



BIOLED

Eng. Uriel Vulej
Founder & CEO

**CREATING LIFE
WITH LIGHT**



815 million people
– more than 1 in 10 of
the world population –
do not get enough
to eat

Not
is enough
u. **Land**

Not
enough
Water

PREVALENCE OF
UNDERNOURISHMENT IN
THE POPULATION
(PERCENT) IN 2014-16



This map shows the prevalence of undernourishment (the percentage of the population that is undernourished) in 2014-16. It is an estimate based on data from the United Nations World Food Programme (WFP) and the United Nations Development Programme (UNDP). The map is based on data from the United Nations World Food Programme (WFP) and the United Nations Development Programme (UNDP). Further information is available at <http://www.un.org/development/desa/poverty/data/inequality/>

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The designations employed and the presentation of material in this map does not imply the expression of any opinion whatsoever on the part of WFP concerning the legal or constitutional status of any country, territory or sea area, or concerning the delimitation of frontiers.

* A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas).

** Spatial data requirements, approximately the size of Canada's provinces and territories, are not shown. The final status of Jerusalem and Kashmir has not yet been agreed upon by the parties.

*** Real boundary between the Republic of Sudan and the Republic of South Sudan has not yet been determined.



GLOBAL HUNGER MAP 2017

FOOD DEMAND INCREASES

BIOLED

To meet global food demand by 2050, agricultural production must increase by 60%

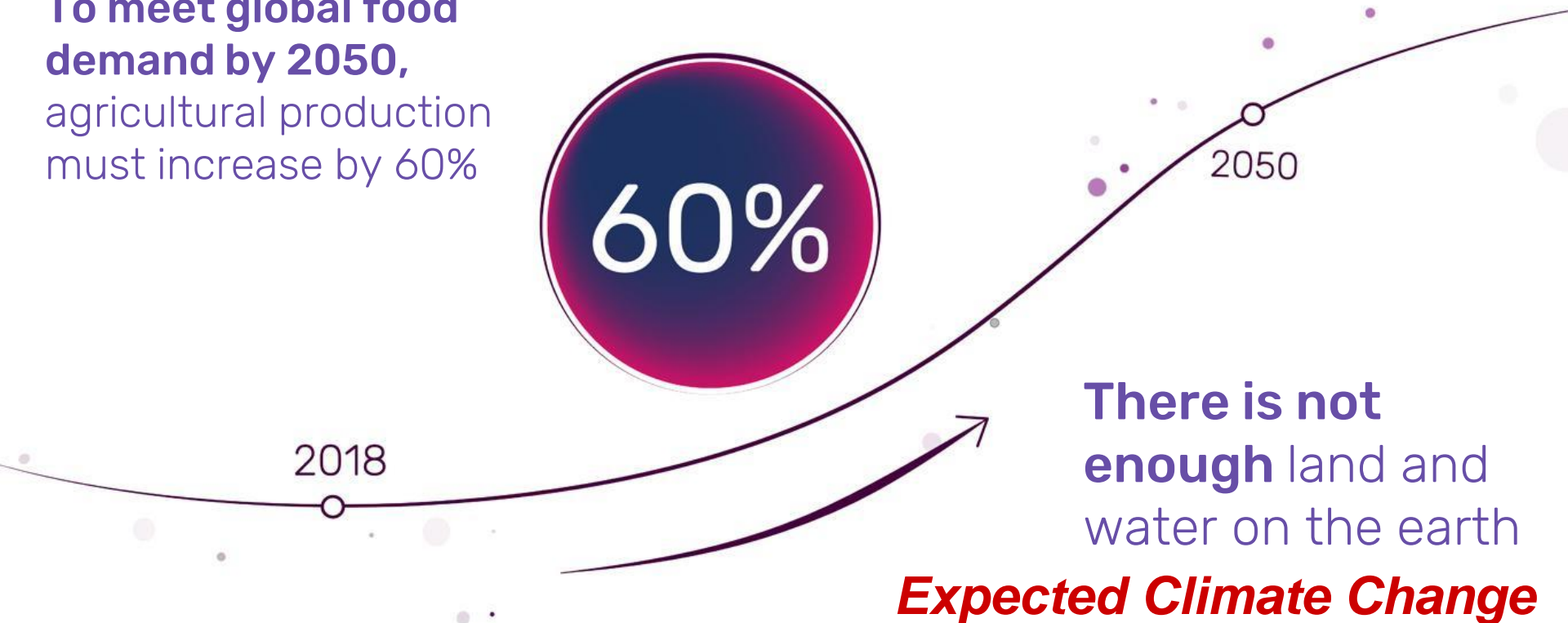
60%

2018

2050

There is not enough land and water on the earth

Expected Climate Change



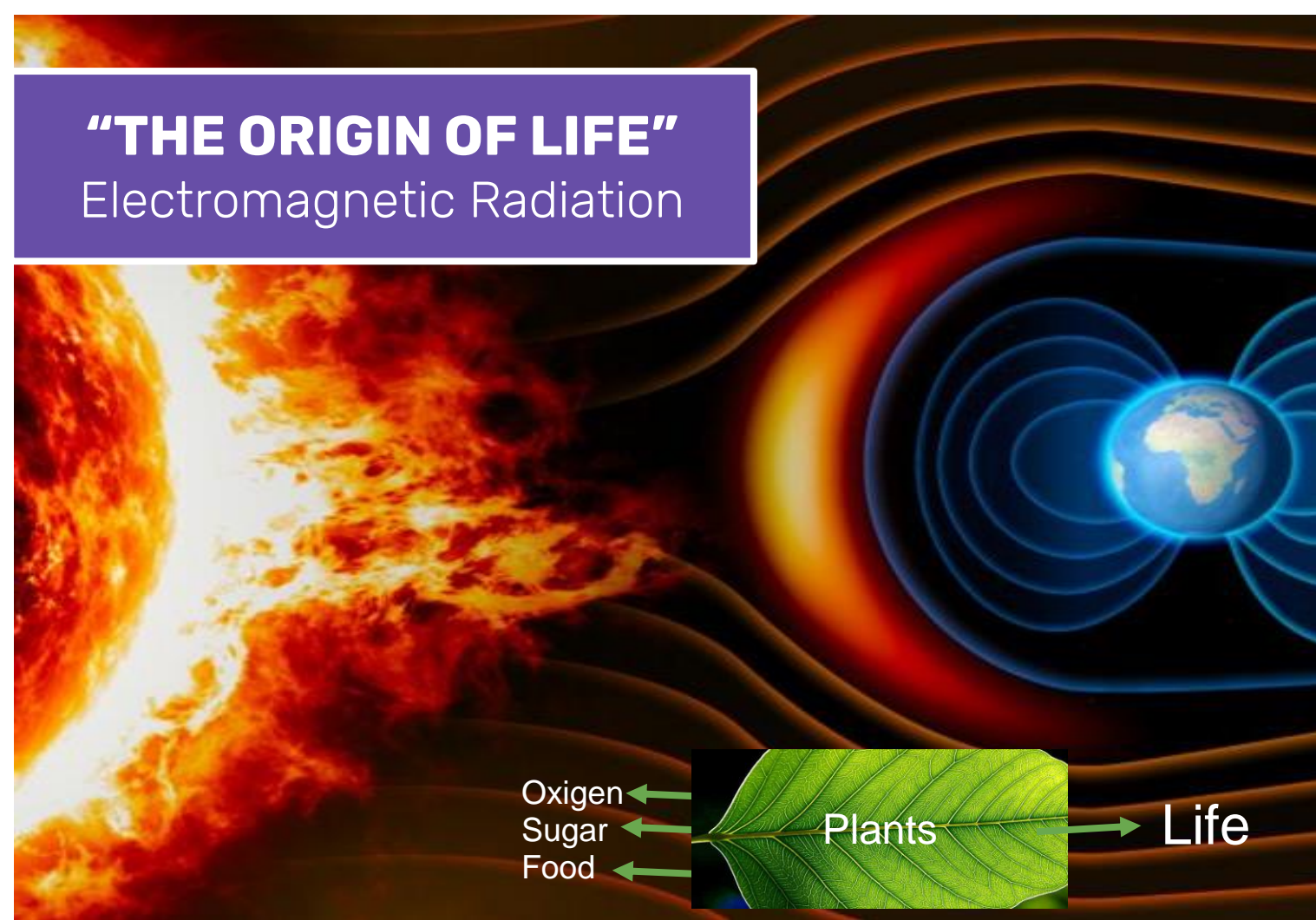
"THE ORIGIN OF LIFE"

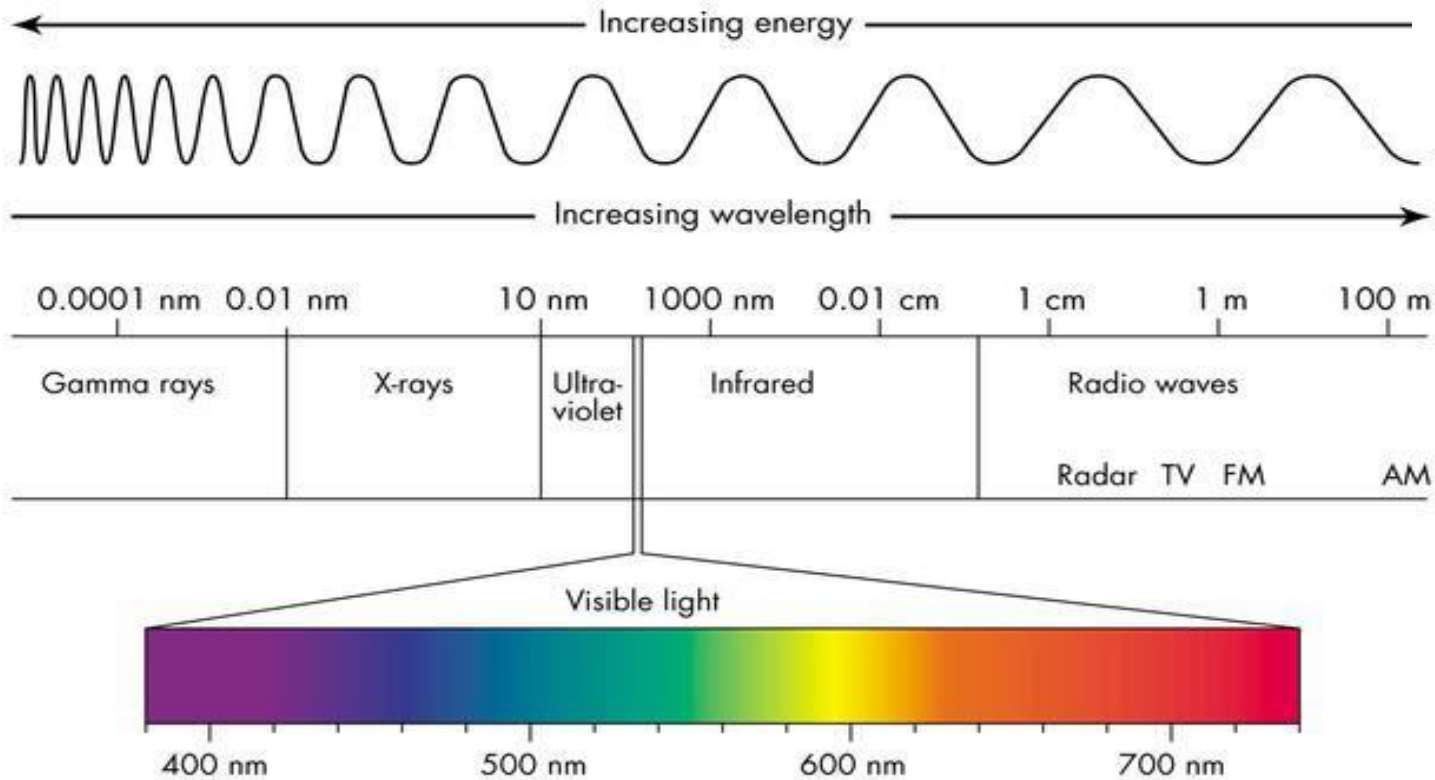
Electromagnetic Radiation

Oxygen
Sugar
Food

Plants

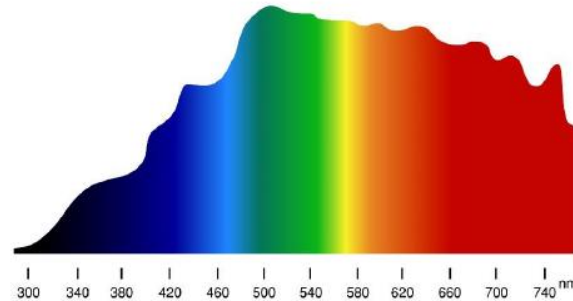
Life





Most natural light – Sunlight

The sunlight, which is the natural light source for plants, provides a broad spectra of different wavelengths.

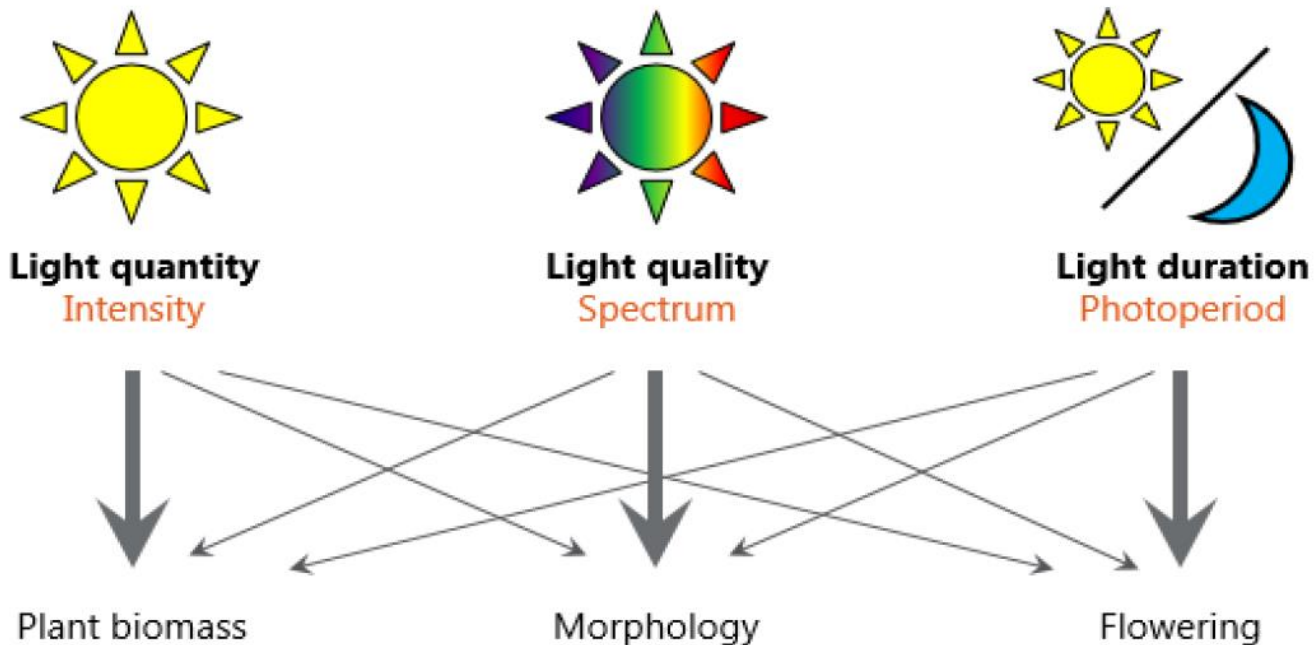


The plants however only absorb specific wavelengths via antenna pigments.

Different regions of wavelength in the illumination spectrum have different effects on the plants:

Wavelength (nm)	Photosynthesis	Effect 1	Effect 2	Effect 3
200 – 280	X	Harmful		
280 – 315	X	Harmful		
315 – 380	X			
380 – 400	✓✓			
400 – 520	✓✓	Vegetative growth		
520 – 610	✓	Vegetative growth		
610 – 720	✓✓	Vegetative growth	Flowering	Budding
720 – 1000	X	Germination	Leaf building	Flowering
> 1000	X	Converted to heat		

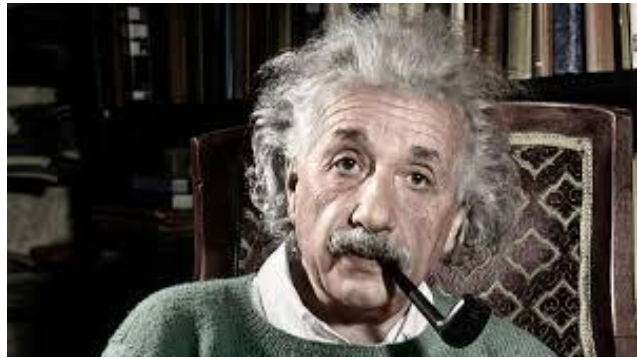
The right Light at the right time



LED REVOLUTION

80% Savings with White Light
> 90% Savings with Photosynthetic Light

Nobel Prizes involved in the LED Revolution



Albert Einstein

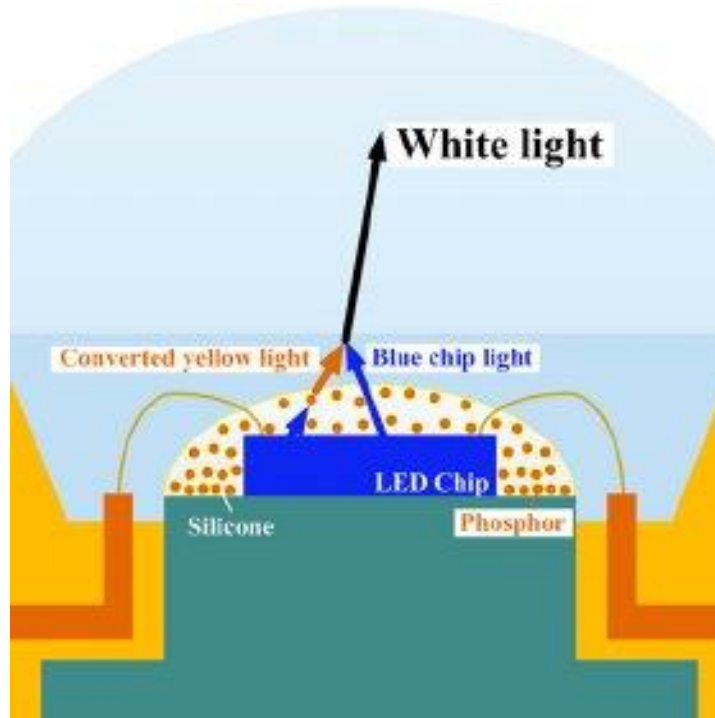


Richard Feynman

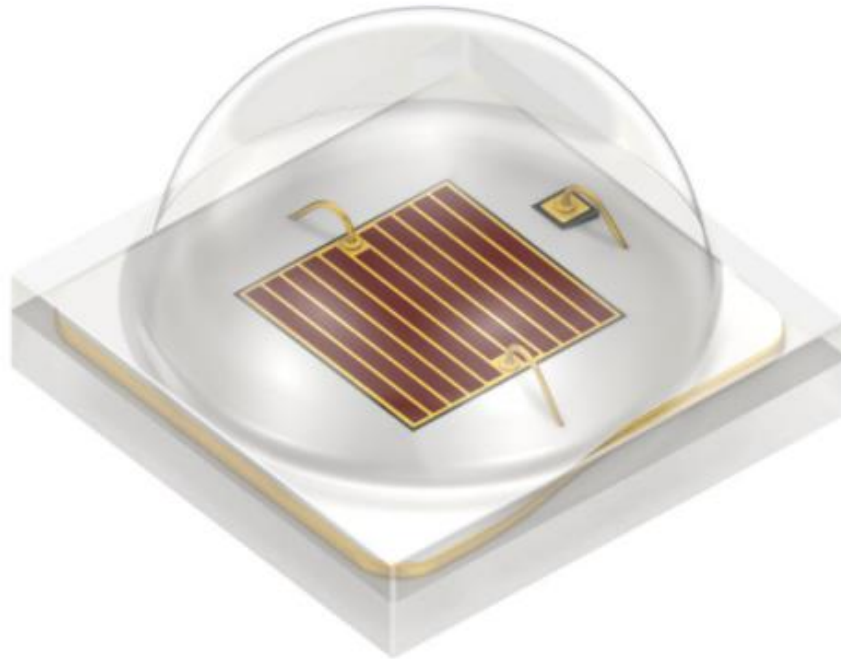


Shuji Nakamura

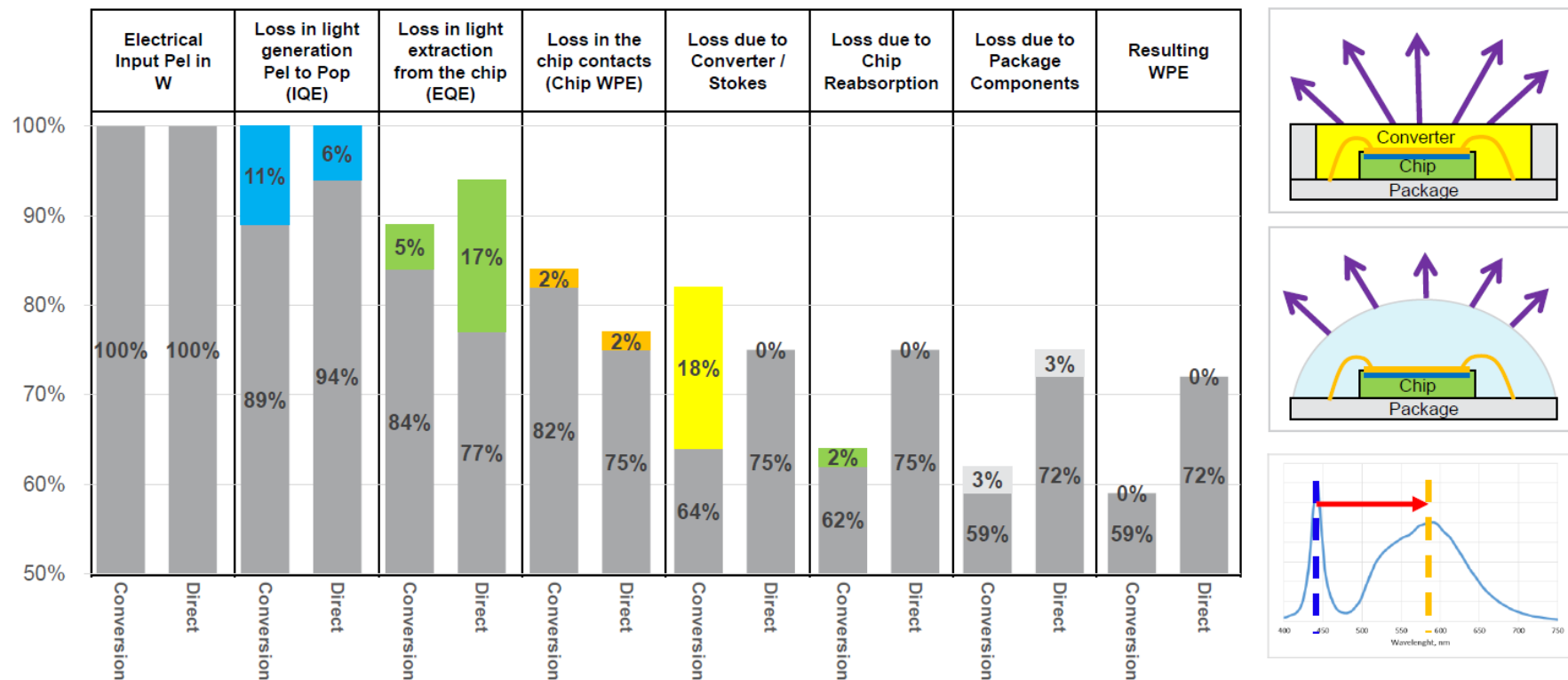
White LED Structure



Horticulture LED Structure



Comparison of the loss channels between a typical 200 lm/W white LED and a direct emitting 660nm LED



Lightsource Test Report

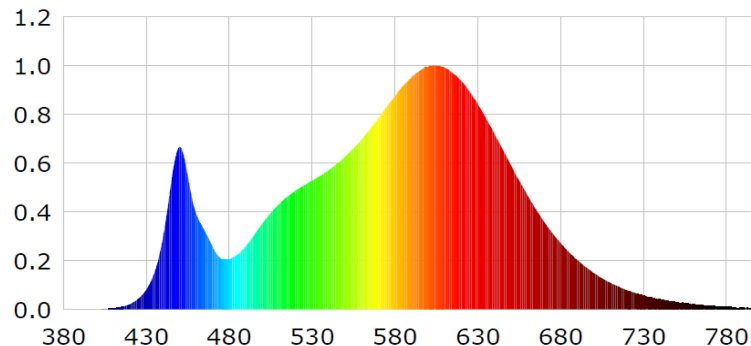
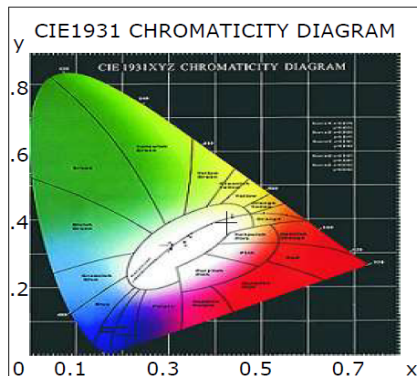
Product Information

Product Category: Bioloed 50W Cannabis

Product Number: 314

Product Type: Horticulture Light

Manufacturer: TzubaVision



Photometric Parameters

Luminous Flux: 3633.11 lm

EEI: 0.13

PAR: 10.846 W

Efficiency: 105.06 lm/W

Energy Efficiency Class: A+ (EU 874-2012)

PPF: 52.049 umol/s

Radiant Power: 11.154 W

R/B: 2.5

Electric Parameters

Voltage: 230.00V

Power Factor: 0.9120

Current: 0.1640A

Frequency: 50.00Hz

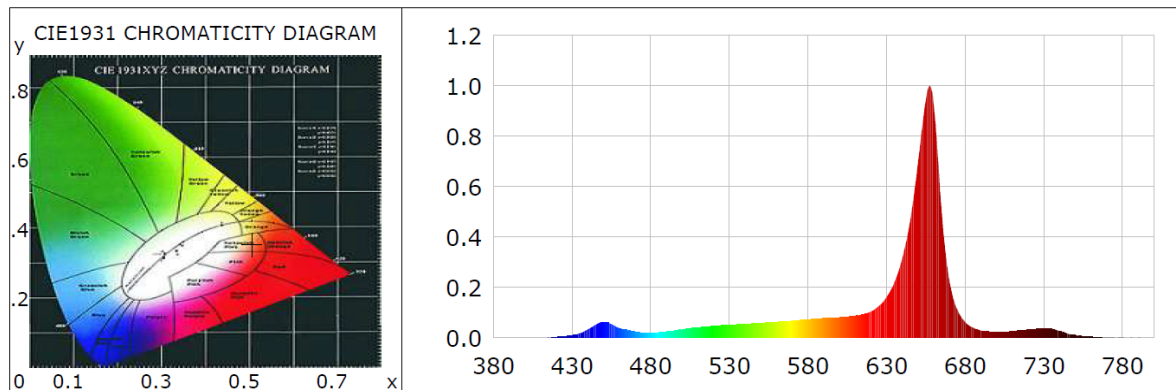
Power: 34.58W

Lightsource Test Report

Product Information

Product Category: Bioled FLW 3W 7R

Product Type: High Power Cannabis Flowering Lamp



Photometric Parameters

Luminous Flux: 44384.83 lm

EI: 0.14

PAR: 261.828 W

Efficiency: 98.59 lm/W

Energy Efficiency Class: A+ (EU 874-2012)

PPF: 1360.398 umol/s

Radiant Power: 273.256 W

R/B: 11.1

Electric Parameters

Voltage: 229.20V

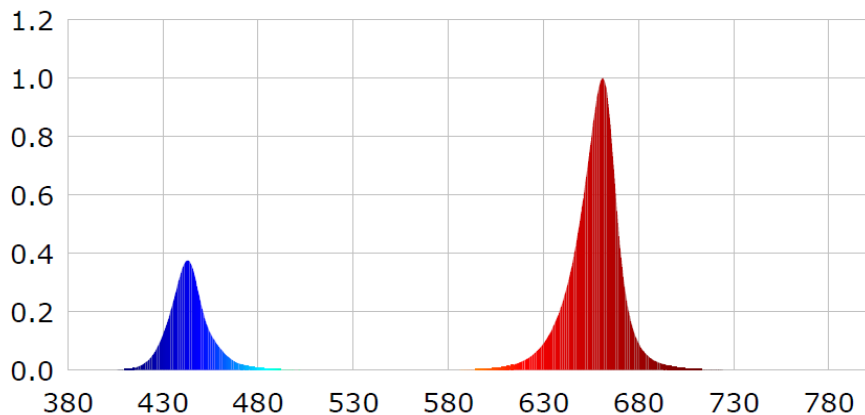
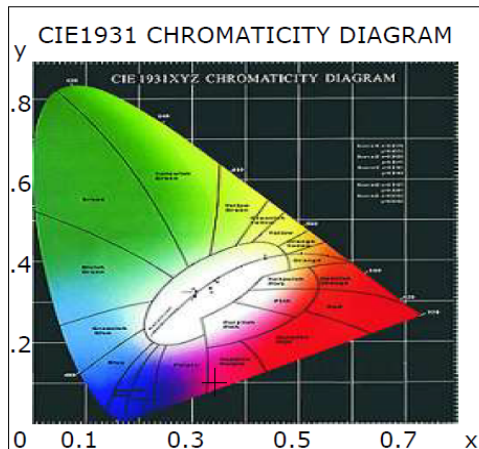
Power Factor: 0.9900

Current: 1.9840A

Frequency: 50.00Hz

Power: 450.20W

Lightsource Test Report



Photometric Parameters

Luminous Flux: 1062.38 lm
EEI: 0.58
PAR: 20.452 W

Efficiency: 22.52 lm/W
Energy Efficiency Class: B (EU 874-2012)
PPF: 103.154 $\mu\text{mol/s}$

Radiant Power: 20.530 W
R/B: 3.0

Electric Parameters

Voltage: 230.10V

Current: 0.2260A

Power: 47.18W

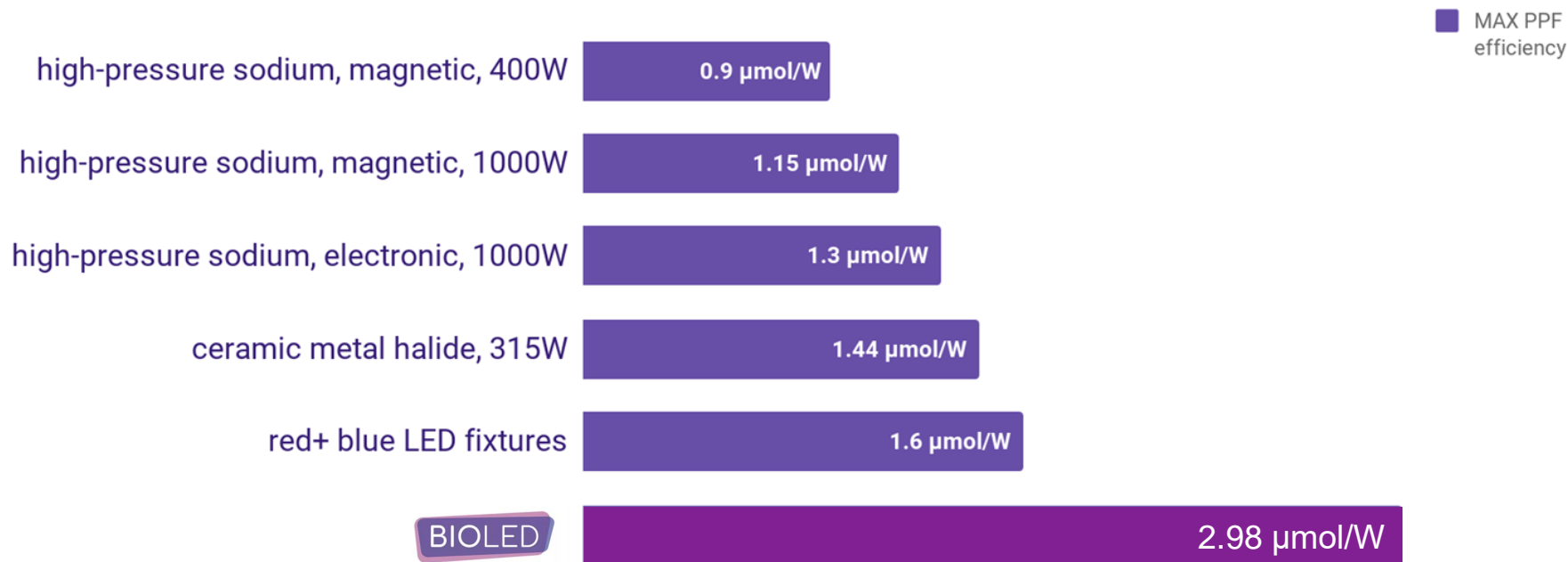
THE GAME CHANGER

Electrical Efficiency of Lamps For Horticulture Light

Source: Bruce Bugbee, Utah State university

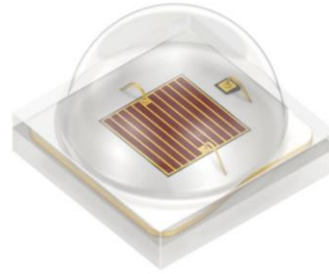
BIOLED

LAMP TYPE



INNOVATIVE SOLUTION

Lightweight and modular
Polycarbonate body



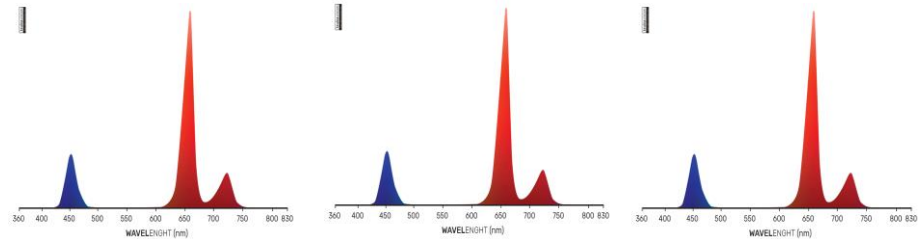
Best LED
On the market

OSRAM
Opto Semiconductors



BIOLED

Extreme Efficient
On-board Driver



Dedicated wavelength
For each crop

Horticultural Lighting – Background

Concepts that are important to know

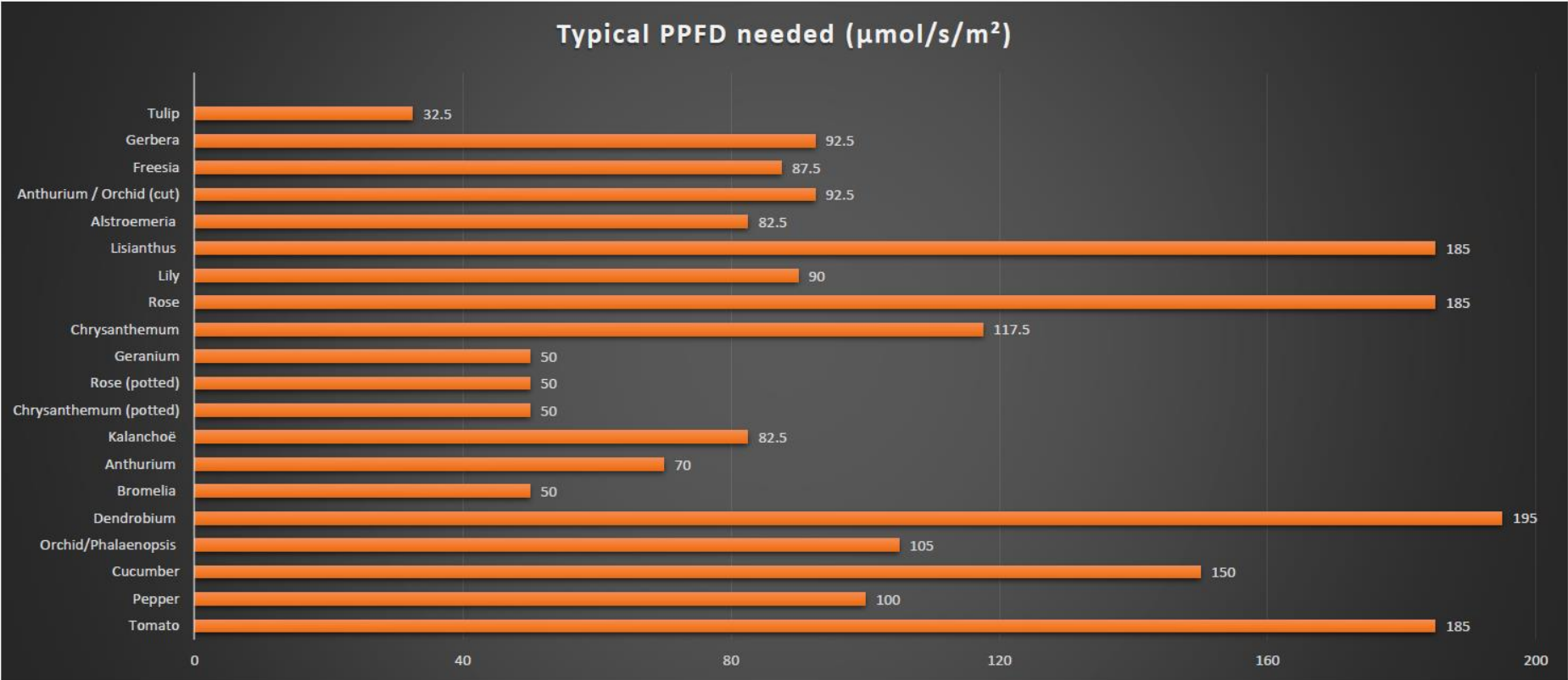
PAR – Photosynthetically Active Radiation (The type of light needed to support photosynthesis in plant life)

PPF – Photosynthetic Photon Flux (Photosynthetically active photons emitted by a lighting system per second in the range of 400-700nm)

PPFD – Photosynthetic Photon Flux Density (The light that actually reaches the surface of the plant)

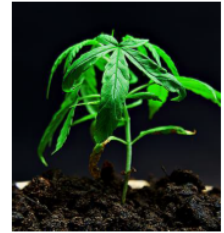
Moles – Number of photons or „light particles“ in visible light. As the number is unquantifiable, we use something related to the Avogadro's number, the micro mole, equivalent to a millionth of a mole.

Different light level requirements of different plants



Cannabis grow light rules and stages

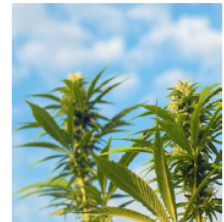
Rooting Stage: 80-160 $\mu\text{mol}/\text{m}^2/\text{s}$ > 20 Hs per day

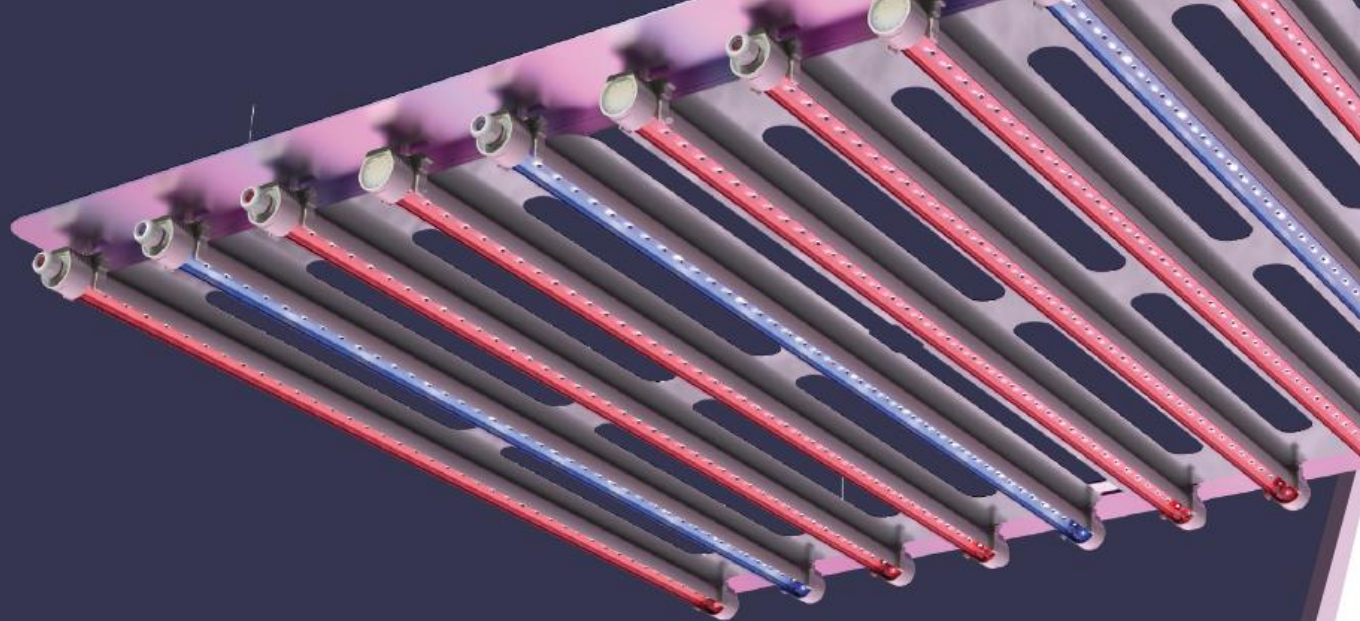


Vegetative Stage: 200-450 $\mu\text{mol}/\text{m}^2/\text{s}$ 18 Hs per Day



Flowering Stage: 750 $\mu\text{mol}/\text{m}^2/\text{s}$ 12 Hs per day



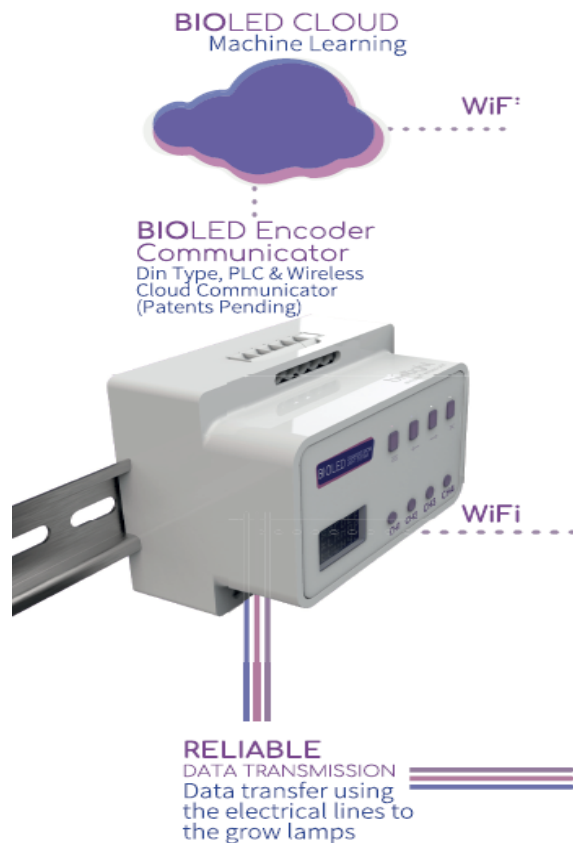


BIOLED CANNABIS GROW LIGHT SYSTEM

Breaking the boundaries of nature

BIOLED SYSTEM

TECHNOLOGY AND PERFORMANCE



CROSS PLATFORM User Interface

Secure Log-In, Remote Control, Programmable, Monitor* & Get support* from anywhere! Using PC, Mobile and Tablet



AGRO EXPERTS

Advisory and support team**



SENSORS

Light, Humidity, Temperature
VideoGrow Monitors
CO₂, PH, O₂

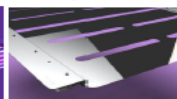
ROUTING Lamps



VEG Lamps



FLOWERING Lamps



BIOLED

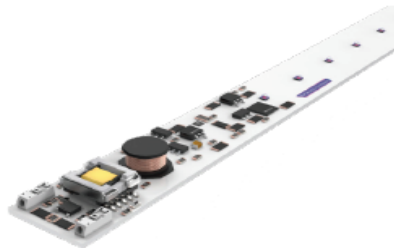
BIOLED LIGHT

TECHNOLOGY AND PERFORMANCE

THE BIOLED PROPRIETY EMBEDDED MICRO DRIVER AND LED PCB (Patent Pending)

Embedded Micro Driver in each single Light Bar
Each Light Bar communicates with the Bioled Encoder
Extremely efficient $\eta > 95\%$, $PF > 0.98$ $THD < 12\%$
Life expectancy up to 100,000 hours
Heavy Duty Ceramic Capacitors
Auto recovery on restart
Thermal, over current and voltage protection
Flicker-Free

The Micro Driver contains:
Programmable CPU
PLC Receiver Decoder
Backup Memory
Dimmer



BIOLED LIGHT BAR

The Light Bar is a single module for any high power Cannabis Lamp which communicates with the Bioled Encoder.

Power +/- 43W
PPF > 125 $\mu\text{Mol/sec}$, $\eta > 2.98 \mu\text{Mol/W}$
Lightweight Polycarbonate Body
Designed for the most extreme environments
UL 94 V-0 Flame retardant
IK10 impact resistant
IP 67 water and dust proof
Large variety of spectrums are available for any crop
UV stabilized



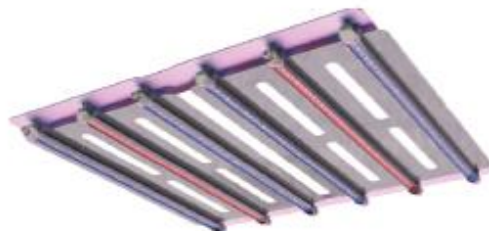
BIOLED FLOWERING LAMP

Photon Flux Efficiency: 2.98μ
Mol/sec/W
PPF (Photonic Power) $>1000 \mu$ Mol/sec
Electric Power +/- 420W
Weight: +/- 18 Lbs.
Dimmable, Tunable, Adjustable Beam
High Efficiency Stainless Steel
Reflector
Quick Connect and easy installation



BIOLED VEG LAMP

Photon Flux Efficiency: 2.98μ
Mol/sec/W
PPF (Photonic Power) $>450 \mu$ Mol/sec
Electric Power +/- 250W
Weight: +/- 14 Lbs.
Dimmable, Tunable, Adjustable Beam
High Efficiency Stainless Steel
Reflector
Quick Connect and easy installation



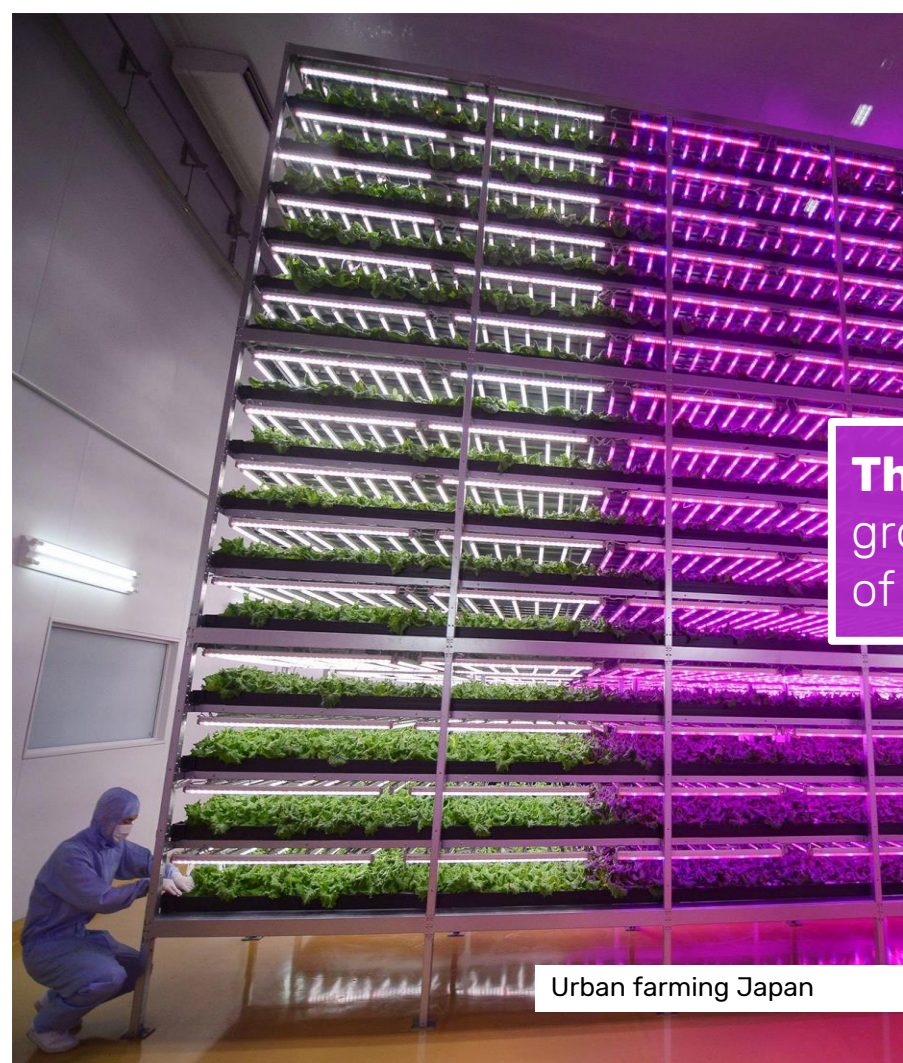
BIOLED CANNABIS GROW
LIGHT SYSTEM

OSRAM
LED TECHNOLOGY INCLUDED



tzubavision
grow light systems ltd.

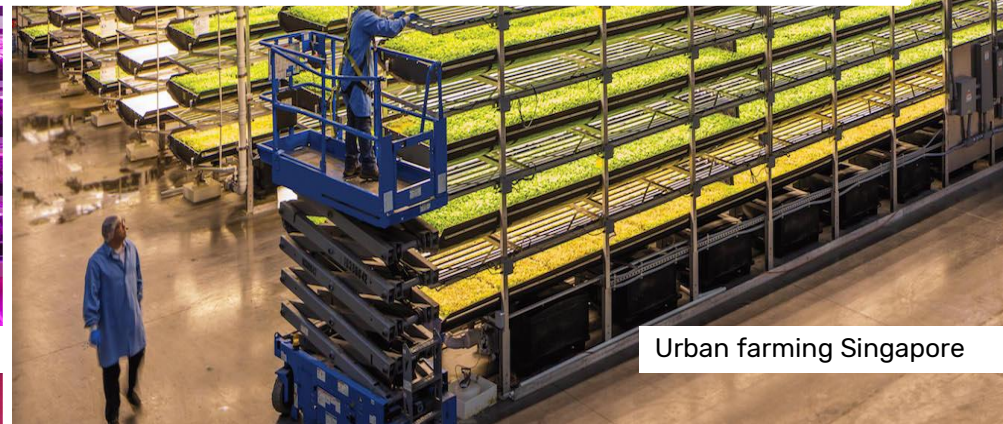




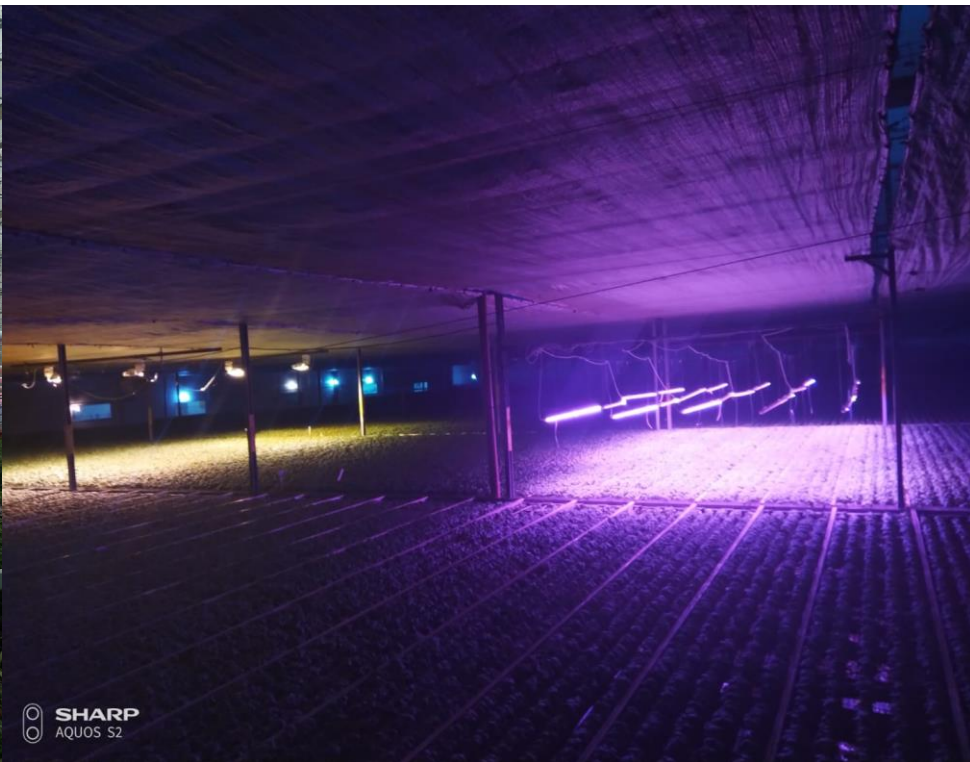
Urban farming Japan



The Solution is Intensive horticultural grow using artificial light, minimal quantity of electricity, water and space



Urban farming Singapore





Market expected by 2022

5.11 Billion USD

not including medical Cannabis



Vertical Farming



Indoor Farming



Green Houses

OUR PARTNERS

BIOLED

Agriculture and Industry
leading cooperative

KIBBUTZ TZUBA

Technological
partner

OSRAM
Opto Semiconductors

Horticulture R & D
leading partner

מינהל המחקר החקלאי | מרכז וולקני
AGRICULTURAL RESEARCH ORGANIZATION (ARO) | VOLCANI CENTER



Presentation Movie
Play