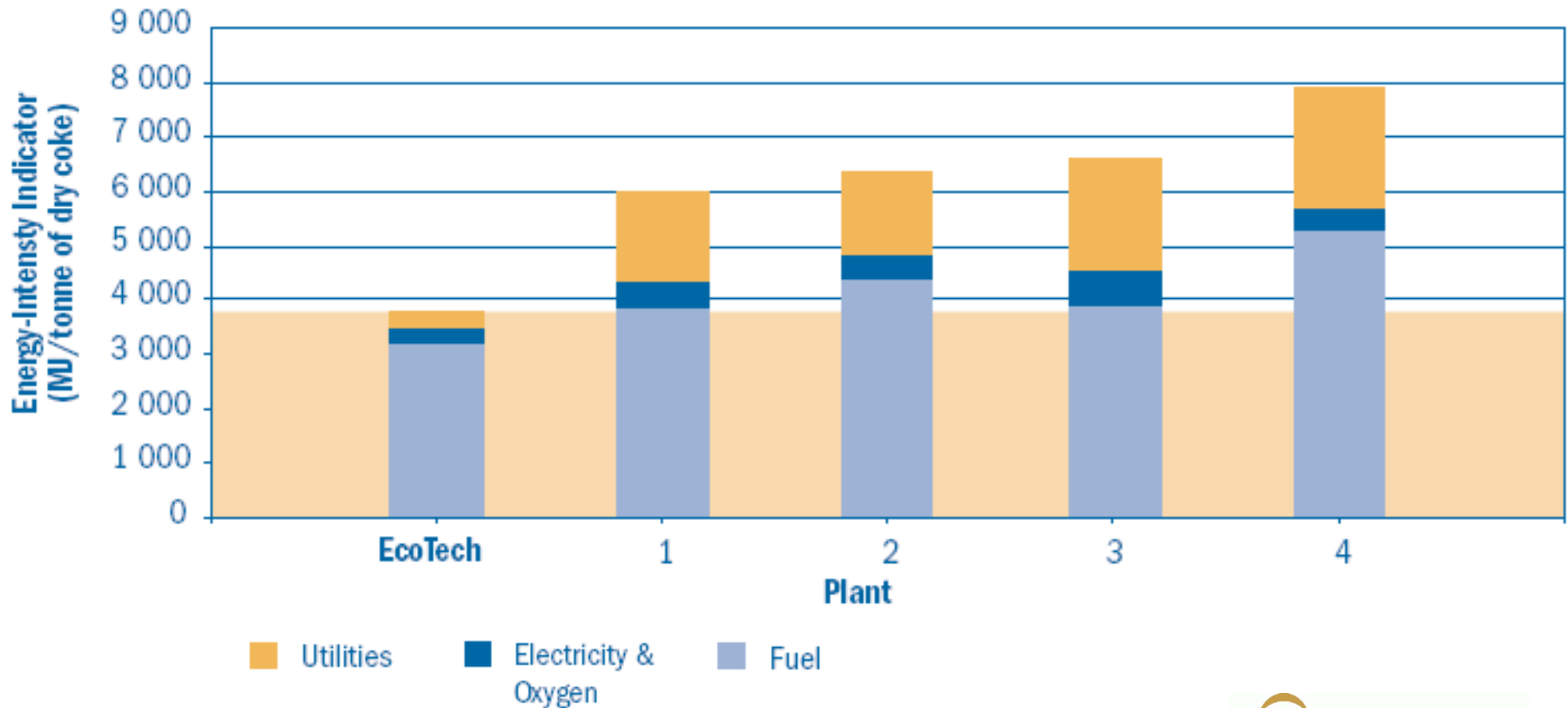
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reduce energy use: typical approach



- Energy audit's first step:
 - Identify opportunities
= improve equipment efficiency
- How good is my energy use performance?
 - Energy use trend
 - Energy intensity (e.g. kW/widget)
 - Benchmark intensity against other plants

energy efficiency benchmarking



Source: Natural Resources Canada(2007).

Benchmarking Energy Intensity in the Canadian Steel Industry

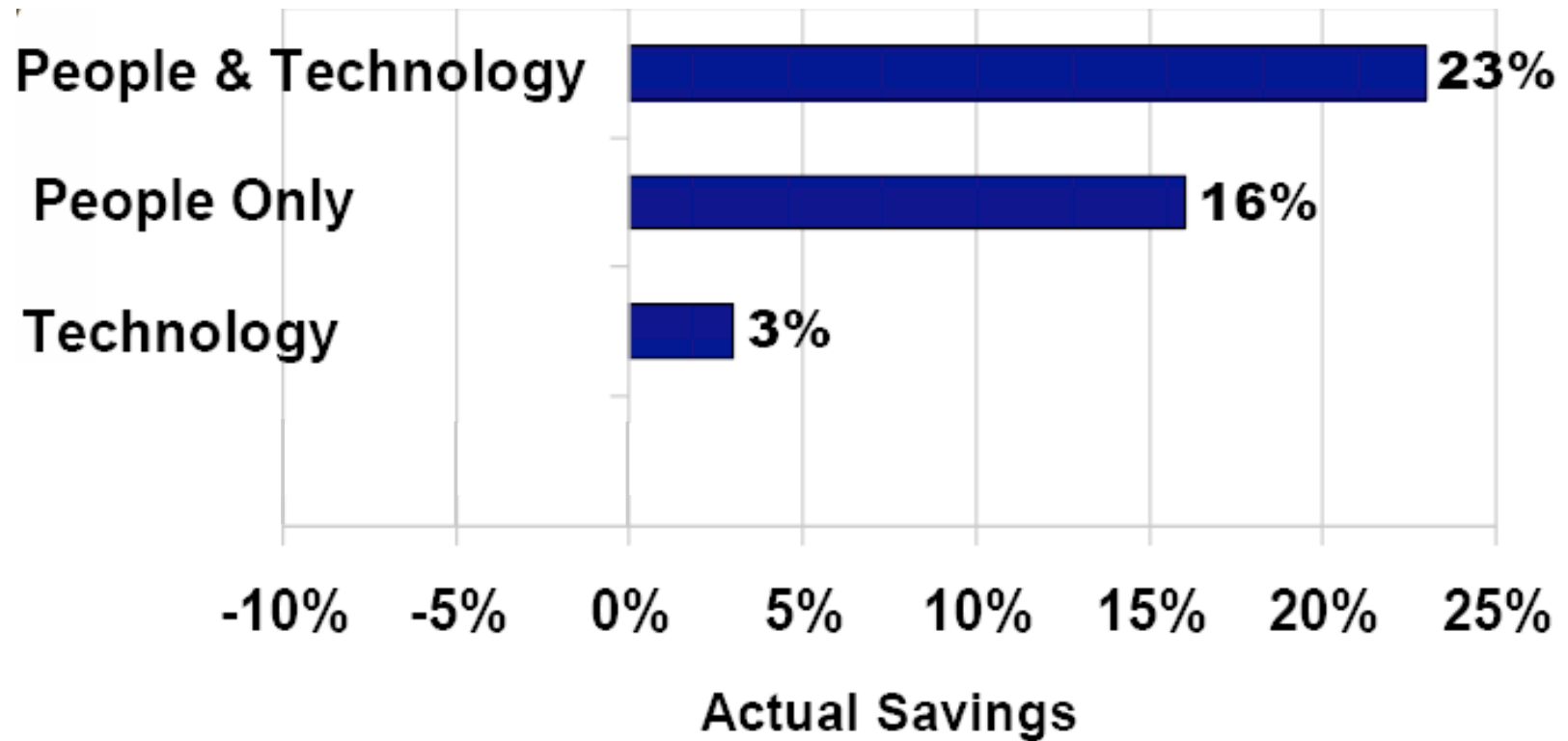
Slide 3

opportunities: technical best practices



- Steam boilers and steam system
 - Condensing boiler
 - Instantaneous steam generation
 - High efficiency burner
 - Economizer
 - Boiler right sizing and load management
 - Blowdown heat recovery
 - Boiler combustion air preheat
 - Process heat recovery to preheat makeup water
 - Condensate return
 - Advanced boiler controls
 - Blowdown control
 - Insulation
 - Boiler preventative maintenance
 - Boiler water treatment
 - Minimize deaerator vent losses
 - Steam trap survey and repair

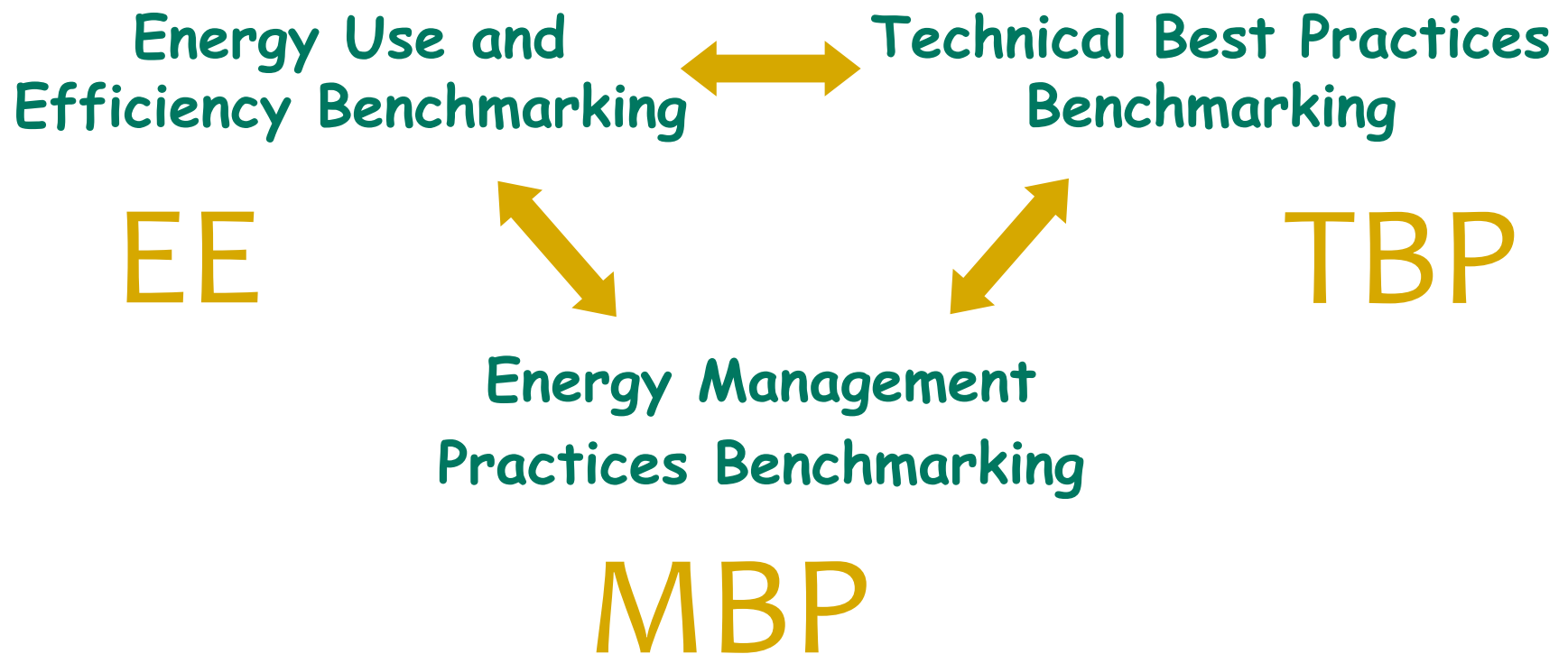
the human factor



Source: Natural Resources Canada – Dollars to \$ense Workshop



integrated benchmarking

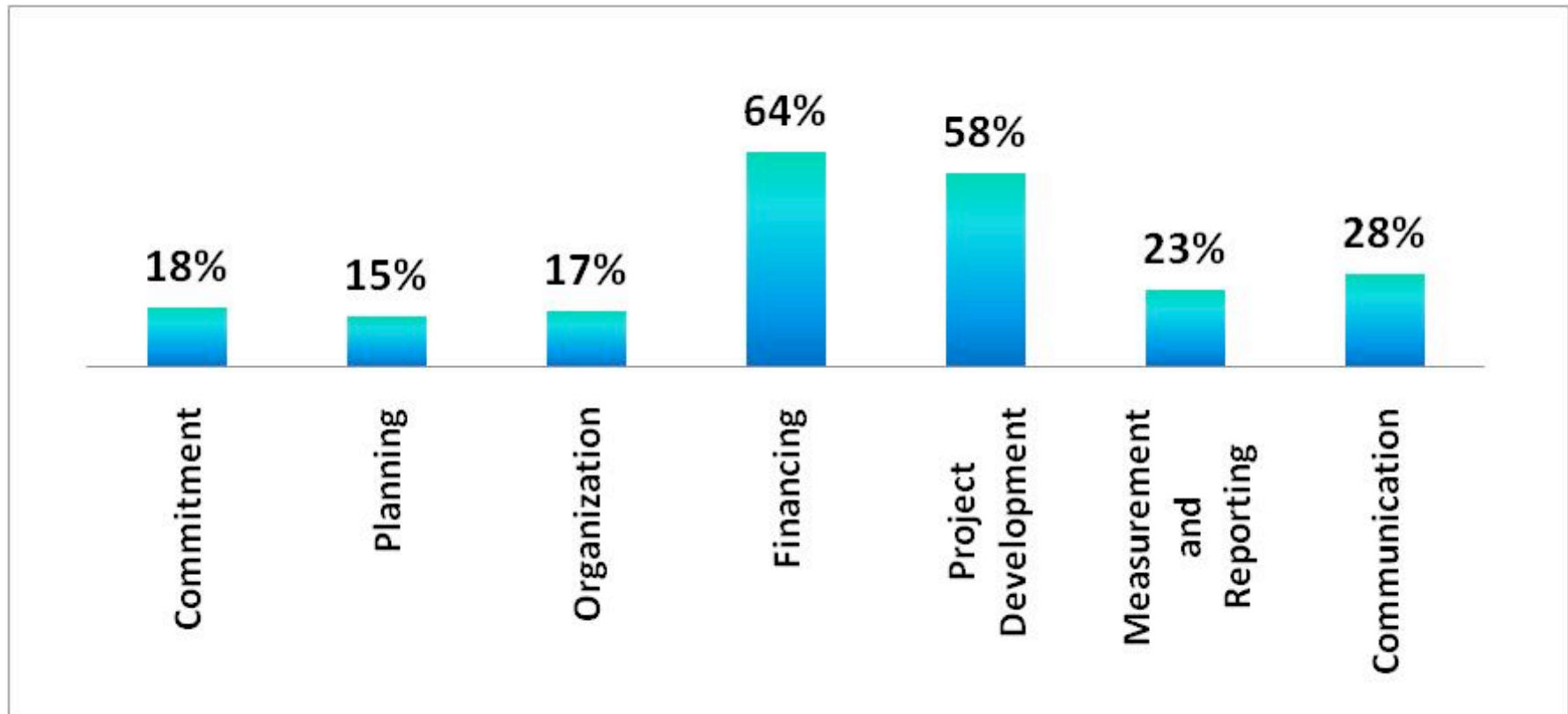


management best practices

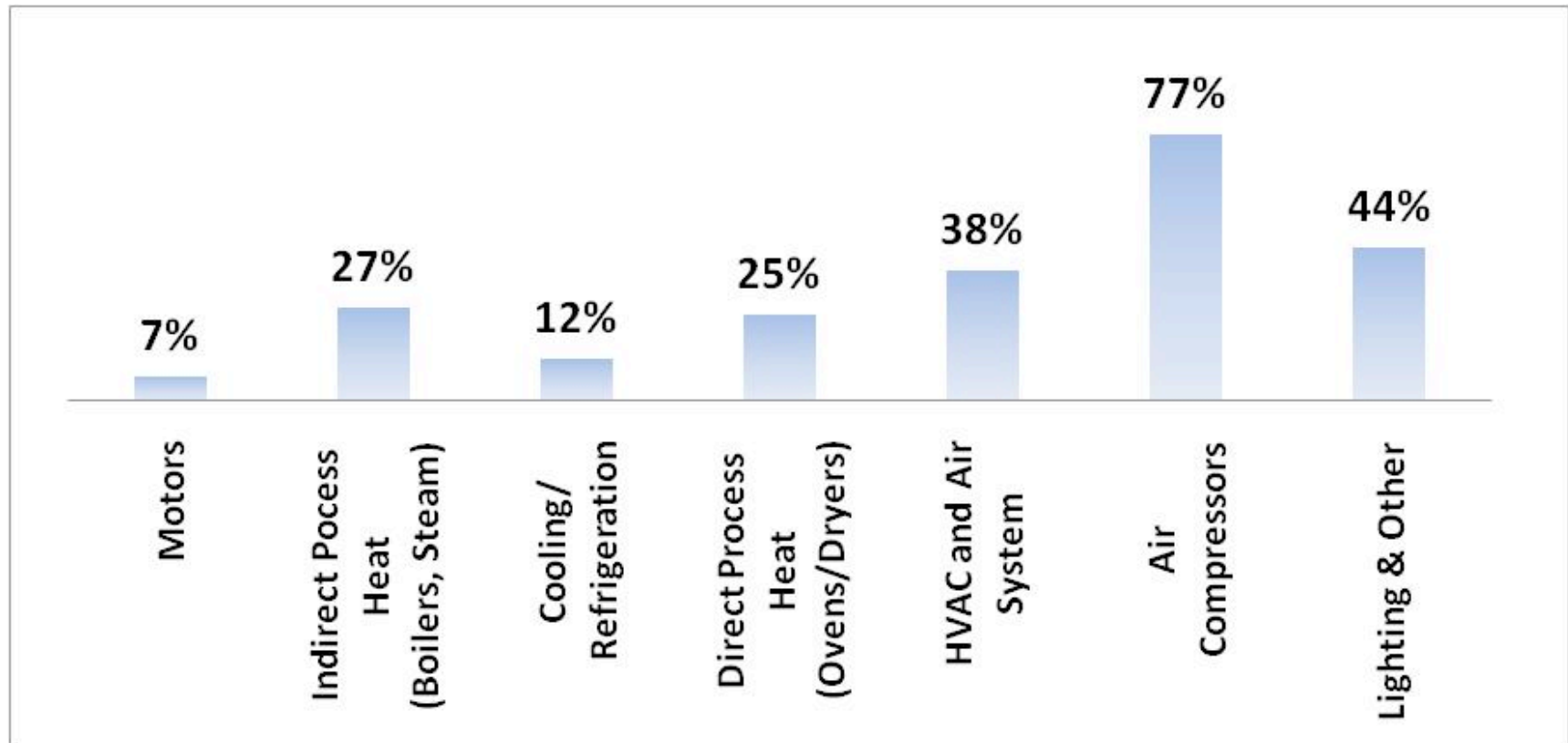


MBP Element	MBP Sub-Element
Commitment	Promotion
	Policy
	Guidelines and Procedures
Planning	Formal Planning
	Support for Planning
	Implementation
Organization	Energy Champion
	Responsibility and accountability
	Energy Leader
	Energy Team
Project Development	Capacity building
	Identification of Opportunities
	Energy Management Best Practices
Financing	Commitment
	Planning
	Integrating energy management with project approval
Measurement and Reporting	Monitoring System
	Reporting
	Use of Monitoring Results
Communication	Extent
	Frequency
	Awareness and Participation

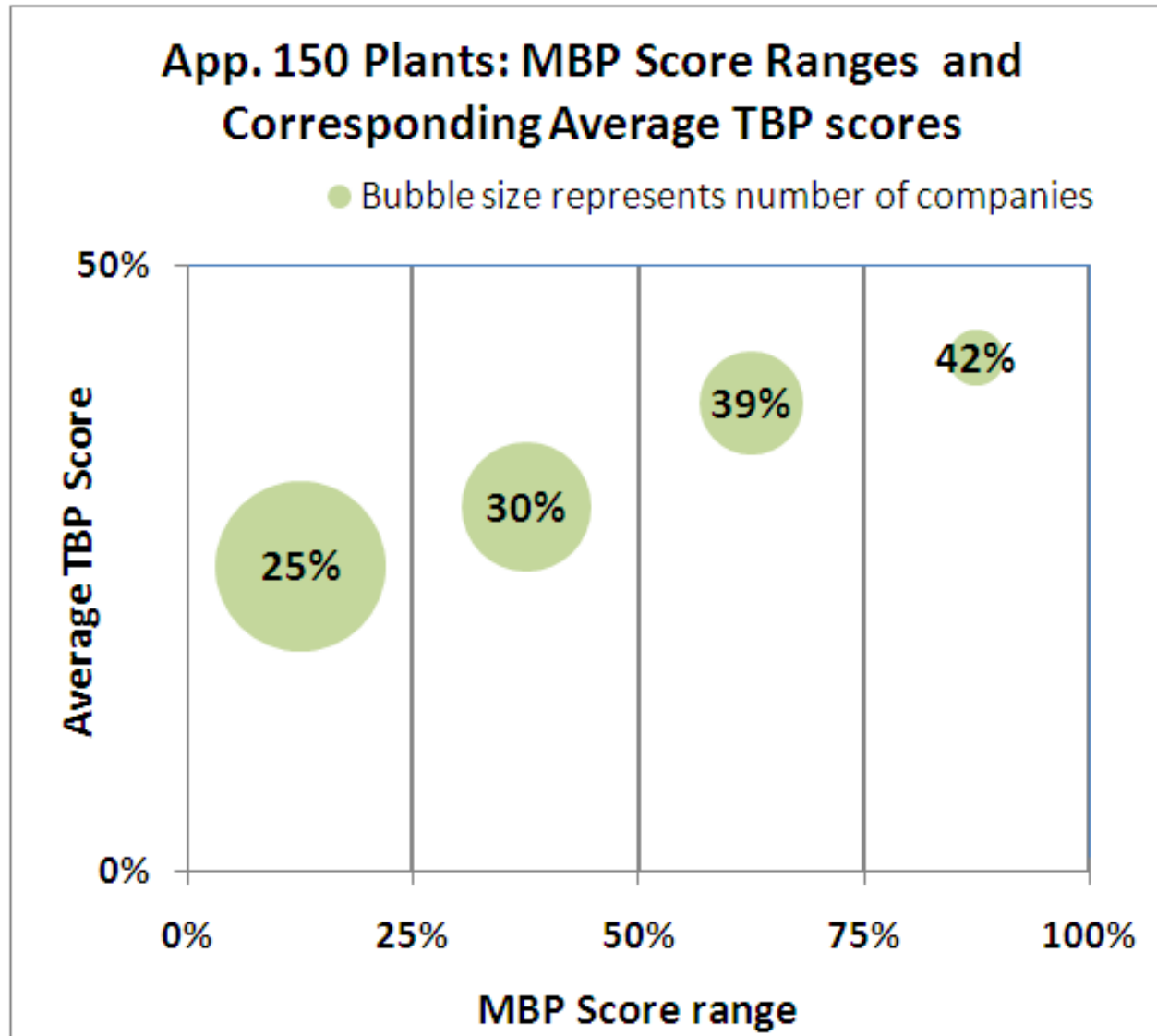
benchmarking: implementation of mbp



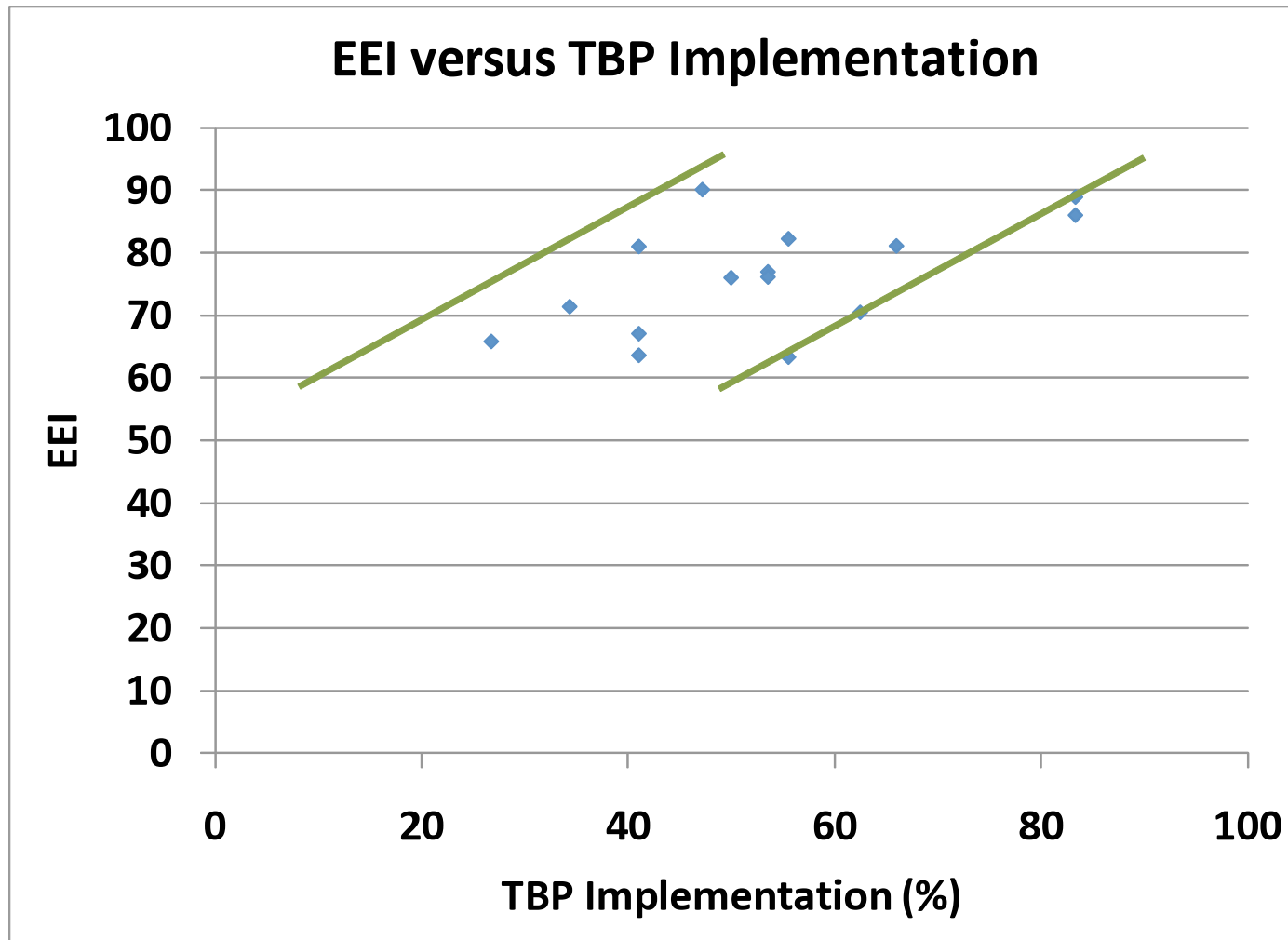
benchmarking: implementation of tbp



mbp vs. tbp



tbp vs. eei



integrated benchmarking



- First step in audit: **MBP workshop**
- **Comprehensive** performance assessment
- Address **reasons** for performance
- Identify and integrate **opportunities** to improve performance
- Guide **program and policy** development

carbon management



- **Carbon intensity** benchmark associated with energy use
- Identify **opportunities** to reduce GHG emissions
- Expand tools to integrate **clean energy** opportunities

industrial sectors benchmarked



➤ Provincial level:

- Ontario (10 sub sectors)
- Nova Scotia (6 sub sectors)
- New Brunswick (5 sub sectors)

➤ National/Sub-sector Specific:

- Cement
- Fossil fuel power generation
- Upstream oil and gas
- Textile

Iron and Steel
Chemical
Mining
Pulp and Paper
Food and Beverage
Plastic and Rubber
Automotive
Fabricated Metal
Non-metallic Mineral
Wood Products
General Manufacturing



Thank you

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