

Emerging Green Conference

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3M Electronics & Energy Business Group

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Agenda

- Intro to 3M, and our place in Electronics industry supply chain
- 3M's Sustainability Goals and specifically, energy efficiency goal
- How 3M contributes to improving the environmental footprint of the electronics industry
 1. Improving the energy efficiency of our own manufacturing processes
 2. Providing innovative products which allow for a reduction in GHG emissions in our customers' manufacturing processes
 3. Providing innovative materials & components which – as components in the devices – allow for lower energy use during the life of the device

Since 1902

- **Subsidiaries in 71 countries**
- **Sales in nearly 200 countries**
- **~90,000 employees**
- **International sales \$20.1B (63% of company total)**
- **200+ factories**
- **Sales: \$31.8B**
- **Net income: \$5.0B**
- **R&D investment: \$1.8B**
- **55,000+ products**
- **100,000 patents**

2014 figures



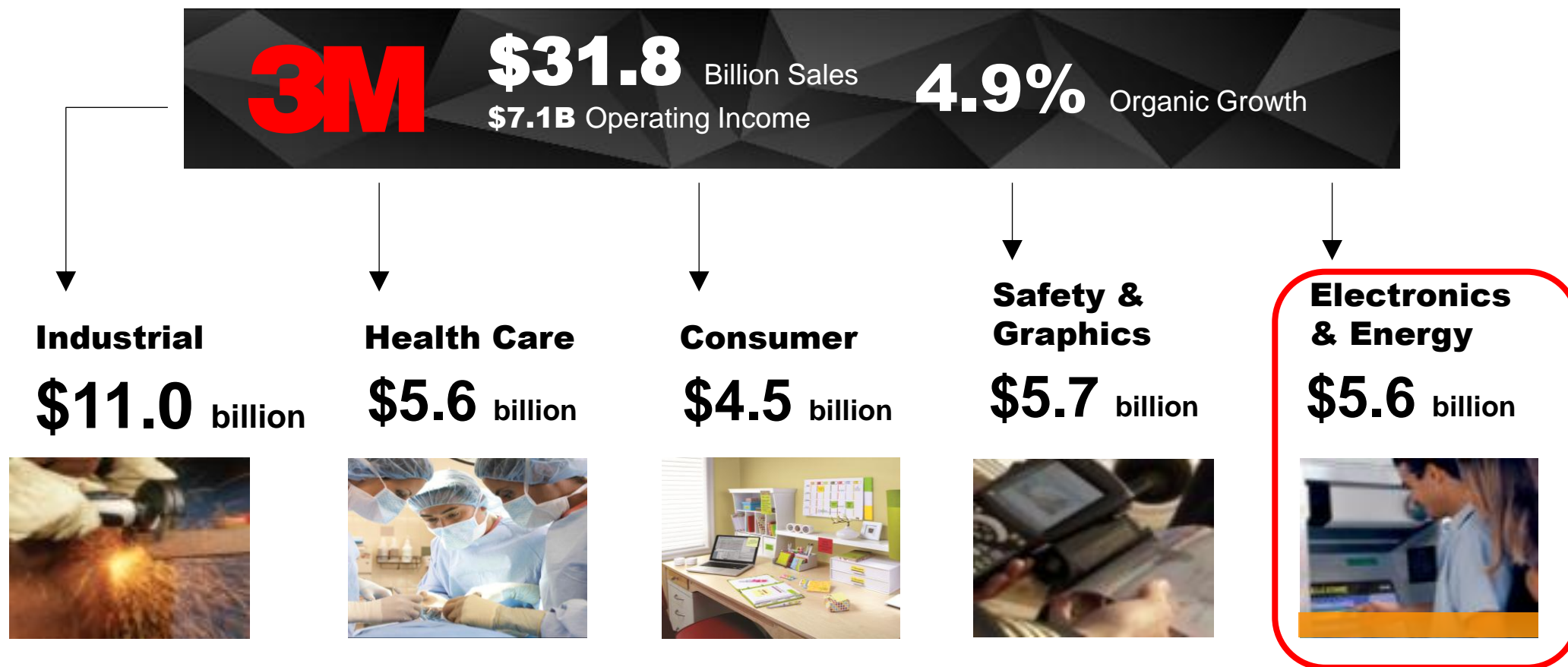
Our Vision

3M Technology Advancing Every Company

3M Products Enhancing Every Home

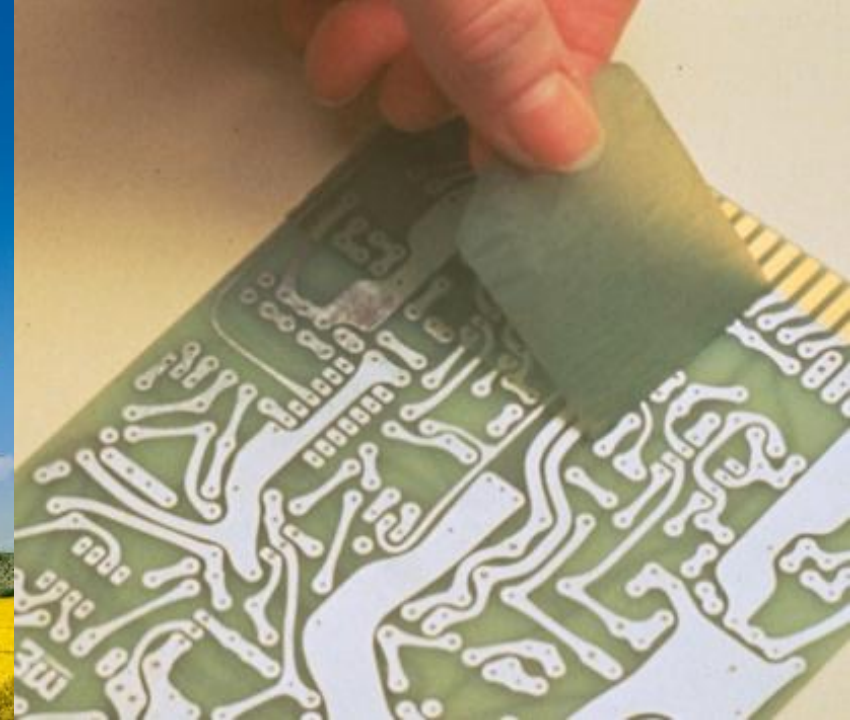
3M Innovation Improving Every Life

Five business groups (2014 results)



Electronics & Energy

Enabling tomorrow's lifestyle
today by contributing to power,
communications and electronics



We Approach our Sustainability Goals & Strategy by:

Building on iconic 3P Program initiated in 1975, we have seen that Pollution Prevention Pays.

Delivering Excellence in Operations

- Reduce manufacturing waste by an additional 10%, indexed to sales
- Achieve “zero landfill” status at more than 30% of manufacturing sites
- Drive supply chain sustainability through targeted raw material traceability and supplier performance assurance
- Reduce water use by an additional 10%, indexed to sales
- Ensure GHG emissions at least 50% below our 2002 baseline, while growing our business
- Improve energy efficiency indexed to net sales by 30%
- Increase renewable energy to 25% of total electricity use
- 100% participation in employee development programs to advance individual and organizational capabilities
- Double the pipeline of diverse talent in management to build a diverse workforce

Innovating to Improve Lives

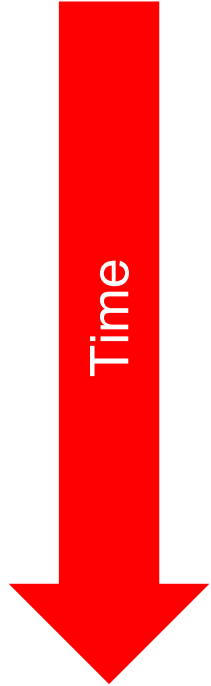
- Invest to develop more sustainable materials and products to help our customers reach their environmental goals
- Help our customers reduce their GHGs by 250 million tons of CO₂ equivalent emissions through use of 3M products
- Provide training to 5 million people globally on worker and patient safety

Enriching Our Communities

- Invest cash and products for education, community and environmental programs
- Engage 100% of water-stressed/scarcce communities where 3M manufactures on community-wide approaches to water management

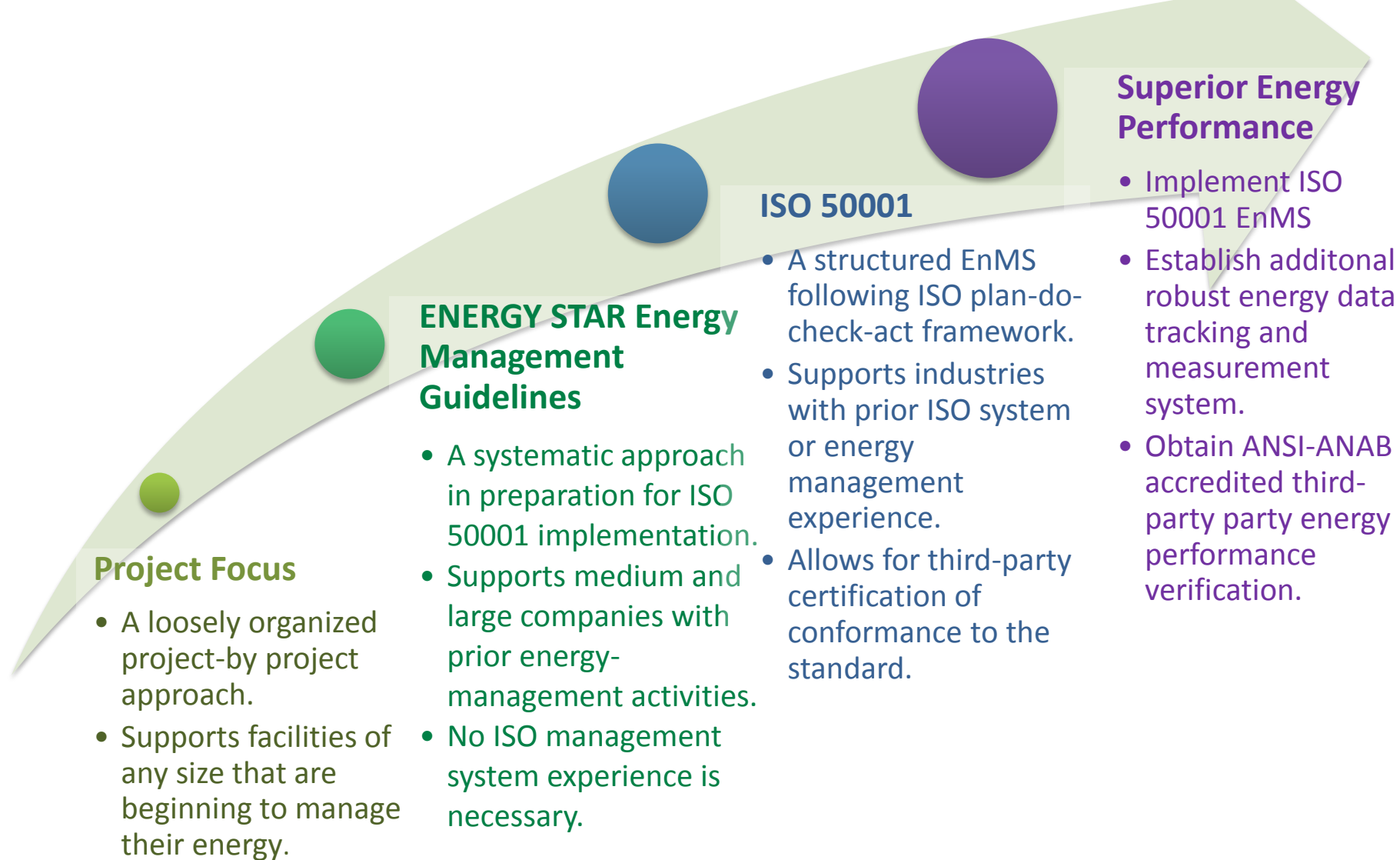
*All goals are global. Unless otherwise noted, all goals have a 2015 baseline and a 2025 end date.

3M Has Aggressive Energy-Efficiency Goals



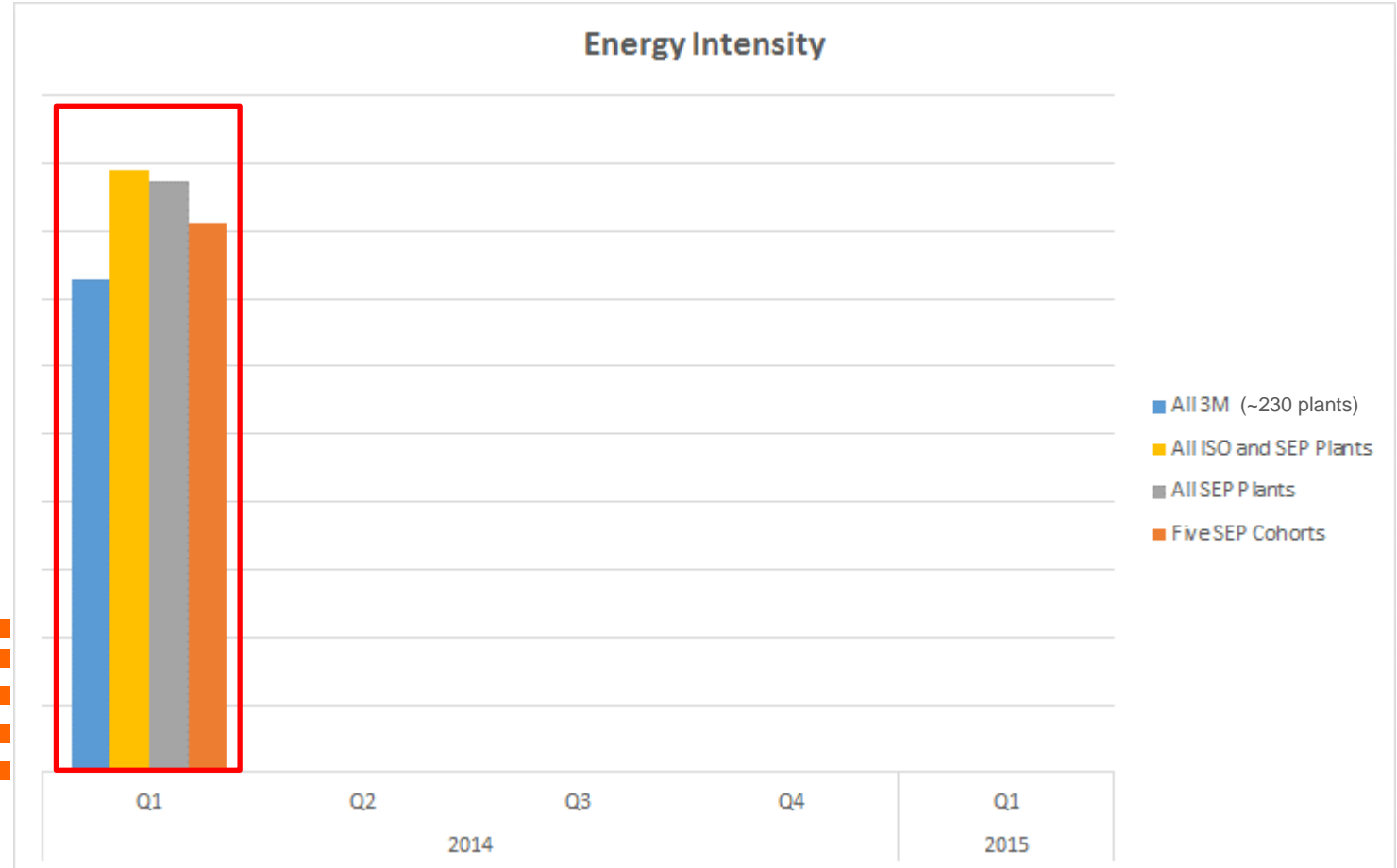
- Challenge '95
- Year 2000 Environmental Targets
- Environmental Targets 2005
- Environmental Targets 2010
- 2015 Sustainability Goals
- **2025 Sustainability Goals**
 - 30% improvement in energy efficiency (indexed to net sales)
 - 25% more of 3M electricity from renewable sources

Strategic Energy Management Continuum



3M Locations Certified or Pursuing Certification

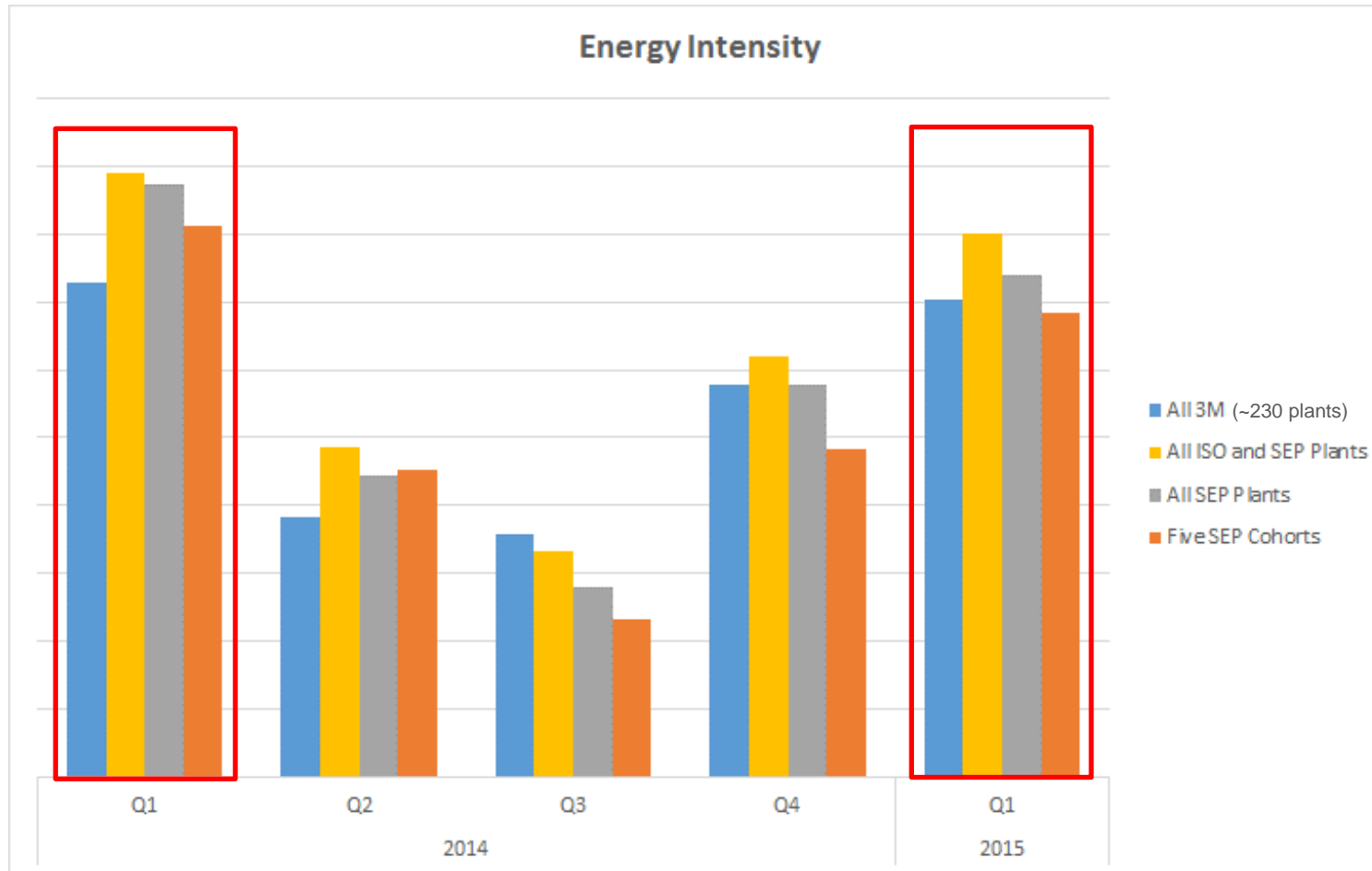
| Country | Site | Latest Action | SEP Certified | |
|---------|-----------------------|--------------------------------|---|-------|
| Canada | Brockville 501 (Tape) | ISO 50001 Certified | Platinum | ■ ■ |
| Canada | London | ISO 50001 Certified | No | ■ |
| Canada | Perth 301 | ISO 50001 Certified | No | ■ |
| Canada | Perth 302 | ISO 50001 Certified | No | ■ |
| France | Tilloy | ISO 50001 Certified | No | ■ |
| Germany | Kempton (Ceradyne) | ISO 50001 Certified | No | ■ |
| Germany | Neuss | ISO 50001 Certified | No | ■ |
| Germany | Hilden | ISO 50001 Certified | No | ■ |
| Germany | Kamen | ISO 50001 Certified | No | ■ |
| Germany | Seefeld & Landsberg | ISO 50001 Certified | No | ■ |
| Germany | Jüchen | ISO 50001 Certified | No | ■ |
| Korea | Naju | 1-Dec-15 | | ■ |
| Poland | Wroclaw PSD | ISO 50001 Certified | No | ■ |
| Poland | Wroclaw Automotive | ISO 50001 Certified | | ■ |
| U.K. | Gorseinon | On-hold | | ■ |
| U.S. | Cordova | ISO 50001 Certified | Silver | ■ ■ |
| U.S. | Aberdeen | Working as a group of co-horts | Enterprise-wide ISO 50001 and individual Superior Energy Performance certificates | ■ ■ ■ |
| U.S. | Cynthiana | | | ■ ■ ■ |
| U.S. | Decatur | | | ■ ■ ■ |
| U.S. | Hutchinson | | | ■ ■ ■ |
| U.S. | Prairie du Chien | | | ■ ■ ■ |



— All data based on BTU's per pound of product

Results

For pdf ver



Energy Efficiency Improvement 1Q 2015 vs 1Q 2014

- 3M global improvement of 1.7%
- 3M ISO 50001 facilities improved 5.3%
- 3M Superior Energy Performance facilities improved 7.8%
- Five SEP cohort plants in Enterprise-wide certification improved 8.1%

— SEP/ISO with best practice sharing yields best results

— All data based on BTU's per pound of product

Collaboration

Engineering

Sourcing

Manufacturing

Sustainability

Energy Efficiency at 3M improves the environmental footprint of our customers' devices

Novec™

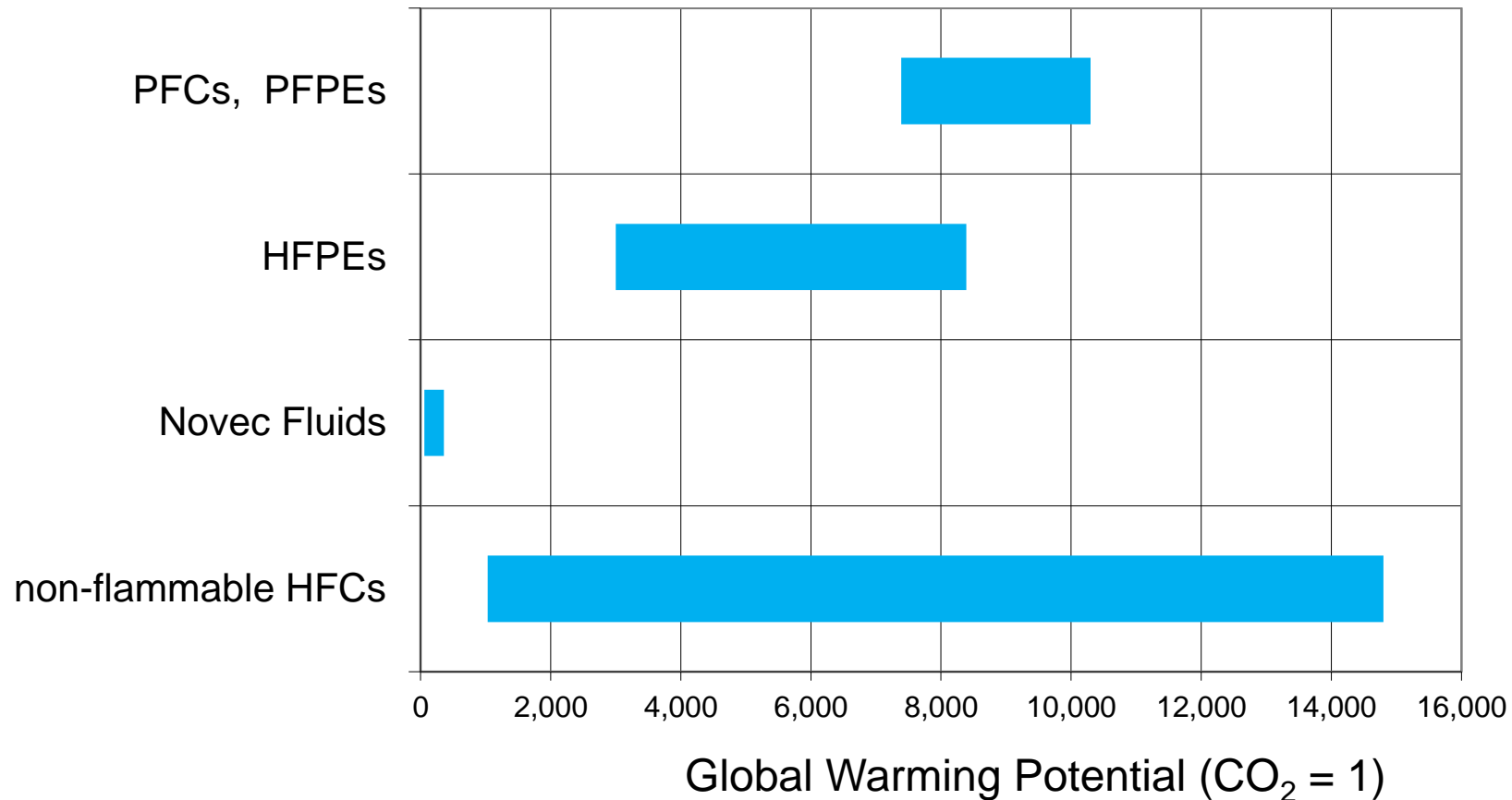


Replacement Materials for
PFCs, SF₆, CFCs, HCFCs,
halons and HFCs



GWP Potential for Legacy Materials vs. 3M™ Novec™ Fluids

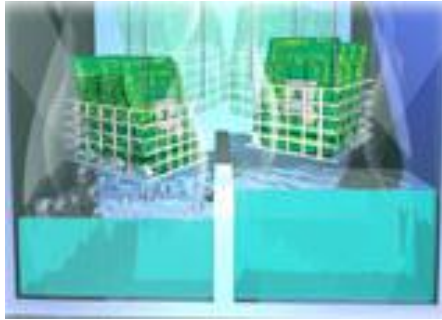
SF₆



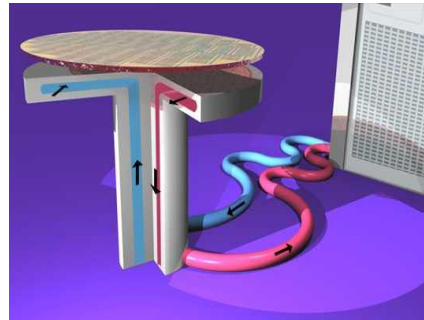
Novec Fluids offer >99% reduction in greenhouse gas emissions

3M™ Novec™ Fluid Applications

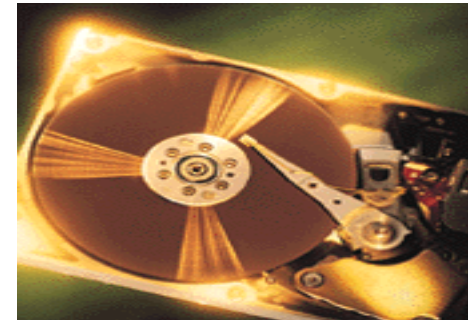
Electronic Assembly Solvents



IC Heat Transfer Fluids



IC/Data Storage Solvents



Needle coating



Fire Suppression



Aerospace cleaning



Oxygen Line Cleaning



Mg protection



SF6 Replacement

Circuit breaker Switchgear



Gas Insulated Lines



Latent Fingerprint Development



Movie Film Cleaning



3M™ Advanced Polarizing Film V3 (APF-V3)



3M DBEF (Dual Brightness Enhancement Film)

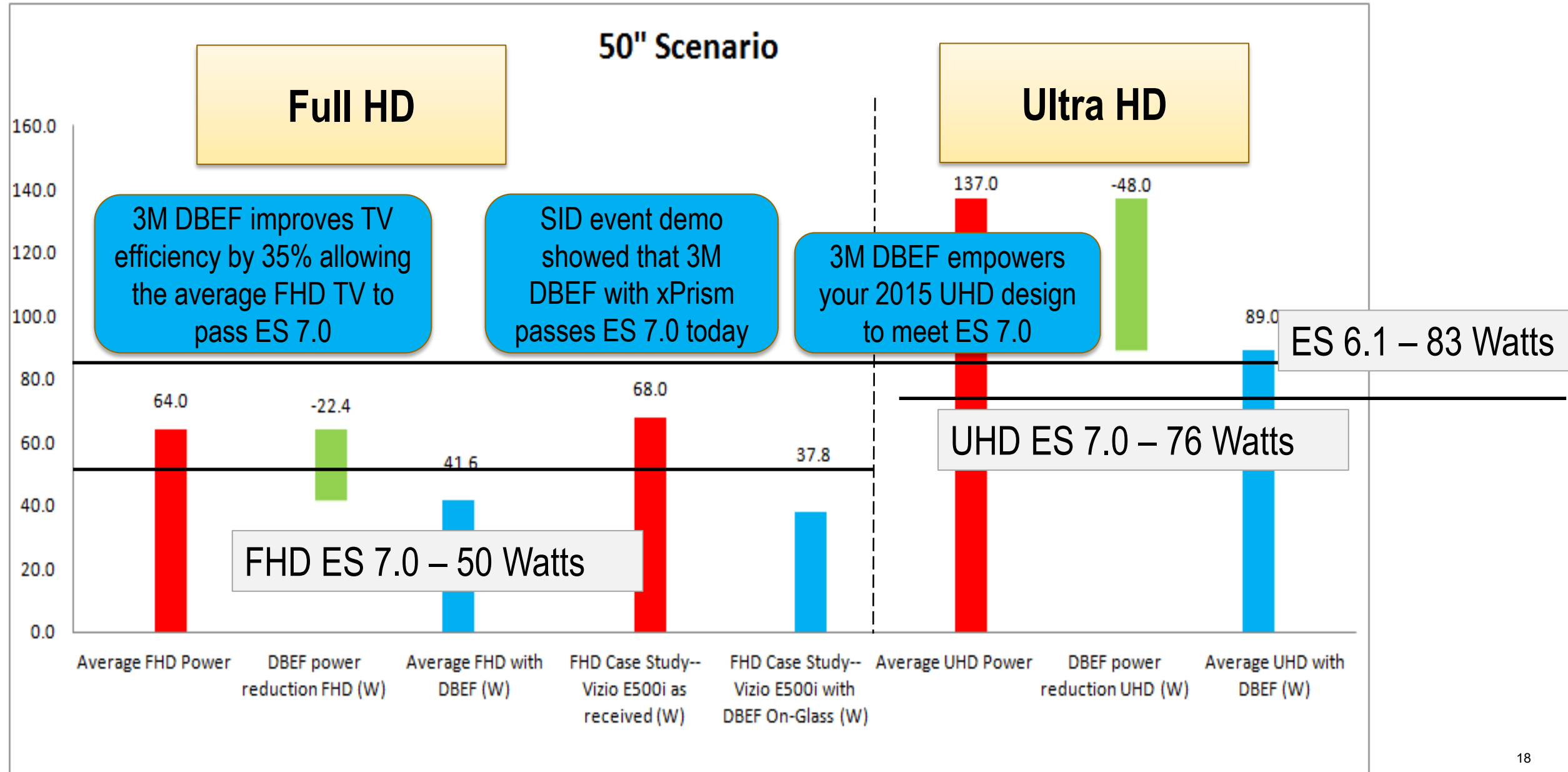
**Thin film
reflective polarizer**



ENERGY STAR version 7.0 TV example

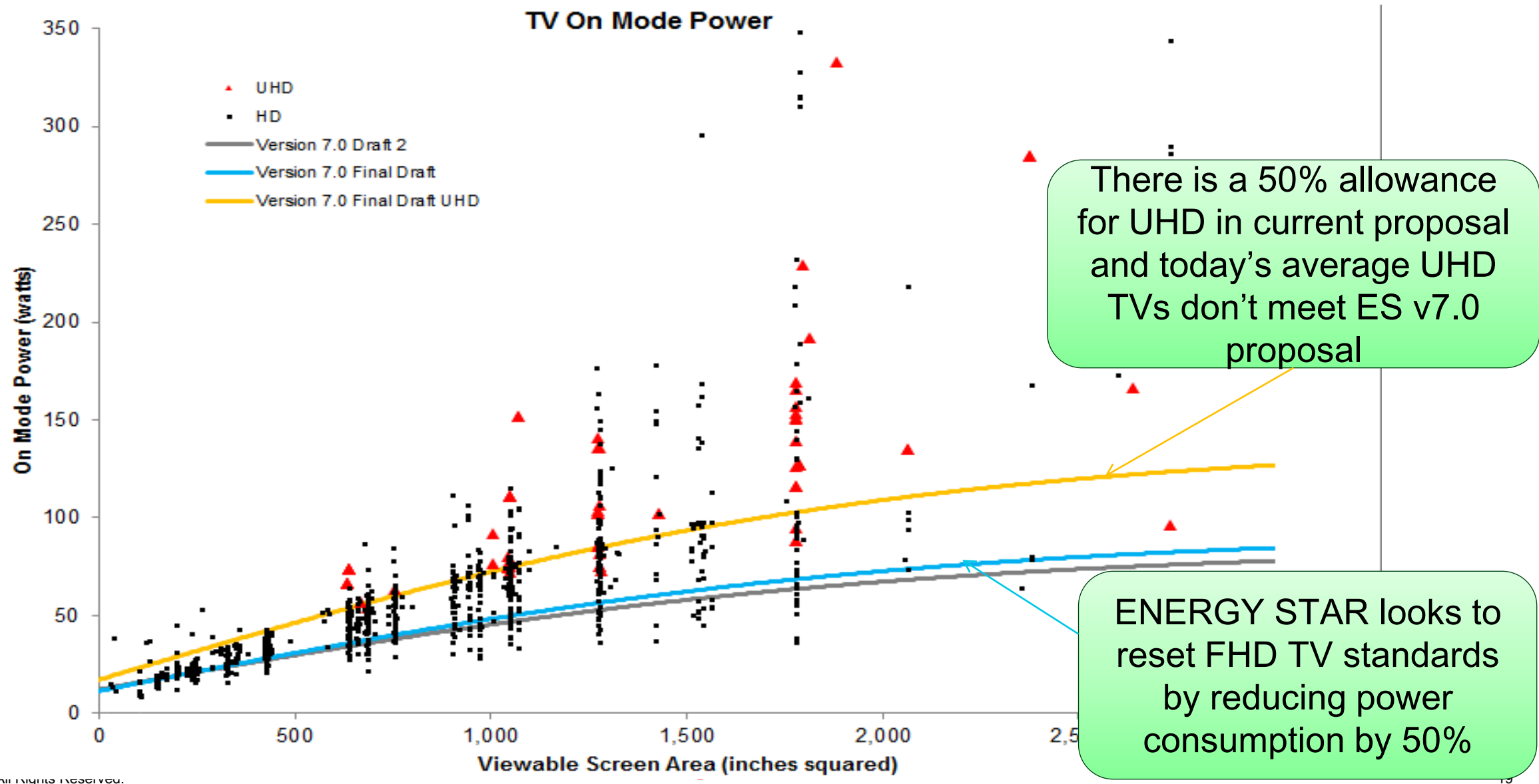
Performance

3M DBEF enables compliance with ES 7.0



ENERGY STAR version 7.0 TV Final Draft

Proposed Dataset – Implementation October 30, 2015



Higher Luminance Impact

Reflective Polarizer Example in 50 “ 4K TV



7.0 UHD

| | Without Reflective Polarizer | With Reflective Polarizer |
|-----------------------------|------------------------------|---------------------------|
| Brightness Increase | 100% | 127% |
| Off Axis (20%, 40%, 60 %) | 76 %,37 %,18 % | 89 %,53 %,22 % |
| Power at 100 % Brightness | 74 Watts | 51 Watts |

High brightness at **virtually** all viewing angles + low power provides **a great** user experience

If all UHD TVs in 2015 used DBEF, would save 759 MW. In 2016, > 1 GW!



In Conclusion

- 3M working to improve the environmental footprint of electronics industry by
 1. Continuous improvement in energy efficiency in our own manufacturing processes
 - e.g. Implementation of ISO 5001 and SEP program
 2. Making innovative alternatives available to the industry to reduce GHG emissions in our customers' manufacturing processes
 - e.g. Low GWP 3M™ Novec™ Engineering Fluids
 3. Offering innovative materials & components that become part of the electronic devices that enable lower energy use as the devices are used
 - e.g. DBEF reflective polarizers



Thank you!