

Project: IEEE P802.15 Working Group for Wireless Personal Area Networks (WPANs)

Submission Title: [Visible Light Communications Regulation Issues]

Date Submitted: [May, 2008]

Source: [Tae-Gyu Kang, Sang-Kyu Lim, Dae Ho Kim] Company [ETRI]

Address [161, Gajeong-dong Youseong-gu Taejeon, Korea]

Voice:[82-42-860-5232], FAX: [], E-Mail:[tgkang@etri.re.kr]

Re: [vlc_sg]

Abstract: [This document describes VLC Regulation issues]

Purpose: []

Notice: This document has been prepared to assist the IEEE P802.15. It is offered as a basis for discussion and is not binding on the contributing individual(s) or organization(s). The material in this document is subject to change in form and content after further study. The contributor(s) reserve(s) the right to add, amend or withdraw material contained herein.

Release: The contributor acknowledges and accepts that this contribution becomes the property of IEEE and may be made publicly available by P802.15.

VLC Regulation Issues

Tae-Gyu Kang
tgkang@etri.re.kr
ETRI

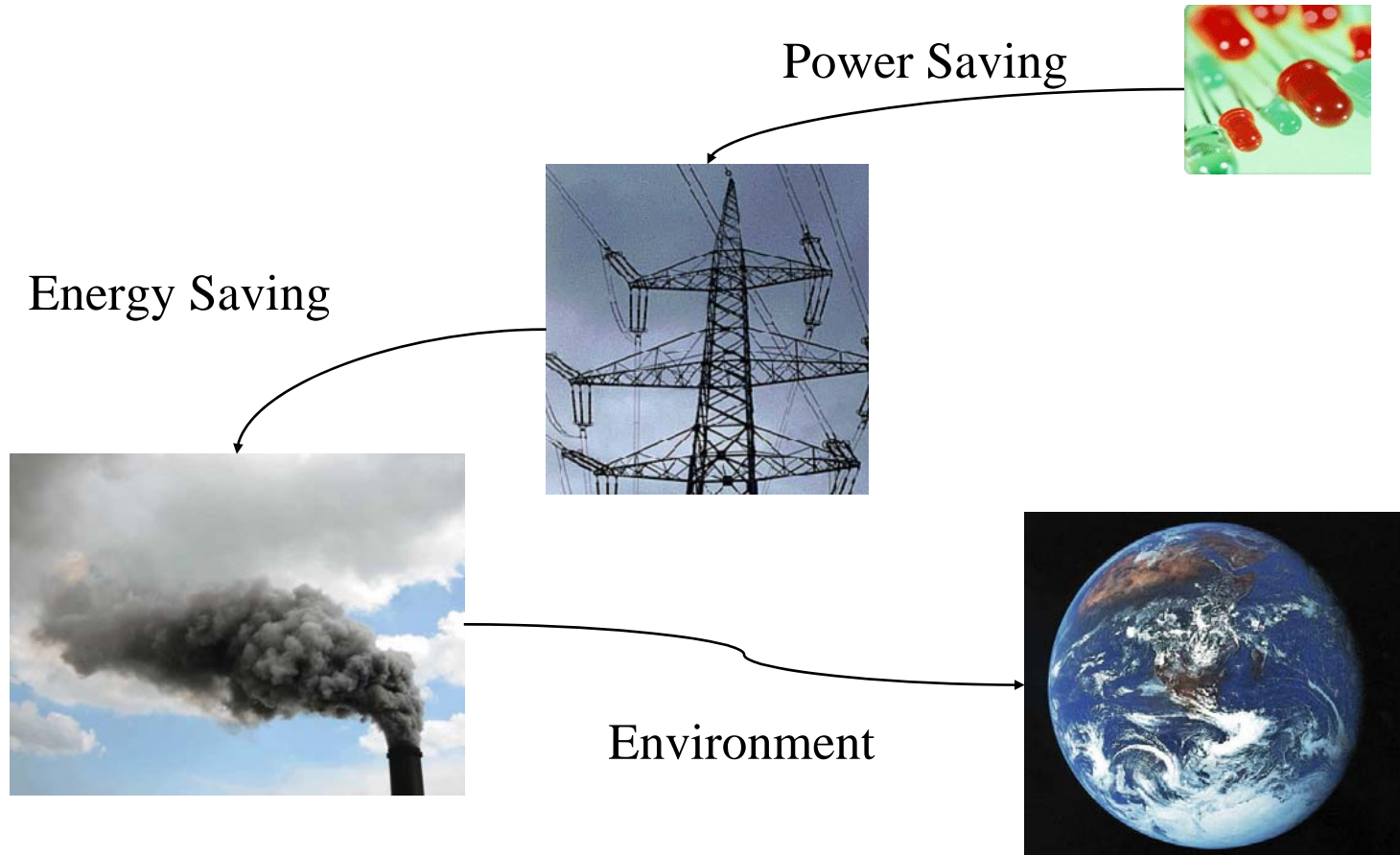
Regulation Consideration Issues

- LED Promotion Regulation
 - Energy issue
 - Environment issue
- Other Considerations
 - Frequency License issue
 - Eye safety issue
 - Power (AC/DC) issue
 - Contents issue
 - Product Certification issue
 - LED Lamp location identification issue
 - Color Identification issue for communication

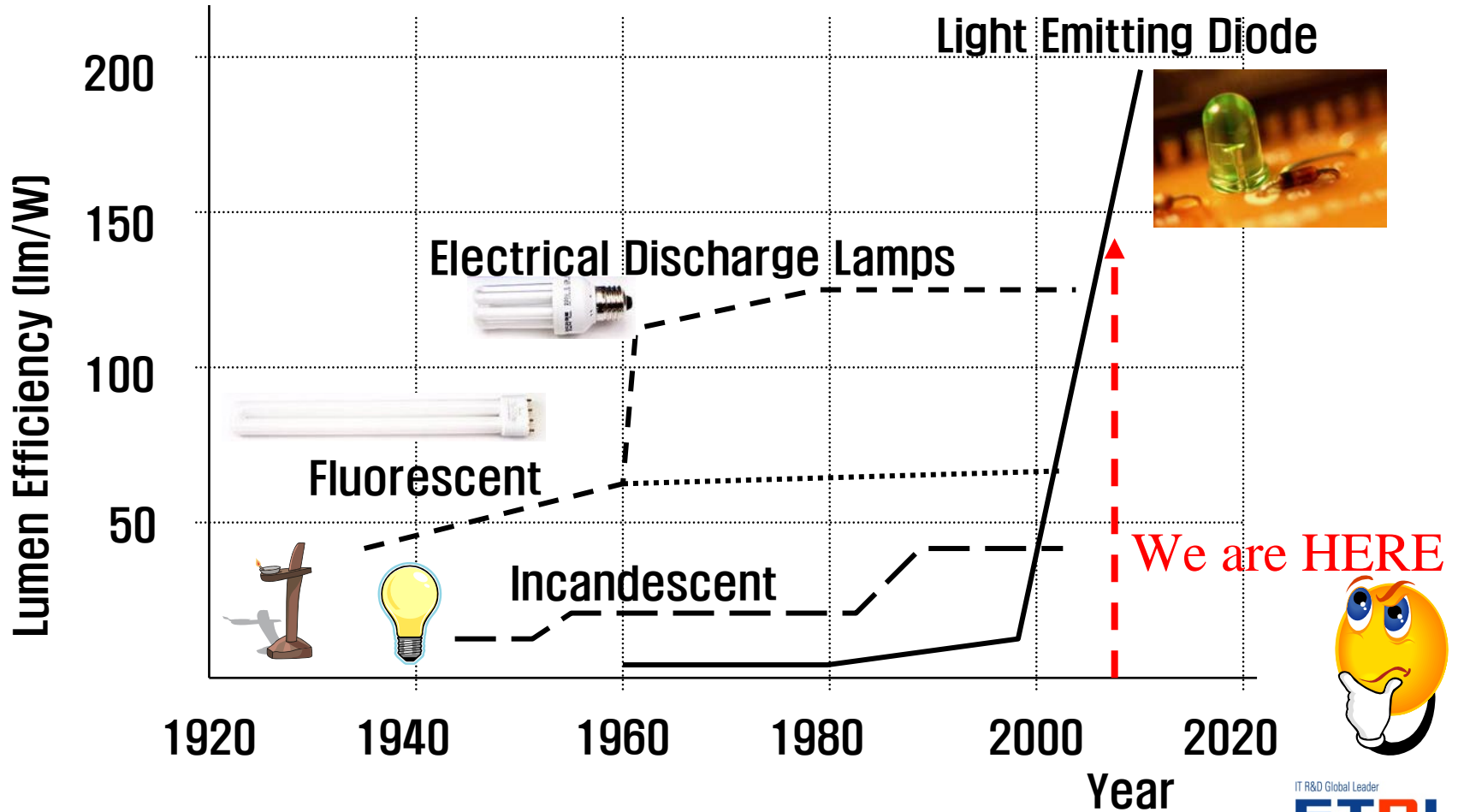
LED promotion Regulations

- **Kyoto Protocol**
 - The Kyoto Protocol is a protocol to the international Framework Convention on Climate Change with the objective of reducing greenhouse gases that cause climate change.
 - As of January 2008, and running through 2012, some countries(170) have to reduce their greenhouse gas emissions by a collective average of 5% below their 1990 levels
- **RoHS**
 - Restriction of Hazardous Substances Directive
 - 6HS: Mercury
- **WEEE**
 - Waste Electrical and Electronic Equipment Directive

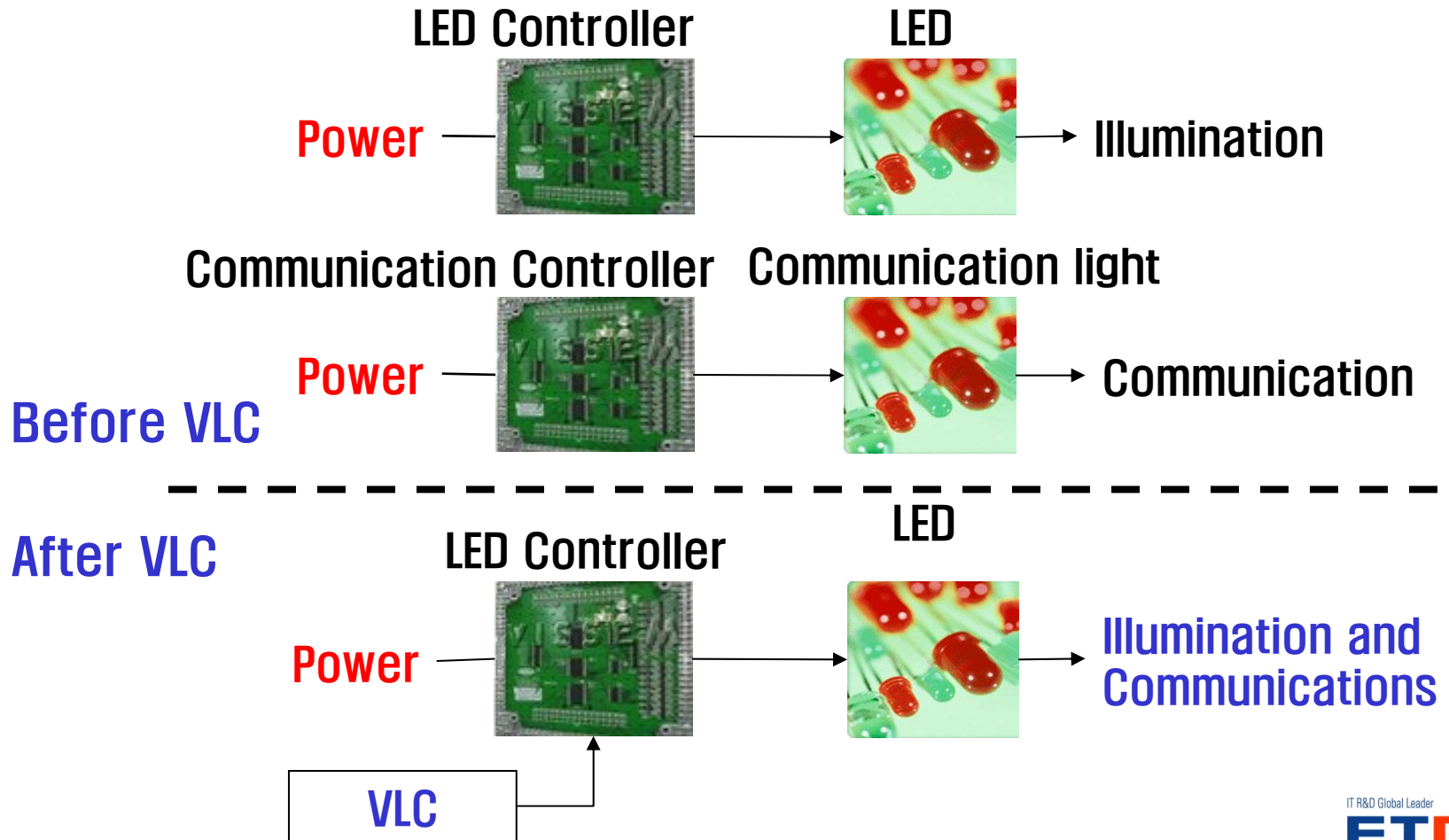
LED can save power



Power saving by an Efficiency



Power saving by a Convergence



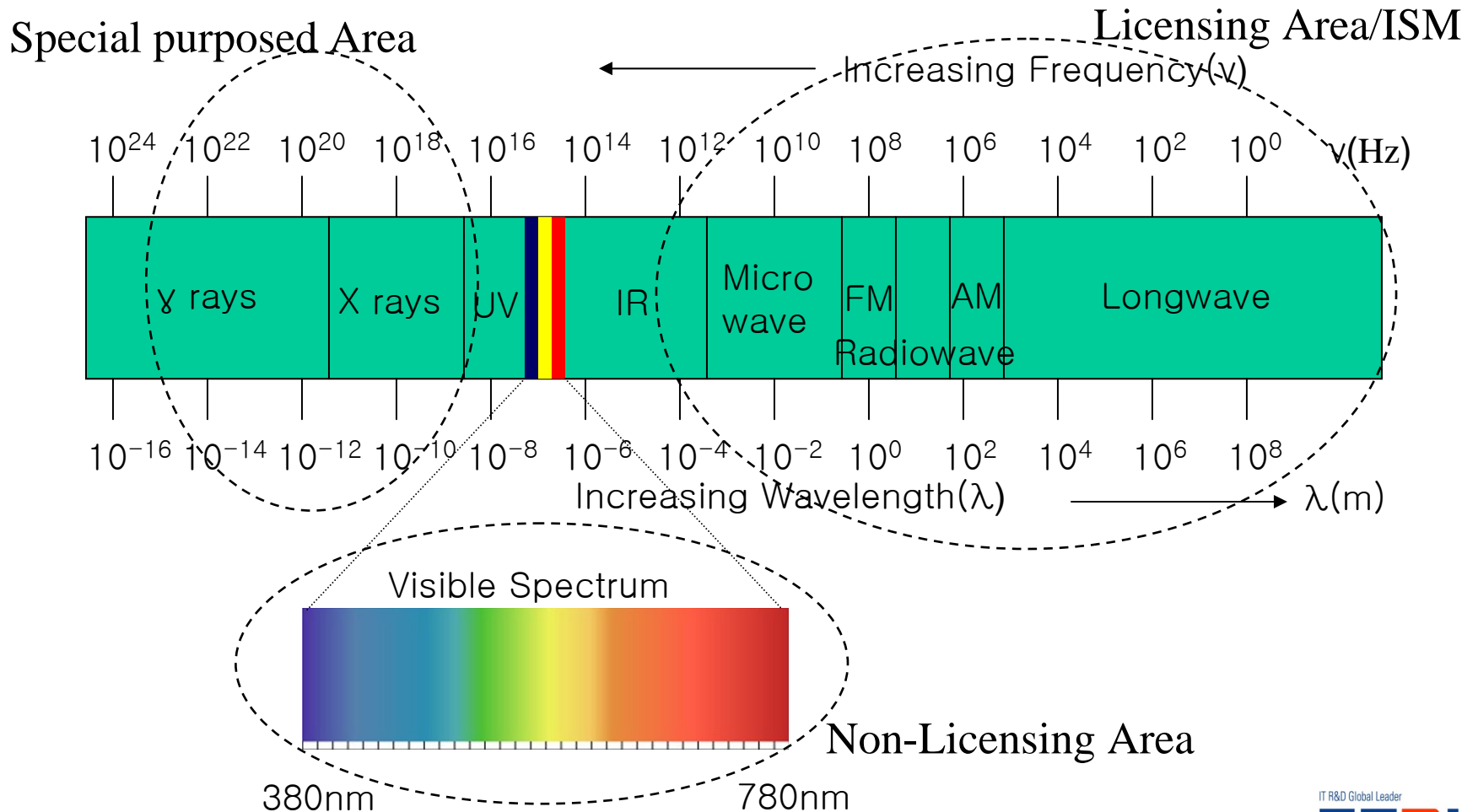
Reasons for LED promotion from regulations

- Power Saving → Kyoto Protocol
 - Use only 10% power than before
- Long Living → WEEE
 - Longer 10 times (about 50,000 hours)
- Conservation of nature
 - No Mercury → RoHS
 - Better waste treatment

License Regulations

- License
 - an intergovernmental treaty text
 - 3 Hz – 300 GHz
 - Broadcasting licensing
 - Cellular licensing
- Non License
 - ISM (Industrial, Scientific and Medical)
 - VLC: 370 THz – 870 THz

Non License Spectrum Area



Eye safety issue

- Sufficiently powerful visible to near infrared laser radiation (400-1400 nm) will penetrate the eyeball and may cause heating of the retina
- References
 - IEC 60825: Laser safety
 - ANSI Z136: Laser Safety Standards - ANSI
 - EN 207: European norm for laser safety eyewear.
- Class 1
 - A class 1 laser is safe under all conditions of normal use.
 - Class: 1, 1M, 2, 2M, 3R, 3B, 4
- VLC eye safety issues
 - Illumination : O.K
 - Modulation (OOK)

VLC chances

- Energy crisis
- Climate changes
- Environment problem
- Lack of radio resources

Summary

- LED Promotion Regulation Issues
 - Energy issue
 - Environment issue
- Other Regulation Issues
 - Frequency License issue
 - Eye safety issue
- For further study
 - Power (AC/DC) issue
 - Contents issue
 - Product Certification issue
 - LED Lamp location identification issue
 - Color Identification issue for communication