



Harness the Power of LED Lighting with Distributed Computing

Mr Henry Yau

CEO and Founder

DeLight Power Products Limited

1. DeLight Introduction
2. Why we need efficient smart lighting?
3. Energy saving use case
4. How efficient smart lighting can be done?



One of **incubatees in HKSTP**
Incu-Tech Incubation Program



Leading technology and
innovation from a **team of HK**
people



Our mission is to “**Enable**
everyone to save electricity
and together we save 5% of
electricity worldwide”





Henry Yau
CEO and Founder
DeLight Power Products Limited

Previously CFO of Tri-con, Philips & YaMing Lighting, and Getz Brothers and senior management positions in different companies across Hong Kong, China, Taiwan and US

Created one of the top three fastest supercomputer in China and received a patent for non-electrolytic capacitor power supply

Holds B.S. / M.S. of Electrical Engineering – Computer Science, J.D. of Law, MBA as well as DBA

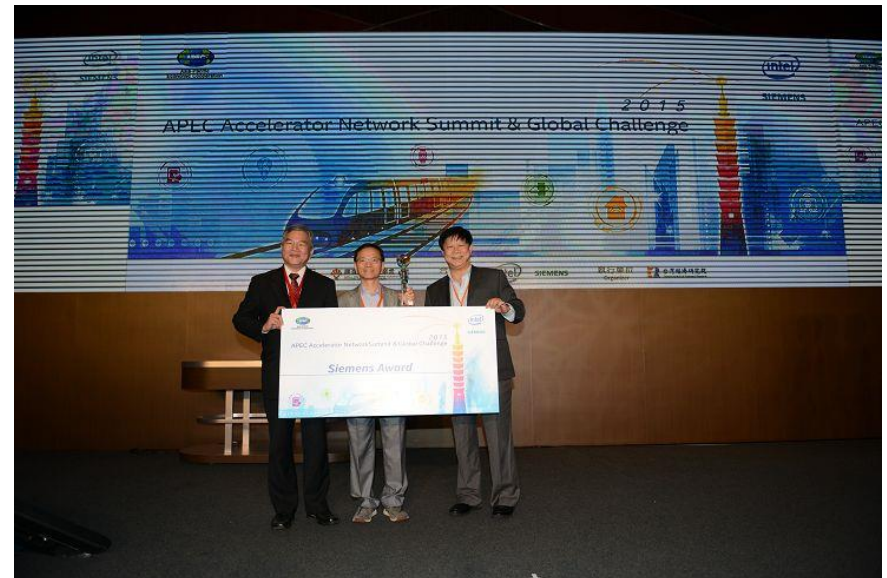


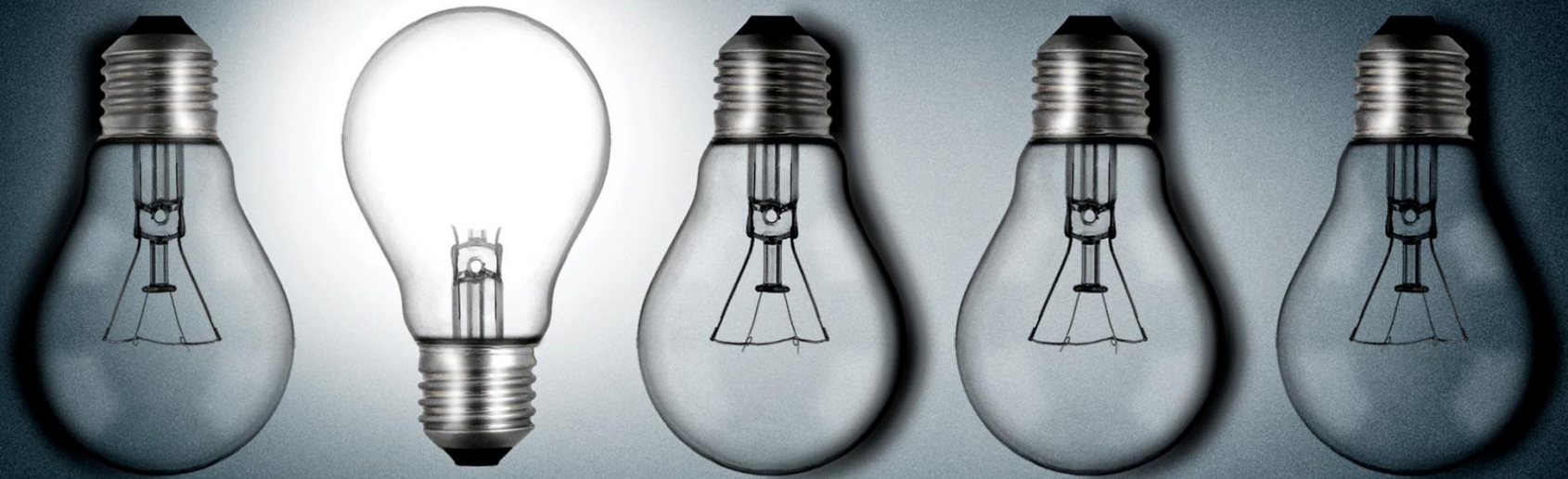
得能LED電源有限公司行政總裁尤建興(右)與業務發展及策略副總經理鮑漢維(左)合力研發及推廣 Delight Power 智能電燈控制系統。

Delight Power 智能電燈控制系統 省電環保新境界

現時不少人凡事倚賴電腦，一旦電腦系統出現故障，隨時釀成大災難，後果不堪設想，但科技發展一日千里，當然有辦法解決以上問題。曾經參與設計超級電腦的得能 (Delight Power) LED 電源有限公司行政總裁尤建興，耗費十多年心血，設計出節能環保的智能電燈控制系統。系統精髓是毋須一個總指揮，只須教懂「成員」分成不同小組，因應實際情況，自行分配工作，以最具成本效益的組合提供合適光源。

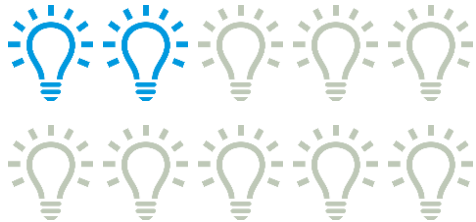
- 2015 APEC Global Challenge
 - Siemens Award (Smart Living category)
- Hong Kong Green Building Council Award
- IE Business School Best Startup Award





WHY EFFICIENT SMART LIGHTING?

20%



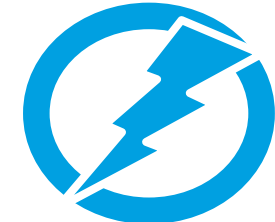
Lighting in global energy consumption^[1]

6%



Lighting in global CO2 emissions^[2]

2.4EJ



Potential saving in lighting in 2030

International Energy Agency recommendations

- **Phase-out inefficient lighting products** (ballast, lamp, fixture & lighting controls) as soon as technically feasible and economically viable.
- Require and promote **energy efficient lighting systems design and management** by ensuring that building codes promote the use of natural light and include MEPS for lighting systems

^[1] 25 Energy Efficiency Policy Recommendations, International Energy Agency [2011]

^[2] LED scale up, The Climate Group [2012]



ENERGY SAVING USE CASE

Energy Saving Use case – Coffee Shop

Energy saving

Lights can be dimmed down with daylight dimming, evening dimming, after-hour switching and occupancy sensors

User friendly

Lights can be dimmed with different user scenario setting for different use

Flexibility

Lighting can be adjusted according to actual use, different timing of the day and different scenarios

Universal to different luminaires

Different decorative luminaires can be supported with controllable ambient light levels to reinforce the high end appearance & cozy environment



Energy Saving Use case – Open Office

Extensibility

Lighting controls (occupancy sensor, sunlight harvesting, etc.) can be connected to suit the needs

Energy saving

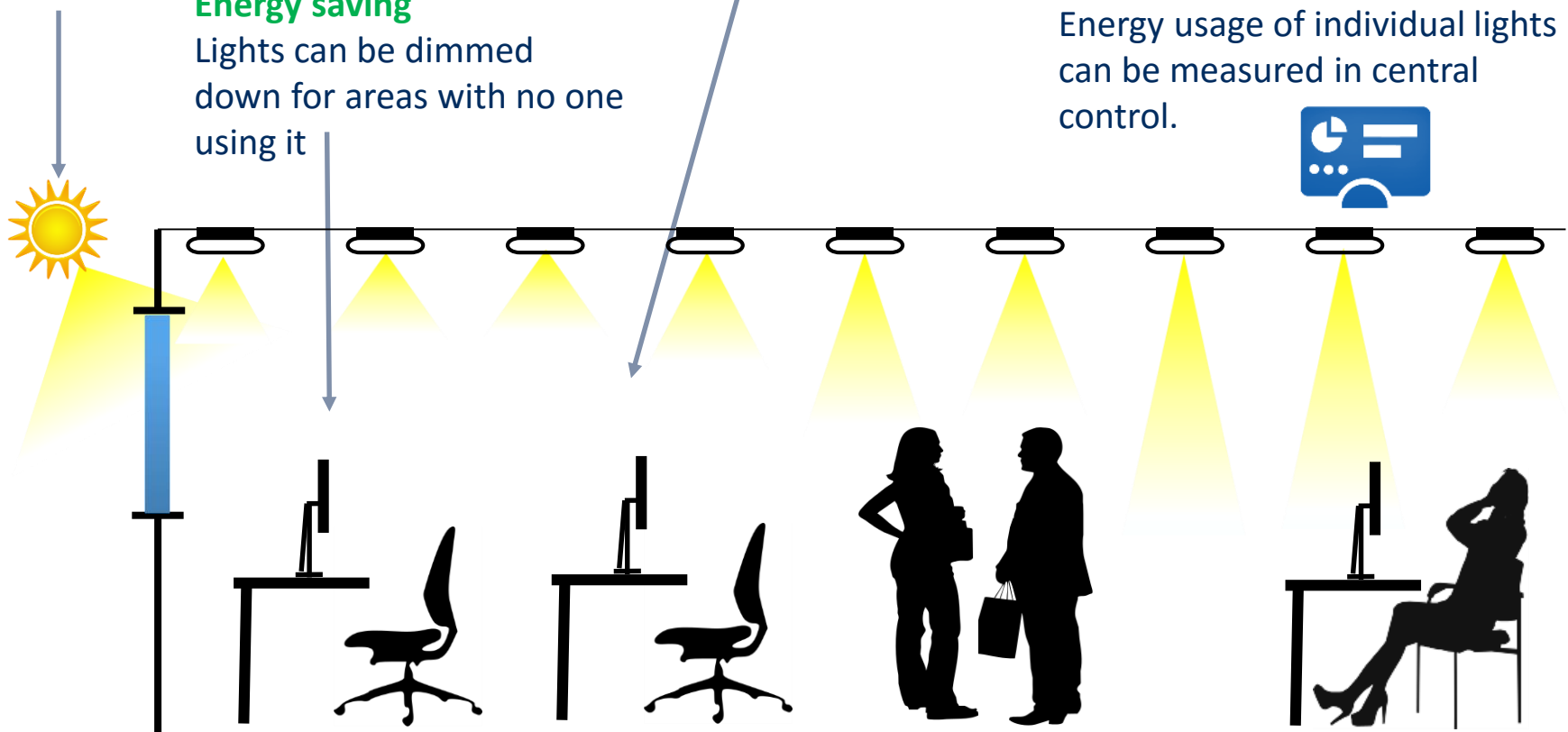
Lights can be dimmed down for areas with no one using it

Flexibility

Office furniture are usually movable; Lighting can be adjusted according to actual use

Centralized energy measurement

Energy usage of individual lights can be measured in central control.



HOW TO DO IT?



Industry Lighting Control Landscape



Some Key Elements on Ideal Lighting Control System



Openness: universal to different low voltage luminaries



Ease of maintenance: easily replace faulty parts without setup, report faulty parts



Plug and use: easy to install and auto configuration on the fly



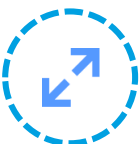
Environmental friendly: no electronic wastage and additional disposal process



Energy efficient and saving: high AC-to-DC conversion



Flexible : intuitive and tailored user scenarios to cater different needs



Highly scalable: design to handle >1,000 luminaries



Customizable and interoperability: open API to integrate with different controls

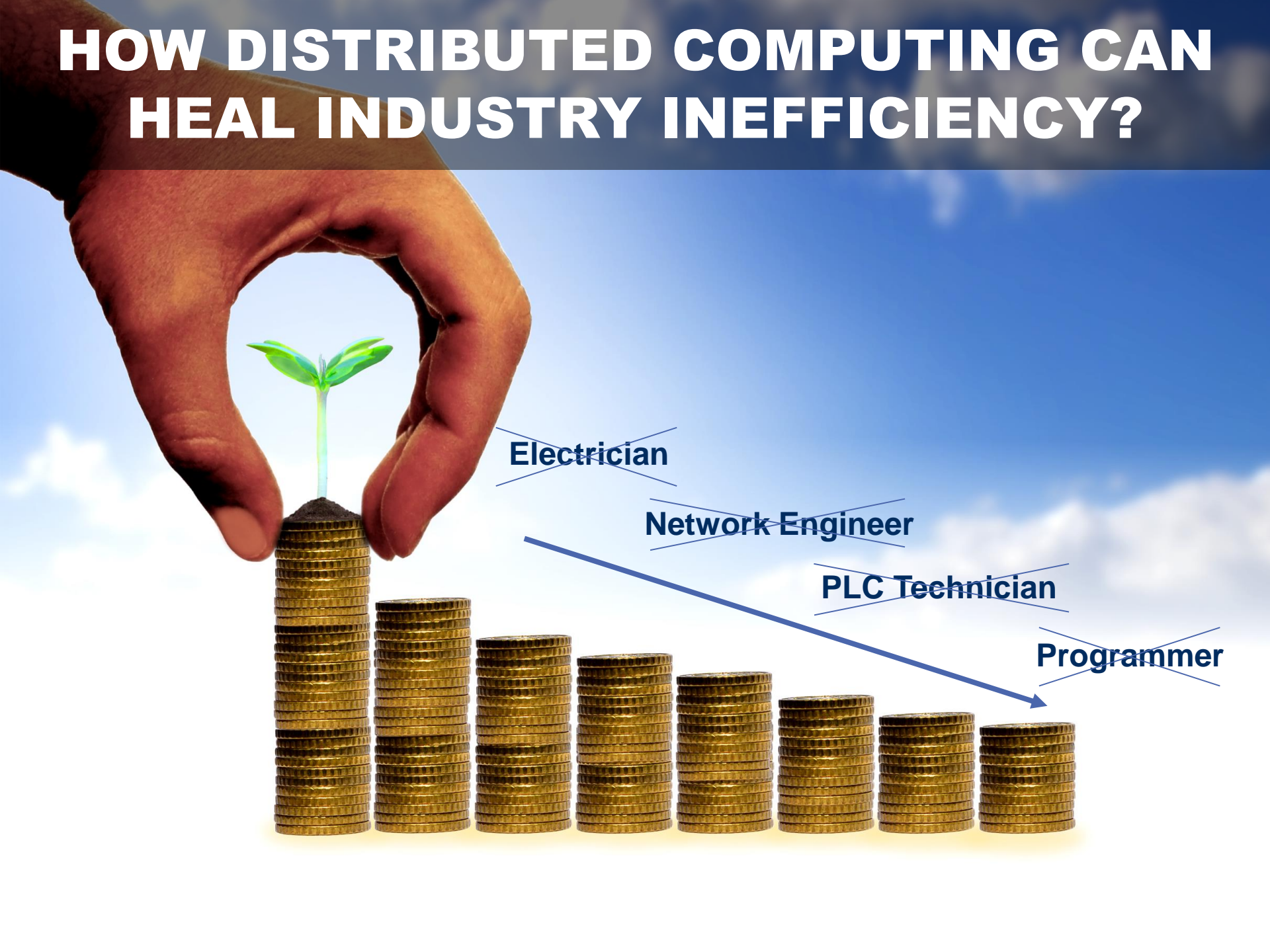


Safety: extra low voltage DC power



Long lifespan: design to operate over 100,000 hours

HOW DISTRIBUTED COMPUTING CAN HEAL INDUSTRY INEFFICIENCY?



~~Electrician~~

~~Network Engineer~~

~~PLC Technician~~

~~Programmer~~

HOW DISTRIBUTED COMPUTING CAN HEAL INDUSTRY INEFFICIENCY?



LOW COST & LONG LIFE

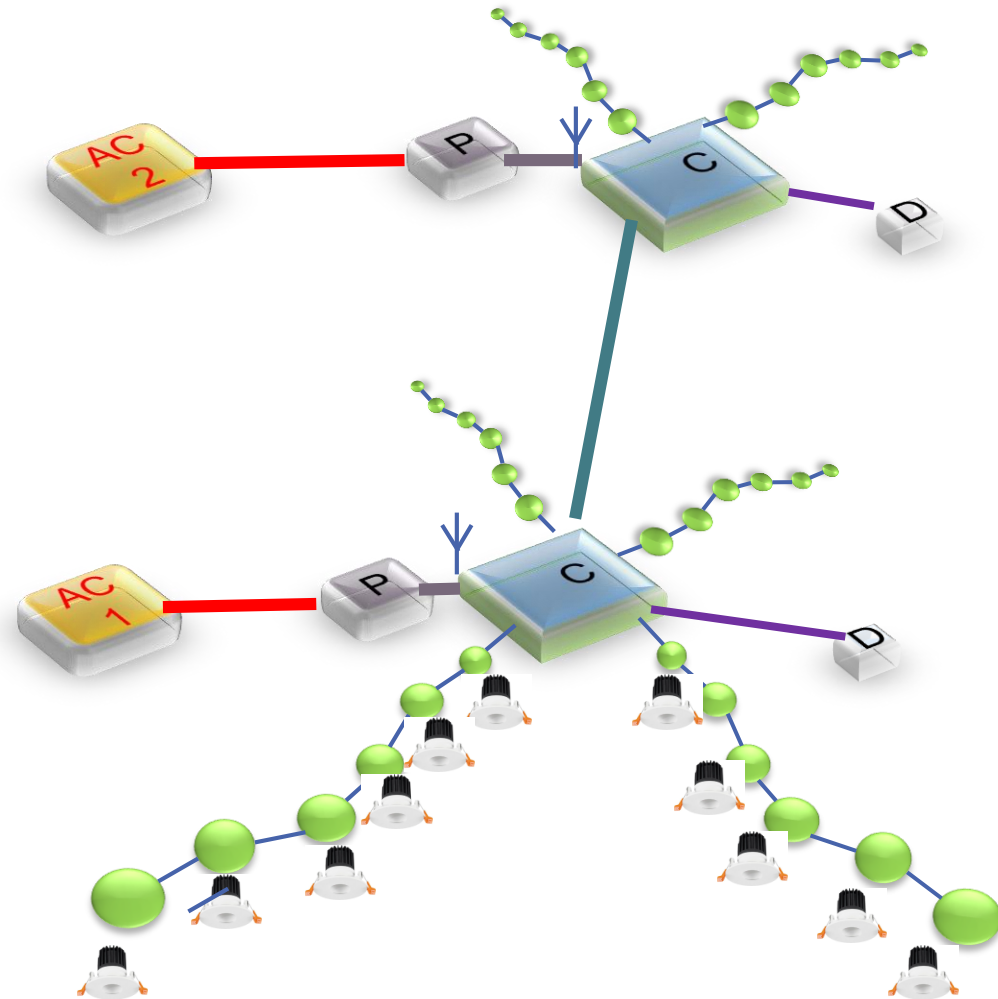
Extends Life of Hardware

Assisted Maintenance

Energy Measurement and Balance

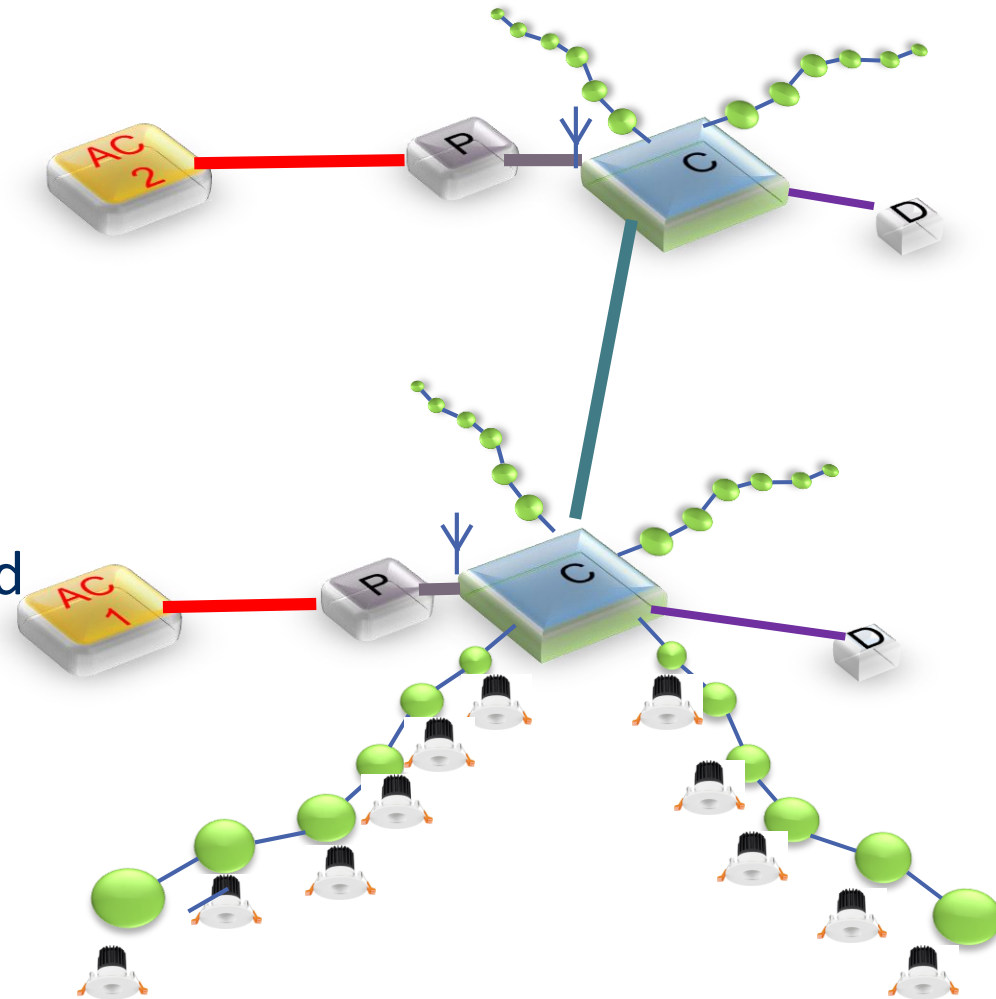
Distributed Computing for Lighting Control System

- Self Align Distributed Computing
- Discrete Neighborhood Function Grouping
- Mutual Fail-over
- Mission based Control with Succession Control

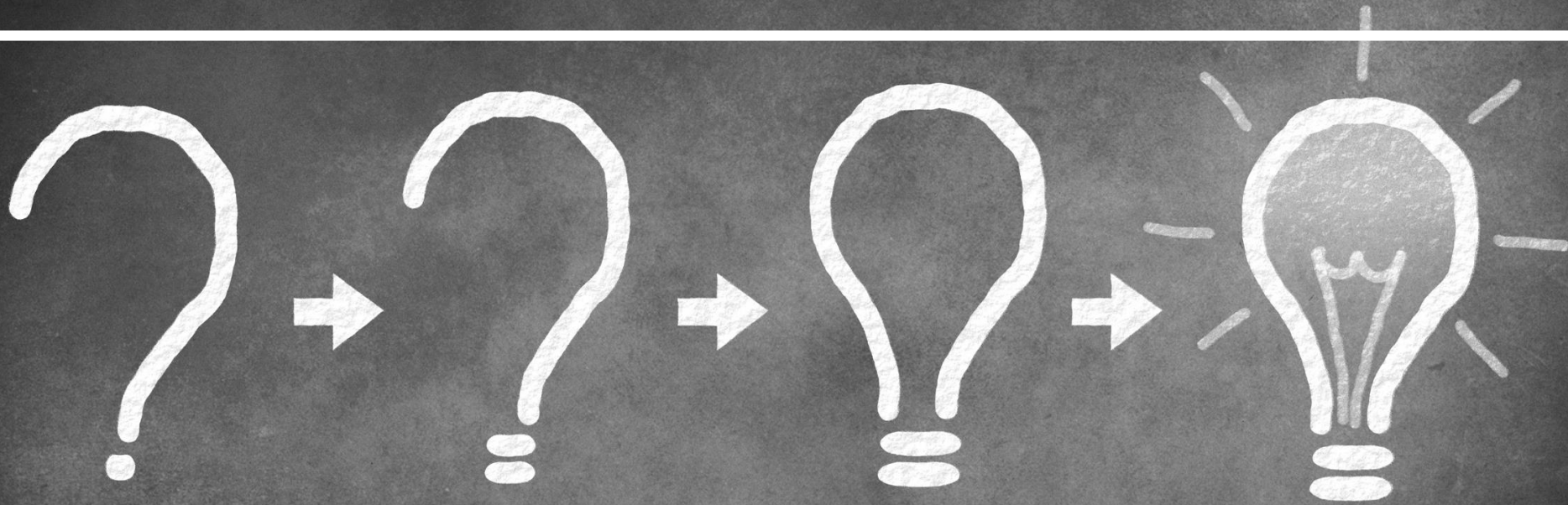


Distributed Computing with Neighborhood Awareness

- Majority of Communication with co-workers
- Distributed Information Backup
- Functional Collaboration
- Failed Lighting Units covered by Neighbors
- Mission Based load sharing
- Demand Response Enabled Functions



DOES IT EXIST?

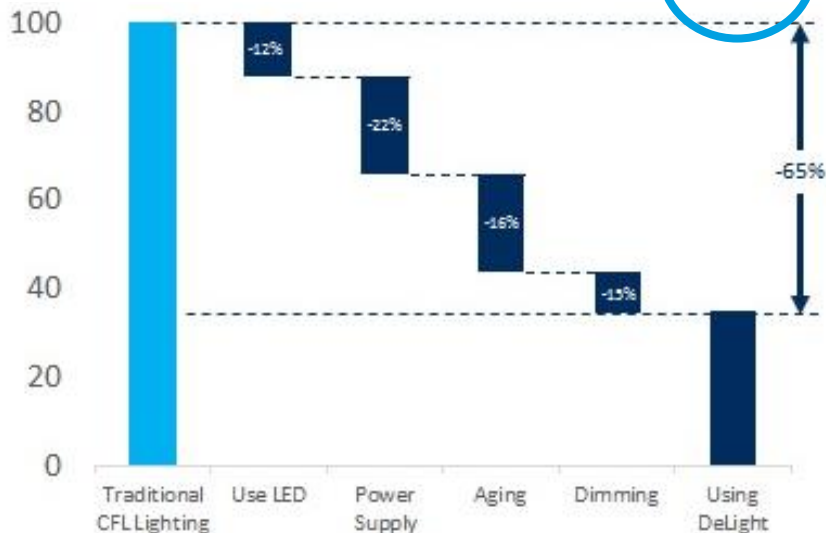


IT WAS PUT TO REAL LIFE &
DEMONSTRATED TO THE WORLD



Energy Usage Comparison

	Scenario	Average Lux	Total Power (Watt)	Energy Saving	Average Watt/Lamp
Prior to Replacement (Nov 7 2015)					
23 set of 18W x2 CFL	All On	327.80	527.24		22.92
After Replacement (Nov 8 2015)					
23 set of 40W x1 LED	All On	438.00	742.90		32.30
	Similar Lux	321.79	186.65	65%	8.12





**USER FRIENDLY
SAVES ENERGY
SIMPLE, LONG LIFE, AFFORDABLE
AND SMART**