



Urban Agenda Platform

The global platform for sharing progress, action and knowledge on the implementation of the New Urban Agenda to achieve sustainable urban development.

Implementation of New lighting Strategy in Abu Dhabi City

Region	Middle East and North Africa
Award Scheme	Dubai International Award
Start Year	2017
Sustainable Development Goals	Goal 11 - Make cities and human settlements inclusive, safe, resilient and sustainable

Summary

As part of the United Arab Emirates plan for urban evolution, economically sustainable and environmentally friendly community. we as a Department of Municipal Affairs at the emirate of Abu Dhabi have developed and implemented a new lighting strategy for urban roads, through the utilization of several methods mainly, the latest technology of Light Emitting Diodes (LED) as a source of lighting to the city roads, standardization of illumination levels.

Background and Objective

Roads lighting network in the Emirate of Abu Dhabi is consisted majorly of high pressure sodium (HPS), Metal halide (MH) luminaire. situation before the initiative was a extra illumination levels, that lead to a higher energy consumption, lighting pollution affecting the ecosystem and aviation movement and subsequently resulted in high electricity bill and maintenance cost.

Actions and Implementation

At the time and till date, municipalities in the emirate of Abu Dhabi are carrying out works based on geographical management organization scheme. that policy resulted in no presence for functional base specialized departments (lighting section) to perform specialized and dedicated maintenance, operation troubleshooting, testing and commissioning works of current street lighting network. and subsequently made it difficult applying improvements and upgrading in accordance with the sustainable lighting strategy. therefore technical core group team was established headed by myself, two high capable electrical engineers and a lighting expert engineer doing studies and researches based on the scientific investigation to develop the lighting solutions. no budget was assigned at the time for the implementation of the sustainable lighting strategy, to overcome this obstacle we (the established core lighting team) launched Operation and Maintenance Projects, dedicated only for Street lighting network in the city Abu Dhabi City. the same was communicated to other municipalities within the emirate of Abu Dhabi. governmental legislation bodies and concerned authorities in the emirate of Abu Dhabi at the time (prior to 2011) lacked of technical specifications for modern lighting systems and technology to go toe to toe with recent and cutting edge technologies and address challenging and solutions. accordingly and to tackle this issue, a technical committee were formed under the leadership of the Municipality of Abu Dhabi City and the participation of lead firms and powerhouses in the field of lighting technology. in order for them to start preparing standard local specifications (Abu Dhabi Public Realm & Street Lighting Handbook) and in accordance to the best international standards and practices. Local Contractors and Consultants are used to current routine and having lots of fears, discomfort, unfamiliarity in applying new standards and adopting unknown technologies and solutions. it is understandable human factor of being afraid of not getting the results once project is completed which may result in increasing the cost of maintenance. to overcome that we organized workshops, training programs, Q&A sessions and pilot projects. the end results were satisfactory as a first trial, however there is plenty of room to improve. and keeping it transparent to local communities. we reached people through medias (TV, Newspaper and Web). results for research and outcomes were published online for community comments and feedback. this resulted in initiative and hearing back ideas and social brainstorming to push more the roof of expectation.

Outcomes and Impacts

embracing the emirate future vision and providing sustainable lighting network as an essential public service we managed to have a positive impact on the following: - financial, the overall efficiency of new lighting network is higher, once the new sustainable strategy in place The overall power bill is reduced significantly, as a reduction rate is estimated at 87-90% in electricity consumption and the reduction has already been applied to external roads in the cities of Abu Dhabi, Al Ain and western region. Reduction of annual maintenance costs by reducing required site routine, preventive and corrective maintenance works. - social and economic, improving the infrastructure of lighting network in the emirate of Abu Dhabi shall surely promote for a better life quality and better social activity, on the other bright side to it will have its share of economy by reducing power levels it is worth mentioning that a precise street lighting assets matrix was created. that functioning as a backbone database for the emirate of Abu Dhabi. - cultural and environmental, adopting the LED



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Technology and the use of clean non toxic elements in manufacturing lighting network will have a better carbon footprint on the environment and less contamination and waste management. furthermore heat and carbon emissions are way less than the other types of lights (HPS & MH) as a final result we end up with more environmental friendly system and balanced ecological system. - Institutional: creating legislation for lighting network shall help in a framework procedures in terms of what to follow and execute for new projects. Efficient, transparent and accountable management systems that make more effective use of human, technical, financial and natural resources enforcing laws shall provide great benefits for consumers, the industry in total and the country in general.

Gender and Social Inclusivity

for the success of network upgrading and correct implementation of the strategy and achieving maximum results, knowledge transfer is essentially identified as a key contributor to the overall plan, thus lead to preparing an integrated methods to implement sustainable public lighting strategy. made presentations to municipalities teams, the same studies have been submitted to the Executive Council for obtaining approval. post the executive council approval we identified target groups for knowledge transfer for time being are consultants and contractors, so they are familiar and aware of the expected work nature, a positive communication was established through the following: - Workshop on Abu Dhabi Sustainable Public Lighting Policy. - Workshops on lighting design in the Emirate of Abu Dhabi. - Holding three workshops on sustainable lighting strategy in Abu Dhabi. - Workshop on new specifications for general lighting. - Workshop on the implementation of sustainable public lighting strategy: technical specifications and implementation programs. - Presentation of the Executive Board on sustainable lighting strategy. - Presentation on projects implemented under the new lighting specifications and strategy. as a second stage our ambition is to convey our knowledge to other emirates communicating our success creating prosperous, yet reliable cost effective and efficient lighting network.

Innovative Initiative

implementing street lighting new strategy, it gave a view toward scaling up the efforts for new lighting technology Projects and supporting larger energy efficiency projects, to describe lessons learned during the implementation of the new strategy, identify possible financing options for future municipal street lighting projects, and offer technical and policy recommendations: - Luminaire and Illumination Specifications & characteristics: as the use of LED street lighting is relatively new to the region, there is limited institutional knowledge in local municipalities regarding the design and practice of good street lighting, limited awareness of the characteristics of LED technologies, which provide higher-quality illumination with much lower lighting wattage levels than older lighting technologies. addressing this issue was by developing channels for knowledge transfer and awareness distribution (workshops, global studies and research in the field of modern lighting of internal roads and public areas, official correspondence, municipalities journals and flyers) - street lighting waste management: Upgrading existing street lighting network will involve the removal and disposal of lamps and ballasts. Some of this waste may be hazardous, and we are to manage it accordingly, encouraging recycling process or incineration, communicate with concerned governmental bodies like Tadweer to check and enforce their requirements. still there is a room to develop further. - better business models and administration systems: it is a valid idea to try to shift the financial, operating and maintenance and administration stress away from municipal sector in developing or upgrading existing infrastructure network by following alternative business models such as Public Private Partnership (PPP). this is being looked at now and theirs a promising plan to adopt one of the PPP models for street lighting network upgrade. we as specialized team are working on the business model details currently. and Risks shall be distributed between public and private sectors equally.

Resources devoted to delivery

No. Title Source Author Publication Title Volume Number Date Page Number 1 ADM to upgrade to LED through PPP Projects
<http://www.constructionweekonline.com/article-46081-adm-to-upgrade-abu-dhabi-street-lighting-through-ppp-contracts/> James Morgan ADM to upgrade to LED through PPP Projects 1 28-08-2017 1 Edit

Conclusion

the approval of sustainable lighting strategy for the emirate of Abu Dhabi has passed through many stages till it was approved and legislated and as below: Phase I - (2010-2011) Preparation of the sustainable lighting strategy for the DMA: Research for best practices . Prepare the initial report of the strategy, presentations and workshops to explain the objectives and expected outcomes of this strategy. technical review by all the beneficiaries and the approval by the Executive Council Phase II - (during 2011)Preparation of new lighting specifications for the Municipality of Abu Dhabi City: draft new specifications. Review the specifications by international consultants. approval of new lighting specifications by Abu Dhabi City Municipality team Phase III - (during 2012) Adoption of new lighting specifications by DMA: Meetings of Beneficiaries for reviewing and auditing. Approving new specifications by the Department of Municipal Affairs and Transport . Phase IV - (2012- 2015) Preparation and publication of Sustainable Lighting Guide for the Emirate of Abu Dhabi: Announcement of tender, award the tender and sign the contract. Search for best practices, approval and publication of the Abu Dhabi Sustainable Lighting Guide Phase V - (post 2015) Implementation of LED projects according to the new strategy