



“The LED Lighting Revolution”

- A breakthrough innovation contributing to a low carbon future -

Harry Verhaar

Head of Global Public & Government Affairs, Philips Lighting

Development Group, Brussels, 4 May, 2016

Breakthrough innovation in energy technologies

- The bigger picture
- Philips Lighting: our journey
- The Energy Efficiency domain
- Speeding-up breakthrough energy innovation

The bigger picture: The World in 2005/6

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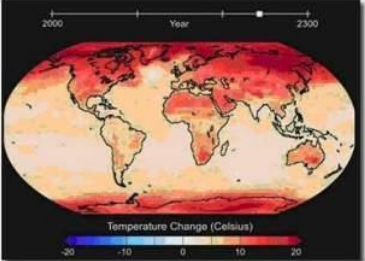
More Information



Govindasamy Bala

Modeling of long-term fossil fuel consumption shows 14.5-degree hike in Earth's temperature

LIVERMORE, Calif. — If humans continue to use fossil fuels in a business-as-usual manner for centuries, the polar ice caps will be depleted, ocean sea levels will rise by seven meters and mean temperatures will soar to 14.5 degrees warmer than current day.



These are the stunning results of a new climate and carbon cycle model conducted by scientists at the Lawrence Livermore National Laboratory. The model coupled climate and carbon cycle models to look at global climate and carbon cycle changes, the scientists found. The model showed that if humans continue to use fossil fuels at the current rate, the entire planet's average temperature would warm by 14.5 degrees Fahrenheit (8.1 degrees Celsius) by the year 2300.

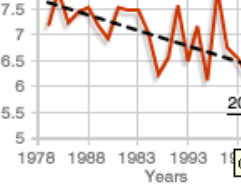
The jump in temperature has alarming consequences for the polar ice caps and the ocean, said Govindasamy Bala of the Energy and Environment Division.

In the polar regions alone, the model predicts a temperature spike more than 20 degrees Celsius.

Animation: Michael Wickett

ARCTIC SEA ICE EXTENT - SEPTEMBER TREND, 1978-2005

Extent (million sq km)



Years

SOURCE: National Ice Data Center

♦ The straight line tracks a decline of more than 8% per decade.

BBC NEWS

UK version International version About the versions | Low graphics

Last Updated: Monday, 30 January 2006, 11:00 GMT

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Stark warning over climate change

By Richard Black
Environment Correspondent, BBC News website

Rising concentrations of greenhouse gases may have more serious impacts than previously believed, a major scientific report has said.



The Heritage Foundation

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RESEARCH energy and environment

Energy Shortages In Energy-Rich America: Why?

by The Honorable Denise A. Bode
Heritage Lecture #692

CNN.com

U.S. > story page

Future energy shortages predicted

Study faults U.S. power preparedness

July 26, 1999
Web posted at: 7:34 p.m. EDT (1934 GMT)

In this story:

What

RELATED STORIES, SITES



Extreme heat may lead to power loss in some portions of the nation, as demand exceeds supply.

VIDEO

CNN's Bill Delaney looks at how the heat wave may affect the country's power supply.

Scientists fear global warming higher than expected

In Short:

New scientific modelling suggests the earth's average temperature could rise by 7.8°C by 2300 if fossil fuel consumption remains unchanged, with polar ice caps melting and seas rising by seven meters.

Brief News:

New climate modelling by researchers at the Lawrence Livermore National Laboratory in California suggest the magnitude of global warming could be much higher than expected, with dire consequences for the economy.

Study Shows Escalating Climate Change Impacts on Human Health, the Environment, and the Economy

NEW YORK-November 1, 2005-The Center for Health and the Global Environment at Harvard Medical School, along with co-sponsors Swiss Re and the United Nations Development Programme, today released a study showing that climate change will significantly affect the health of humans and ecosystems and these impacts will have economic consequences.

The bigger picture: a Paradigm Shift

- 
- Lowest 1st cost
 - Behaviour
 - Processes
 - Judgement
 - Linear Society
 - Extraction
 - Consumption
 - Disposal / emission
 - GDP



- 
- Lifecycle value
 - Economical
 - Ecological
 - Social
 - Circular Society
 - Resource efficiency
 - Energy; Materials
 - Water; Food
 - Quality of Life

Shaping the LED Lighting Revolution

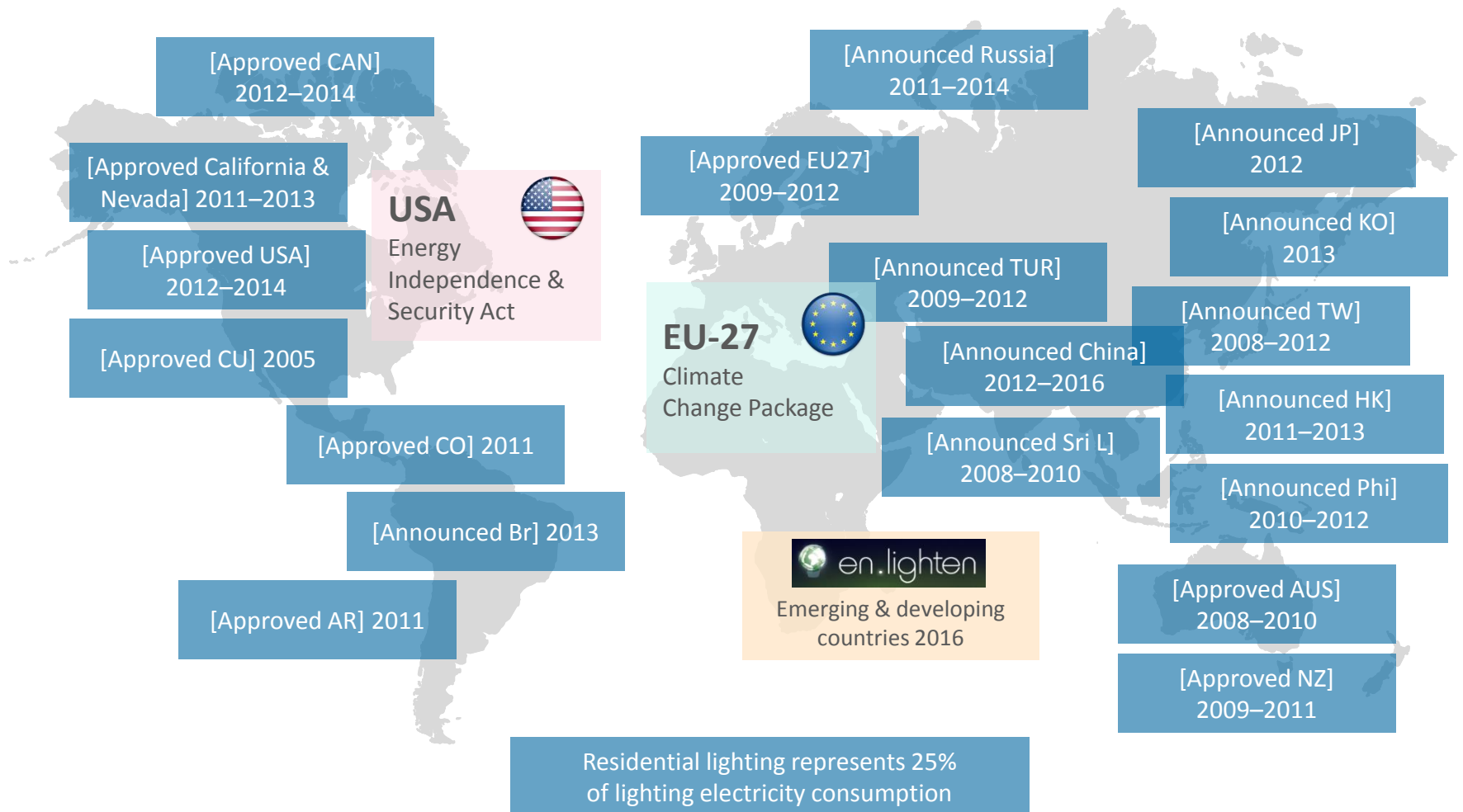
Lighting is evolving beyond offering products



- Analog / Lamps
- Stand-alone / 'Dumb'
- Products / Replacement sales

- Digital / LEDs
- Connected / 'Smart' - IoT
- Systems & Services / Circular / Projects

Global phase-out incandescent lamps



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Country Lighting Assessments

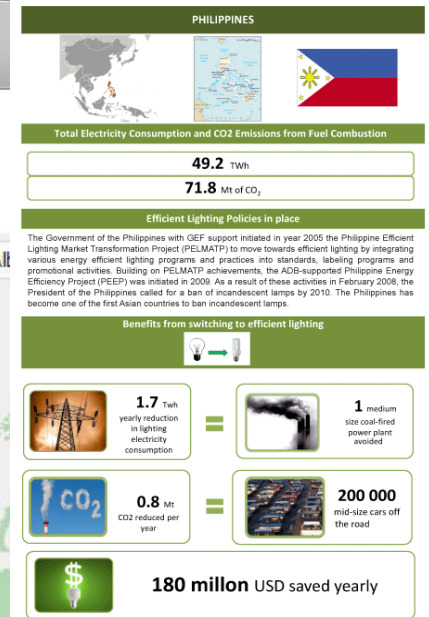
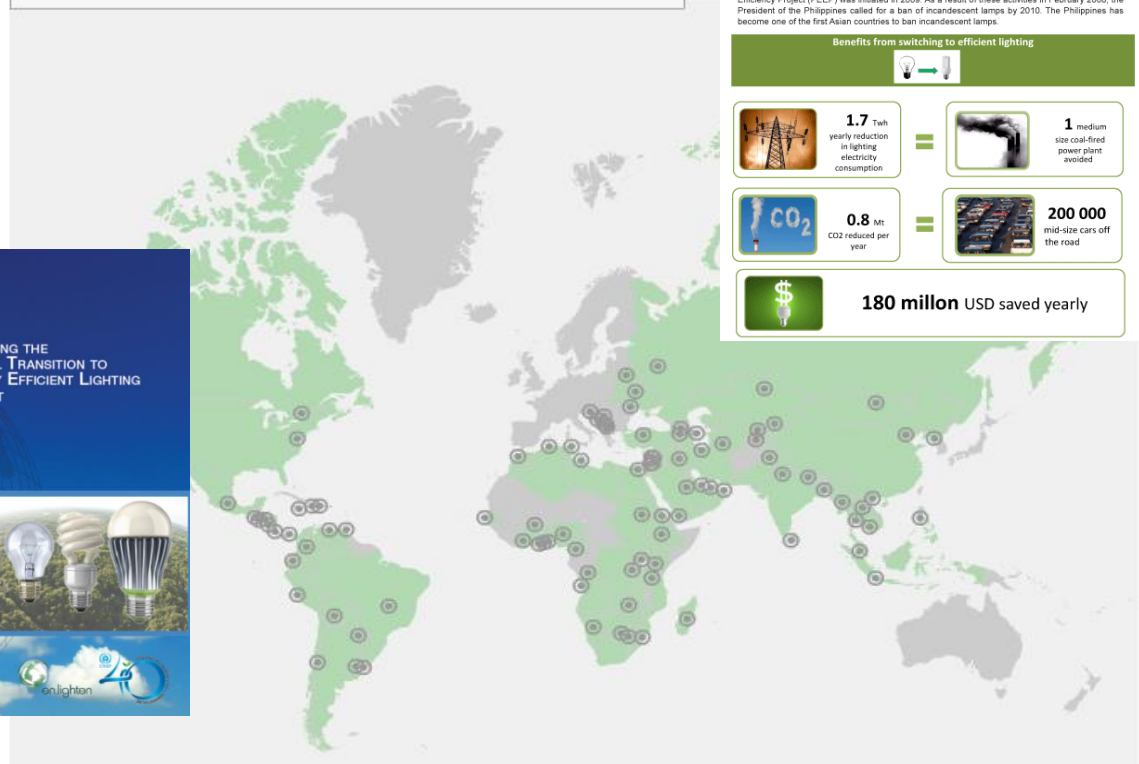
Global Partnership Program
Efficient Lighting Toolkit
Country Lighting Assessments
What are Country Lighting Assessments?
Energy Savings Benefits
Financial Benefits
Climate Change Mitigation Benefits
Conference Material
Regional Conference in Southeast Asia
Regional Conference in the Middle East and North Africa
Regional Conference in Latin America and the Caribbean



tool by ammap.com

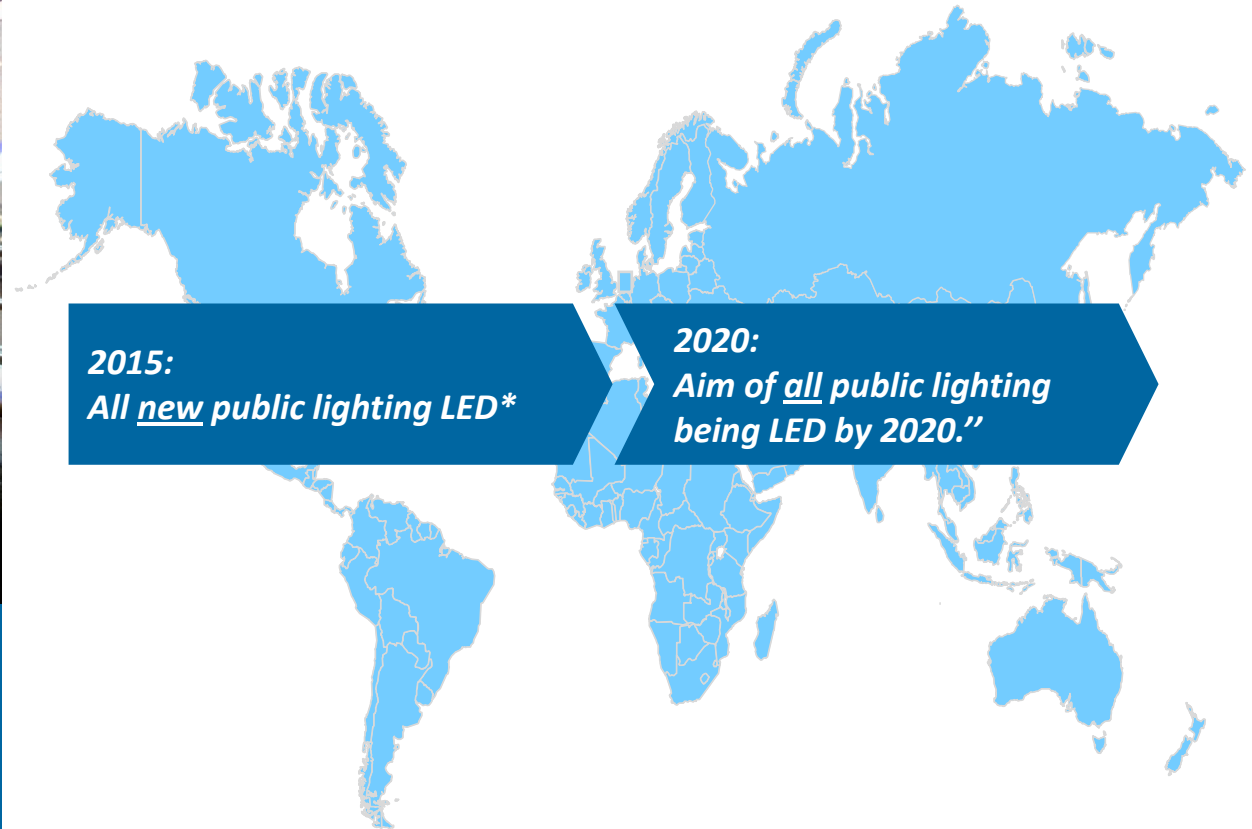
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Partnership with The Climate Group

Focus on Cities – Call for large scale LED adoption



*or as energy efficient

New York City switches all streetlights to LED



New York City is set to upgrade all 250,000 of its streetlights to LED over the next few years. This is part of the city government's PlaNYC to cut its carbon footprint by 30 per cent by 2017.

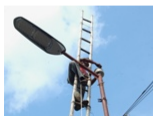
The current high pressure sodium streetlights need to be replaced every six years and consume a lot of energy, resulting in huge bills for the city. The LED lanterns are expected to require far less maintenance and last up to 10 years, saving the city around US\$8 million (£6 million) a year in expenses. New York believes this retrofit, which

Home » [LED street-lighting pilot program begins in Kolkata, India](#)

LED street-lighting pilot program in Kolkata, India

Kolkata, the Climate Group and HSBC have launched an outdoor LED lighting project that will cu

The Kolkata Municipal Corporation (KMC), international NGO The Climate Group and HSBC have launched India's largest LED street-lighting pilot program in Kolkata. This LED pilot project will undertake a comprehensive trial of over 270 lights installed on several of the city's arterial roads.



Installing LED street lights

The Climate Group. The project cost is equally shared between BEE and KMC.

Sustainable Sydney 2030

Towards 2030

- Business and economy
- Communities and culture
- Sustainability
- Urban ecology
- Greening the city
- Water management
- Waste management
- Carbon reduction
- Renewable energy
- Urban heat island effect
- Trigeneration
- LED lighting project
- Carbon neutral
- C40 global cities climate network

THE CLIMATE GROUP

#10YEARS OF INNOVATION & LEADERSHIP

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[Scotland proposes switch to 100% LED lighting](#)

SCOTLAND PROPOSES SWITCH TO 100% LED LIGHTING

DATE 14 MAY 2013

LONDON: All of Scotland's street lighting could be switched to low carbon light-emitting diodes (LEDs) as part of the Scottish Government's bold emissions reductions plans.

The government's LED upgrade plan is to be considered for funding by the UK's Green Investment Bank (GIB), as one of £500 million worth of low carbon nationwide proposals that are being reviewed by the Bank.

Speaking at a Green Investment Bank conference in Edinburgh, Richard Lochhead, Rural Affairs and Environment Secretary, said: "By working closely with the GIB, converting Scotland's street lighting to LED is a program the Scottish Government has identified which would be ideal for potential GIB funding. Payback time is estimated at around seven to nine years, which is an outstanding spend to save cash based on energy savings of as much as 40-60%. It is an excellent example of how investing in low carbon projects can have long term savings as well as helping to protect the environment."

Lighting currently accounts for 15% of the world's electricity consumption, but pilot studies that The Climate Group has carried out with city governments around the world show that it is possible for cities to benefit from 50-70% energy savings by replacing their outdoor lighting with LEDs.

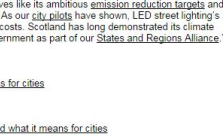
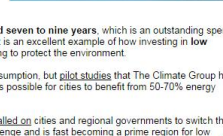
Mark Kenber, CEO, The Climate Group, said: "Last year we called on cities and regional governments to switch their street lighting to LEDs by 2020. Scotland has taken up this challenge and is fast becoming a prime region for low carbon investment from businesses around the world – bold moves like its ambitious emission reduction targets and this innovative LED lighting roll-out is a green light for investors. As our city pilots have shown, LED street lighting's energy savings can yield huge reductions in a city's operational costs. Scotland has long demonstrated its climate leadership and The Climate Group is proud to work with its Government as part of our States and Regions Alliance."

Explore our LED work:

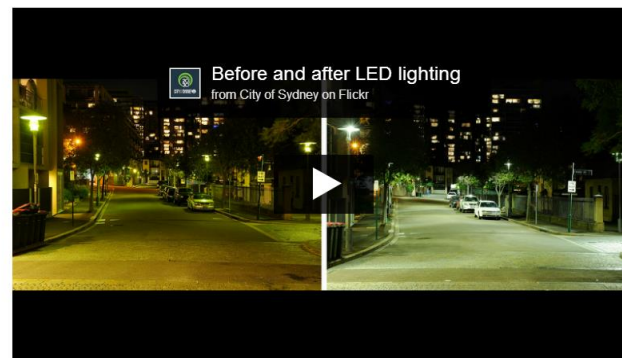
[Lighting the clean revolution: The rise of LEDs and what it means for cities](#)

[Global outdoor LED trials](#)

[Infographic - Lighting the Clean Revolution: The rise of LEDs and what it means for cities](#)



LED lighting project



Before and after LED lighting from City of Sydney on Flickr



Kong joined Sydney in another LED onal environment collective, the Climate

veyed by the City said they found the ie-quarters said the LEDs improved

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London switches on to LED lighting revo

£11m project to switch 35,000 street lights to LEDs should save £1.85m a year and reduce energy consumption by 40 per cent

By BusinessGreen staff

More from this author

03 Dec 2013

3 Comments



London is set for the largest-ever single investment to modernise its street lighting in a move that should reduce energy consumption by 40 per cent.

Around 35,000 of the capital's 52,000 street lights will be replaced by energy-efficient LEDs by 2016, while a new system will also be introduced to remotely manage and control lighting levels in line with traffic flows and road usage.

COP21: Philips Messaging

Global trends => Need to double the rate of EE improvement



Energy demand growing 2x fast (3% p.yr)
as rate of EE improvement (1.5% p.yr)

1. Energy efficiency and the need to **accelerate renovation** of existing infrastructure, primarily in developed countries
2. Energy efficiency and the need to **leapfrog** to the most efficient and clean tech solutions for emerging and developing countries
3. At Philips, we will become **carbon neutral** by 2020
4. At Philips, we will continue to strongly lead the **Global Lighting Sector Transition**

Philips to become carbon neutral by 2020

"Leadership by example"

– *Achim Steiner,
Executive Director
UNEP*

"This is great!"

– *Robert Orr, Under
Secretary General, UN -
Executive Office of the
Secretary General*

"Philips leadership offers the real possibility of extending sustainable energy to all. Efficiency is at the heart of a new pathway of low carbon growth that leaves no one behind - it's a solution for climate change and inequality."

– *Rachel Kyte, VP World Bank and designated CEO and Special representative to the UN SG on Sustainable Energy for All (SE4All)*

"What a great announcement!"

– *Mark Watts, Executive
Director, C40 Cities Climate
Leadership Group*

"Wow, that is fantastic and so consistent with Philips' reputation for leadership! Congratulations from all of us!"

– *Kathy Calvin, President & Chief
Executive Officer UN Foundation*

"This very timely and relevant commitment from Philips. It is not a surprise because of the company long experience in promoting energy efficiency and innovative low carbon technologies on the global market. Congratulations to Philips!"

– *Benoit Lebot, Executive Director, IPEEC
(Int'l Partnership Energy Efficiency
Coalition)*

"Great to see Philips continuing to lead"

– *Nigel Topping, CEO We Mean Business*

"Thank you very much for sharing this exciting news - and a very warm congratulations on this ambitious goal! Of course, Philips is a forerunner on the matter, and I really admire your efforts to push this forward. I will happily share this within my networks."

– *Jennifer Lenhart, IISD (the media reporting organization of all global UN events)*

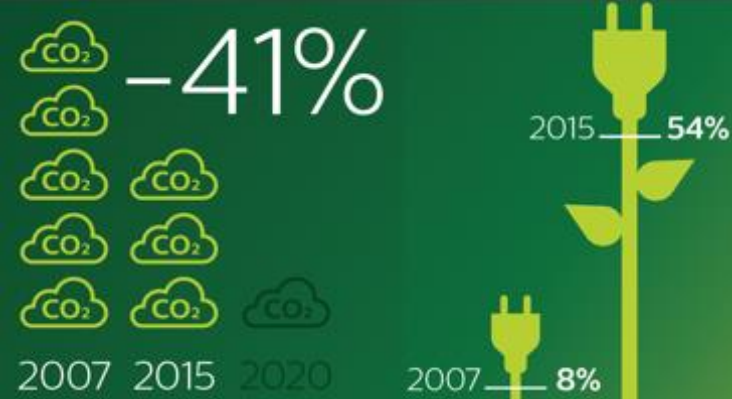
"This is indeed excellent news! It is a big step and a step that surely will inspire others to follow. We are very happy to have Philips with us in Climate Neutral Now!!"

– *Niclas Svenningsen, Manager
Strategy & Relationships, UNFCCC*

"Doubling the annual rate of energy efficiency improvement using available technologies would deliver half the emission reductions needed to meet the 2°C climate goal. Philips can play a major role in achieving this by tackling its corporate carbon footprint, and by strengthening its innovation across all markets"

– *Amory B Lovins, Chief Scientist & Co-Founder,
Rocky Mountains Institute*





2.5 planets

The world is currently consuming over 2.5 times the amount of resources than the Earth can sustainably support

Our Commitment

Carbon neutral by 2020

Our commitment

We are committed to carbon neutrality for our global operations by 2020, including combustion in operations, purchased electricity, logistics and business travel

Drivers of becoming carbon neutral by 2020

- Drive down carbon emissions in own operations, logistics, and business travel by becoming more energy efficient
- Purchase our energy from renewable sources and compensate remaining emissions via carbon credits

Our progress

- Since 2007 we reduced our carbon footprint by 41%
- We increased our use of renewable energy from 8% in 2007 to 54% in 2015
- We became member of the [RE100 program](#)

UN SE4All Partnership

Global Energy Efficiency Accelerator Platform

Launched @UN Climate Summit NYC

EE Accelerators

- Buildings
- Lighting & Appliances
- District Heating
- Transport

Partnership for global progress

- UN (UNF; UNEP; SE4All; UNFCCC)
- Sub-national governments



Achim Steiner (UNEP), Sarah Watson (FIA), Harry Verhaar (Philips), Ban Ki Moon (UN), Kandeh Yumkella (SE4All), Clay Nesler (JCI), Amanda Eichel (C40), Reid Detchon (UNF)



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GLOBAL ENERGY EFFICIENCY ACCELERATOR PLATFORM

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- Appliances and Equipment
- Building Efficiency
- District Energy
- Lighting
- Transport and Motor Vehicle Fuel Efficiency
- Industrial Energy Efficiency
- SE4ALL Energy Efficiency Committee Report
- Contact

COUNTRY LEVEL ACTIONS

HIGH IMPACT OPPORTUNITIES



Global Energy Efficiency Accelerator Platform

Sustainable Energy for All, an initiative led by the UN Secretary-General and the President of the World Bank, has as one of its three objectives for 2030 a doubling of the global rate of improvement in energy efficiency.

The Global Energy Efficiency Accelerator Platform was established to help reach this objective. It will do so by driving action and commitments by national and sub-national leaders at the country, city, state, region, or sector level.

A key deliverable will be Integrated Policy and Investment Roadmaps prepared with committed public and private partners. These Roadmaps will guide project implementation supported by a global network of experts, institutions and businesses.



[Download the Global Energy Efficiency Accelerator Platform Flyer and read more](#)

Energy Efficiency Accelerators

Stimulating Innovation = Stimulating Energy Efficiency

EE capabilities are a European strength

Lighting



Appliances & Equipment



Vehicle Fuel Efficiency



Buildings



District Energy

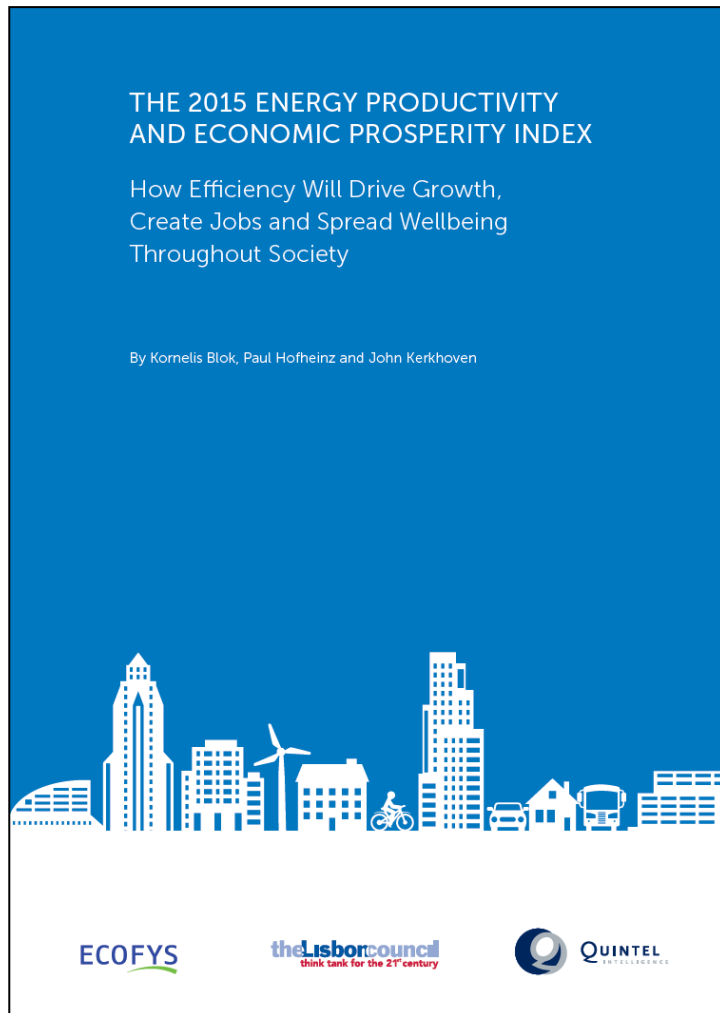


Industry



Speeding-up breakthrough energy innovation

Benefits of doubling the rate of EE improvement (from 1.5 to 3% p.yr)



EU Impact

1. Reduction of energy expenditure by one third
2. Improved security of energy supply
3. Job creation 1.2 million by 2020 (renovation; innovation)
4. Quality of life
5. Competitiveness / Trade

Speeding-up breakthrough energy innovation

Revision Energy Efficiency Directive

ART 1 Subject matter and scope

- Our key ask: Reduce opt-outs/flexibility clauses and adopt a streamlined legislation to improve enforcement at national level

ART. 2: Energy efficiency target

- Our key ask: Align the EE target with the Paris Agreement supporting an EU 40% EE target for 2030 in both primary and final energy consumption

ART. 6: Purchasing by public bodies of EE buildings, goods and services

- Our key ask: EED aligned with art. 67 PPD (i.e. life cycle cost approach) and extension to all public authorities to cover all public contracts

ART. 7: Energy Efficiency Obligation Schemes

- Our key asks: keep art 7!; remove sunset clauses;
- Doubling of EE improvement rate to $\geq 3\%$ p.yr (>2020)



EUROPEAN ALLIANCE TO
SAVE ENERGY
Creating an Energy-Efficient Europe

Speeding-up breakthrough energy innovation

Barriers and solutions

Ambition without Policies = Dreaming
Policies without Ambition = Sleepwalking

1. Technology innovation

- R&D investment at **3%**
- Stimulating development & uptake new (smart) technologies

2. Policy innovation

- Energy neutral infrastructure by 2050
 - **Accelerated renovation** (buildings 3% p.yr)
 - Net zero energy new built
- EE Ambition **>=40%** by 2030; leverage EED; EPBD; EuP

3. Financing innovation

- **Performance based** ('Green') procurement
- **Off-balance sheet** financing mechanisms (IFRS)

4. Communication / Partnership innovation

- Engaging **narrative** (mobilizing the 'eco-majority')
- Horizontal: **Sectoral** programs; Vertical: Public Private **Partnerships**

