



3M Science.
Applied to Life.™

The Power of Partnerships: The 3M Energy Management Story

Chrissie Olson
Energy Analyst

3M
October
18th, 2018

3M at a glance



- Sales in ~200 countries
- \$32 billion in sales
- Five business groups
- 90,000 3Mers globally
- 113,000 patents
- 101 straight years of dividends
- One of 30 companies on the Dow Jones Industrial Index

Our Vision

3M Technology Advancing Every Company

3M Products Enhancing Every Home

3M Innovation Improving Every Life

Science.
Applied to Life.



Our Sustainability Strategy

Building on our long-standing leadership in environmental stewardship and commitment to customer-inspired innovation, we focus our Sustainability strategy on overcoming the global challenges that serve as barriers to improving every life.

Global Challenges



Raw Materials



Energy & Climate



Water



Health & Safety



Education & Development

Our 2025 Sustainability goals



Energy & Climate

- Improve energy efficiency indexed to net sales by 30%
- Increase renewable energy to 25% of total electricity use
- Ensure GHG emission at least 50% below our 2002 baseline, while growing our business
- Help our customers reduce their GHGs by 250 million tons of CO₂-equivalent emissions through use of 3M products



Raw Materials

- Invest to develop more sustainable materials and products to help our customers reach their environmental goals
- 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



Health & Safety

- Provide training to 5 million people globally on worker and patient safety



Water

- Reduce global water use by an additional 10%, indexed to sales
- Engage 100% of water-stressed/water-scarce communities where 3M manufactures on community-wide approaches to water management



Education & Development

- Invest cash and products for education, community and environmental programs
- 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

Energy & Climate



- Improve energy efficiency indexed to net sales by 30%.
- Increase renewable energy to 25% of total electricity use.
- Ensure GHG emissions at least 50% below our 2002 baseline, while growing our business.

Energy & Climate

A large, white, cylindrical wind turbine tower dominates the center of the image. A spiral staircase with metal railings leads up to a door on the tower. The tower is set against a backdrop of other wind turbines and a sky with scattered clouds. The ground is a mix of green grass and brown patches.

Energy usage and climate concerns require systematic change, and we're here to drive that forward.

3M Engineering

Corporate Energy Management

Corporate Energy Manager

Energy Analyst

Energy Engineering
Specialist

The 3M Energy
Management Team

“Hire good people and leave them alone.”

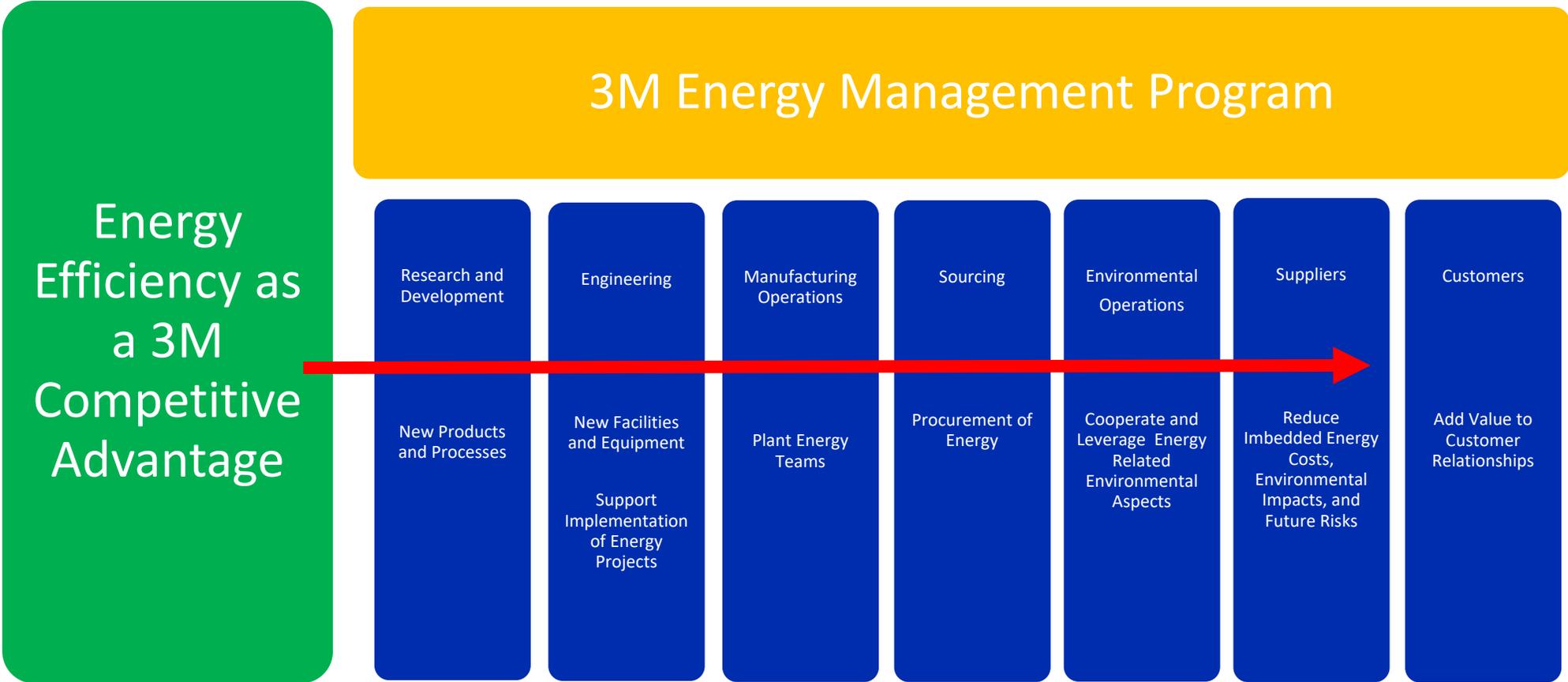


William L. McKnight
President (1929-1949) and
Chairman of the Board (1949-1966)

Collaboration across our enterprise



Cross Company Effort



3M Engineering

Corporate Energy Management

Corporate Energy Manager

Energy Analyst

Energy Engineering
Specialist

Regional Energy Coordinators

Global Network
of Energy Champions

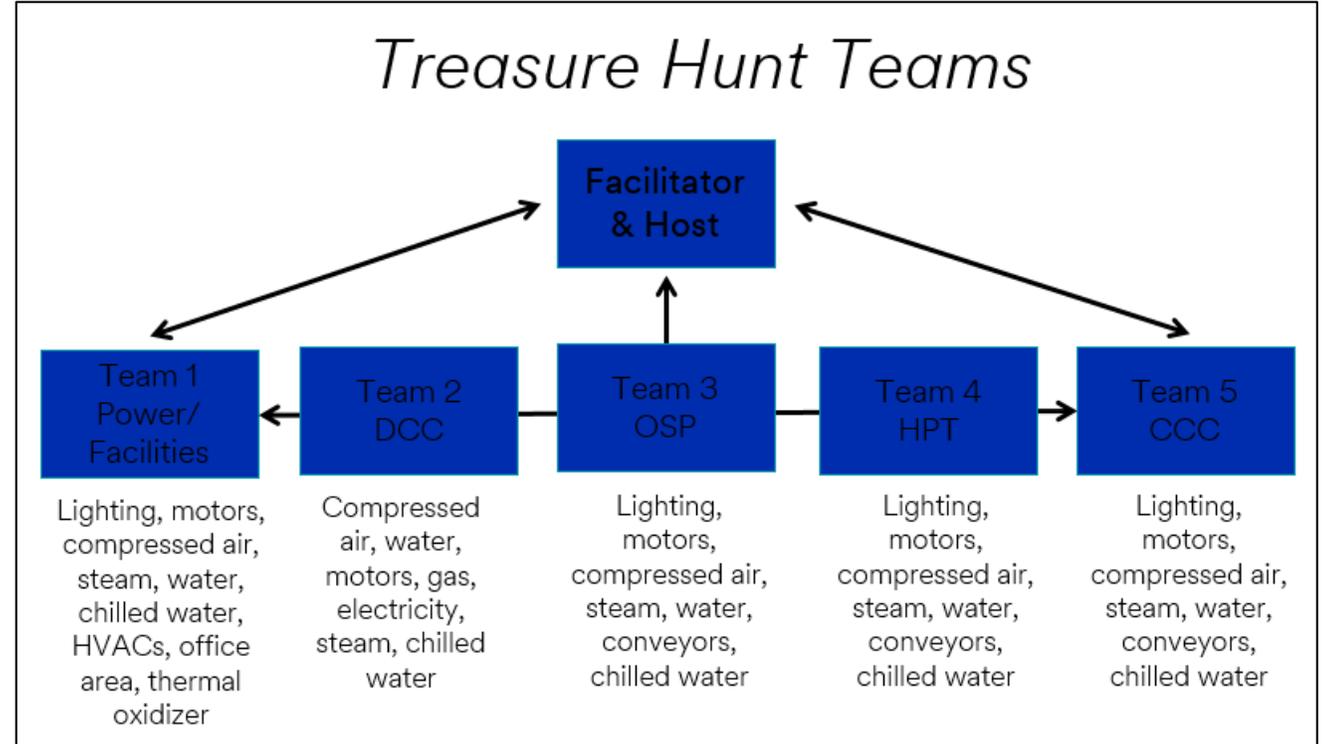
Power in Partnerships: Network of Global Energy Champions

Global Energy Champions lead, coach, and facilitate a facility-wide, cross functional team to achieve significant energy reductions and cost savings



Power in Partnerships: 3M-lead Treasure Hunts

- Teams are cross-functional
- Aims to build on-site partnerships in energy management and effective program maintenance
- Build the energy culture on-site; beyond the core energy teams



Power in Partnerships: Regional Coordinators

Active, engaged regional coordinators using common tools and sending common messages

- Lead regional efforts to help 3M operations improve energy performance
- Provide communications to and obtain support from regional executive management to achieve corporate goals
- Maintain a linkage with 3M Corporate Energy Management, local and regional partners, and all regional 3M locations



3M Engineering

Corporate Energy Management

Corporate Energy Manager

Energy Analyst

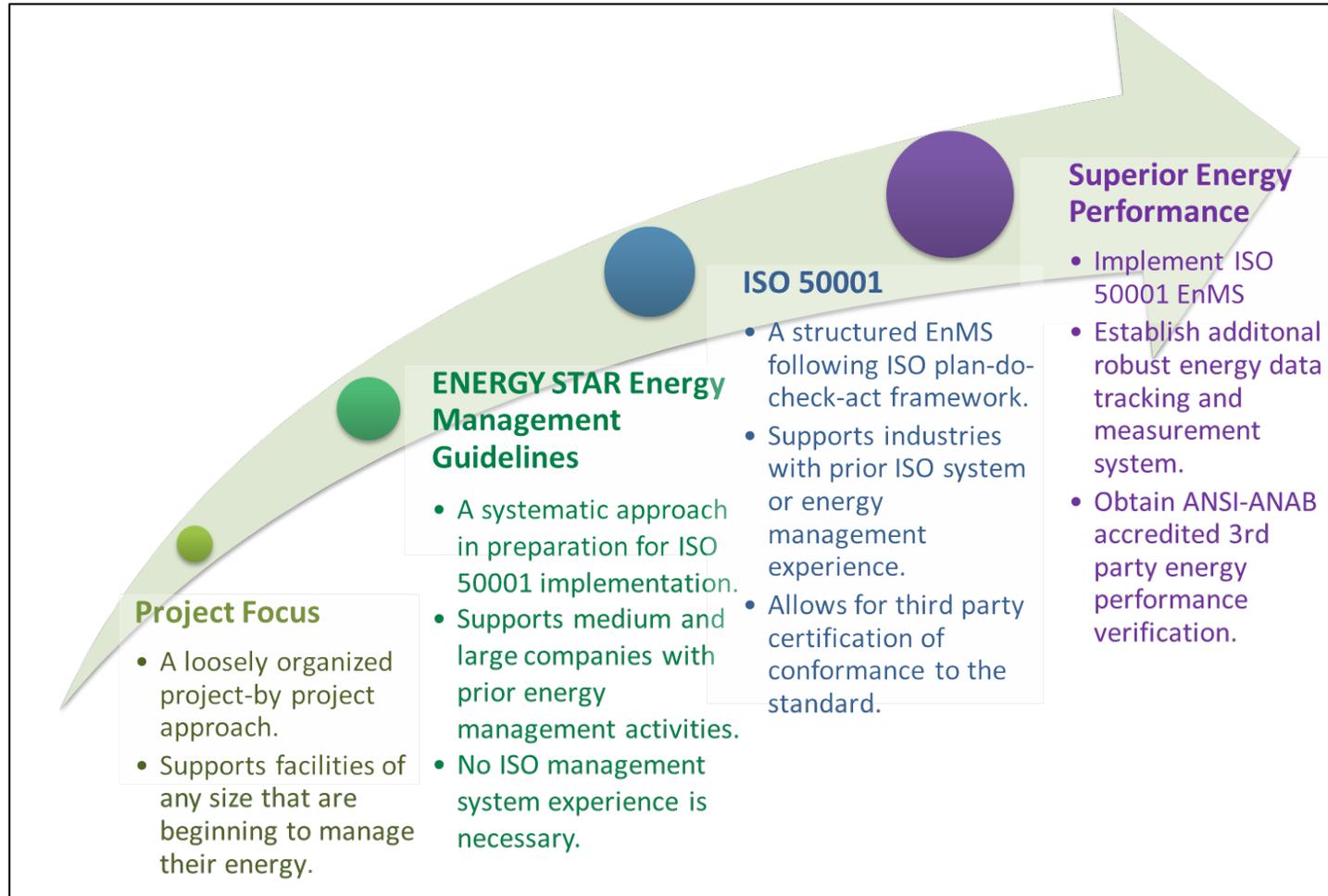
Energy Engineering
Specialist

ISO 50001 / SEP
Coordinator

Regional Energy Coordinators

Global Network
of Energy Champions

Power in Partnerships: ISO 50001 & SEP Coordinator



3M Engineering

Corporate Energy Management

Corporate Energy Manager

Energy Analyst

Energy Engineering Specialist

Regional Energy Coordinators

Global Network of Energy Champions

3M Sustainability and Product Stewardship

3M Environment, Health and Safety

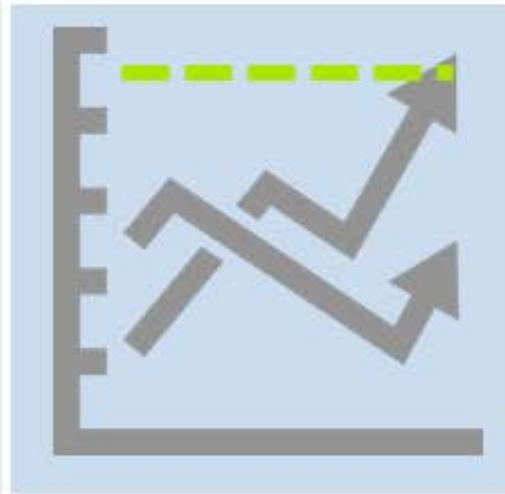
ISO 50001 / SEP Coordinator

Power in Partnerships: 3M Engineering

Energy Monitoring



- I. What you can't measure you can't control – make energy visible
- II. Sub-metering
- III. Energy Map – identify where energy is used and how much it costs



- IV. Establish energy baselines
- V. Establish energy targets normalized for product types, outside weather conditions and any other related variables



- VI. Provide real-time energy information for operating personnel



- VII. Provide energy consumption reporting for management for tracking and budgeting

Power in Partnerships: Environmental, Health, & Safety

Sustainability Reporting and Teamwork

3M Science. Applied to Life.™ 2018 Sustainability Report

3D Text: Improve
Demond Rachon Bryant Jr., 2018
Juxtaposition Arts

We tapped youth design apprentices at Minneapolis, MN based Juxtaposition Arts to interpret Sustainability at 3M and design this cover. Learn more inside. →

How We Work | Environmental Management | Climate and Energy

Climate and Energy

Our Commitment

A steady focus on climate and energy conservation.

Through the years, 3M has been a proactive leader in addressing both the challenges and the opportunities presented by climate change and energy conservation.

Our proactive leadership is best defined by five areas of action:

- Executive-level commitment to these important topics and our related principles, commitments, and risk-mitigation planning efforts
- Industry-leading efforts to reduce our own greenhouse gas (GHG) emissions

- Extensive public policy engagement on both climate change and energy conservation
- A decades-long track record of improving energy efficiency at our locations
- Serving our customers through a wide range of innovative products that help them improve energy efficiency and reduce their carbon footprints

Executive-Level Commitment

Climate change and energy efficiency are high-priority issues throughout 3M, up to the Corporate Operating Committee and Chief Executive Officer. The Corporate Environmental, Health and Safety (EHS) Committee has been empowered by company leadership to take proactive steps and be responsible for all final decisions on climate change and energy strategy, including setting company reduction



goals and policies. For climate change strategy and GHG emission guidance, the Corporate EHS Committee has appointed

- Provide full credit for early reductions in GHG emissions

Public

3M employees should be and follow

- Apply and
- Be guid
- Utilize
- Encour proper
- Include tradin compli

operations, and move from delivering energy projects in a loosely-organized fashion to a structured system of management. By integrating the systematic ISO-based framework of "plan-do-check-act" for the management of energy in on-site operations, our locations have seen savings in energy costs and consumption, expansion of employee engagement, and increased visibility to the tracking of site energy performance. 3M has been busy increasing its ISO 50001 and ISO 14001 certified profiles, with 28 locations now certified or working toward certification under those two programs.

In 2017, we were recognized by the Clean Energy Ministerial (CEM) Energy Management Leadership Awards program. 3M was one of 50 organizations, across 21 countries, to receive the Energy Management Insight Award. The award recognizes 3M's role in building awareness of ISO 50001 and contributing to global knowledge of energy management implementation. 3M has been invited to speak at two related events: joint China-U.S. Energy Efficiency forum at Denver in October; and the International Energy Agency (IEA) Workshop on Energy Management Systems and Digital Technologies for Industrial Energy Efficiency and Productivity, at Paris in December.

We are transforming the ways we use and evaluate energy

In 2017, 3M piloted a project at select facilities focusing on energy reduction opportunities in heating, ventilation, and air conditioning (HVAC) technology. We realized approximately \$175,000 in savings with optimization of HVAC units completed at no cost. With the successful demonstration of this project, we seek to introduce this process at more 3M facilities in 2018.

Also in 2017, we have seen energy monitoring getting increased visibility and support within engineering on new projects and upgrades. This new metering technology will aid in the identification of energy costs associated with the manufacturing process and allow for better analysis to reduce energy costs both during production and non-production time periods.

In addition, we developed an energy analysis tool for use by all 3M locations. The tool is designed to provide quick analysis and identification of energy projects, and estimated payback periods. It uses actual site energy costs and weather data for analysis of energy costs in lighting, motors, makeup air, and compressed air.

We continued our Lighting Challenge in 2017, focused on 3M locations upgrading their lighting systems to lighting-efficient diode LED technology. It is estimated that over 250,000 lamps have been purchased for installation in 2017, producing a cost savings of approximately \$3.2 million.

Plant Engineering and Energy Global Leadership Summit

In June 2017, leaders of our growing energy network met in St. Paul, Minnesota as a part of the Plant Engineering and Energy Global Leadership Summit. For the first time, 3M included a specific energy track, with inspirational results. More than 160 energy professionals who work at various levels throughout the corporation attended.

Over the course of three days, we had 12 energy-specific 3M presenters and seven poster session participants, with an electrical meter vendor and the Department of Energy offering unique breakout session opportunities. Topics covered included:

- How to Build a Cross-Functional Energy Team
- On-Site Solar at 3M Locations
- The Value of Energy Metering
- Energy Programs in Canada
- Energy Project Prioritization

On the final day of the conference, the 3M Cottage Grove, Minnesota facility hosted an [Energy Treasures](#).



2017 Plant Engineering & Energy Leadership Summit
June 13, 2017

160 | 3M 2018 Sustainability Report

plant training session. The 3M Corporate Environmental team gave its first live and in-person group training with a global team of participants, using tools, resources, and training for successful treasure hunt events. At the end of the day, participants identified an estimated \$190,000 in annual energy cost savings.

Energy Excellence Awards

The Energy Excellence Award honors individuals and teams that incorporate the goals of the Corporate Energy Program in engineering projects. The projects and individuals nominated actively demonstrate their commitment to include energy efficiency in the design of projects, in equipment selection, or in the use of alternative energy supplies. The award is one of global recognition within the 3M Engineering community. In May 2017, three awards were given at the 2017 Engineering Awards ceremony in St. Paul, Minnesota:

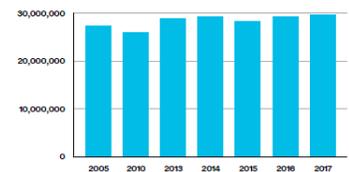
- 3M Greenville, South Carolina for eliminating solvent from the curing process for box sealing tapes

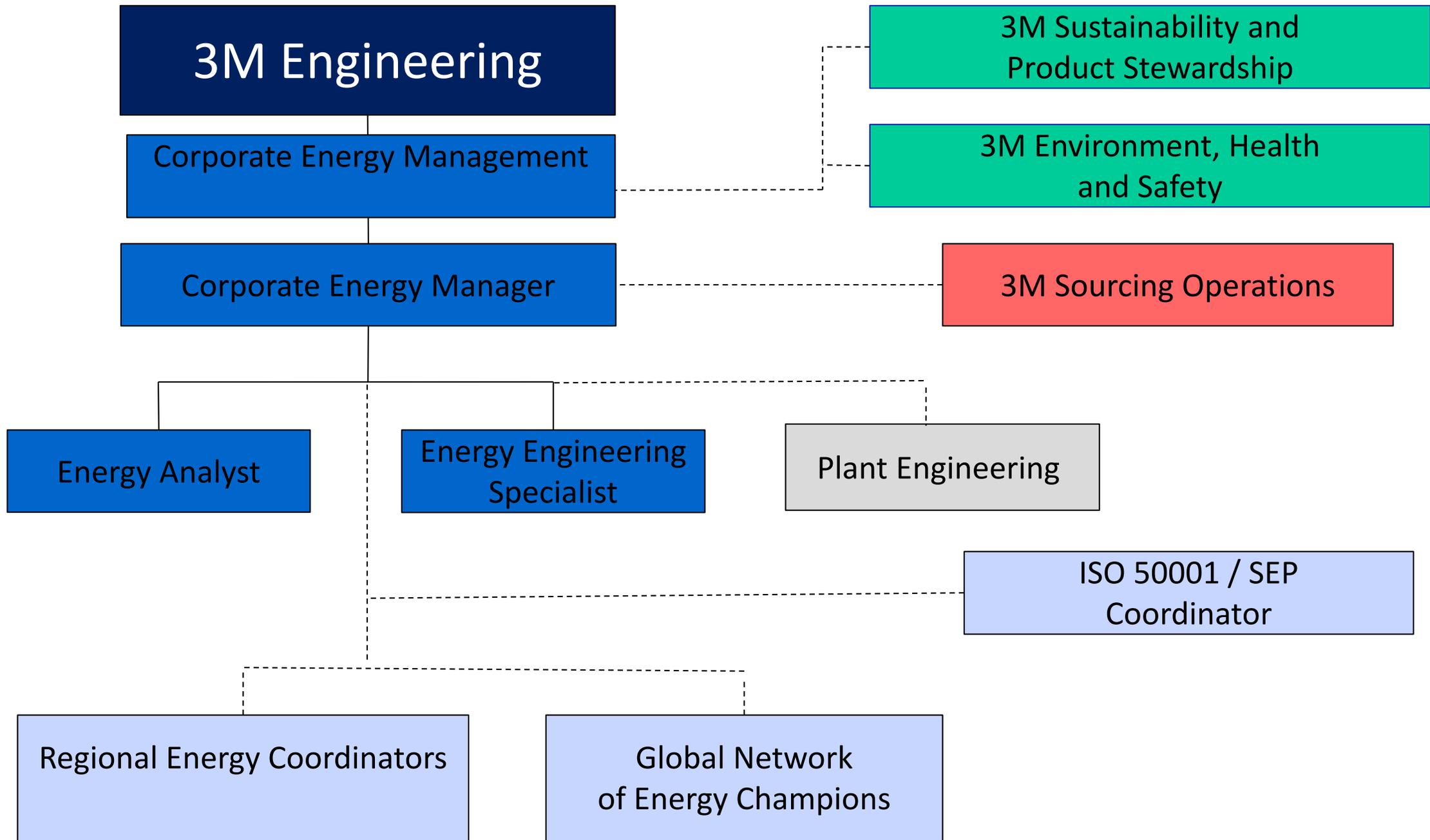
- 3M Taiwan, for increasing solvent recovery efficiency and reducing steam consumption in solvent recovery units
- 3M India, for energy cost reductions related to the installation of a rooftop solar system that meets 10 percent of the Ranjanangon facility's power needs

2017 Plant Energy Award

At the conclusion of each year, the Corporate Energy Management team recognizes the top facilities in our program for their results in energy metrics. To qualify, these facilities must demonstrate an active culture of energy management practices on-site, as evidenced by their delivered project savings, their energy team assessment score, and the resulting improved efficiency in energy intensity on-site. Fourteen platinum awards, six gold awards, and three silver awards were presented to facilities with the most impressive results.

Global Energy Use
MMBtu





Power in Partnerships: Plant Engineering

PEGE & Energy Annual Leadership Summit



PEGE as energy team leaders and members



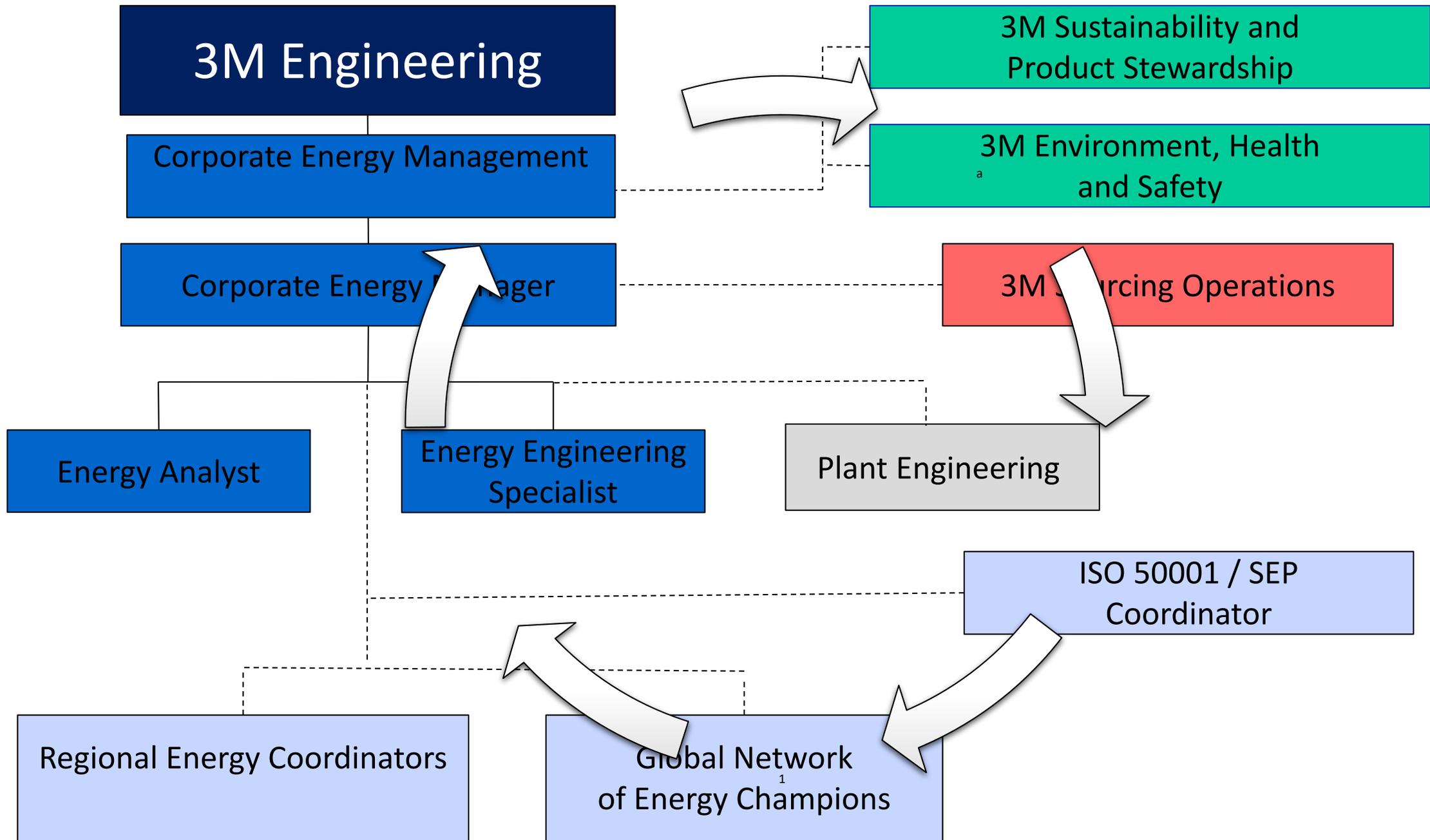
Power in Partnerships: 3M Sourcing

Contract negotiations and utility engagement



Teamwork in Renewables





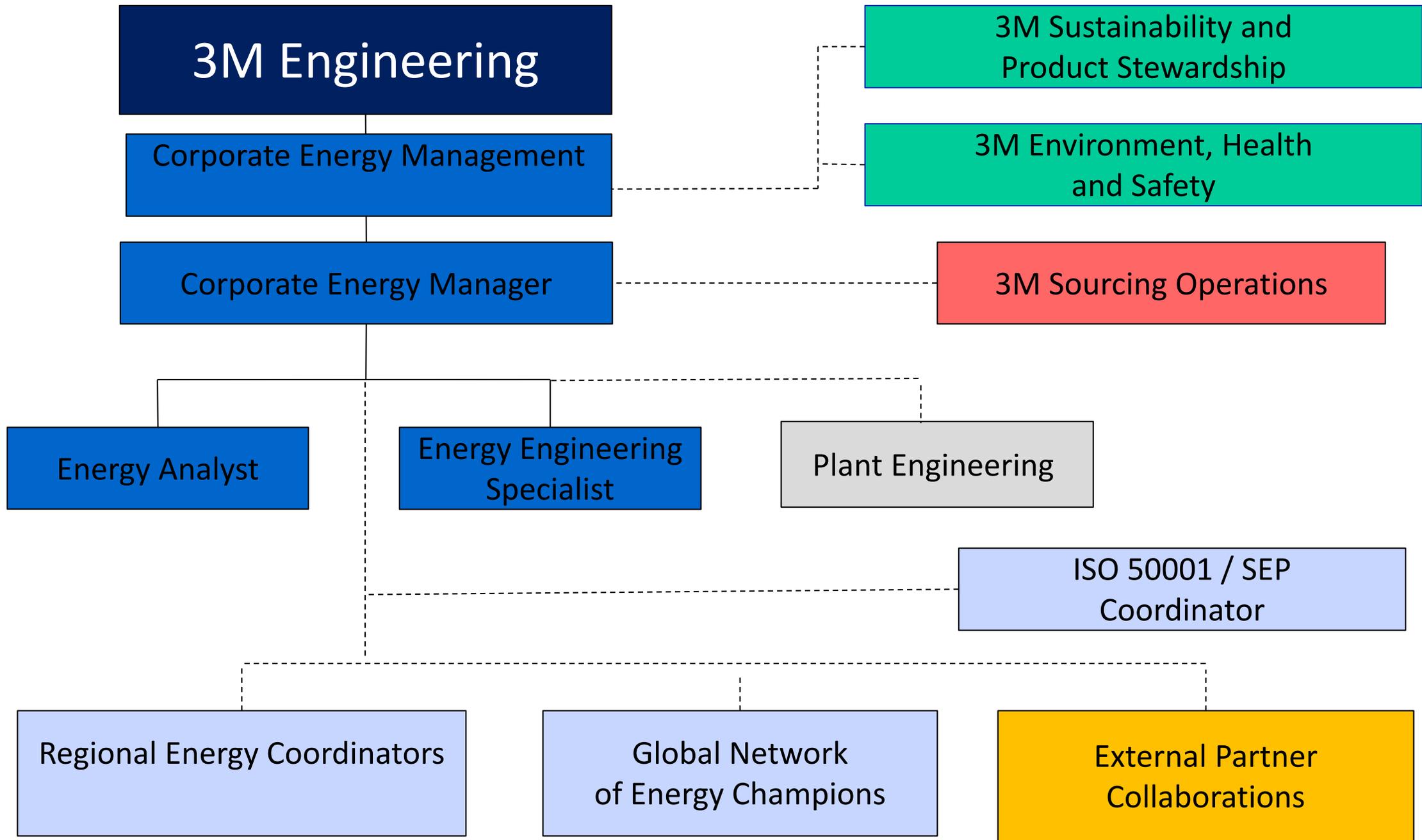
Power in Partnerships: 3M Energy Leadership Team

Meets on a bi-weekly basis to discuss energy initiatives that include multiple facets of 3M organization

Team Members from:

- Energy Management
- Environmental Health & Safety
- Engineering
- Plant Engineering
- Legal
- Sourcing
- 3M Center's Energy Team
- Energy EMTC (Engineering Technical Learning Forum)





Power in Partnerships: External Collaborations

Better Buildings
U.S. DEPARTMENT OF ENERGY

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ALL | SEARCH SOLUTIONS

SOLUTIONS | PROGRAMS & PARTNERS | SUMMIT & SWAP | LEARN MORE

EXPLORE BY TOPICS | BROWSE SOLUTION TYPES | TOOLKITS | FINANCING NAVIGATOR

3M

3M is a diversified technology company serving customers and communities with innovative products and services operating in more than 65 countries. Between 1990 and 2010, 3M cut absolute worldwide greenhouse gas emissions by 72%.

As a partner of the Better

OVERVIEW

CHALLENGE COMMITMENT

99 Facilities

GOALS



Our Work

MINNESOTA SUSTAINABLE GROWTH COALITION

3M **ACKERBERG** **Andersen** **AVEDA**
THE ART AND SCIENCE OF PL FLOWER AND PLANT ESSENCE





*The Road to Success is Driven With the Efforts of
Us All....*

3M Science.
Applied to Life.™

Thank you

