LIGHTING THE CLEAN REVOLUTION
PRESENTATION TO THE CESC
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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 1st
1900 2nd
1958 3rd
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, Pg, heavy metals > LED devices recyclable
Mission: To build a future with greener, more sustainable lighting

* Thane is part of the Mumbai Conurbation
Our mandate: Shift the S-Curve!

Tipping point = 15% - 25% of market
LIGHTEIVERS AT RIO + 20

THE °CLIMATE GROUP

LIGHTING THE CLEAN REVOLUTION
The rise of LEDs and what it means for cities
Key insight: LED efficiency is rapidly surpassing conventional technologies
Key insight: LEDs offer developing countries economic opportunities with a range of specializations—global lighting market $160 billion by 2020
Scale-up underway in N.A.

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

BHANDARKAR, V., 2011, LED LIGHTING MARKET TRENDS, STRATEGIES UNLIMITED, PRESENTATION TO STRATEGIES IN LIGHT CONFERENCE, SANTA MONICA.
Key insight: LEDs and adaptive controls yield 50 - 80% energy savings
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.
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)

Data courtesy The Climate Group
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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