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# gGRO Horticulture



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Our patented lights grow marijuana plants that deliver more grams per watt, and more potent THC per gram

## *Customer Benefits:*

- Indoor organic farming energy savings
- Increased productivity
- Higher plant quality and yields
- Lower install costs
- Accelerated ROI

\*Results validated with 3<sup>rd</sup> Party side-by-side test grow, supervised by Dr. Robert Flannery, Horticultural PhD, in licensed Palm Springs, CA grow facility, and 3<sup>rd</sup> party CA licensed analytics lab

# Market Problems/Opportunity

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## Horticultural Energy Consumption

- Growers use 1000W HPS for indoor grow and greenhouses (cost of Energy) as a low acquisition cost high-output light source
- Regulators looking for solutions to mandate lower wattage options (<36W/ft<sup>2</sup>)
- LED fixtures are expensive and require extensive setup/tailoring to be successful due to lack of UV/FR/IR
- Growers need a better way to reduce facility wattage draw /BTUs/ energy consumption.



## Photosynthetic Productivity

- The industry has adopted the HPS myth of “every photon is created equal for plants to use”
- Full spectrum offers best photosynthetic eV application efficiency (e.g. gGRO is 30% higher eV than HPS at the same PAR uMol intensity)

# Competitive Landscape Analysis

## LED Systems

- LED has no natural UV or IR
- eV limited to output between 350-700nm/m<sup>2</sup>, with similar input watts to gGRO
- LED suppliers price points 35% higher than gGRO
- Upfitting from HPS to LED is prohibitively expensive
- Difficult for growers to choose amongst many LED supplier offerings, no design standard



## HPS Systems

- UVAB mW/m<sup>2</sup> from HPS only half of gGRO CMH output
- HPS (at 10cents/kwhr) cost of operation \$197/yr higher than gGRO CMH operation
- Regulatory threat from state energy regulators to ban HPS usage in grows.
  - For reference: 4% of Colorado power grid used for indoor grows (2018 data)
  - California CEC (mandating higher efficiency of fixtures)
  - Massachusetts Lighting Power Density compliant
  - Illinois requires DLC for lighting fixtures in licensed facilities (LED only standard)



# Value Proposition

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- **Reduced Energy Consumption:** Patented High frequency CMH operation “boosts photosynthetic efficiency above HPS” through providing plants the entire spectrum:
  - 35% energy savings, plus reduced AC loading benefits
  - 14% greater efficiency in Reds and 102% in Far Reds over other CMH sources
  - Targeted optics for enhanced application efficiency “every photon is targeted at the canopy”
  - Presence of IR allows for HPS replacement without the need for growers to “re-set” environment or compensate with costly nutrients
  - Double lamp life (faster crop-flips, lower material costs)
- **Enhanced Productivity:** Full-Spectrum yields increased growth per watt, 20% faster grow/maturity cycles
- **Acquisition Cost vs LED Systems:** 30%+ First year savings on initial acquisition costs over competitive LED systems



# Our Technology

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## THE SCIENCE OF gGRO HORTICULTURE

- **Patented Features**
  - High frequency operation
    - Higher Reds and Far Reds over standard full-spectrum CMH
    - Continuous photon flow, better energy transfer
      - Forster resonance – 130kHz arc faster than photosynthetic energy transfer decay rate
    - Lamp UV content
  - Glass content for shield
  - Renewable Energy Compatible (Solar power ready)
- **Optical footprint optimized for indoor grow**
- **Ease of Mechanical installation**
- **Full spectrum efficiency** (Plank's law) to generate productivity and yields
  - Driving eV absorption across both Chlorophyl A and B
  - Faster growth in Veg and Flower
- **DC Microgrid compatible** for Renewable Energy driven sites



# Enhance Your Operations

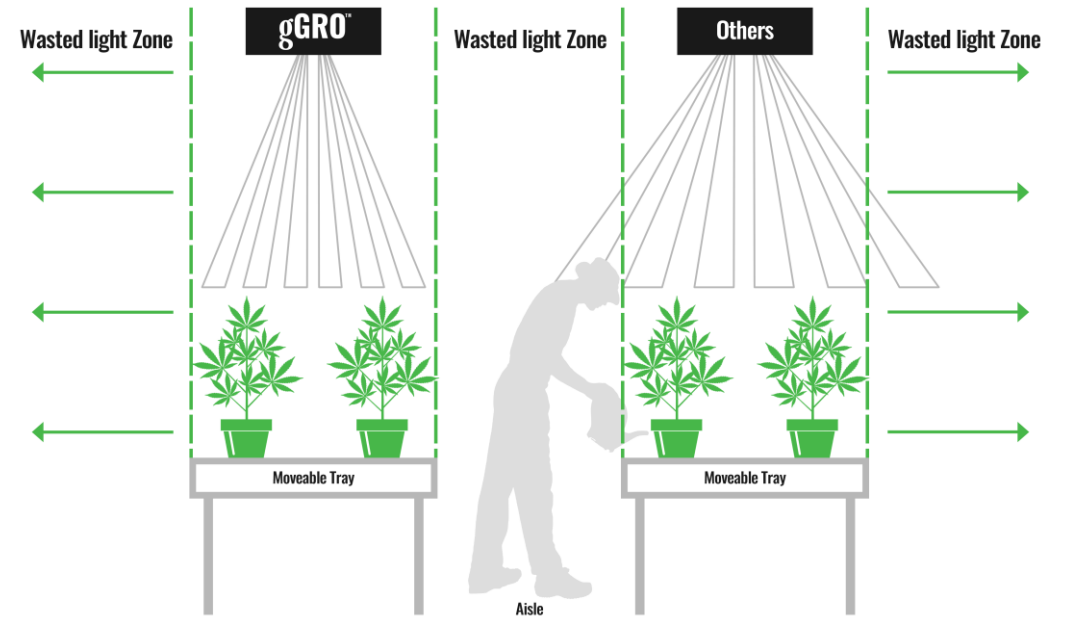
Faster installation with the gGRO 630 CMH fixture



- Daisy-chaining of power for fewer electrical drops
- Solar-Ready (360V DC input) for Micro-Grid installations
- Custom Reflector Optimized for 5x5 spacing (Miro Silver Highly Reflective Optic)
- 0-10V continuous dimming range down to 50%
- Option for lamps to be independently controlled for limitless spectrum tailoring options
- 37% energy savings over 1000W HPS (630W vs 1000W)
- Made in the USA

## No Photons Wasted

gGRO optics are designed for horticulture applications specifically, not for general application commercial lighting



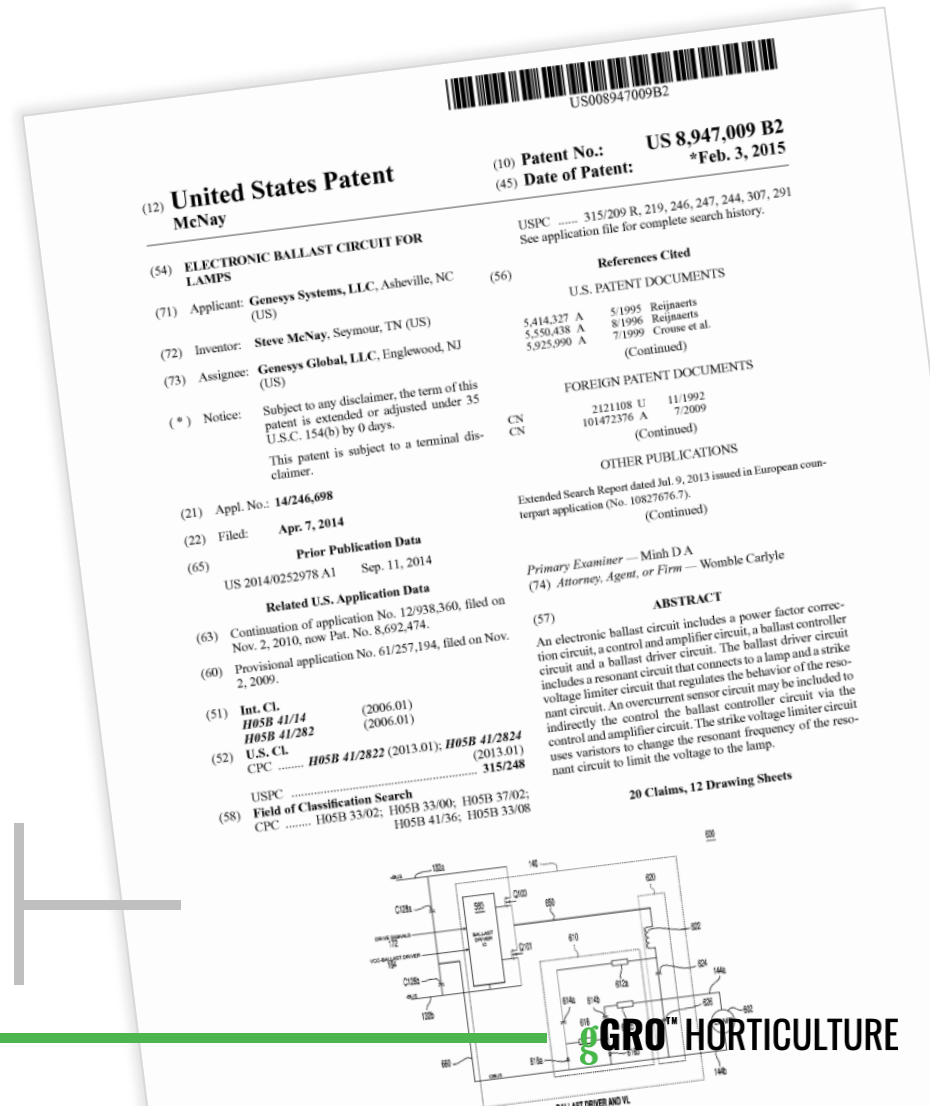
- gGRO innovative technology optimizing a 5x5 layout over plant canopy
- Light does not venture into the wasted light zone of aisles or walls like competitor fixtures.

# Boost Your Yields

Cultivate higher yields from every harvest with our proprietary gHID™ grow lights. **More hertz. More micromoles. Greater Efficiency.**

- *We proudly offer our patented gHID™ technology designed to last longer and run more efficiently than our competitors' technology, and save you money on energy and maintenance.*
- The next generation of HID efficiency
  - Higher efficiency: Greater than **97%+ ballast efficiency**
  - Lifetime: **2X Lifetime** for Metal Halide lamps
  - Greater System LPW: **10-15% boost** in lamp efficiency, depending on lamp technology
  - **Enhanced spectrum:** Patented sinusoidal high frequency improves the activation of the halides in HID lamps directly improving the lamp output for the same power.

*Patented with global coverage, high frequency resonant circuit ballast for high intensity discharge lamps.*



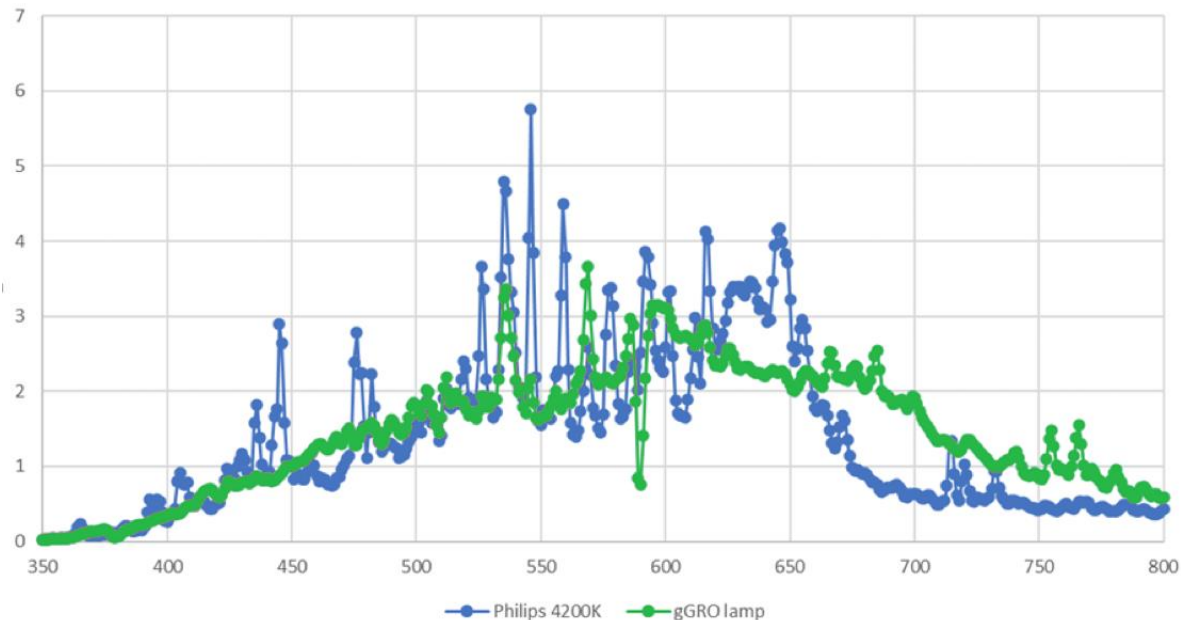


# Bring The Sun Indoors

Traditional HID lamps were optimized for the human eye. gGRO *optimized* their lamp output *for plant growth!*

**gGRO lamps** are Ceramic Metal Halide technology that is a type of metal-halide lamp which is 10-20% more efficient than the traditional quartz metal halide and produces a color gamut far superior to HPS.

Philips 4200K vs gGRO 4200K lamp at 343W



**gGRO CMH** produces **+14% more Red** and **+102% more Far Red** than competitor's CMH lamps, in side-by-side spectral measurements.

**gGRO™  
Spectrums  
Available:**

**'3K'**

(2800K CCT  
nominal)

**'4K'**

(3800K CCT  
nominal)



# gGRO CMH vs HPS

## FIXTURE COMPARISON



Feature	Gavita Pro 1000 DE (HPS)	gGRO 630W CMH	The gGRO Difference
Lamp Wattage Consumed	1000W	630W	37% Energy Savings
Ballast Efficiency	95%	97% +	Patented ballast design
Canopy uMol/s/m	1000 (at 3ft distance)	1073 (at 2ft distance)	Lower IR emission allows for closer suspension to canopy, less wasted light
Viewing angle (FWHM)	138 degrees (Wide-beam)	90.4 degrees (5x5 Focal Plane)	Narrow-beam Micro optic focuses ALL photons on canopy
Blue/UV Content: 200-500nm	~ 3%	12-17% (depending on spectrum selected)	Higher THC, Enhanced Node Shortening and Anti-Fungal Effect
Far Red Content: 700-800nm	~ 5%	7-11% (depending on spectrum selected)	Enhanced Emerson Effect
Input Voltage	240VAC +/-10%	208-277VAC +/-10% or 360 VDC for Solar MicroGrid	Simplify your specification, future-proof your build
Spectrum Shifting Capable	NO	YES	Option: Independently Controlled Lamps
Standard Dimming	NO, Proprietary Protocol	YES, 0-10V Protocol	Works on any standard Horti control
Fixture Daisy-Chaining Capable	NO	YES	Simplify your install, save time/cost

Note: Gavita values cited per documentation located at <https://gavita.com/retail/products/gavita-pro-line-classic/gavita-pro-1000-de/> updated 12/16/20)

# gGRO Spectral Power Distribution

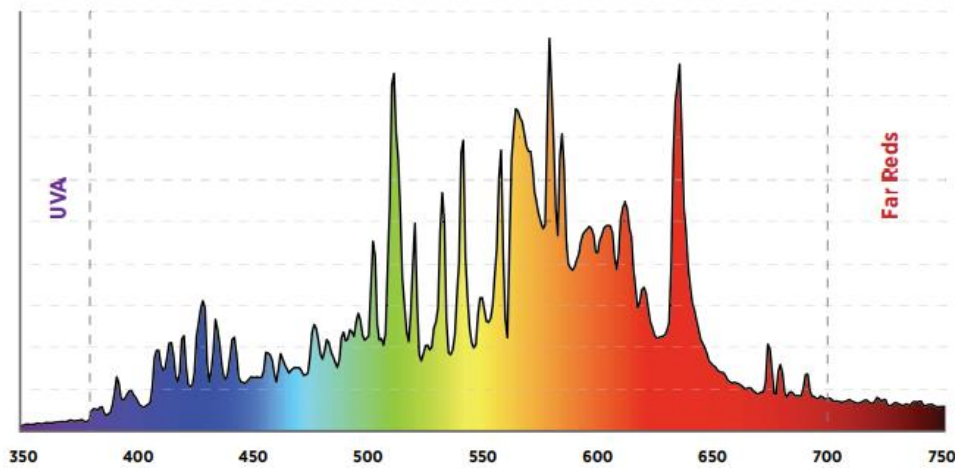
## COMPARISON TO HPS



**gGRO™ HORTICULTURE**



3000K gGRO LAMP

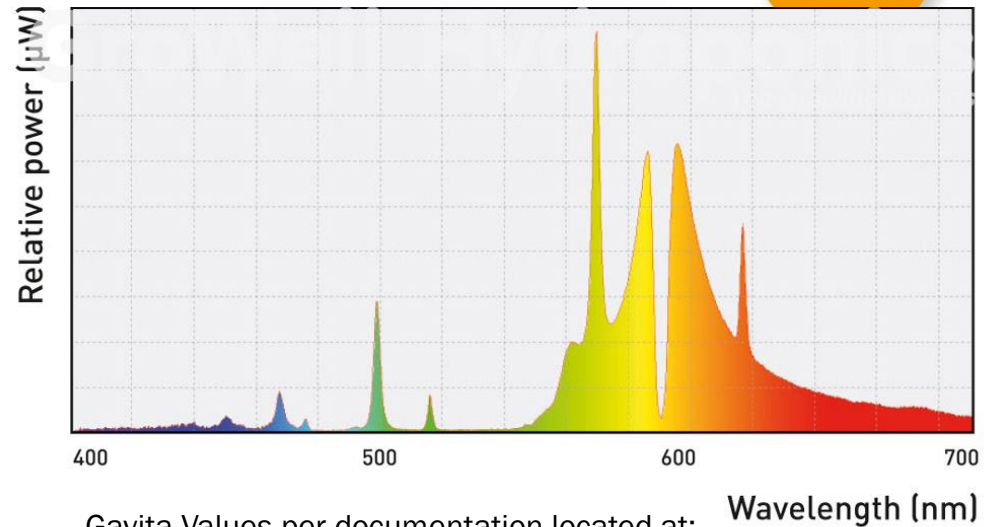


Pro line Plus

**Gavita Pro Plus 1000 W EL DE**



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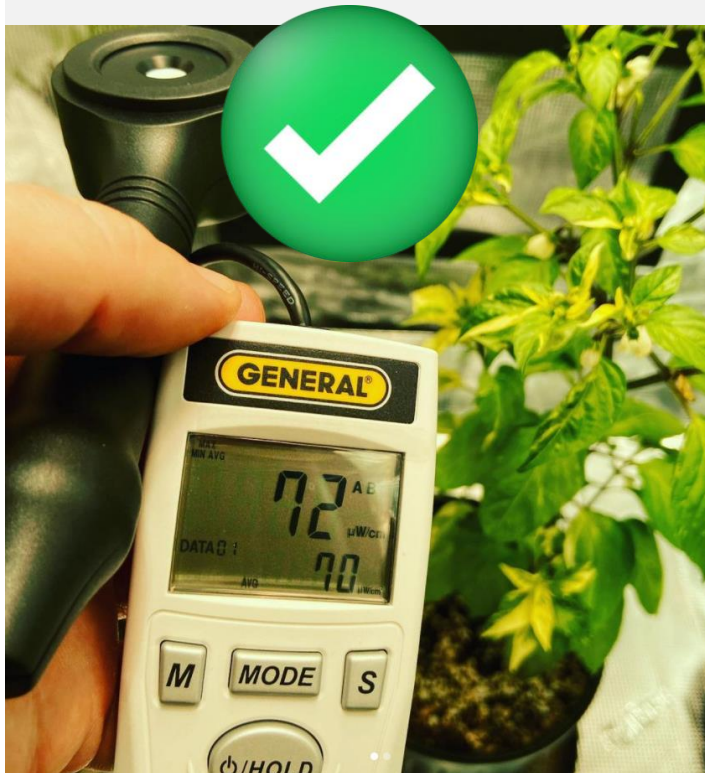


Gavita Values per documentation located at:  
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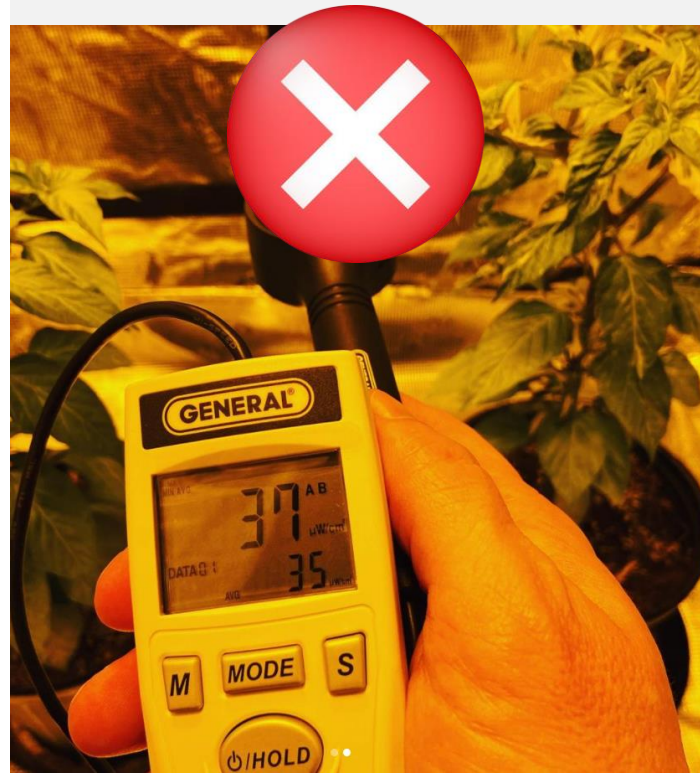
# gGRO CMH vs HPS (UVA & B Content)

UVA and UVB are a critical part of the spectrum for quality plant growth; UV rays reduce mold and mildew, enhance flavonoid production and, in cannabis specifically, increase THC yields.

gGRO 630W Fixture



DE1000W HPS fixture @ 1100W



**gGRO** HORTICULTURAL  
LIGHTING  
SOLUTIONS™

is providing

**DOUBLE**

the beneficial UVA&B

**FOR 40%**

**LESS**

**POWER!**

# Plant Fuel Genetics Side-by-Side



gGRO vs HPS TESTING



The gGRO PAR readings are 20% higher than the HPS I have been using.”

– Doug Jackson,  
*President of Plant Fuel Genetics*

Growth from April 9 – April 28, 2021



HPS 1000W fixtures as baseline



# gGRO CMH vs LED Flower Test

Conducted at Bud, Sweat & Tears  
Indoor Grow (OKC)

## Test Parameters

- Comparison to HLG 650R Diablo LED fixture (650W)
- Strain- Same for each: “Mega Jackpot”
- Ongoing comparison



Side-by-Side Layout

# gGRO CMH vs LED Flower Test

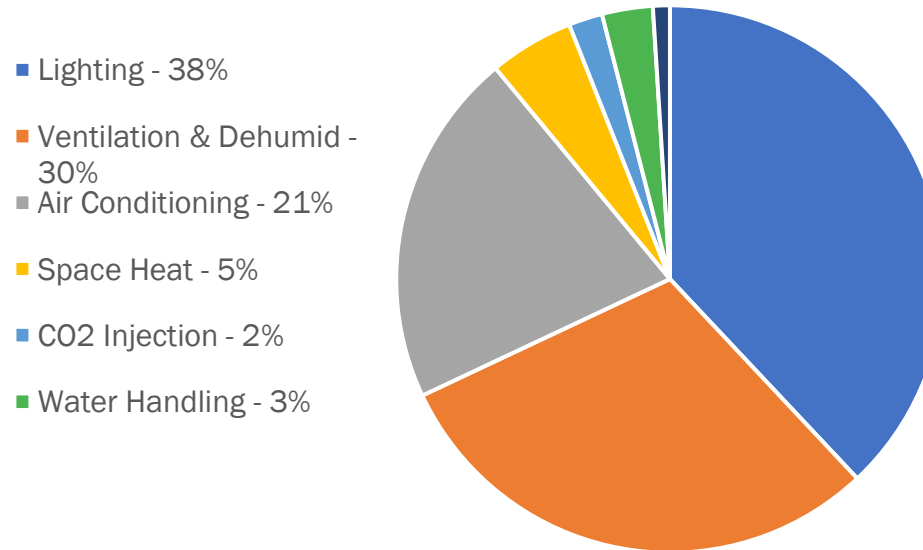
Conducted at Bud, Sweat & Tears Indoor Grow (OKC)



# Cannabis Indoor Grow Energy Use

- Lighting is the largest source of energy usage in a Cannabis grow facility (38%)
- However, 89% of energy usage is directly related to managing indoor environment, from lighting load.
- Reduction of lighting load translates to even larger energy savings within the facility (~2X)

## Indoor Energy Consumption by End Use



Source: California Public Utility Commission, "Energy Impacts of Cannabis Cultivation", April 20, 2017



# Energy Savings

## gGRO SAVINGS CALCULATOR

Cost of Energy	\$0.10per kWhr
Horti. Lighting Hours per Day	12hrs
Annual Horti. Fixture Usage	4,380hrs
gGRO Wattage Savings vs HPS	450 Watts per fixture
gGRO Fixture Energy Savings Over HPS	\$197.10 per fixture per year savings

**37%** Energy Savings over HPS

creates quick ROI for retrofit and better cash flow for new construction.

# Business Model - Target Customers

*Customer "A"*

## Growers already using HPS lighting

Energy Savings | Productivity | Quality

### Existing HPS Fixture Retrofit (*Customer "A"*)

[Price per gGRO fixture + Lamp Subscription model] < [Delta HPS Energy Costs + HPS Re-Lamp costs]

**PAYBACK VS HPS < 2YRS**

*Customer "B"*

## Growers adding capacity or building new grows

Reduced Infrastructure | Reduced First Year Cost | Higher ROI | Quality

### New Construction Pricing Model (*Customer "B"*)

[Price per gGRO fixture < [HPS Fixture + Delta HPS Energy Costs+ HPS Re-lamp Costs]

gGRO Lamp Subscription Model: Annual shipment of replacement lamps, direct from manufacturer. 3-yr commitment is the most favorable piece-price.

**PAYBACK VS HPS < 1YR**

# gGRO is **BUILT TO GROW**

Winning with gGRO Science™

## **gGRO CMH offers enhanced full spectrum**

- **More UV** = more THC for cannabis growers
- **More UV** = less mold and mildew
- **More Far Red** = faster growth /bigger buds

**Each gGRO lamp is independently dimmable with standard Horticultural control systems**

**gGRO 630W fixture allows horticultural growers to tailor both uMol and Spectrum during the lifecycle of the plant**

- Need help with optimum settings by grow-week? Ask Us!
- Now you can create your own optimized and proprietary grow profiles for your branded strains





Contact: Randy McBride (CEO - Canada)  
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www.BizReps.ca

- Canadian Reps in: Ontario, British Columbia, Alberta and Quebec.
- US Reps in: Oregon, California, Washington, Arizona, New Mexico, Missouri, Michigan, Texas, Colorado, Illinois, Iowa, North Dakota, Minnesota, and Silao Mexico.
- Synergy with EV Charger Sales
- Synergy with Solar Sales

THANK YOU

