

Photo courtesy NASA



Canadian
URBAN
Institute

LIGHTING THE CLEAN REVOLUTION

PRESENTATION TO THE CESC

PHILIP JESSUP, DIRECTOR, LIGHTSAVERS CANADA

DECEMBER 12, 2012

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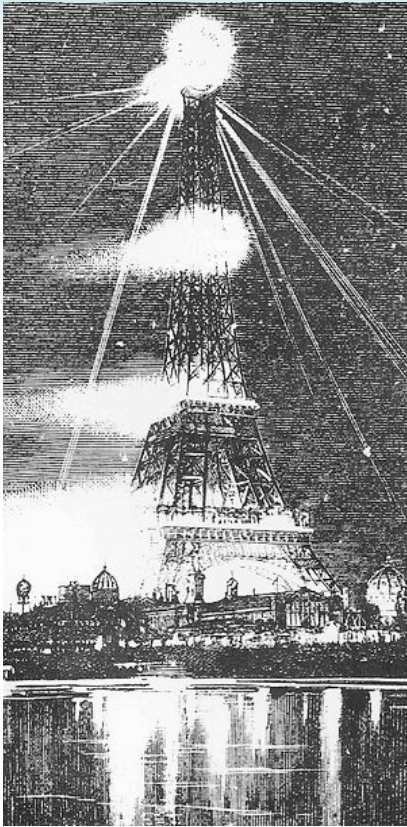


WHY IS LIGHTING IMPORTANT?

- Lighting accounts for 19% of the world's electricity
- Lighting energy and maintenance costs \$356 billion p.a.
- Lighting produces 6% of global CO₂ emissions = 70% of the emissions from cars
- 90 million streetlights globally & 2.7 million in Canada
- Canada's street and parking area lighting = KWh of 230,000 homes
- Conversion of Canada's streetlights = \$1-\$2 billion investment



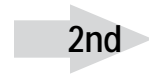
THREE LIGHTING REVOLUTIONS



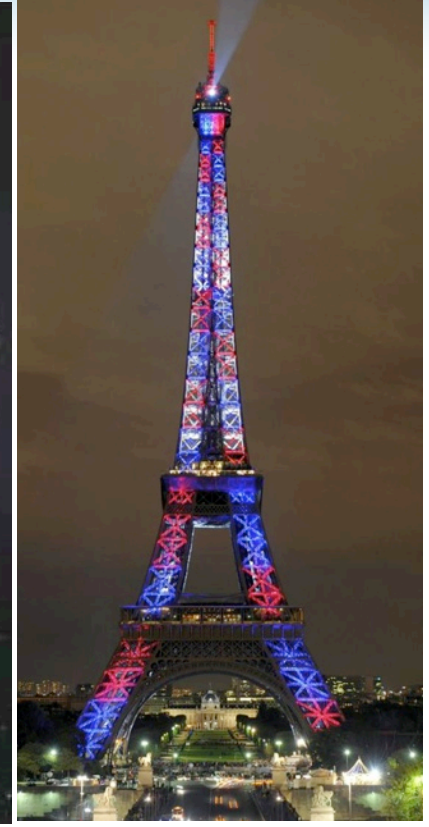
1889



1900



1958



2009



LED LIGHTING BENEFITS?

- LEDs are extremely energy efficient (165 lumens/watt)
- LEDs are directional > no wasted light & any pattern or colour possible
- LED uniformity is better, i.e., no hotspots but instead a “carpet effect”
- Long lifetime > 50,000 hours+ to L₇₀
- Inherently rugged > no filament to break
- Infinitely dimmable & controllable leading to innovative new lighting applications & uses



LED GREENING BENEFITS?

- Improves the aesthetic quality of streetscapes and brings more people out at night for social interaction
- Improves visual acuity and public safety
- Reduces energy use and GHGs (in fossil grids) by 50 - 70%
- Reduces peak electricity use (garages)
- Reduces municipal operating and maintenance costs
- Adaptive controls facilitate innovation, such as emergency warnings
- Frees up off peak load for charging EVs
- Environmentally sound > no Hg, Pb, heavy metals > LED devices recyclable

Photo credit Ryan Pyle courtesy The Climate Group



LIGHTSAVERS' MISSION

Mission: To build a future with greener, more sustainable lighting



Graphic courtesy The Climate Group

* Thane is part of the Mumbai Conurbation



OUR MANDATE: SHIFT THE S-CURVE!

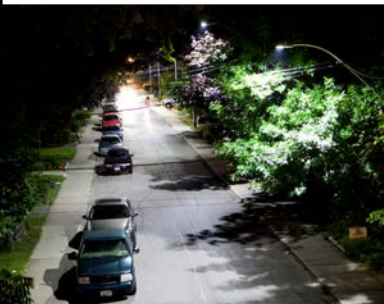
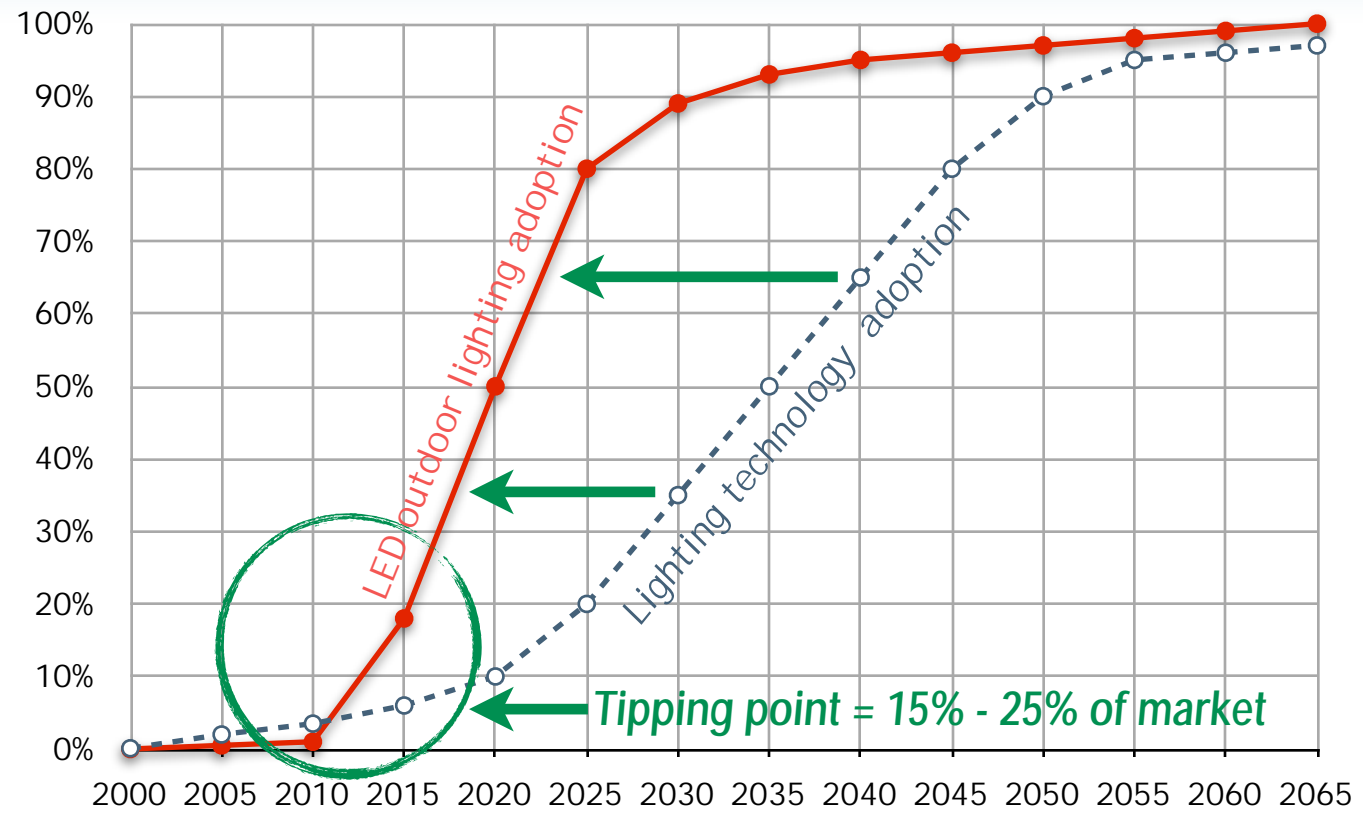


Photo credit Ryan Pyle courtesy The Climate Group





LIGHTSAVERS AT RIO+20



LED

June 2012

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**LIGHTING THE
CLEAN REVOLUTION**

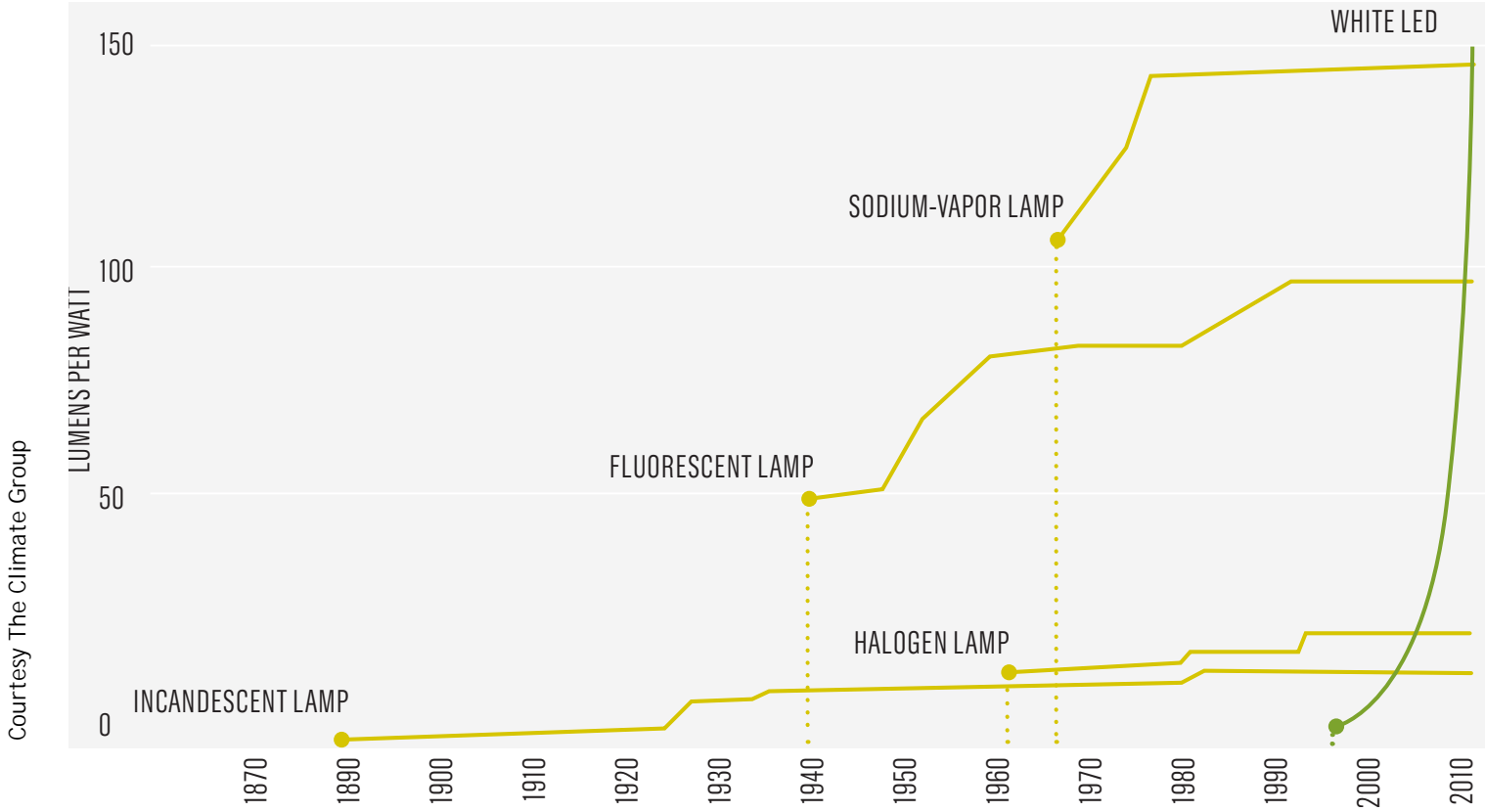
The rise of LEDs and what it means for cities

This is part of
THE CLEAN REVOLUTION



LED MARKET PROFILE

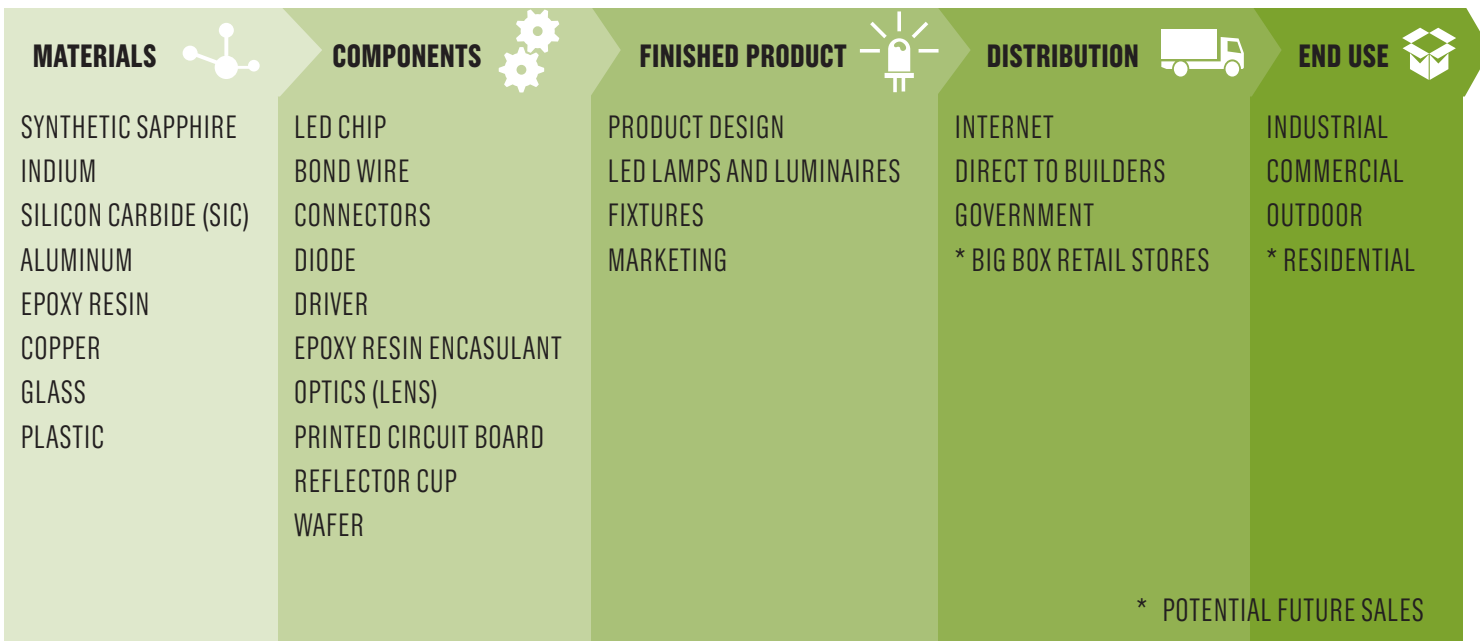
Key insight: LED efficiency is rapidly surpassing conventional technologies





LED MARKET PROFILE

Key insight: LEDs offer developing countries economic opportunities with a range of specializations—global lighting market \$160 billion by 2020



Courtesy The Climate Group

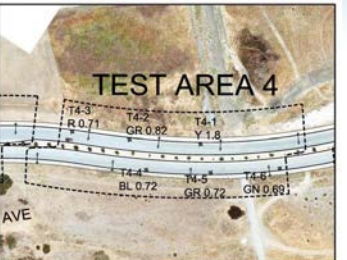
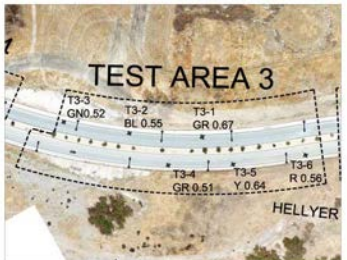
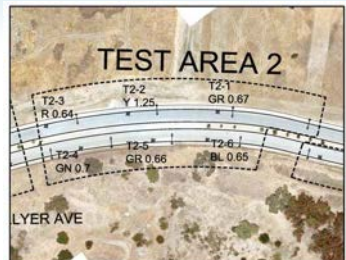
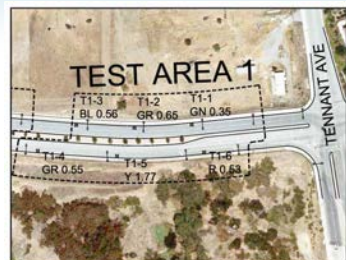
* POTENTIAL FUTURE SALES



SCALE-UP UNDERWAY IN N.A.



Photo credit Ryan Pyle courtesy The Climate Group



Graphic courtesy City of San Jose

U.S.

- Anchorage—4,000 of 16,000 installed
- Baltimore—11,000 in progress
- Boston—18,000 installed of 64,000
- Las Vegas—41,000 being installed
- Los Angeles—98,690 installed of 140,000
- New York—1,600 installed
- San Antonio—20,000 tender complete
- San Francisco—18,500 being installed
- Seattle—21,000 of 72,000 installed

Canada

- Edmonton—11,000 installed of 98,000
- Lethbridge—4,500 tendered of 12,000
- Mississauga—49,000 tender awarded
- New Brunswick—75,000 tender awarded
- North Bay—5,550 installed
- Nova Scotia—25,000 tendered of 120,000
- Welland—6,710 installed

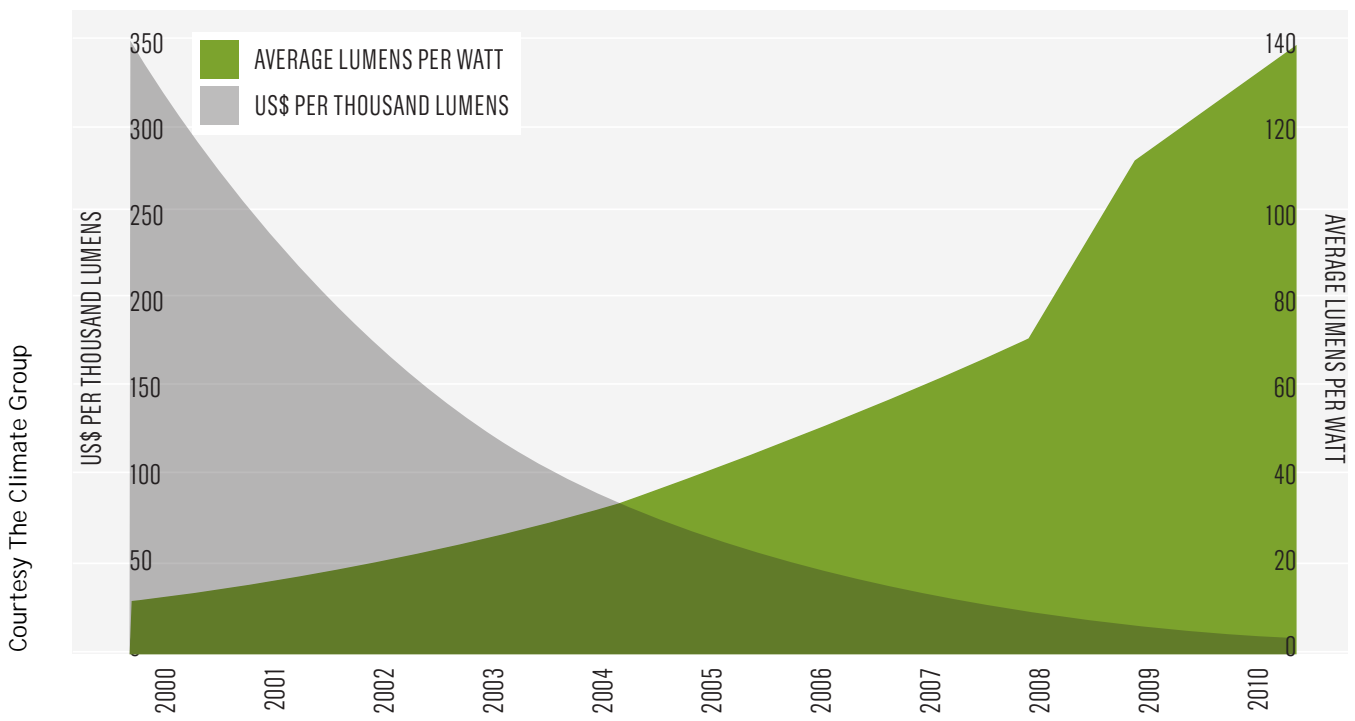


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LED MARKET PROFILE

Key insight: LED prices have declined 50% over past three years!



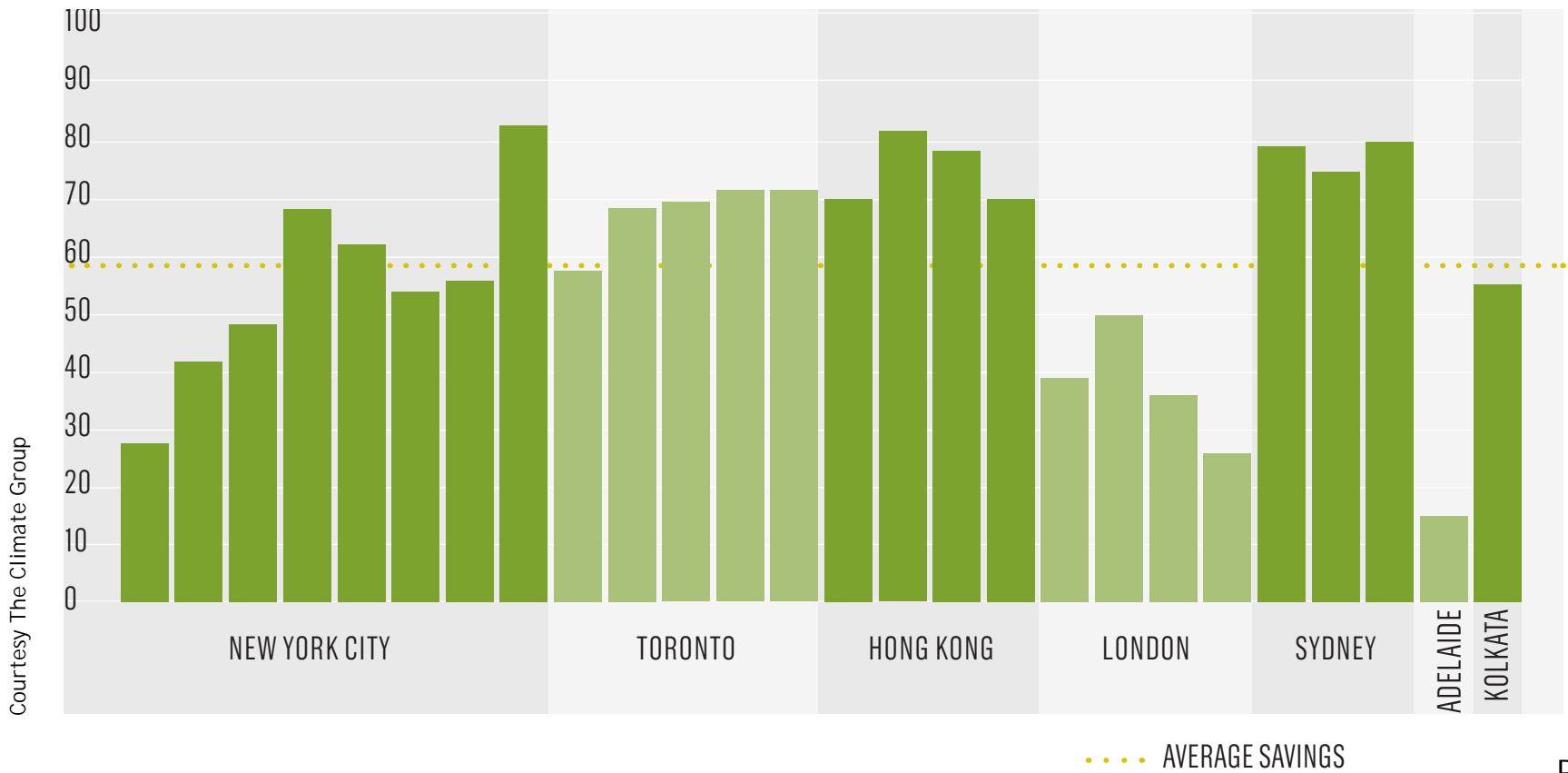
Courtesy The Climate Group

BHANDARKAR, V., 2011, LED LIGHTING MARKET TRENDS, STRATEGIES UNLIMITED, PRESENTATION TO STRATEGIES IN LIGHT CONFERENCE, SANTA MONICA.



OUR GLOBAL TRIAL RESULTS

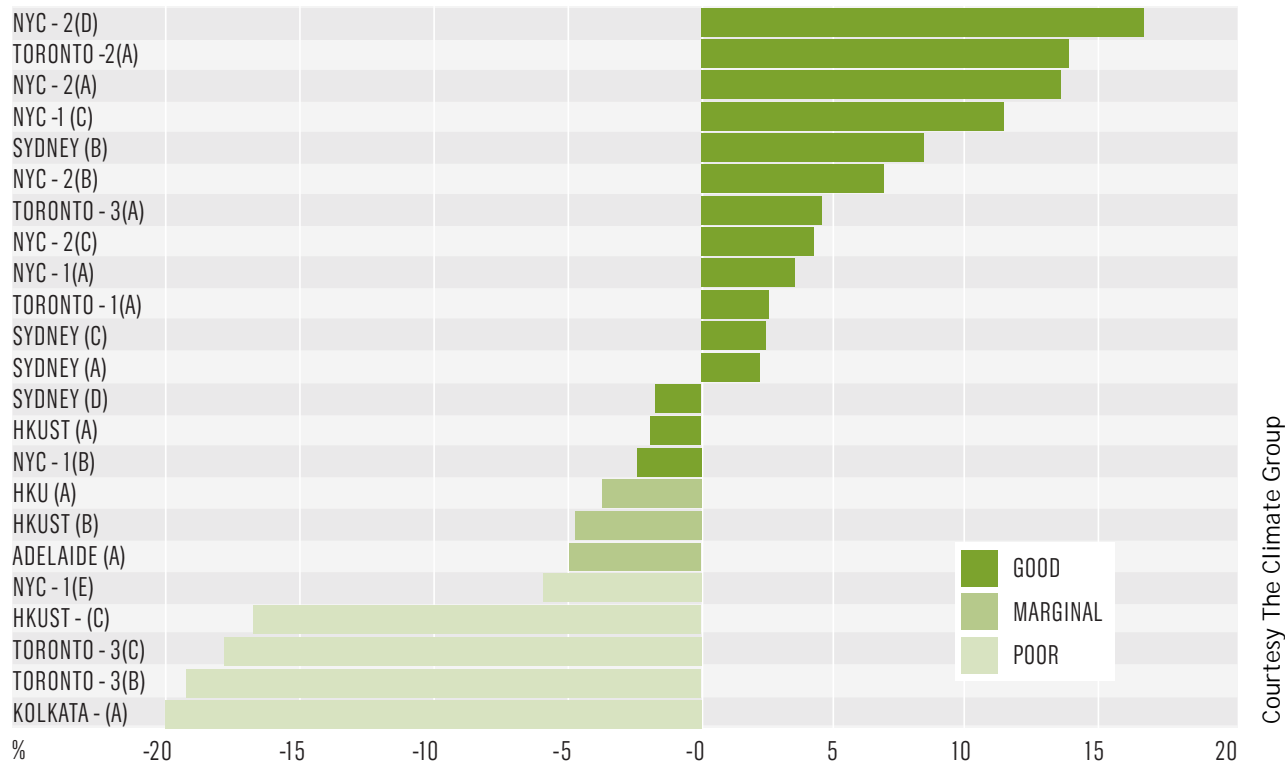
Key insight: LEDs and adaptive controls yield 50 - 80% energy savings





OUR GLOBAL TRIAL RESULTS

Key insight: most LED luminaires maintained excellent light output over time



* DATA IS BASED ON 3000-6000 HOURS OF OPERATION – TRIALS AT LESS THAN 3000 HOURS WERE EXCLUDED. DATA FROM THE TRIALS SHOULD NOT BE USED TO PREDICT LONG-TERM PRODUCT PERFORMANCE. A MINIMUM OF 10,000 HOURS OF OPERATION IS REQUIRED FOR THIS PURPOSE.

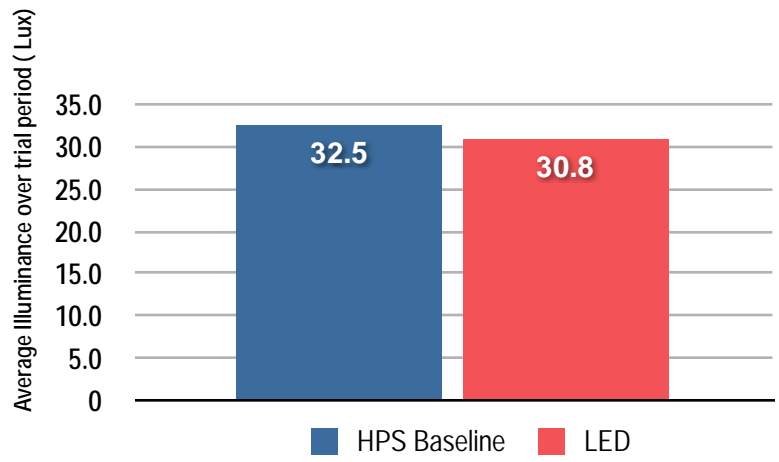
Courtesy The Climate Group



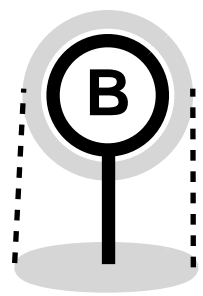
KOLKATA LED TRIAL RESULTS

Key insight: Almost equivalent light output accompanied by 52% energy savings due to the superior directionality of the LED streetlights

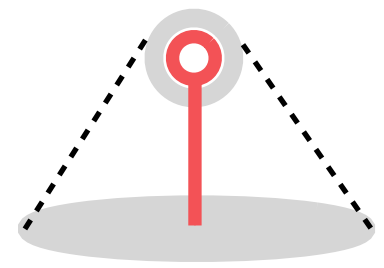
LightSavers Kolkata Trial Illuminance Results



Target area system effectiveness indexed to the baseline HPS lamp (normalized value = 1.0 lumen/watt)



Baseline HPS
1.0 l/watt



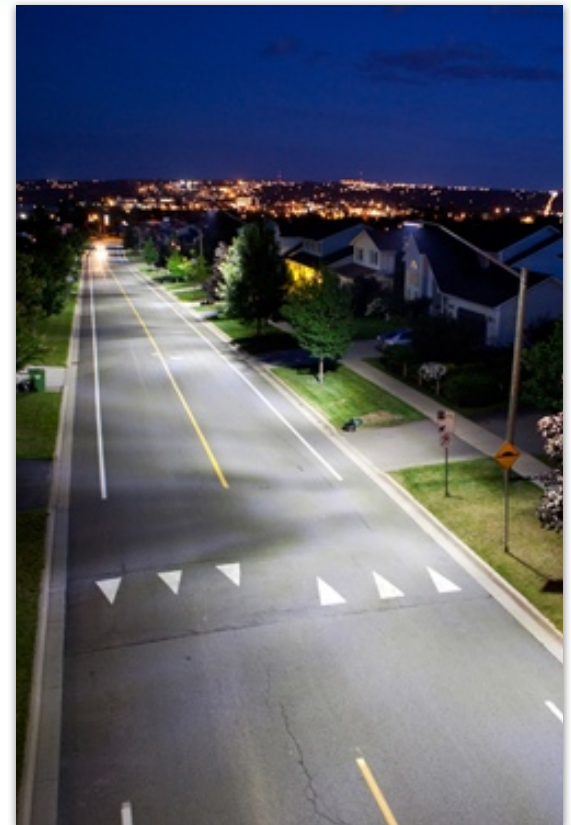
KOL-1
2.0 l/watt

Data courtesy The Climate Group



SUMMARY: KEY LESSONS

- LED streetlights are mature and market ready!
 - ★ In North America lighting managers are very aware of LED performance
 - ★ Many cities/provinces are scaling up now
 - ★ Barriers: procurement, financing, & utilities
- 50 - 70% energy savings
 - ★ Directionality accounts for most of efficiency
 - ★ Adaptive controls add another 20%
- Considerable lifespan, 50,000 - 100,000 hours
- Financing in various forms is needed to address budgetary constraints
- Public loves LEDs according to surveys!





ADVICE TO POLICYMAKERS

- Municipal and state procurement plays a key role in expanding the market
 - ◆ Aggressively retrofit government owned lighting
 - ◆ Standardize technical procurement specifications and processes
 - ◆ Facilitate prequalification of foreign owned companies to bid domestically
- Modernize roadway lighting standards to accommodate the scotopic benefits of LED white light
- Codes for new urban development should mandate LEDs!
- Develop lighting testing laboratory capacity domestically



THANKS!

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