

Global Lighting Challenge: Changing the world through public-private partnerships

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Abstract

Lighting accounts for 15 % of global electricity consumption and 5 % of global greenhouse gas emissions. Accelerating the transition to energy efficient lighting could be one of the most significant short-term initiatives to improve economic and climate conditions around the world. In recognition of this tremendous potential, the Global Lighting Challenge (GLC) was launched in December 2015 by the Clean Energy Ministerial and the US Department of Energy. The GLC is a race to reach cumulative global sales of 10 billion high-efficiency, high quality, and affordable lighting products, such as light-emitting diode (LED) lamps. Since its launch, the GLC has built a public-private volunteer coalition of more than 50 governments, manufacturers, retailers, and expert groups working together to accomplish its 10 billion product goal. We put **market** actors on the same side of the climate change project by promoting businesses who make commitments, and showcasing governments who make endorsements. We have persuaded global industry leaders such as Cree, Philips, and IKEA and smaller groups such as San Francisco Airport and Urban Volt to make commitments. Some governments, such as Sweden and India, have launched their own nationwide LED lighting campaigns. The GLC also looked to collaborate with other international efforts such as the SEAD Initiative's Global Efficiency Medal competition, which is pushing the boundaries of energy efficiency by recognizing innovative new industrial and outdoor lighting technologies. We believe that a major key to success is the focus on building a public-private partnership to reach the COP21 Paris Agreement goals.

This paper presents a theory of change for international campaigns by discussing the difficulties and benefits of building a volunteer coalition on a global scale that seeks to accelerate the transition to energy efficient lighting. We believe that it is very important both socially and **economically**, to unite public and private groups to the same side of major world issues.

Introduction

The Global Lighting Challenge (GLC) could be described as “A mission to change the world – a constantly evolving process to find the most effective tools to combine priorities and interests between the public and private sectors.”

The GLC set out to cut global carbon emissions from lighting. Representatives from 13 countries and the European Commission endorsed the launch of the Challenge at the Sixth Clean Energy Ministerial (CEM6) in May 2015. The GLC is a race to reach cumulative global sales of 10 billion high efficiency, high quality, and affordable advanced lighting products, such as light-emitting diode (LED) lamps as quickly as possible. The campaign sought to follow the voluntary quality and performance lighting standards¹ developed by the Solid State Lighting (SSL) Annex² of the International Energy Agency (IEA) Technology Collaboration Programme (TCP) on Energy Efficient End-Use Equipment (4E). The GLC specifically looks at efficient lighting, not necessarily just LEDs. However, most lighting that will meet the SSL Annex standards are LEDs.

1. <http://ssl.iea-4e.org/product-performance>

2. <http://ssl.iea-4e.org/>

To achieve this goal, the GLC sought commitments and endorsements from public and private sector leaders, market actors, energy ministers, CEOs, mayors, funders, and others, to accelerate the deployment of LED lighting products around the world, otherwise known as a public-private partnership (PPP) model. The race displays the way businesses, governments, and other public-sector leaders can work together to take meaningful, practical action on climate change, while also fast-tracking their businesses into the technology of the future. The GLC created a space for policymakers, private companies, and manufacturers to combine their strengths with a shared goal of deploying 10 billion LED lighting products.

The aim of this paper is to explain how the GLC is using a PPP to create a meaningful global shift toward cutting carbon emissions through highly efficient lighting. It discusses why efficient lighting is important, other examples of the PPP model and how it has grown, and the challenges and successes of a global PPP. Finally, the paper discusses ideas for future expansion of PPPs and campaigns to spur social change.

WHY LIGHTING?

Lighting accounts for 15 % of global electricity consumption and 5 % of global greenhouse gas emissions – more than double the emissions for global air travel.³ Few actions could reduce carbon emissions as cheaply and easily as the phase-out of inefficient lighting, making it one of the most effective and economically advantageous ways to combat climate change.⁴

Because lighting is so globally prevalent, implementing an efficient lighting program is a common way that a country can make a positive impact on the global environment by reducing the generation of greenhouse gas (GHG) emissions from fossil fuel electricity generation.⁵

Accelerating the transition to energy efficient lighting could be one of the most significant short-term initiatives to improve economic and climate conditions around the world. An overnight global transition to highly efficient LED lamps would avoid 801 Mt of CO₂ emissions⁶, equivalent to displacing 684 coal-fired power plants around the world. But such things don't happen on their own or overnight.

India Paves the Way for a Global Campaign

India took up the challenge by launching the world's first program to forge a public-private partnership with the sole purpose of deploying efficient lighting, by designing and implementing the world's first standards for LED lighting. India's Bureau of Energy Efficiency (BEE) accomplished this goal in 2012 with support from the Super-efficient Equipment and Appliance Deployment (SEAD) Initiative. (The SEAD Initiative is a collaboration among governments working to promote the manufacture, purchase, and use of energy-efficient appliances, lighting, and equipment worldwide. SEAD is an initiative under the Clean Energy Ministerial (CEM) and a task of the International Partnership for Energy Efficiency Cooperation (IPEEC)).⁷

These standards laid the groundwork for India's Unnat Jyoti⁸ by Affordable LEDs for All (UJALA), which is working to deploy nearly 800 million LED lights to residents throughout the country, but "domestic household having a metered connection from their respective Electricity Distribution Company is eligible to get the LED bulbs under the UJALA Scheme."⁹ BEE's innovative standards were used by Energy Efficiency Services Limited (EESL – a joint venture of state-owned utilities created by the Ministry of Power) to define high quality and high efficiency lightbulbs for bulk LED lightbulb procurement (millions of bulbs per purchase). Competitive bidding by manufacturers who participate in the UJALA program has led to sales of over 150 million certified LED bulbs and has brought the price per bulb in India down to less than \$1 per bulb.¹⁰

THE LAUNCH OF THE GLOBAL LIGHTING CHALLENGE

The Indian lighting story is a model to inspire and encourage other countries to deploy high quality, high efficiency lighting products. Building on, and inspired by, the Indian Government's ambitious goal to deploy 800 million of these bulbs through the UJALA program, the CEM imagined an "everybody wins" race to deploy high efficiency and high quality lighting products – now the GLC. In recognition of this tremendous potential and India's successful PPP model, the GLC launched in May 2015 by 14 member governments¹¹ of the Clean Energy Ministerial. The GLC provides a high-profile global platform to recognize public- and private sector leaders driving the global transition to efficient lighting.

The GLC has four types of commitments: endorsers, supporters, participants, and partners. While only governments can endorse, each interested group could choose whether they wanted to be a partner, supporter, or participant.

Endorsers

Endorsers are any national governments endorsing the Global Lighting Challenge through a specific commitment, supporting statement, or other supporting activity. For example, China endorsed the GLC¹² with:

As a major producer and consumer of lamps and lighting systems, China supports the CEM Global Lighting Challenge in the joint efforts to push up sales of high-efficiency, high-quality and affordable advanced lamps and lighting systems. China will work to achieve the domestic sales of over 5 billion LED lamps and lighting systems in the next two years.

Supporters

Supporters are market enablers that are critical for supporting efforts by Participants and Endorsers, such as lighting manufacturers, utilities, ESCOs, and others.

Phillips Lighting¹³ supported the GLC with:

8. Literal translation "Advanced Flame".

9. <http://ujala.gov.in/FAQ>

10. <http://ujala.gov.in/FAQ>

11. Australia, China, France, Germany, India, Indonesia, Korea, Mexico, Russia, South Africa, Sweden, the United States, and the European Commission.

12. <http://globallightingchallenge.org/WhosIn/Endorsing-governments/China>

13. <http://globallightingchallenge.org/WhosIn/Supporters/Philips>

3. UNEP, "Achieving the Global Transition to Energy Efficient Lighting Toolkit" 2012.

4. enlighten-initiative.org

5. UNEP, "Achieving the Global Transition to Energy Efficient Lighting Toolkit" 2012.

6. <http://www.globallightingchallenge.org/>

7. <http://www.superefficient.org>

The global transition to energy efficient lighting, increasingly synonymous to the switch to smart LED lighting, is a real triple win for our economy, environment and quality of life. We are very encouraged and appreciative of the early support and leadership shown by the US Department of Energy, some years ago with the L-prize and now with setting a global challenge for all of us to move faster to a better future for all.

Participants

Participants make tangible and specific commitments counted toward the 10 billion product goal. These might be lighting retailers, building owners, storefronts with retail space, national and subnational governments, development banks, and related institutions.

MGM Resorts¹⁴ is participating in the GLC, saying:

MGM Resorts International has a comprehensive corporate sustainability strategy covering five key areas: Energy & Water Conservation, Green Building, Recycling & Waste Management, Sustainable Supply Chain along with Outreach & Education. As part of its Energy & Water Conservation efforts, the company made a commitment in 2014 to retrofit 1.3 million traditional light bulbs to high efficiency lamps. At this point in the initiative, MGM had already installed over 850,000 lamps, and as such over half way towards its goal.

The high efficiency lamp retrofit project is expected be completed by the end of 2017 and is forecast to reduce lighting-specific energy use by as much as 90 percent. The project will play a key role in helping MGM Resorts reduce energy use by 20 percent by 2020, as committed to under the White House supported American Business Act on Climate Pledge released prior to COP21.

Partners

Partners are organizations and initiatives that provide and implement support for lighting policies and programs that have agreed to promote and be promoted through the GLC platform. They are largely responsible for contributing to the initial concept, technical support, launch, and operation of the GLC. For example the IEA 4E Solid State Lighting Annex¹⁵, is a partner of the GLC:

Solid State Lighting (SSL) has the potential to provide high-quality, energy-efficient lighting that surpasses traditional technologies and offers a lower life-cycle cost. However, there is a wide variation in the performance and quality of SSL products currently found on the market, and some of the poor-quality products could undermine consumer confidence in SSL, delaying market penetration and the associated energy and environmental benefits.

Launched in July 2010, the IEA 4E SSL Annex is a joint initiative of nine countries working together to address common challenges with SSL technologies. The Annex member countries understand there are significant advantages in engaging in an international collaboration and joint activities

relating to SSL performance and quality. Sponsoring governments of the SSL Annex include Australia, Denmark, France, Korea, the Netherlands, Sweden, the United Kingdom and the United States. China also participates as an expert member of the SSL Annex.

Other Stakeholders

The GLC also has the support of small to medium enterprises (SME) like Urban Volt¹⁶ of Ireland:

UrbanVolt offers commercial lighting as a service to SME businesses. We install new LED lighting at no up-front cost to the customer, assume all the cost of maintenance for 5+ years and in return we receive a share of the monthly savings.

Light as a Service removes the traditional barriers to adoption of a new technology, allowing businesses of all sizes to gain the immediate benefits of an LED retrofit without any of the traditional financial risks.

Energy efficiency is a team sport and so we have partnered with Bord Gais Energy, the most forward-thinking Irish utility company, to roll out LED lighting retrofits to their 33,000 commercial customers over the next 3 years.

Importantly, SMEs often find it difficult to access funding for new investments and UrbanVolt helps them to unlock trapped energy profits which in turn create new jobs and fund the underlying growth in any economy.

And it even represents the off-grid community with a commitment from Green Solar Africa¹⁷:

SUB-SAHARAN AFRICA FACTS: Approximately 24 % of the population has access to electricity. Power outages occur on average 190 days a year. The average tariff is north of \$0.12 per kilowatt hour yet the average income is \$470 per year.

HERE'S WHAT WE ARE DOING: We are going beyond the grid in some of the most innovative and affordable ways yet seen in sub-Saharan Africa. We are exploring ways in which to reduce the average tariff to \$0.08 per kilowatt hour. We are educating our customers on the benefits of going beyond the grid by explaining their smart energy uses and savings. We follow up our service with constant communication between our customers and our teams. Most importantly, at every solar installation, we replace existing light fixtures with LEDs at no additional cost to the customer.

COMMITMENT: Green Solar Africa will replace 100,000 light fixtures with LEDs by 2020- bringing electricity to over 30,000 people in rural and urban sub-Saharan Africa.

Combined with commitments and endorsements from 17 governments including the United Arab Emirates, China, the US State of Washington, the Australian State of Victoria, the GLC is built by the public and private sectors alike.

This model puts market actors, energy ministers, CEOs, mayors, funders, and others on the same side of the climate change project by promoting businesses who make commitments, and

14. <http://globallightingchallenge.org/WhosIn/Participants/MGM-Resorts>

15. <http://globallightingchallenge.org/WhosIn/Partners/iea4e>

16. <http://globallightingchallenge.org/WhosIn/Participants/Urban-Volt>

17. <http://globallightingchallenge.org/WhosIn/Participants/Green%20Solar%20Africa>

by showcasing governments who make endorsements. The GLC promotes all groups as leaders in the LED lighting movement.

THE VALUE OF PPP

Since its launch, the GLC has built a public-private volunteer coalition of governments, manufacturers, retailers, and expert groups working together to accomplish its 10 billion product goal. Over the last 18 months, the GLC actively recruited commitments based on three guiding principles:^{18, 19}

- Commitments should be measureable and related to number of lights deployed
- Delivery approaches should strive to be self-sustaining and designed to minimize distortions to commercial markets
- Programs should seek to ensure quality over the lifetime of the product/system

Today, the GLC has eight billion LED products committed from over 50 countries, manufacturers, and private groups. We found that many companies were excited to join the GLC and found it valuable enough to spend time and resources on building commitments. The 7th meeting of the Clean Energy Ministerial (CEM7)²⁰ saw major announcements for the GLC, and notability from unexpected places, a testament to the momentum of the GLC:

- Philips Lighting announced its aspiration to sell more than two billion energy efficient LED lights by 2020. Reaching this goal would save energy equivalent to decommissioning 60 medium-sized coal-fired power stations with emissions equivalent to 24 million cars. At the same time, the company reaffirmed its pledge to make its global operations carbon neutral by 2020.
- The White House issued a press release that specifically called out the GLC as a group that is increasing access to clean energy and efficient technology.²¹
- The Vatican endorsed the GLC in a letter to the CEM. Monsignor Marcelo Sánchez Sorondo, Chancellor, Pontifical Academy of Sciences and Pontifical Academy of Social Sciences wrote, "I want to call out and commend the Clean Energy Ministerial's Global Lighting Challenge, which is working to deploy 10 billion energy saving LED light bulbs as quickly as possible. Success in this challenge can significantly decrease energy consumption around the world while at the same time increase access to modern lighting services for the poorest of the world."
- The CEM so strongly believes in the PPP idea that they hosted a Public-Private Action Summit at CEM7. The summit featured opportunities for energy ministers and business leaders to highlight ambitious clean energy efforts and announce new actions to help achieve national and global clean energy goals.²²

CEM7 took place just a year following the official launch of the GLC. In that time, the value of the GLC was such that there was quick industry buy-in, looking to highlight their LED work in a different light. The PPP model recognizes the contributions of industry beyond making a sale. In this case, it offered a space for Philips, MGM, and Sweden to all work toward the same goal of deploying 10 billion LED bulbs through the lens of cutting carbon emissions and making the world a better place.

The GLC Expands its Reach

The GLC has extended beyond the original scope of its work, by working with Sweden to launch its own national campaign, and by collaborating with an industry-facing awards competition, the SEAD Global Efficiency Medal. The PPP helped the GLC grow to where it could reasonably encourage and support other interactions between policymakers and private industry.

Sweden Launches National Campaign²³

The GLC has not only inspired change amongst the participating public-private actors, it has also inspired additional efforts at a national level and it leverages existing market transformation efforts. Just a year after the GLC launch at CEM6, Sweden launched their own lighting challenge. In May 2016, Minister Ibrahim Baylan launched Belysningsutmaningen²⁴, Sweden's commitment to the GLC. Together with public and private actors, the Swedish government now races to reduce by half the electricity demand for lighting by 2020 and challenges other countries to follow suit. The Swedish Energy Agency is in a unique position to reach out to Swedish organizations and companies and spur local pride for their lighting challenge, something the GLC cannot do on its own.

Ahead of the launch, Minister Baylan met with several public and private sector actors to offer information on the Global Lighting Challenge. The National Property Board and the Swedish Fortifications Agency, which share responsibility for all central government buildings, committed to replace lighting at their facilities. The newly established National Agency for Public Procurement also committed to procuring more efficient, high quality lighting. Finally, Örebrobostäder, a local tenement owner, joined Belysningsutmaningen by promising to initiate additional activities and to serve as a testbed for best practices. IKEA and Aura Light had already joined the Global Lighting Challenge. The evolution of the lighting markets has brought greater knowledge about how lighting can be used in both outdoor and indoor environments, such as schools, hospitals, offices, and hotels.

GLC leverages the SEAD Awards

The GLC also looked to collaborate with other international efforts such as the SEAD Initiative's Global Efficiency Medal (SEAD Awards) competitions that push the boundaries of energy efficiency by recognizing innovative new lighting technologies.

Since 2012, the SEAD Awards have spotlighted innovative new technologies that can push the boundaries of efficiency and slash energy consumption. With competitions for televisions, computer displays, electric motors, and lighting prod-

18. <http://www.globallightingchallenge.org/Choose.aspx>

19. <http://ssl.iea-4e.org/>

20. <http://globallightingchallenge.org/Latest/GLC-CEM7>

21. <https://obamawhitehouse.archives.gov/the-press-office/2016/06/02/fact-sheet-us-hosts-worlds-energy-ministers-scale-clean-energy-and-drive>

22. <http://globallightingchallenge.org/Latest/GLC-CEM7>

23. <http://www.cleanenergyministerial.org/Blog/sweden-challenges-other-countries-to-join-the-global-lighting-challenge-64446>

24. Literally translated as 'Lighting Challenge'.

ucts, SEAD has created a high-profile global platform built to recognize public- and private-sector leaders driving the global transition to efficient products and cutting carbon emissions.

The SEAD Awards recognize manufacturers, purchasers, purchase influencers, and policymakers' achievements in the production, sale, purchase, promotion, and financing of highly energy-efficient products around the world.

This year, SEAD's Global Efficiency Medal will recognize the world's most energy-efficient industrial and outdoor lighting products. Each manufacturer has the opportunity to make a commitment to the GLC while they are submitting their products to the competition, in order to promote their products to a broader audience beyond the SEAD Awards.

Challenges and Risks

According to the World Bank Group²⁵, PPPs can "increase the availability, quality, and resilience of infrastructure and public services, while sharing the risk involved in providing them with the private sector." While the GLC continues to make efficient lighting a priority around the world, as an example of the PPP model, it has experienced setbacks and difficulties along the way.

Challenge 1: Building Support

Without major private sector commitments, the GLC risked not being taken seriously on the international stage. In preparation for the 21st Conference of the Parties in December 2015, the GLC worked hard to recruit commitments from well-known organizations like IKEA, Phillips, and Aura Light to garner press coverage and attention from other governments. With a strong combination of commitments from countries around the world, and receiving buy-in from large and small organizations alike, the GLC was able to grow organically, garner press coverage, and tackle its larger mission of deploying efficient lighting around the world.

Challenge 2: Tracking Success

Both a strength and a weakness, the GLC did not set hard standards for commitments or truly define the terms for qualifying lighting products. It gave endorsers and participants the freedom to commit to efficient lighting in the way that made the most sense for their organization. It also made the GLC open and compelling when it was first growing – governments, manufacturers, even individuals could contribute as they were able. However, retroactively enforcing more structure has proven very difficult to implement. While commitments are upwards of eight billion products, the GLC's total products deployed are around 200 million with only four groups reporting so far. Currently we are working on implementing a reporting structure that captures all the efforts put forth by GLC participants. Efforts are being defined quantitatively as sales and purchase numbers, and qualitatively as engagement activities like webinars, policies at varying stages, outreach, and spin-off efforts and programs. Reporting standards need to be enacted at the outset of the campaign, and enforceable to truly measure the reach and impact of the program. For example, a campaign

currently being built is the Advanced Cooling Challenge²⁶ that is similarly using a PPP model. It is following a PPP format – giving credibility to the model – and building the monitoring and evaluation program before it seeks commitments.

Challenge 3: Leveraging Industry

As we noted earlier in the paper, the GLC saw many successes by forging partnerships with the private sector. We gained commitments, the endorsements of popular brands and big companies. One opportunity for growth is engaging further with these private groups to measure impacts, as discussed, and to further promote the GLC. If given the opportunity, there is room to encourage companies who made commitments to provide further exposure to the GLC, or perhaps spur other commitments from other companies. It would be wise to continue building and pushing beyond the current PPP model, to offer greater opportunity for involvement and influence to private companies.

Conclusion

In this paper, we examine the GLC as a model for how PPPs can unite public and private groups to the same side of major world issues. In a world where the goals of the public and private sector seem to be largely at odds with one another, the GLC has successfully brought together more than 50 public and private institutions together, all committed to deploying efficient lighting. It's a new way of conversing – looking first at the common ground we all share.

The GLC has eight billion products committed from more than 50 public and private sector groups. India's model is successfully driving down the price of LED bulbs so they are affordable for the average person. Meanwhile, Sweden is working to cut their electricity demand due to lighting by 50 % by 2020. Backed by policymakers, these programs needed support from private industry and manufacturers to achieve their goals.

India and Sweden have launched their own nationwide LED lighting campaigns. Just a year after the GLC launch, Sweden launched their own public-private partnership lighting challenge, involving many local government groups and manufacturers in the process. These programs are all based on the PPP model where policymakers further a societal goal by harnessing the interests and power of the private sector. Based around working with industry, each plan would not be able to accomplish such lofty efficient lighting goals without first forging partnerships between governments and manufacturers.

Each program shows ways to integrate the priorities of the public and private sectors to spur global change. We believe that it is very important both socially and economically. PPPs offer an opportunity to overcome differences, forge new partnerships, and understand our world better. We believe that this new form of conversation is the future of major shifts in climate change, and potentially beyond. Our theory of change understands that our world is complex, but on some level, our goals are shared by all. And it will take the public and private sectors, together, to find ways to work productively and find ways to benefit each other.

25. <http://ppp.worldbank.org/public-private-partnership/overview/what-are-public-private-partnerships>

26. <http://www.cleanenergyministerial.org/News/clean-energy-ministerial-launches-advanced-cooling-challenge-68679>