KAWNEER

UNE FILIALE D'ALCOA

Bienvenue

Présentation par

Michel Lalande
michel.lalande@alcoa.com
www.kawneer.com

ALCOA

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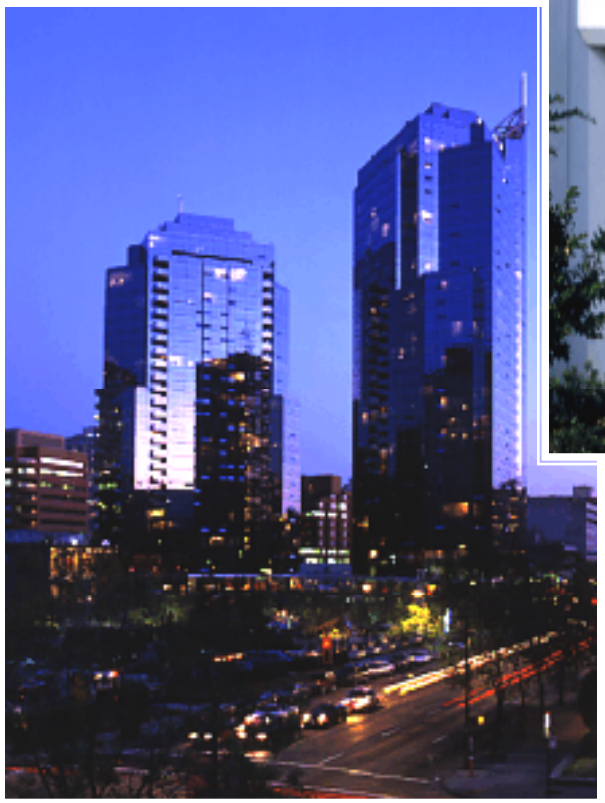
Leadership dans les produits

Une gamme complète de produits et services



Murs rideaux

Entrées et cadres de devantures

Fenêtres architecturales

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Aluminum
Shaping Green Buildings

Aluminum and Sustainable Building Design

Présenté par Michel Lalande

Représentant Architectural Kawneer Canada

Préparé par Eddie Bugg PE, LEED AP

Director, Sustainable Solutions

Kawneer/Alcoa Building & Construction Systems

Colloque CEBO/OAO 2010 | | Décembre 1-2

The Aluminum Association

Agenda

- Introduction USGBC LEED système d'évaluation des Bâtiments
- LEED & l' aluminium comme solutions Durable
  - Crédits/Points
  - Aluminium Solutions Durable
- Les outils pour faire les évaluations
  - Thermal/Window Modeling
  - Façade Modeling
  - Whole Building Energy Modeling
  - Daylight Modeling
  - BIM
- Pourquoi l' Aluminium: Les avantages de l' aluminium pour les bâtiments Durable
  - Matériaux
  - Finis
  - Versatilité

- Kawneer un Leader dans l'industrie

L’engagements envers les Bâtiments Durable

- C’est d’abord une prise de conscience des enjeux environnementaux par les propriétaires et professionnels de l’industrie;
  - Bâtiments Commercial
  - Bâtiments Corporatifs
  - Bâtiments Institutionnels

L’engagements envers les Bâtiments Durable

Bâtiments Commercial

- Engagements Sociale
- Réductions des coûts énergétiques
- Réductions des coûts d’entretiens
- Réductions des coûts de remplacements ou de remise à neufs à long terme.

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L’engagements envers les Bâtiments Durable

Bâtiments Corporatifs

- **Dans le développent stratégique marketing , en 2009, 80% des corporations Américaine * avait des études en place pour le déploiement de leurs actions envers la création des politiques et de leur mission envers les bâtiments durable.**

***** **Corporate American Smart Market Report.**

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L’engagements envers les Bâtiments Durable

Bâtiments Institutionnels

- **Toutes les agences et groupes gouvernementaux en Amérique du Nord sont engagé de façon permanente et croissante pour réduire leur emprunte sur l’environnement. Les projets de nouveaux Bâtiments ainsi que la rénovations des Bâtiments existant seront conçue de façon Durable.**

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Leadership in Energy & Environmental Design

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Leadership in Energy and Environmental Design

A leading-edge system for certifying the greenest performing buildings in the world

What Is Green Building?

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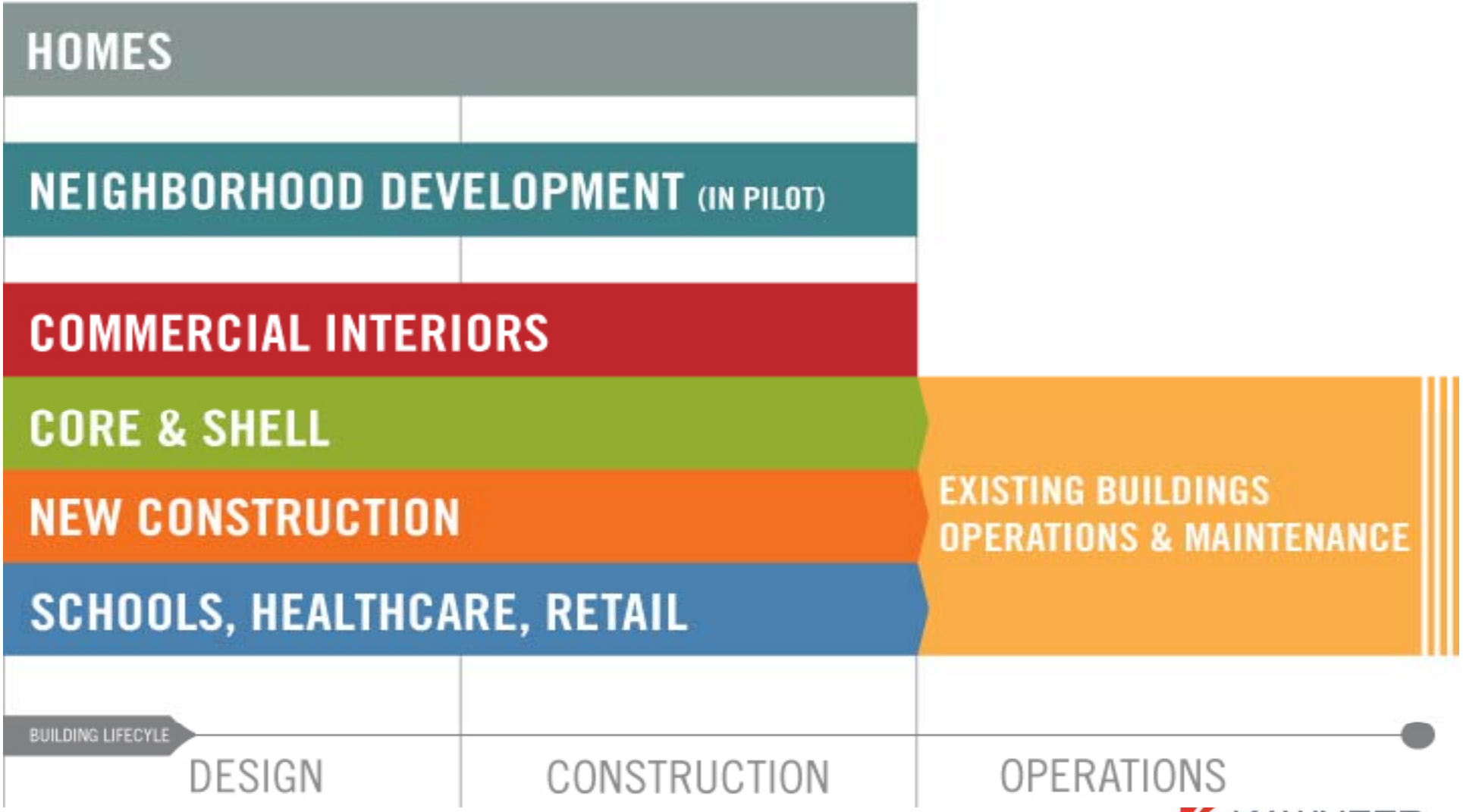
LEED address the complete lifecycle of buildings:



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Cross-Functional Team

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USGBC has four levels of LEED:

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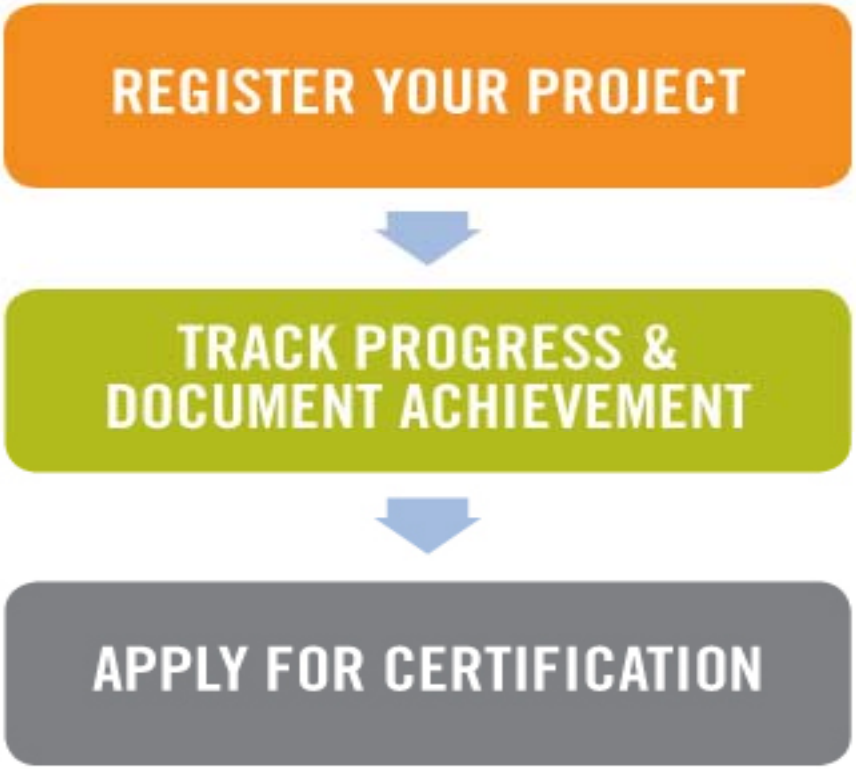
Steps to LEED Certification



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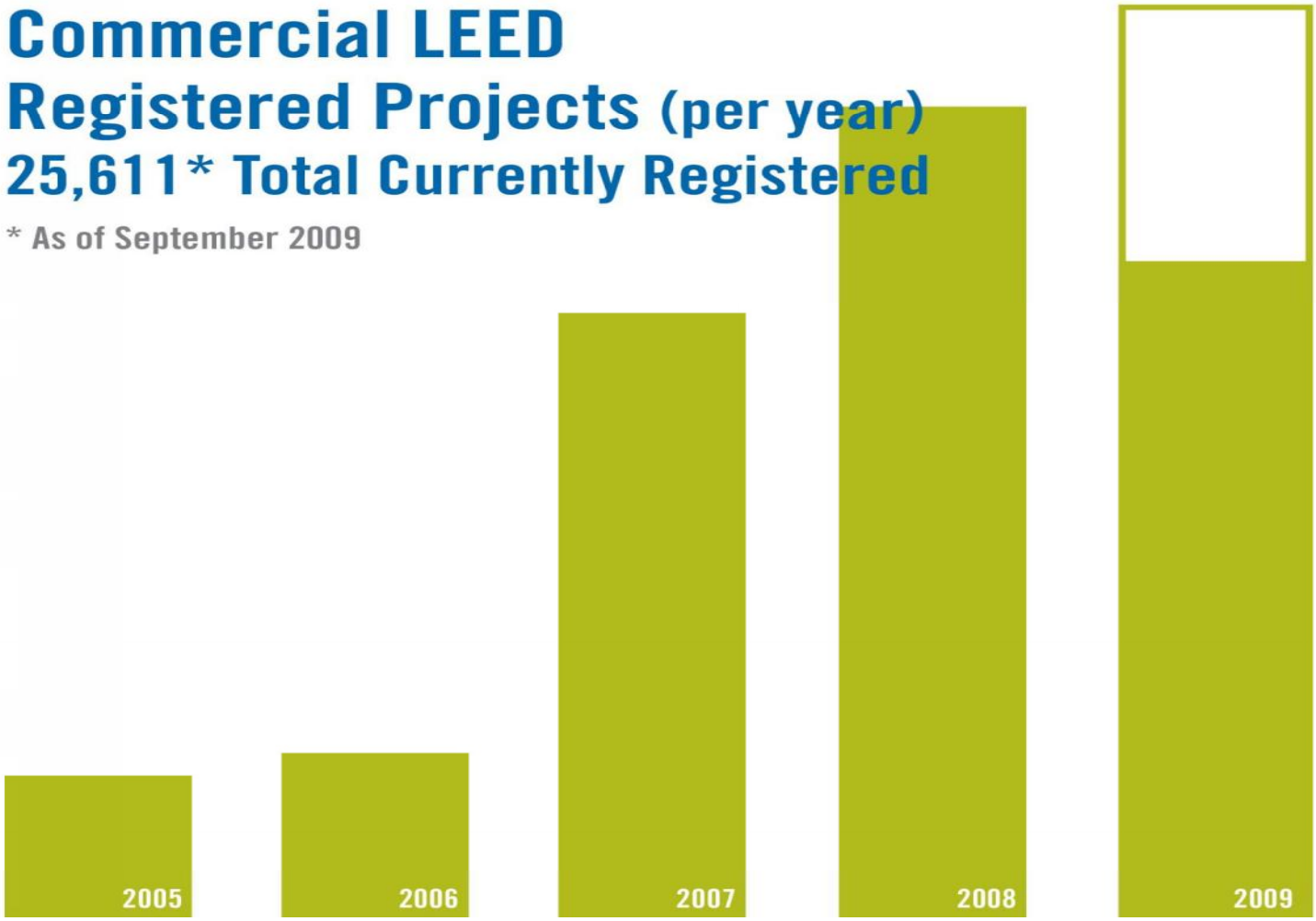
Commercial LEED Registered Projects (per year)

25,611* Total Currently Registered

* As of September 2009



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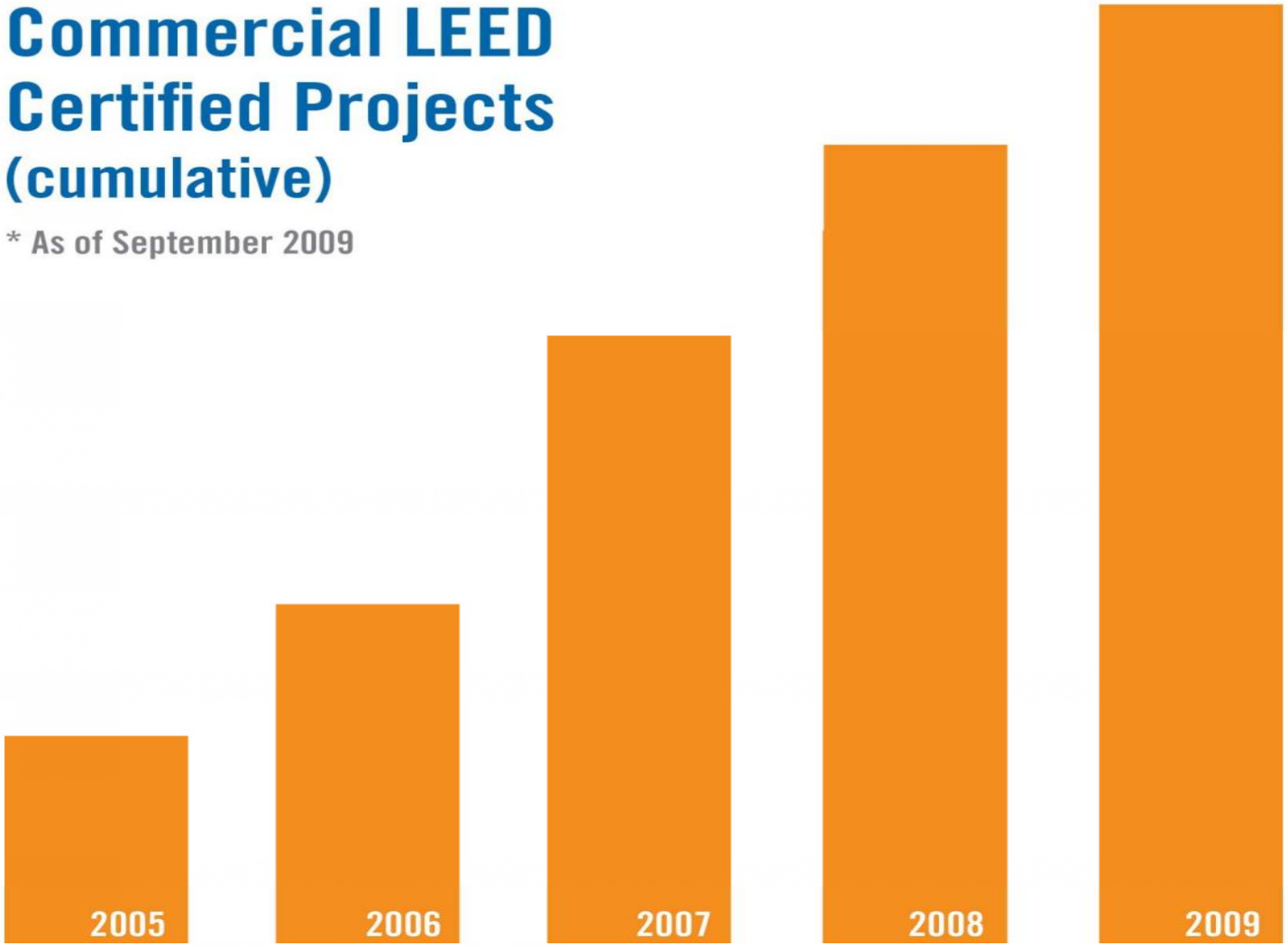
Commercial LEED Certified Projects (cumulative)

* As of September 2009



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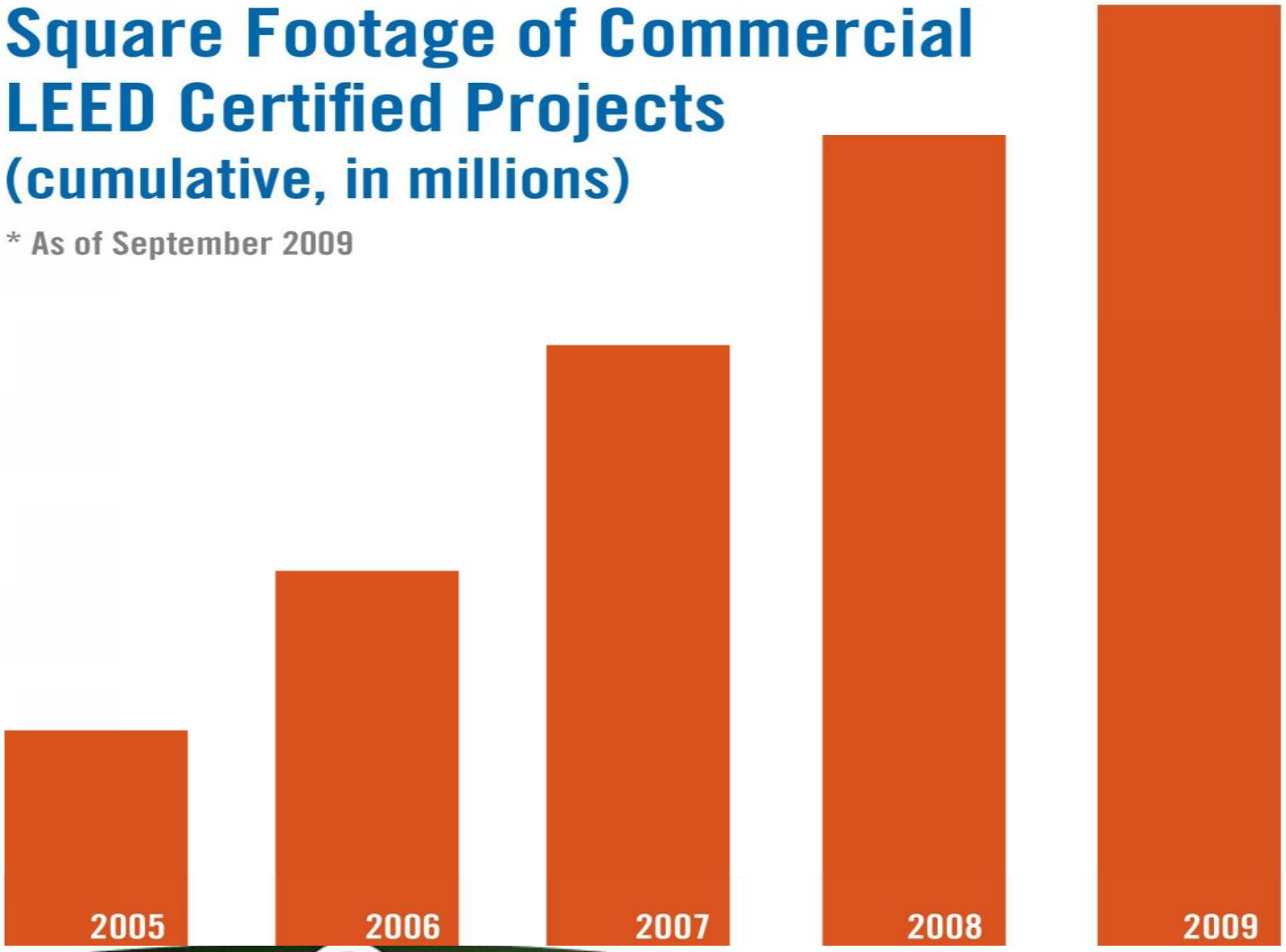
Square Footage of Commercial LEED Certified Projects
(cumulative, in millions)

* As of September 2009



613* million

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130,000 building professionals across all areas of practice have become LEED credentialed professionals.

GREEN BUILDING®
CERTIFICATION INSTITUTE

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Projected Green Building Market Value

	2006	2010
Projection U.S. Market	$12 billion (new) $130 billion (renovation)	$30-$60 billion (new) $240 billion (renovation)
Commercial & Institutional	$4 billion	$10-$20 billion
Residential	$8 billion	$20-$40 billion

Source: McGraw-Hill Construction 2007

LEED 2009 Scorecard

LEED for New Construction and Major Renovation 2009
Project Scorecard

Project Name:
Project Address:

Yes	?	No			
			Sustainable Sites	26	Points
Y			Prereq 1 **Construction Activity Pollution Prevention**	Required	
			Credit 1 **Site Selection**	1	
			Credit 2 **Development Density & Community Connectivity**	5	
			Credit 3 **Brownfield Redevelopment**	1	
			Credit 4.1 **Alternative Transportation,** Public Transportation Access	6	
			Credit 4.2 **Alternative Transportation,** Bicycle Storage & Changing Rooms	1	
			Credit 4.3 **Alternative Transportation,** Low-Emitting & Fuel-Efficient Vehicles	3	
			Credit 4.4 **Alternative Transportation,** Parking Capacity	2	
			Credit 5.1 **Site Development,** Protect or Restore Habitat	1	
			Credit 5.2 **Site Development,** Maximize Open Space	1	
			Credit 6.1 **Stormwater Design,** Quantity Control	1	
			Credit 6.2 **Stormwater Design,** Quality Control	1	
			Credit 7.1 **Heat Island Effect,** Non-Roof	1	
			Credit 7.2 **Heat Island Effect,** Roof	1	
			Credit 8 **Light Pollution Reduction**	1	
Yes	?	No			
			Water Efficiency	10	Points
			Prereq 1 **Water Use Reduction,** 20% Reduction	Required	
			Credit 1.1 **Water Efficient Landscaping,** Reduce by 50%	2	
			Credit 1.2 **Water Efficient Landscaping,** No Potable Use or No Irrigation	2	
			Credit 2 **Innovative Wastewater Technologies**	2	
			Credit 3.1 **Water Use Reduction,** 30% Reduction	2	
			Credit 3.2 **Water Use Reduction,** 40% Reduction	2	
Yes	?	No			
			Energy & Atmosphere	35	Points
Y			Prereq 1 **Fundamental Commissioning of the Building Energy Systems**	Required	
Y			Prereq 2 **Minimum Energy Performance:** 10% New Bldgs or 5% Existing Bldg Renovations	Required	
Y			Prereq 3 **Fundamental Refrigerant Management**	Required	
			Credit 1 **Optimize Energy Performance**	1 to 19	
			12% New Buildings or 8% Existing Building Renovations	1	
			16% New Buildings or 12% Existing Building Renovations	3	
			20% New Buildings or 16% Existing Building Renovations	5	
			24% New Buildings or 20% Existing Building Renovations	7	
			28% New Buildings or 24% Existing Building Renovations	9	
			32% New Buildings or 28% Existing Building Renovations	11	
			36% New Buildings or 32% Existing Building Renovations	13	
			40% New Buildings or 36% Existing Building Renovations	15	
			44% New Buildings or 40% Existing Building Renovations	17	
			48% New Buildings or 44% Existing Building Renovations	19	
			Credit 2 **On-Site Renewable Energy**	1 to 7	
			1% Renewable Energy	1	
			5% Renewable Energy	3	
			9% Renewable Energy	5	
			13% Renewable Energy	7	
			Credit 3 **Enhanced Commissioning**	2	
			Credit 4 **Enhanced Refrigerant Management**	2	
			Credit 5 **Measurement & Verification**	3	
			Credit 6 **Green Power**	2	
Yes	?	No			

			Materials & Resources	14	Points
Y			Prereq 1 **Storage & Collection of Recyclables**	Required	
			Credit 1.1 **Building Reuse,** Maintain 75% of Existing Walls, Floors & Roof	2	
			Credit 1.2 **Building Reuse,** Maintain 95% of Existing Walls, Floors & Roof	1	
			Credit 1.3 **Building Reuse,** Maintain 50% of Interior Non-Structural Elements	1	
			Credit 2.1 **Construction Waste Management,** Divert 50% from Disposal	1	
			Credit 2.2 **Construction Waste Management,** Divert 75% from Disposal	1	
			Credit 3.1 **Materials Reuse,** 5%	1	
			Credit 3.2 **Materials Reuse,** 10%	1	
			Credit 4.1 **Recycled Content,** 10% (post-consumer + ½ pre-consumer)	1	
			Credit 4.2 **Recycled Content,** 20% (post-consumer + ½ pre-consumer)	1	
			Credit 5.1 **Regional Materials,** 10% Extracted, Processed & Manufactured Regionally	1	
			Credit 5.2 **Regional Materials,** 20% Extracted, Processed & Manufactured Regionally	1	
			Credit 6 **Rapidly Renewable Materials**	1	
			Credit 7 **Certified Wood**	1	
Yes	?	No			
			Indoor Environmental Quality	15	Points
Y			Prereq 1 **Minimum IAQ Performance**	Required	
Y			Prereq 2 **Environmental Tobacco Smoke (ETS) Control**	Required	
			Credit 1 **Outdoor Air Delivery Monitoring**	1	
			Credit 2 **Increased Ventilation**	1	
			Credit 3.1 **Construction IAQ Management Plan,** During Construction	1	
			Credit 3.2 **Construction IAQ Management Plan,** Before Occupancy	1	
			Credit 4.1 **Low-Emitting Materials,** Adhesives & Sealants	1	
			Credit 4.2 **Low-Emitting Materials,** Paints & Coatings	1	
			Credit 4.3 **Low-Emitting Materials,** Flooring Systems	1	
			Credit 4.4 **Low-Emitting Materials,** Composite Wood & Agrifiber Products	1	
			Credit 5 **Indoor Chemical & Pollutant Source Control**	1	
			Credit 6.1 **Controllability of Systems,** Lighting	1	
			Credit 6.2 **Controllability of Systems,** Thermal Comfort	1	
			Credit 7.1 **Thermal Comfort,** Design	1	
			Credit 7.2 **Thermal Comfort,** Verification	1	
			Credit 8.1 **Daylight & Views,** Daylight 75% of Spaces	1	
			Credit 8.2 **Daylight & Views,** Views for 90% of Spaces	1	
Yes	?	No			
			Innovation & Design Process	6	Points
			Credit 1.1 **Innovation in Design:** Provide Specific Title	1	
			Credit 1.2 **Innovation in Design:** Provide Specific Title	1	
			Credit 1.3 **Innovation in Design:** Provide Specific Title	1	
			Credit 1.4 **Innovation in Design:** Provide Specific Title	1	
			Credit 1.5 **Innovation in Design:** Provide Specific Title	1	
			Credit 2 **LEED® Accredited Professional**	1	
Yes	?	No			
			Regional Bonus Credits	4	Points
			Credit 1.1 **Region Specific Environmental Priority:** Region Defined	1	
			Credit 1.2 **Region Specific Environmental Priority:** Region Defined	1	
			Credit 1.3 **Region Specific Environmental Priority:** Region Defined	1	
			Credit 1.4 **Region Specific Environmental Priority:** Region Defined	1	
Yes	?	No			
			Project Totals (Certification Estimates)	110	Points

Not Certified — Certified: 40-49 points Silver: 50-59 points Gold: 60-79 points Platinum: 80+ points

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LEED-NC 2009 – Energy and Atmosphere

Optimize Energy Performance

EA Credit 1: Optimize Energy Performance

1–19 Points

Intent

To achieve increasing levels of energy performance beyond the prerequisite standard to reduce environmental and economic impacts associated with excessive energy use.

Requirements

Select 1 of the 3 compliance path options described below. Project teams documenting achievement using any of the 3 options are assumed to be in compliance with EA Prerequisite 2: Minimum Energy Performance.

OPTION 1. Whole Building Energy Simulation (1–19 points)

Demonstrate a percentage improvement in the proposed building performance rating compared with the baseline building performance rating. Calculate the baseline building performance according to Appendix G of ANSI/ASHRAE/IESNA Standard 90.1-2007 (with errata but without addenda[1]) using a computer simulation model for the whole building project. The minimum energy cost savings percentage for each point threshold is as follows:

New Buildings	Existing Building Renovations	Points
12%	8%	1
14%	10%	2
16%	12%	3
18%	14%	4
20%	16%	5
22%	18%	6
24%	20%	7
26%	22%	8
28%	24%	9
30%	26%	10
32%	28%	11
34%	30%	12
36%	32%	13
38%	34%	14
40%	36%	15
42%	38%	16
44%	40%	17
46%	42%	18
48%	44%	19

Appendix G of Standard 90.1-2007 requires that the energy analysis done for the building performance rating method include all the energy costs associated with the building project. To achieve points under this credit, the proposed design must meet the following criteria:

- Compliance with the mandatory provisions (Sections 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4) in Standard 90.1-2007 (with errata but without addenda).
- Inclusion of all the energy costs within and associated with the building project.
- Comparison against a baseline building that complies with Appendix G of Standard 90.1-2007 (with errata but without addenda). The default process energy cost is 25% of the total energy cost for the baseline building. If the building's process energy cost is less than 25% of the baseline building energy cost, the LEED submittal must include documentation substantiating that process energy inputs are appropriate.

For the purpose of this analysis, process energy is considered to include, but is not limited to, office and general miscellaneous equipment, computers, elevators and escalators, kitchen cooking and refrigeration, laundry washing and drying, lighting exempt from the lighting power allowance (e.g., lighting integral to medical equipment) and other (e.g., waterfall pumps).

Regulated (non-process) energy includes lighting (e.g., for the interior, parking garage, surface parking, façade, or building grounds, etc. except as noted above), heating, ventilating, and air conditioning (HVAC) (e.g., for space heating, space cooling, fans, pumps, toilet exhaust, parking garage ventilation, kitchen hood exhaust, etc.), and service water heating for domestic or space heating purposes.

For this credit, process loads must be identical for both the baseline building performance rating and the proposed building performance rating. However, project teams may follow the exceptional calculation method (ANSI/ASHRAE/IESNA Standard 90.1-2007 G2.5) to document measures that reduce process loads. Documentation of process load energy savings must include a list of the assumptions made for both the base and proposed design, and theoretical or empirical information supporting these assumptions.

Projects in California may use Title 24-2005, Part 6 in place of ANSI/ASHRAE/IESNA Standard 90.1-2007 for Option 1.

OR

OPTION 2. Prescriptive Compliance Path: ASHRAE Advanced Energy Design Guide (1 point)

Comply with the prescriptive measures of the ASHRAE Advanced Energy Design Guide appropriate to the project scope, outlined below. Project teams must comply with all applicable criteria as established in the Advanced Energy Design Guide for the climate zone in which the building is located.

PATH 1. ASHRAE Advanced Energy Design Guide for Small Office Buildings 2004

The building must meet the following requirements:

- Less than 20,000 square feet.
- Office occupancy.

PATH 2. ASHRAE Advanced Energy Design Guide for Small Retail Buildings 2006

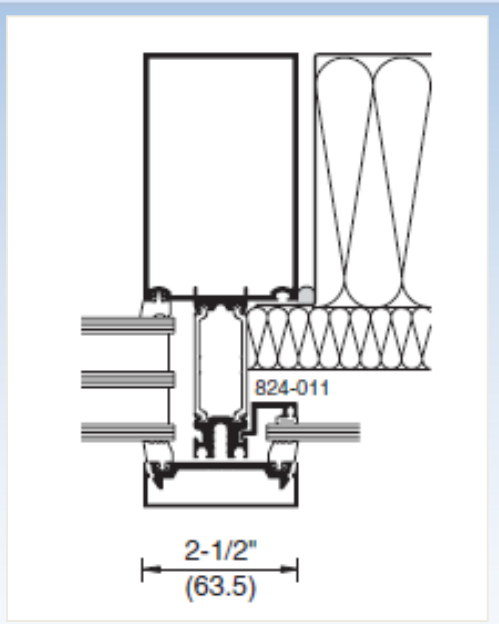
The building must meet the following requirements:

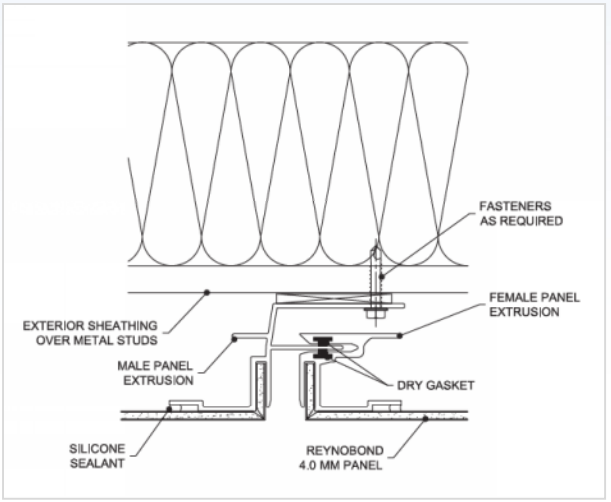
- Less than 20,000 square feet.
- Retail occupancy.

Performance Énergétique

Aluminium une Solution Durable

- Systèmes de fenestrations Utra-Thermique
- Systèmes de revêtements Utra-Thermique





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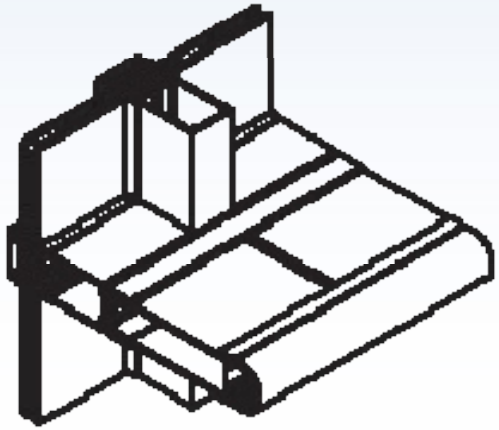
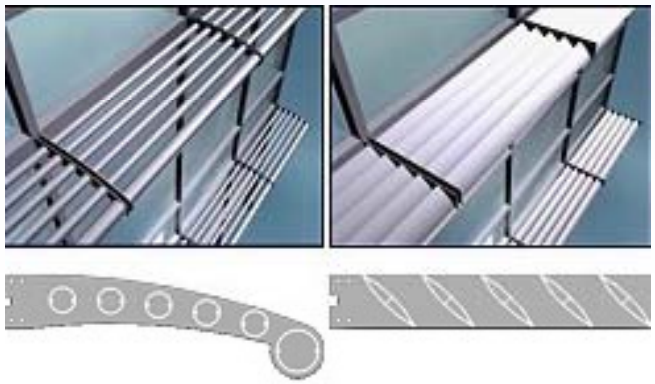
Performance Énergétique

Aluminium une Solution Durable

- Pare-Soleils
- Tablettes réfléchisantes





LEED-NC 2009 – Energy and Atmosphere

On-Site Renewable Energy

EA Credit 2: On-site Renewable Energy

1–7 Points

Intent

To encourage and recognize increasing levels of on-site renewable energy self-supply to reduce environmental and economic impacts associated with fossil fuel energy use.

Requirements

Use on-site renewable energy systems to offset building energy costs. Calculate project performance by expressing the energy produced by the renewable systems as a percentage of the building's annual energy cost and use the table below to determine the number of points achieved.

Use the building annual energy cost calculated in EA Credit 1: Optimize Energy Performance or the U.S. Department of Energy's Commercial Buildings Energy Consumption Survey database to determine the estimated electricity use.

The minimum renewable energy percentage for each point threshold is as follows:

Percentage Renewable Energy	Points
1%	1
3%	2
5%	3
7%	4
9%	5
11%	6
13%	7

Potential Technologies & Strategies

Assess the project for nonpolluting and renewable energy potential including solar, wind, geothermal, low-impact hydro, biomass and bio-gas strategies. When applying these strategies, take advantage of net metering with the local utility.

Energie renouvlable sur le site

Aluminium une Solution Durable

- Panneaux Photovoltaics Indépendants
- Panneaux Photovoltaics intégré au Batiment

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LEED-NC 2009 – Materials and Resources

Recycled Content

MR Credit 4: Recycled Content

1–2 Points

Intent

To increase demand for building products that incorporate recycled content materials, thereby reducing impacts resulting from extraction and processing of virgin materials.

Requirements

Use materials with recycled content[1] such that the sum of postconsumer[2] recycled content plus 1/2 of the preconsumer[3] content constitutes at least 10% or 20%, based on cost, of the total value of the materials in the project. The minimum percentage materials recycled for each point threshold is as follows:

Recycled Content	Points
10%	1
20%	2

The recycled content value of a material assembly is determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.

Mechanical, electrical and plumbing components and specialty items such as elevators cannot be included in this calculation. Include only materials permanently installed in the project. Furniture may be included if it is included consistently in MR Credit 3: Materials Reuse through MR Credit 7: Certified Wood.

Potential Technologies & Strategies

Establish a project goal for recycled content materials, and identify material suppliers that can achieve this goal. During construction, ensure that the specified recycled content materials are installed. Consider a range of environmental, economic and performance attributes when selecting products and materials.

Contenue *Recyclé*

Aluminium une Solution Durable

- Extrusions
- Feuilles
- Moulage
- Conceptions et assemblages

LEED-NC 2009 – Materials and Resources

Regional Materials

MR Credit 5: Regional Materials

1–2 Points

Intent

To increase demand for building materials and products that are extracted and manufactured within the region, thereby supporting the use of indigenous resources and reducing the environmental impacts resulting from transportation.

Requirements

Use building materials or products that have been extracted, harvested or recovered, as well as manufactured, within 500 miles of the project site for a minimum of 10% or 20%, based on cost, of the total materials value. If only a fraction of a product or material is extracted, harvested, or recovered and manufactured locally, then only that percentage (by weight) can contribute to the regional value. The minimum percentage regional materials for each point threshold is as follows:

Regional Materials	Points
10%	1
20%	2

Mechanical, electrical and plumbing components and specialty items such as elevators and equipment must not be included in this calculation. Include only materials permanently installed in the project. Furniture may be included if it is included consistently in MR Credit 3: Materials Reuse through MR Credit 7: Certified Wood.

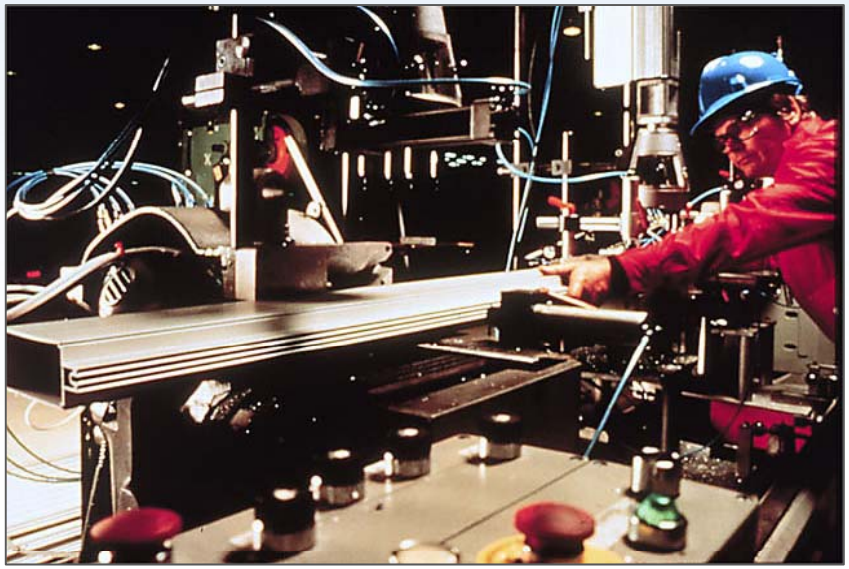
Potential Technologies & Strategies

Establish a project goal for locally sourced materials, and identify materials and material suppliers that can achieve this goal. During construction, ensure that the specified local materials are installed, and quantify the total percentage of local materials installed. Consider a range of environmental, economic and performance attributes when selecting products and materials.

Matériaux Régional

Aluminium une Solution Durable

- Lieu d’extraction
- Lieu de fabrication final



LEED-NC 2009 – Indoor Environmental Quality

Daylight & Views: Daylight

IEQ Credit 8.1: Daylight and Views—Daylight

1 Point

Intent

To provide building occupants with a connection between indoor spaces and the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

Requirements

Through 1 of the 4 options, achieve daylighting in at least the following spaces:

Regularly Occupied Spaces	Points
75%	1

OPTION 1. Simulation

Demonstrate through computer simulations that 75% or more of all regularly occupied spaces areas achieve daylight illuminance levels of a minimum of 25 footcandles (fc) and a maximum of 500 fc in a clear sky condition on September 21 at 9 a.m. and 3 p.m. Areas with illuminance levels below or above the range do not comply. However, designs that incorporate view-preserving automated shades for glare control may demonstrate compliance for only the minimum 25 fc illuminance level.

OR

OPTION 2. Prescriptive

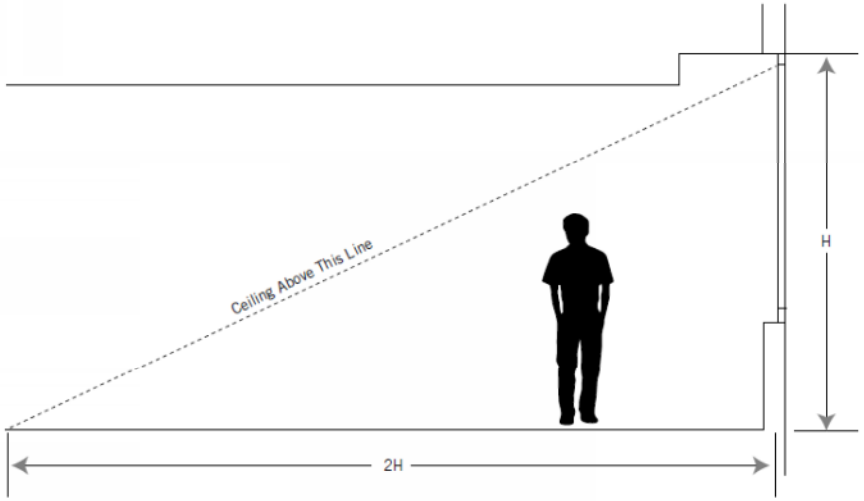
Use a combination of side-lighting and/or top-lighting to achieve a total daylighting zone (the floor area meeting the following requirements) that is at least 75% of all the regularly occupied spaces.

For the Side-lighting Daylight Zone (see diagram below):

- Achieve a value, calculated as the product of the visible light transmittance (VLT) and window-to-floor area ratio (WFR) of daylight zone between 0.150 and 0.180. The window area included in the calculation must be at least 30 inches above the floor.

$$0.150 < VLT \times WFR < 0.180$$

- The ceiling must not obstruct a line in section that joins the window-head to a line on the floor that is parallel to the plane of the window; Is twice the height of the window-head above the floor in, distance from the plane of the glass as measured perpendicular to the plane of the glass.
- Provide sunlight redirection and/or glare control devices to ensure daylight effectiveness.



For Top-lighting Daylight Zone (see diagram above):

- The daylight zone under a skylight is the outline of the opening beneath the skylight, plus in each direction the lesser of:
  - 70% of the ceiling height,

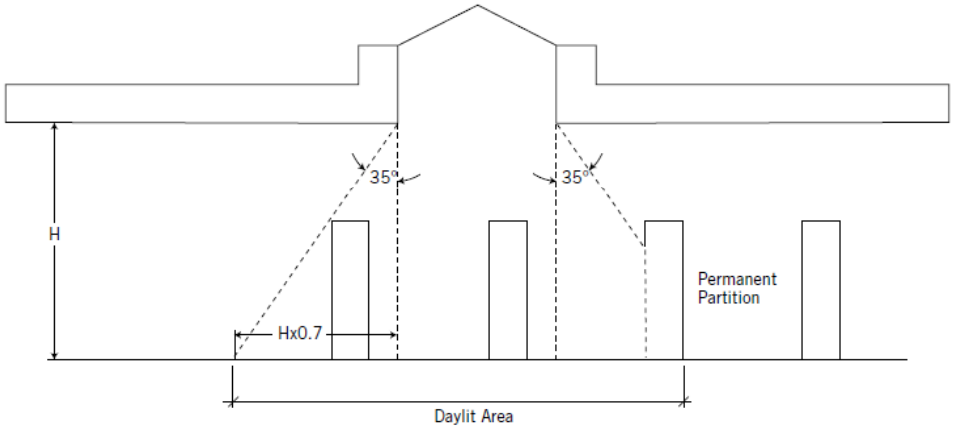
  OR
  - 1/2 the distance to the edge of the nearest skylight,

  OR
  - The distance to any permanent opaque partition (if transparent show VLT) farther than 70% of the distance between the top of the partition and the ceiling.
- Achieve skylight roof coverage between 3% and 6% of the roof area with a minimum 0.5 VLT.
- The distance between the skylights must not be more than 1.4 times the ceiling height.
- A skylight diffuser, if used, must have a measured haze value of greater than 90% when tested according to ASTM D1003. Avoid direct line of sight to the skylight diffuser.

Exceptions for areas where tasks would be hindered by the use of daylight will be considered on their merits.

LEED-NC 2009 – Indoor Environmental Quality

Daylight & Views: Daylight



OR

OPTION 3. Measurement

Demonstrate through records of indoor light measurements that a minimum daylight illumination level of 25 fc has been achieved in at least 75% of all regularly occupied areas. Measurements must be taken on a 10-foot grid for all occupied spaces and recorded on building floor plans.

Only the square footage associated with the portions of rooms or spaces meeting the minimum illumination requirements may be counted in the calculations.

For all projects pursuing this option, provide daylight redirection and/or glare control devices to avoid high-contrast situations that could impede visual tasks. Exceptions for areas where tasks would be hindered by daylight will be considered on their merits.

OR

OPTION 4. Combination

Any of the above calculation methods may be combined to document the minimum daylight illumination in at least 75% of all regularly occupied spaces. The different methods used in each space must be clearly recorded on all building plans.

In all cases, only the square footage associated with the portions of rooms or spaces meeting the requirements may be applied toward the 75% of total area calculation required to qualify for this credit.

In all cases, provide glare control devices to avoid high-contrast situations that could impede visual tasks. Exceptions for areas where tasks would be hindered by the use of daylight will be considered on their merits.

Lumière du jour

Aluminium une Solution Durable

- Fenêtres et Murs Rideaux
- Puits de lumières et Lanterneaux
- Tablettes réfléchissantes

DAY LIGHTING SIMULATION - SUN SHADING SIMULATION

Model effects of glazed openings and enhanced benefits of light shelves.
Use measurements to estimate energy savings using artificial lighting controls.

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LEED-NC 2009 – Indoor Environmental Quality

Daylight & Views: Views

IEQ Credit 8.2: Daylight and Views—Views

1 Point

Intent

To provide building occupants a connection to the outdoors through the introduction of daylight and views into the regularly occupied areas of the building.

Requirements

Achieve a direct line of sight to the outdoor environment via vision glazing between 30 inches and 90 inches above the finish floor for building occupants in 90% of all regularly occupied areas. Determine the area with a direct line of sight by totaling the regularly occupied square footage that meets the following criteria:

- In plan view, the area is within sight lines drawn from perimeter vision glazing.
- In section view, a direct sight line can be drawn from the area to perimeter vision glazing.

The line of sight may be drawn through interior glazing. For private offices, the entire square footage of the office may be counted if 75% or more of the area has a direct line of sight to perimeter vision glazing. For multi-occupant spaces, the actual square footage with a direct line of sight to perimeter vision glazing is counted.

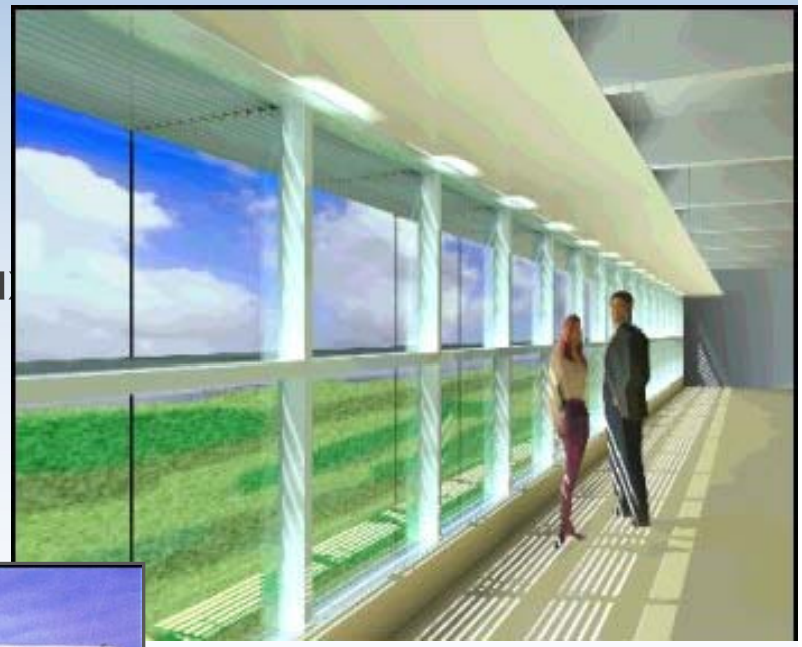
Potential Technologies & Strategies

Design the space to maximize daylighting and view opportunities. Strategies to consider include lower partitions, interior shading devices, interior glazing and automatic photocell-based controls.

Vues extérieures

Aluminium une Solution Durable

- Fenêtres
- Murs Rideaux
- Portes coulissantes à grands panneau



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LEED-NC 2009 – Indoor Environmental Quality

Controllability of Systems - Thermal Comfort

IEQ Credit 6.2: Controllability of Systems—Thermal Comfort

1 Point

Intent

To provide a high level of thermal comfort system control[1] by individual occupants or groups in multi-occupant spaces (e.g., classrooms or conference areas) and promote their productivity, comfort and well-being.

Requirements

Provide individual comfort controls for 50% (minimum) of the building occupants to enable adjustments to meet individual needs and preferences. Operable windows may be used in lieu of controls for occupants located 20 feet inside and 10 feet to either side of the operable part of a window. The areas of operable window must meet the requirements of ASHRAE Standard 62.1-2007 paragraph 5.1 Natural Ventilation (with errata but without addenda[2]).

Provide comfort system controls for all shared multi-occupant spaces to enable adjustments that meet group needs and preferences.

Conditions for thermal comfort are described in ASHRAE Standard 55-2004 (with errata but without addenda[2]) and include the primary factors of air temperature, radiant temperature, air speed and humidity.

Potential Technologies & Strategies

Design the building and systems with comfort controls to allow adjustments to suit individual needs or those of groups in shared spaces. ASHRAE Standard 55-2004 (with errata but without addenda[2]) identifies the factors of thermal comfort and a process for developing comfort criteria for building spaces that suit the needs of the occupants involved in their daily activities. Control strategies can be developed to expand on the comfort criteria and enable individuals to make adjustments to suit their needs and preferences. These strategies may involve system designs incorporating operable windows, hybrid systems integrating operable windows and mechanical systems, or mechanical systems alone. Individual adjustments may involve individual thermostat controls, local diffusers at floor, desk or overhead levels, control of individual radiant panels or other means integrated into the overall building, thermal comfort systems and energy systems design. Designers should evaluate the closely tied interactions between thermal comfort as required by ASHRAE Standard 55-2004 (with errata but without addenda[2]) and acceptable indoor air quality as required by ASHRAE Standard 62.1-2007 (with errata but without addenda[2]), whether natural or mechanical ventilation.

Controls des Systèmes – Comfort Thermique

Aluminium Solutions Durable

- Volets de ventilation
- Volets dissimulés
- Aérateur

LEED-NC 2009 – Innovation in Design

ID Credit 1: Innovation in Design

1–5 Points

Intent

To provide design teams and projects the opportunity to achieve exceptional performance above the requirements set by the LEED Green Building Rating System and/or innovative performance in Green Building categories not specifically addressed by the LEED Green Building Rating System.

Requirements

Credit can be achieved through any combination of the Innovation in Design and Exemplary Performance paths as described below:

PATH 1. Innovation in Design (1-5 points)

Achieve significant, measurable environmental performance using a strategy not addressed in the LEED 2009 for New Construction and Major Renovations Rating System.

One point is awarded for each innovation achieved. No more than 5 points under IDc1 may be earned through PATH 1—Innovation in Design.

Identify the following in writing:

- The intent of the proposed innovation credit.
- The proposed requirement for compliance.
- The proposed submittals to demonstrate compliance.
- The design approach (strategies) used to meet the requirements.

PATH 2. Exemplary Performance (1-3 points)

Achieve exemplary performance in an existing LEED 2009 for New Construction and Major Renovations prerequisite or credit that allows exemplary performance as specified in the LEED Reference Guide for Green Building Design & Construction, 2009 Edition. An exemplary performance point may be earned for achieving double the credit requirements and/or achieving the next incremental percentage threshold of an existing credit in LEED.

One point is awarded for each exemplary performance achieved. No more than 3 points under IDc1 may be earned through PATH 2— Exemplary Performance.

Potential Technologies & Strategies

Substantially exceed a LEED 2009 for New Construction and Major Renovations performance credit such as energy performance or water efficiency. Apply strategies or measures that demonstrate a comprehensive approach and quantifiable environment and/or health benefits.

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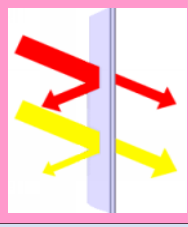
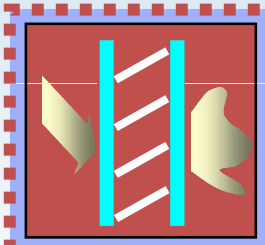
Sustainable Design Tools

IGDB
(Specular Glass Data Source)



Optics
(Window Glass)

THERM
(Window Frame)



CGDB
(Complex Glazing Data Base)

WINDOW
(Whole Window)

NFRC Ratings and Labels

National Fenestration Rating Council

Design / Simulation Tools
DOE-2, EnergyPlus
Radiance

COMFEN
(Whole Building Commercial)

RESFEN
(Whole Building Residential)

http://windows.lbl.gov/software

BERKELEY LAB

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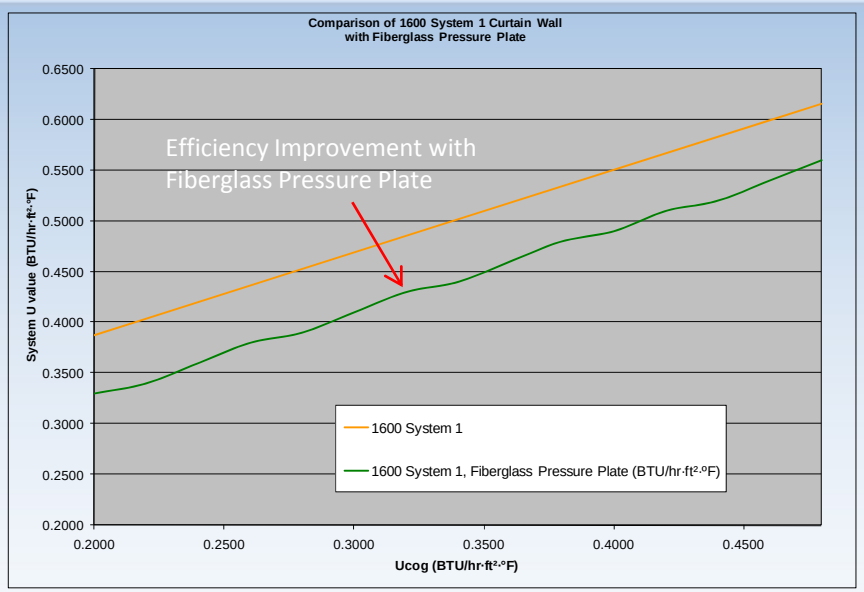
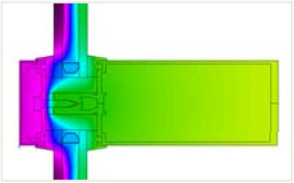
THERM & WINDOW Thermal Modeling

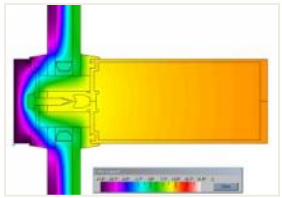
COG U-Value (BTU/hr·ft²·ºF)	1600 System 1 U-Value (BTU/hr·ft²·ºF)	1600 System 1, Fiberglass Pressure Plate (BTU/hr·ft²·ºF)
0.4800	0.6159	0.56
0.4600	0.5996	0.54
0.4400	0.5833	0.52
0.4200	0.5670	0.51
0.4000	0.5508	0.49
0.3800	0.5345	0.48
0.3600	0.5182	0.46
0.3400	0.5018	0.44
0.3200	0.4856	0.43
0.3000	0.4693	0.41
0.2800	0.4529	0.39
0.2600	0.4365	0.38
0.2400	0.4202	0.36
0.2200	0.4039	0.34
0.2000	0.3875	0.33



COG U-Value (BTU/hr·ft²·ºF)	Percent Decrease in System U-Value
0.4800	9.08%
0.4600	9.94%
0.4400	10.85%
0.4200	10.05%
0.4000	11.04%
0.3800	10.20%
0.3600	11.23%
0.3400	12.32%
0.3200	11.45%
0.3000	12.64%
0.2800	13.89%
0.2600	12.94%
0.2400	14.33%
0.2200	15.82%
0.2000	14.84%

COG U-Value (BTU/hr·ft²·ºF)	Raw Decrease in System U-Value (BTU/hr·ft²·ºF)
0.4800	0.0559
0.4600	0.0596
0.4400	0.0633
0.4200	0.0570
0.4000	0.0608
0.3800	0.0545
0.3600	0.0582
0.3400	0.0618
0.3200	0.0556
0.3000	0.0593
0.2800	0.0629
0.2600	0.0565
0.2400	0.0602
0.2200	0.0639
0.2000	0.0575
Average Decrease	0.0591
Standard Deviation	0.002987753





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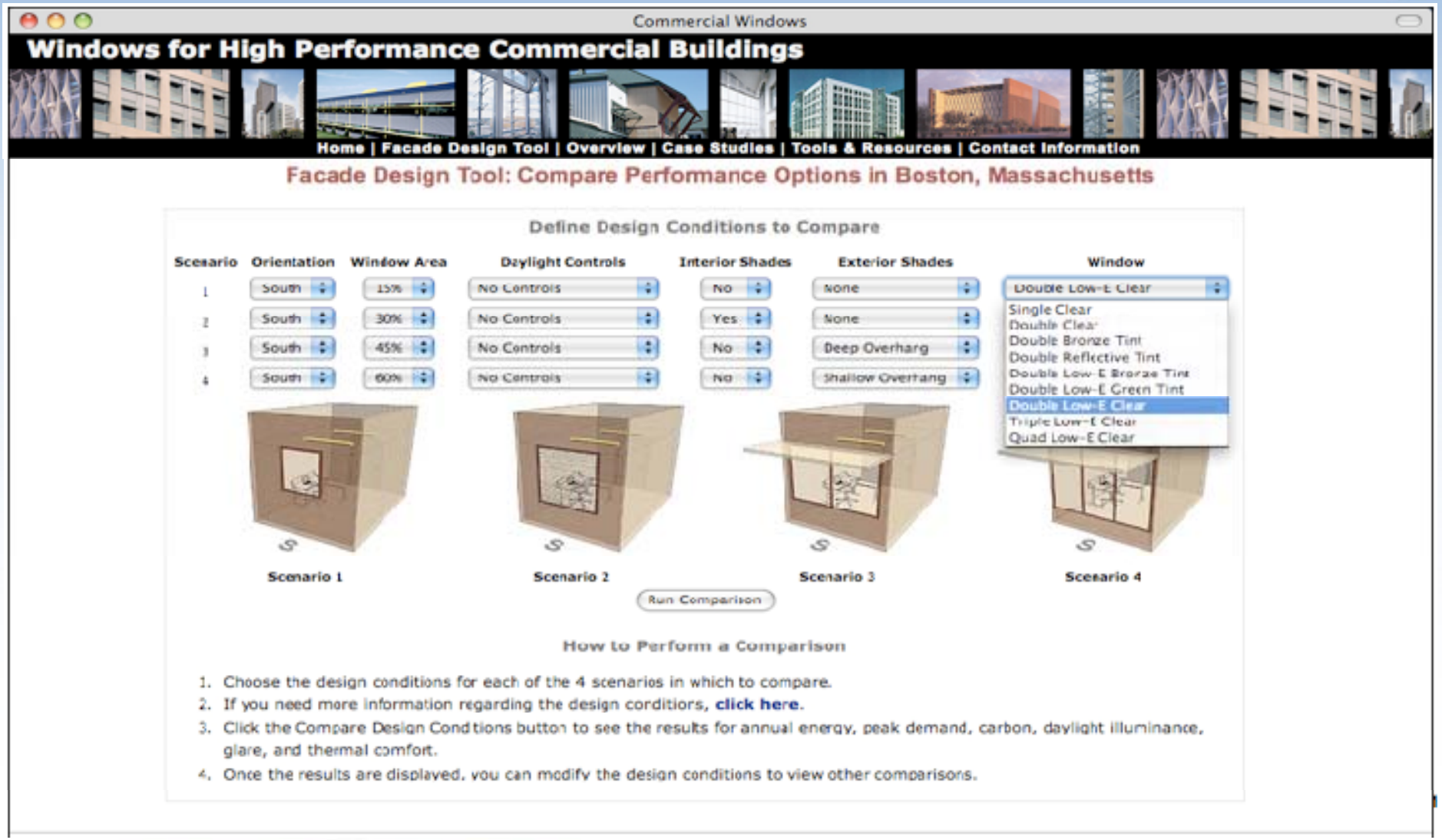
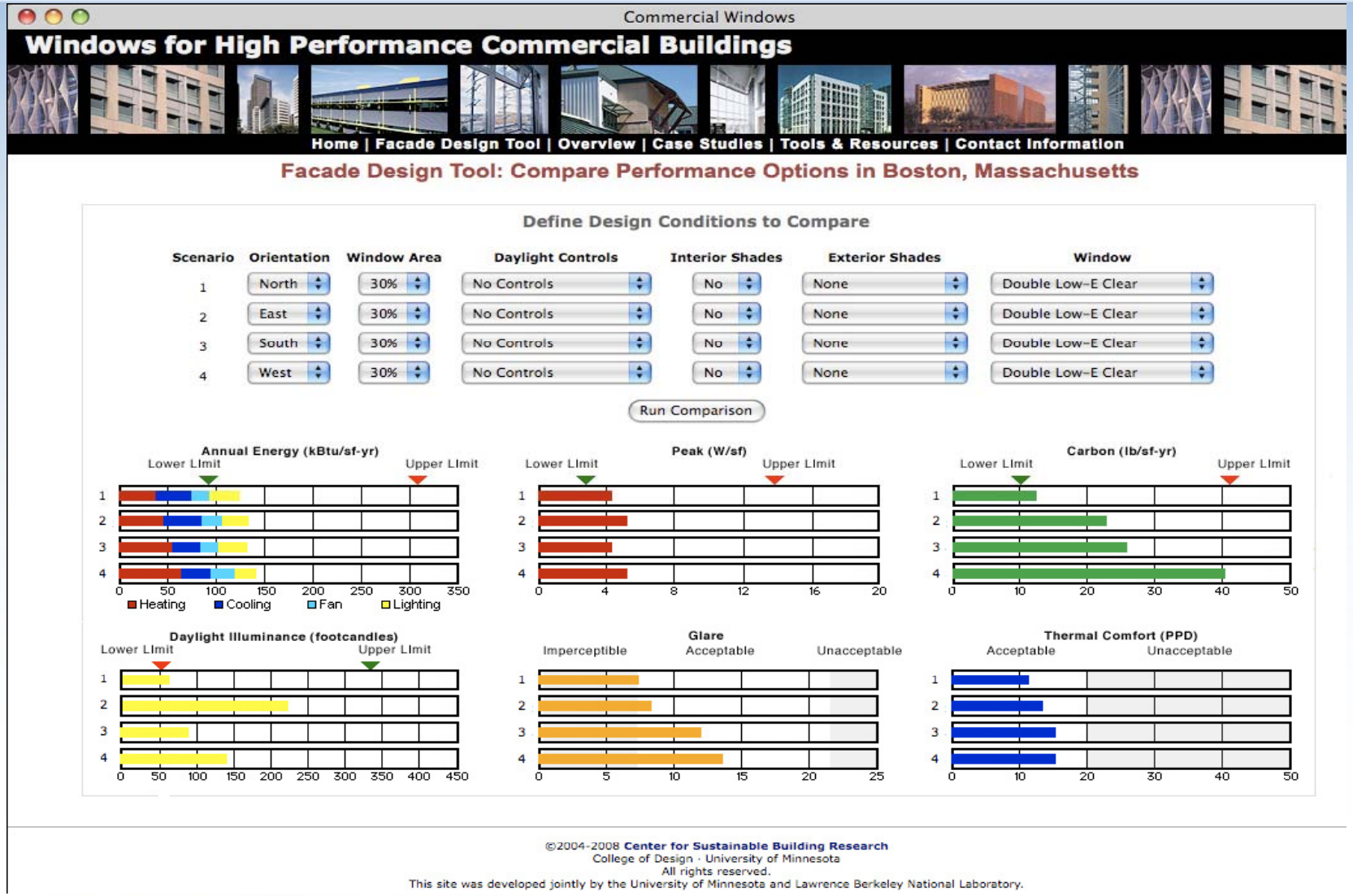
COMFEN- Façade Energy Modeling



COMFEN- Façade Energy Modeling



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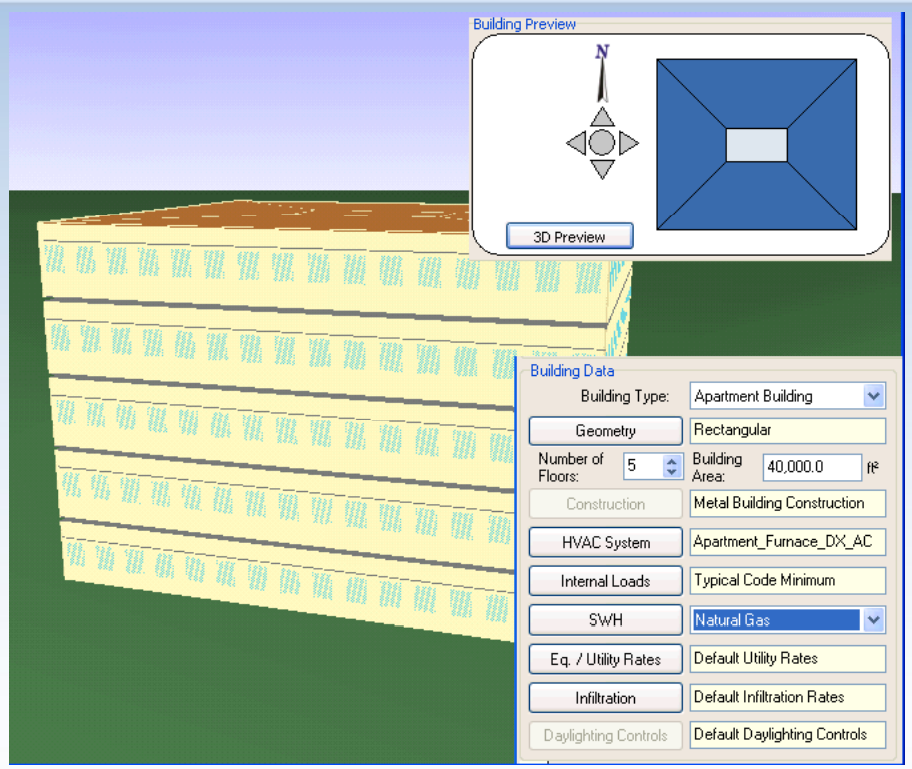
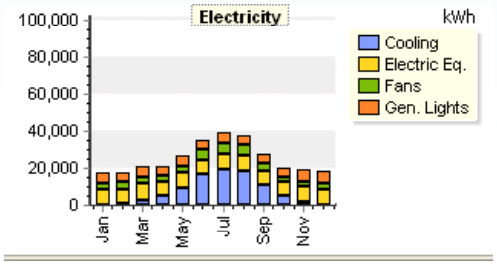
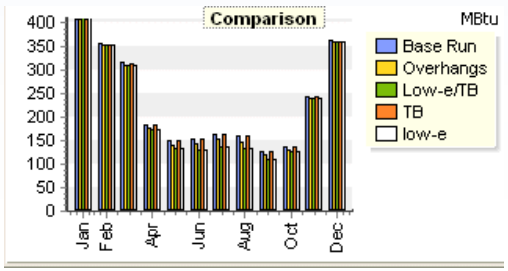
EFEN - Whole Building Energy Modeling







EFEN is developed by DesignBuilder Software, © 2007.
Phone: (413) 256-4647
Fax: (413) 256-4823
Web: www.designbuildersoftware.com
Email: info@designbuildersoftware.com

DesignBuilder SOFTWARE

Building Energy Analysis Report

Report Generated by EFEN v1.00, an EnergyPlus based program
Date: April 22, 2008

Project Information
Title: Project 2
Address: Chicago, IL
City/State/Zip:

Building Owner
Name:
Phone:
Address:
City/State/Zip:

Analyst
Name:
Company:
Address:
City/State/Zip:

Architect
Name:
Phone:
Address:
City/State/Zip:

Building Information

Building Type:	Office Building
Building Shape:	Rectangular
Orientation:	North
Number of Floors:	2
Floor-to-floor Height:	13.0 ft
Conditioned Area:	37,500.0 ft²

Dimensions
W1: 147.9 ft L1: 126.8 ft

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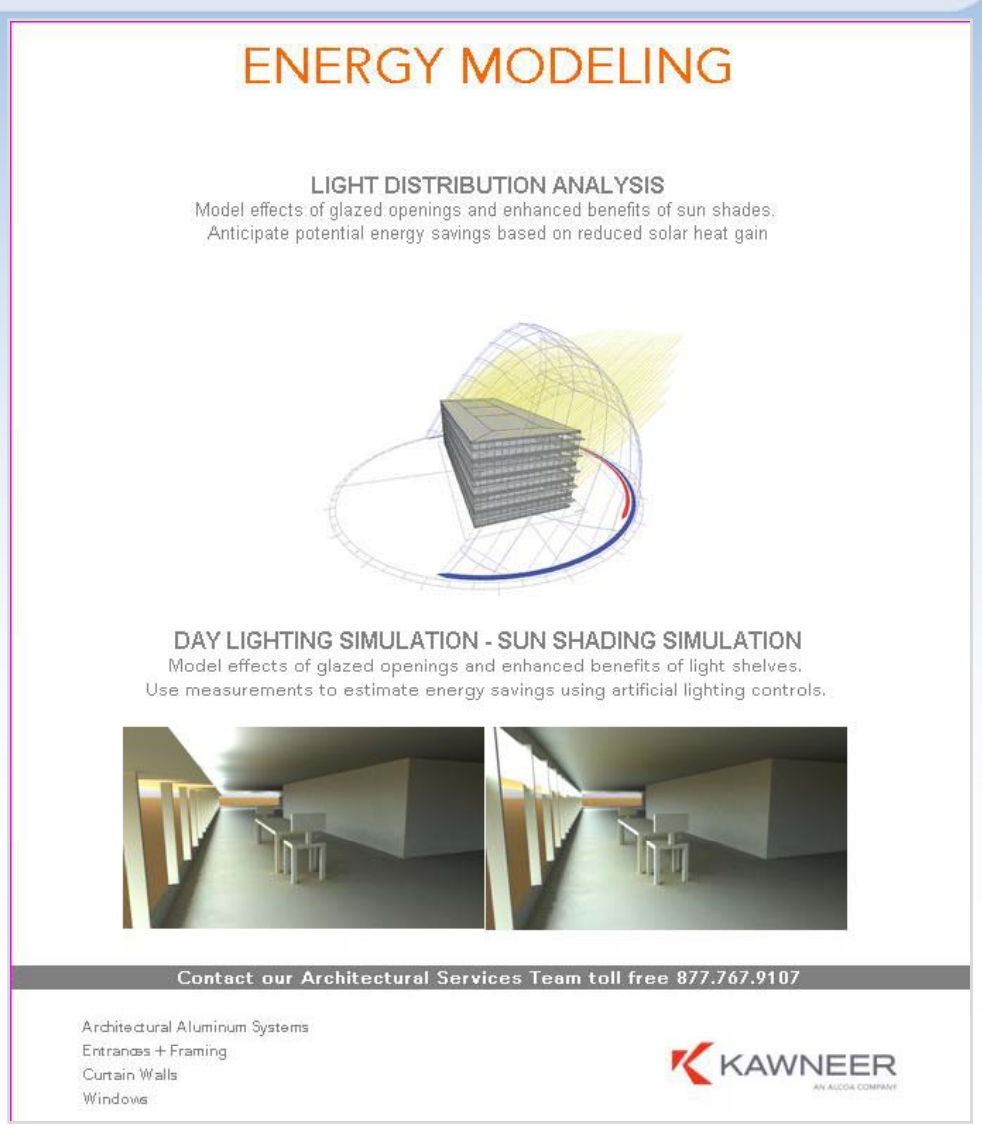
Ecotect - Daylight Modeling

EcoTect (AutoDesk) -DAYSIM (NRCC)

- Radiance (LBNL)
  - Visual Rendering

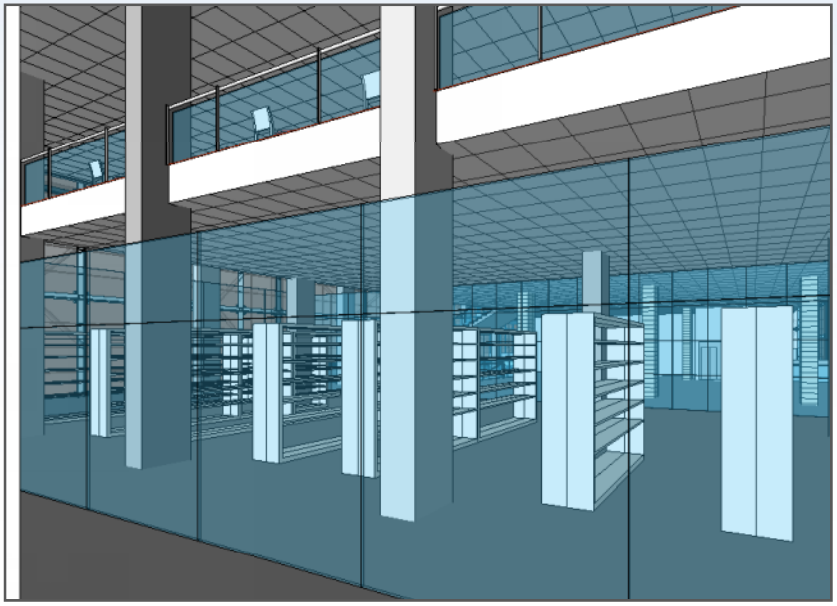
Light Distribution

- Glazed Openings
  - Windows
  - Ribbon Windows
  - Curtain Walls
  - Skylights
- Sun Shades
- Light Shelfs



Building Information Modeling

- Integrated Building Design
- Product Properties
- Energy Performance



Pourquoi L’ Aluminium?

Propriétées

- Léger
- Structurale
- Rigide
- Facile à Fabriquer
- Facile à rendre étanche
- Recyclable à l’infini

Options des finis

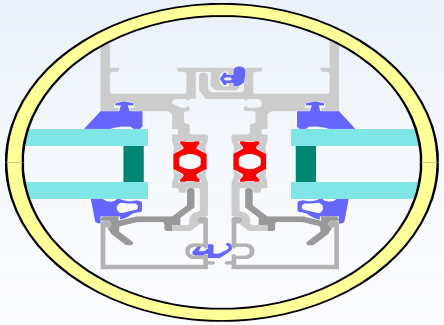
- Anodisation
- Peintures Architecturales
- Qualité des surfaces
- Durabilité
- Resistance à la Corrosion

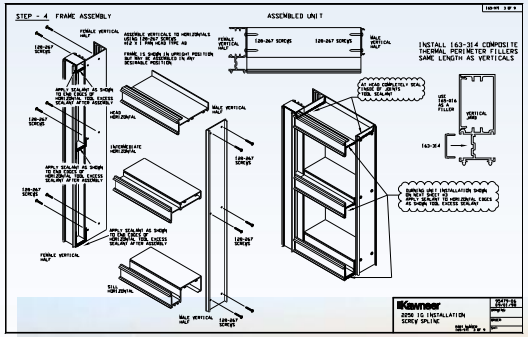



Pourquoi L' Aluminum?

Versatilité du Design

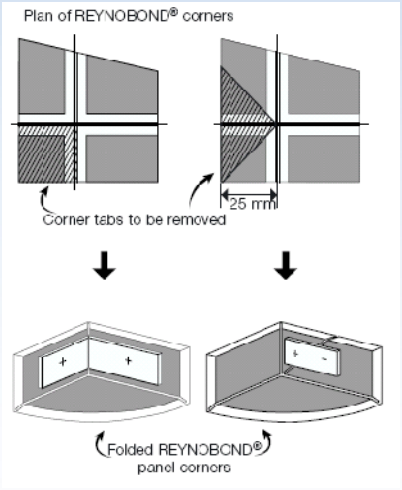
- Systèmes conçue par Extrusions
  - Fenêtres en baie ou en bandeaux
  - Murs rideaux simple à résille
  - Murs rideaux pré-assemblé
  - Murs rideaux pré-Vitré
  - Assemblage avec matières non conducteurs





Feuilles/ pliage

- Rigide et plat
- Facile à façonner, pliages et assemblages



Conclusions

KAWNEER
UNE FILIALE D'ALCOA

Un Leader international dans l'industrie de la construction qui developpe et conçoie des systèmes à la fine pointe de la technologie pour l'enveloppe du bâtiment.