Focus your energy on productivity.

Optimize your building with envelope improvements.

There are many energy conservation technologies available to help you save money. It is essential not only to choose the right products but also to complete your upgrades in a sequential order such that you can maximize your profits. Often, envelope upgrades (such as window film) are overlooked, and owners jump right to optimizing their HVAC system. If you create a more efficient building envelope before HVAC improvements, you can downsize your HVAC equipment in the future, enabling you to reach the maximum possible performance for your profits.

Comfortably cool.

3M™ Sun Control Window Film can reduce the temperature in direct sunlight by as much as 9°F, making your space much more usable and comfortable. The graph below shows a four-day temperature logging experiment conducted in an office building.

**LEED Certification**

Window films may be used toward the following LEED credits:

- SS-8
- EQ-7.1
- EA-1
- EQ-7.2
- MR 11.1-1.2
- EQ-8.1-8.2
- MR 5.1-5.2
- ID

The energy efficiency upgrade cycle.

3M was issued the first patent for sun control window film in 1966. Today, 3M™ Window Films have been installed in buildings all around the world. We never stop creating new window film products and solutions to help protect people and property, reduce energy costs and improve interior comfort. Put your trust in 3M, a name you know for quality products and services.

Globally, more than 5 million buildings have 3M™ Window Film installed.

The Skin Cancer Foundation recommends the use of window film in automobiles and commercial and residential buildings due to its properties that screen out UV rays.
Focus your energy on productivity.

There are many energy conservation technologies available to help you save money. It is essential not only to choose the right products but also to complete your upgrades in a sequential order such that you can maximize your profits. Often, envelope upgrades (such as window film) are overlooked, and owners jump right to optimizing their HVAC system. If you create a more efficient building envelope before HVAC improvements, you can downsize your HVAC equipment in the future, enabling you to reach the maximum possible performance for your profits.

Comfortably cool.

3M™ Sun Control Window Film can reduce the temperature in direct sunlight by as much as 9°F, making your space much more usable and comfortable. The graph below shows a four-day temperature logging experiment conducted in an office building.

The energy efficiency upgrade cycle.

Optimize your building with envelope improvements.

3M was issued the first patent for sun control window film in 1966. Today, 3M™ Window Films have been installed in buildings all around the world. We never stop creating new window film products and solutions to help protect people and property, reduce energy costs and improve interior comfort. Put your trust in 3M, a name you know for quality products and services.

Globally, more than 5 million buildings have 3M™ Window Film installed.
ConSol Study

Background
ConSol Energy and Environmental Solutions is a leading consulting firm for builders, government agencies, utilities and trade associations. ConSol utilized the US DOE recommended software platform, Energy Plus, to calculate the effects of adding window film to a commercial building. The commercial building model used was the DOE-recommended Energy Plus Commercial Building Benchmark Model. The study was completed in ICC Climate Zones 1, 2 and 3.

Results
This study further justified the DOE study with the following results:
- Single-pane glass showed paybacks in as short as 1.4 years.
- Double-pane glass showed paybacks in as short as 2.1 years.
- Annual energy savings as much as 19 kWh/sq ft.

Additional Results
Only four technologies received both a fastest payback rating and highest probability of success:
- Window films.
- PC power management.
- Condensing water heaters.
- Air side economizers and filters for data centers.

ConSol Study

Background
ConSol Energy and Environmental Solutions is a leading consulting firm for builders, government agencies, utilities and trade associations. ConSol utilized the US DOE recommended software platform, Energy Plus, to calculate the effects of adding window film to a commercial building. The commercial building model used was the DOE-recommended Energy Plus Commercial Building Benchmark Model. The study was completed in ICC Climate Zones 1, 2 and 3.

Results
This study further justified the DOE study with the following results:
- Single-pane glass showed paybacks in as short as 1.4 years.
- Double-pane glass showed paybacks in as short as 2.1 years.
- Annual energy savings as much as 19 kWh/sq ft.

Additional Results
Only four technologies received both a fastest payback rating and highest probability of success:
- Window films.
- PC power management.
- Condensing water heaters.
- Air side economizers and filters for data centers.

ConSol Study

Background
ConSol Energy and Environmental Solutions is a leading consulting firm for builders, government agencies, utilities and trade associations. ConSol utilized the US DOE recommended software platform, Energy Plus, to calculate the effects of adding window film to a commercial building. The commercial building model used was the DOE-recommended Energy Plus Commercial Building Benchmark Model. The study was completed in ICC Climate Zones 1, 2 and 3.

Results
This study further justified the DOE study with the following results:
- Single-pane glass showed paybacks in as short as 1.4 years.
- Double-pane glass showed paybacks in as short as 2.1 years.
- Annual energy savings as much as 19 kWh/sq ft.

Additional Results
Only four technologies received both a fastest payback rating and highest probability of success:
- Window films.
- PC power management.
- Condensing water heaters.
- Air side economizers and filters for data centers.

Climate Zone 1 | Case Study: Mount Vernon Condominiums, Honolulu, Hawaii
Challenge: To retain a consistent look for the condominium complex while also finding ways to reduce energy costs by managing the building.
Solution: 3M™ Sun Control Window Film Prestige 50 was chosen to obtain a maximum amount of energy rejection while maintaining the current look of the building. In addition, the 3M™ Prestige Series Window Film product was chosen because it has no metallic and therefore no possibility of corrosion from the ocean air.
Results:
- Payback — Less than 2 years
- Savings — Greater than $107,000 annually
- Energy saved — 17 kWh/sq ft (180 kWh/sq m) of glass

Climate Zone 2 | Case Study: National Bank of Arizona, Phoenix, Arizona
Challenge: To retain the natural lighting while reducing both the heat generated and glare on the banking floor.
Solution: 3M™ Sun Control Window Film Prestige External 4C was installed because of its high infrared heat and harmful ultraviolet rejection. It is non-metallic in that it will not corrode, negate the need for edge sealing and minimizing installation. Much of the project’s cost was offset by an energy-efficiency rebate from Salt River Project (SRP).
Results:
- Glass — Double pane tinted
- Payback — Less than 5 years
- Savings — Greater than $25,000 annually
- Energy saved — 12 kWh/sq ft (126 kWh/sq m) of glass

Climate Zone 3 | Case Study: Century Plaza Towers, Los Angeles, California
Challenge: To solve interior temperature imbalance and make the towers more energy efficient without drastically changing the look of the historic buildings.
Solution: 3M™ Sun Control Window Film Neutral 30, which offers high rejection and neutral light appearance, was installed. Much of the project’s cost was offset by a rebate of $15,000 from the Los Angeles Department of Water and Power.
Results:
- Payback — Less than 1 year
- Savings — Greater than $200,000 annually
- Energy Saved — Greater than 15 kWh/sq ft (161 kWh/sq m) of glass

Climate Zone 4 | Case Study: Fifth Third Center, Cincinnati, Ohio
Challenge: To control incoming light and heat in order to keep tenants comfortable, reduce energy costs and maintain the building’s striking aesthetics.
Solution: Solar Tint, which had installed 3M™ Window Film in 1980, was chosen to update the facility’s window film to further reduce energy costs by installing 3M™ Sun Control Window Film Neutral 20.
Results:
- Payback — Less than 1 year
- Savings — Greater than $100,000 annually
- Date Completed — 2000

Climate Zone 5 | Case Study: 1501 Clinton Avenue, Baltimore, Maryland
Challenge: To non-intrusively cut energy costs and increase interior comfort in a short time frame without affecting the tower’s reflective modernism. Paramount was the issue of paying for up-front job costs on a limited budget.
Solution: 3M™ Sun Control Window Film Ceramic Series 30, which offers high clarity and outstanding heat reduction, was installed. To help pay for the project, 3M facilitated a custom rebate program with ICF International, the entity that supports Baltimore Gas and Electric’s (BGE) energy efficiency programs.
Results:
- Payback — Less than 1 year
- Savings — Greater than $100,000 annually
- Date Completed — 2000

3M™ Window Films

Proven savings in every climate.

The 3M™ Window Film family offers a range of technologies that are built to fit specific targeted applications.

Climate Zone 1
Includes: Honolulu/Hilo/Pearl River/Virgin Islands
Climate Zone 7
Includes: Miami/Broward/Palm Beach/Ft. Huachuca/沫州/Northern Nebraska/Northern Arizona/Southeast Florida/Water Hampton/Aiken/Rock-Hill-Spartanburg
Climate Zone 2
Includes: Phoenix/Mesa/Scottsdale/Panhandle FL/Some-Rhode Islands
Climate Zone 8
Includes: Boston/Albuquerque/Palmer/Alaska/Central and Northern Arizona/Pacific Northwest/Trans-Alaska

For a complete list of all 3M™ Sun Control Window Films, please visit 3M.com/WindowFilm.
3M™ Window Films

Department of Energy (DOE) Study

Background

In 2010, the US DOE completed a study on a top 50 commercially available energy conservation technologies. The technologies were ranked in these categories:

- Payback
- Probability of success
- Overall energy savings
- Technologies with less benefit that may be considered

The following results:

- Only four technologies received both a fastest payback ranking and lower investment costs and disruption to tenants required.
- Received much slower payback ratings and lower probability of success ranking (based on customer acceptance, ease of retrofit, knowledge base of the technology and supply chain strength).

Additional Results

- Four technologies received both a fastest payback rating and highest probability of success.
- Annual energy savings as much as 19 kWh/sq ft.
- Double-pane glass showed paybacks in as short as 1.4 years.
- Single-pane glass showed paybacks in as short as 4 years.

ConSol Study

ConSol Energy and Environmental Solutions is a leading consulting firm for builders, government agencies, utilities and trade associations. ConSol utilized the DOE-recommended software platform Energy Plus, to calculate the effects of adding window film to a commercial building. The commercial building model used was the DOE-recommended Energy Plus Commercial Benchmark Model. The study was completed in ICC Climate Zones 1, 2 and 3.

The technologies were ranked in these categories:

- Commercial building model used was the DOE-recommended software platform Energy Plus.
- Utilized the US DOE-recommended software platform Energy Plus.

Results

This study further justified the DOE study with the following results:

- Single-pane glass showed paybacks in as short as 4 years.
- Double-pane glass showed paybacks in as short as 2 years.
- Annual energy savings as much as 19 kWh/sq ft (203 kWh/sq m) of glass.
- An 8.8% carbon emission reduction would occur if every home in California had window film.

Solution:

After this study was published in 2011, the state of California updated its building code to include window films. After this study was published in 2011, the state of California updated its building code to include window films.

Challenge:

- To retain a consistent look for the condominium complex while also finding ways to reduce the cost of managing the building.

Solution:

- 3M™ Sun Control Window Film Prestige 50, which offers high heat rejection and neutral light appearance, was installed. To help pay for the project, the DOE facilitated a custom rebate program with ICF International, the entity that supports Baltimore Mayor's Office of Sustainability.

Proven savings in every climate.

- The US DOE conducted eleven mini-site different climate zones as experiments with building codes.
- Climate Zone: Fine tuning the technologies and Climate Zone 8 in the world.

Climate Zone 1

Includes: 1501 Clinton Avenue, Baltimore, Maryland

Challenge: To non-intrusively cut energy costs and increase interior comfort in a short time frame without affecting the tower’s reflective modernism.

Solution: 3M™ Sun Control Window Film Prestige Series 30, which offers high clarity and outstanding heat reduction, was installed. To solve interior temperature imbalance and make the towers more energy efficient without drastically changing the look of the historic buildings.

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $100,000 annually

Payback — Less than 1 year

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $25,000 annually

Payback — Less than 1 year

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $200,000 annually

Payback — Less than 1 year

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $270,000 annually

Climate Zone 2

Includes: 1501 Clinton Avenue, Baltimore, Maryland

Challenge: To retain the natural lighting while reducing both the heat generated and glare on the banking floor.

Solution: 3M™ Sun Control Window Film Prestige Series 30, which offers high heat rejection and neutral light appearance, was installed. To help pay for the project, the DOE facilitated a custom rebate program with ICF International, the entity that supports Baltimore Mayor’s Office of Sustainability.

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $12,000 annually

Payback — Less than 1 year

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $15,000 annually

Payback — Less than 1 year

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $35,000 annually

Climate Zone 3

Includes: 5th Third Centre, Cincinnati, Ohio

Challenge: To solve interior temperature imbalance and make the towers more energy efficient without drastically changing the look of the historic buildings.

Solution: 3M™ Sun Control Window Film Neutral 30, which offers high clarity and neutral light appearance, was installed. Much of the project’s cost was offset by a rebate of $116,000 from the Los Angeles Department of Water and Power.

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $10,000,000 annually

Payback — Less than 1 year

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $12,000 annually

Climate Zone 4

Includes: 1501 Clinton Avenue, Baltimore, Maryland

Challenge: To solve interior temperature imbalance and make the towers more energy efficient without drastically changing the look of the historic buildings.

Solution: 3M™ Sun Control Window Film Neutral 30, which offers high clarity and neutral light appearance, was installed. Much of the project’s cost was offset by a rebate of $116,000 from the Los Angeles Department of Water and Power.

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $12,000 annually

Payback — Less than 1 year

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $15,000 annually

Climate Zone 5

Includes: 1501 Clinton Avenue, Baltimore, Maryland

Challenge: To solve interior temperature imbalance and make the towers more energy efficient without drastically changing the look of the historic buildings.

Solution: 3M™ Sun Control Window Film Neutral 30, which offers high clarity and neutral light appearance, was installed. Much of the project’s cost was offset by a rebate of $116,000 from the Los Angeles Department of Water and Power.

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $12,000 annually

Payback — Less than 1 year

Results:

- Glass — Double pane tinted
- Payback — Less than 5 years

Savings — Greater than $15,000 annually

Payback — Less than 1 year

Results:
3M™ Window Films

Department of Energy (DOE) Study

Background
In 2011, the US DOE completed a study on a top 50 commercially available energy conservation technologies. The technologies were ranked in this categories:
• Payback
• Probability of success
• Overall energy savings
• Technologies with less benefit that may be considered

Window films

The technologies with the highest probability of success ranking (based on probability of success due to the significant initial investment costs and disruption to tenants required) received much slower payback ratings and lower probability of success. Replacement windows were also studied, but they received much slower payback ratings and higher probability of success due to the significant up-front job costs on a limited budget.

Additional Results

Only four technologies received both a fastest payback rating and highest probability of success:
• Window films
• PC power management
• Condensing water heaters
• Air side economizers and filters for data centers

ConSol Solay

Only four technologies received both a fastest payback rating and highest probability of success:

ConSol Energy and Environmental Solutions is a leading consulting firm for building, government agencies, utilities and trade associations. ConSol utilized the DOE-recommended software platform, Energy Plus. To calculate the effects of adding window film to a commercial building, the commercial building model used was the DOE-recommended Energy Plus Commercial Building Benchmark Model. The study was completed in ICC Climate Zones 1, 2 and 3.

Results

This study further justified the DOE study with the following results:
• Single-pane glass showed paybacks in as short as 2.1 years
• Double-pane glass showed paybacks in as short as 2.5 years
• Annual energy savings as much as 18 kWh/sq ft (200 kWh/sq m) of glass

Challenge:
An 8.8% carbon emission reduction would occur if every home in California had window film.

Results:

After this study was published in 2011, the state of California updated its building code to include window films.

Climate Zone 1

Mount Vernon Condominiums, Hawaiian Kai, Hawaii
Challenge: To retain the natural lighting while reducing both the heat generated and glare on the backing floor. Minimizing disruption to normal banking operations was paramount.

Solution:
3M™ Sun Control Window Film Prestige 50 was chosen to obtain a maximum amount of energy rejection while maintaining the current look of the building. In addition, the 3M™ Prestige Series Window Film product was chosen because it has no metallic and therefore no possibility of corrosion from the ocean air.

Results:
• Payback — Less than 2 years
• Savings — Greater than $270,000 annually
• Energy saved — 17 kWh/sq ft (180 kWh/sq m) of glass

Date completed — 2012

Climate Zone 2

National Bank of Arizona, Phoenix, Arizona
Challenge: To retain the natural lighting while reducing both the heat generated and glare on the backing floor.

Solution:
3M™ Sun Control Window Film Prestige Exterior 40 was installed because of its high infrared heat and harmful ultraviolet ray rejection. It is a non-metallic film that will not corrode, negate the need for edge sealing and minimize installation time. Much of the project’s cost was offset by an energy-efficiency rebate from Salt River Project (SRP).

Results:
• Glass — Double pane tinted
• Payback — Less than 5 years
• Savings — Greater than $25,000 annually
• Energy saved — 12 kWh/sq ft (130 kWh/sq m) of glass

Date completed — 2011

Climate Zone 3

Century Plaza Towers, Los Angeles, California
Challenge: To solve interior temperature imbalance and make the towers more energy efficient without drastically changing the look of the historic buildings.

Solution:
3M™ Sun Control Window Film Neutral 30, with its visible light rejection and neutral light appearance, was installed. Much of the project’s cost was offset by a rebate of $15,000 from the Los Angeles Department of Water and Power.

Results:
• Payback — Less than 1 year
• Savings — Greater than $210,000 annually

Climate Zone 4

Fifth Third, Cincinnati, Ohio
Challenge: To control incoming light and heat in order to keep tenants comfortable, reduce energy costs and maintain the building’s striking aesthetics.

Solution: Solar Tint, which had installed 3M™ Window Film in 1990, was chosen to refresh the facility’s window film to further reduce energy costs by installing 3M™ Sun Control Window Neutral 2D.

Results:
• Payback — Less than 1 year
• Savings — Greater than $10,000 annually

Climate Zone 5

1501 Clinton Avenue, Baltimore, Maryland
Challenge: To non-intrusively cut energy costs and increase interior comfort in a short timeframe without affecting the tower’s reflective modernism. Paramount was the issue of paying for up-front job costs on a limited budget.

Solution: 3M™ Sun Control Window Film Ceramic Series 30, which offers high clarity and outstanding heat reduction, was installed. To help pay for the project, 3M facilitated a custom rebate program with ICF International, the entity that supports Baltimore Gas and Electric’s (BGE) energy efficiency programs.

Results:
• Payback — Less than 1 year
• Savings — Greater than $10,000 annually

1. www.energystory.gov/energy/technologies/new_technologies.html
2. www.consol.ws/index.php
Optimize your building with envelope improvements.

There are many energy conservation technologies available to help you save money. It is essential not only to choose the right products but also to complete your upgrades in a sequential order such that you can maximize your profits. Often, envelope upgrades (such as window film) are overlooked, and owners jump right to optimizing their HVAC system. If you create a more efficient building envelope before HVAC improvements, you can downsize your HVAC equipment in the future, enabling you to reach the maximum possible performance for your profits.

Comfortably cool.

3M™ Sun Control Window Film can reduce the temperature in direct sunlight by as much as 9°F, making your space much more usable and comfortable. The graph below shows a four-day temperature logging experiment conducted in an office building.

**LEED Certification**

Window films may be used toward the following LEED credits:

- SS-8
- EA-1
- MR 11.2
- MR 5.1-5.2
- EQ-7.1
- EQ-7.2
- EQ-8.1-8.2
- EQ-8.3

**The energy efficiency upgrade cycle.**

1. **Assessment:** Identify energy opportunities
2. **Measurement and Verification:** Baseline the building
3. **Commissioning:** Ensure the building is built right
4. **Lighting:** Improve efficiency and comfort
5. **Envelope Improvements:** Minimize heat loss and gain
6. **HVAC:** Optimize the HVAC system
7. **Education:** Educate the building occupants

The Skin Cancer Foundation recommends the use of window film in automobiles and commercial and residential buildings due to its properties that screen out UV rays.